Form No. 3353-815 Rev A

Trencher

for TX 413 Compact Utility Loaders

Model No. 22465—240000001 and Up

Operator's Manual

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Introduction

Read this manual carefully to learn how to operate and maintain your product properly. The information in this manual can help you and others avoid injury and product damage. Although Toro designs and produces safe products, you are responsible for operating the product properly and safely.

You may contact Toro directly at www.Toro.com for product and accessory information, help finding a dealer, or to register your product.

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. Figure 1 illustrates the location of the model and serial numbers on the product.

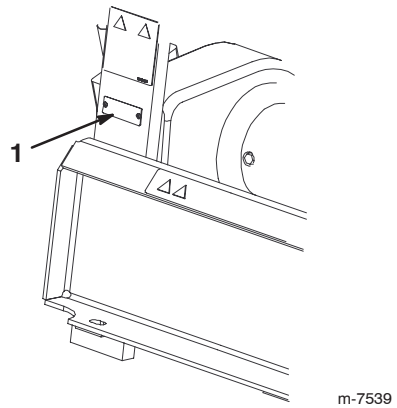


Figure 1

1. Model and serial number plate

Write the product model and serial numbers in the space below:

Model No. _____

Serial No. _____

This manual identifies potential hazards and has special safety messages that help you and others avoid personal injury and even death. ***Danger***, ***Warning***, and ***Caution*** are signal words used to identify the level of hazard. However, regardless of the hazard, be extremely careful.

Danger signals an extreme hazard that **will** cause serious injury or death if you do not follow the recommended precautions.

Warning signals a hazard that **may** cause serious injury or death if you do not follow the recommended precautions.

Caution signals a hazard that may cause minor or moderate injury if you do not follow the recommended precautions.

This manual uses two other words to highlight information. **Important** calls attention to special mechanical information and **Note:** emphasizes general information worthy of special attention.

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Safety

To ensure maximum safety and best performance, and to gain knowledge of the product, it is essential that you and any other operator of the product read and understand the contents of this manual before the engine is ever started.

⚠ This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

Improperly using or maintaining this product could result in injury or death. To reduce this potential, comply with the following safety instructions.

⚠ Danger ⚠

If there are buried power, gas, or telephone lines in the work area, you may dig into them and cause a shock or explosion.

Have the property or work area marked for buried lines and do not dig in marked areas.

⚠ Danger ⚠

The moving teeth and auger will severely cut hands, feet, or other body parts.

- **Keep hands, feet, and any other part of your body or clothing away from moving teeth, auger, or other parts.**
- **Before adjusting, cleaning, repairing, or inspecting the trencher, lower it to the ground, stop the engine, wait for all moving parts to stop, and remove the key.**

⚠ Warning ⚠

If you do not fully seat the quick-attach pins through the attachment mount plate, the attachment could fall off of the traction unit, crushing you or bystanders.

- **Ensure that the quick-attach pins are fully seated in the attachment mount plate.**
- **Ensure that the attachment mount plate is free of any dirt or debris that may hinder the connection of the traction unit to the attachment.**
- **Refer to your traction unit *Operator's Manual* for information on safely connecting an attachment to your traction unit.**

⚠ Warning ⚠

The loader arms may lower when in the raised position after stopping the engine, crushing anyone under them.

Lower the loader arms before stopping the engine.

⚠ Warning ⚠

Hydraulic fluid escaping under pressure can penetrate the skin and cause injury. Fluid injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.

- **Keep your body and hands away from pin hole leaks or nozzles that eject high pressure hydraulic fluid.**
- **Use cardboard or paper to find hydraulic leaks; never use your hands.**

⚠ Caution ⚠

Hydraulic couplers, hydraulic lines and valves, and hydraulic fluid may be hot. If you contact hot components, you may be burned.

- **Wear gloves when operating the hydraulic couplers.**
- **Allow the traction unit to cool before touching hydraulic components.**
- **Do not touch hydraulic fluid spills.**

Safety Decals



99-9952

1. Cutting hazard, chain and auger—stay away from moving parts and keep bystanders away.
2. Warning—stop the engine and remove the key before performing maintenance or repairs.
3. Explosion and/or electric shock hazard—do not dig in areas with buried gas or power lines.



99-9953

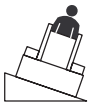
1. Explosion and/or electric shock hazard—do not dig in areas with buried gas or power lines.

Specifications

Width	36 in. (91 cm)
Length	52 in. (132 cm)
Height	24 in. (61 cm)
Weight with 3 ft. boom	400 lb. (182 kg)
Trench depth with a 2 ft. boom	0–29 in. (0–74 cm) 24 in. (61 cm) at a 65 degree angle
Trench width	4–6 in. (10–15 cm)
Trenching angle	0–90 degrees
Auger diameter	12.5 in. (31.8 cm)
Auger speed	108 RPM at 6.5 GPM (25 LPM), 90% eff.
Torque	385 ft-lb. (523 N·m) at 2650 psi. (183 bar)

Stability Ratings

To determine the degree of slope you can traverse with the trencher installed on a traction unit, find the stability rating for the hill position you want to travel in the table below, then find the degree of slope for the same rating and hill position in the Stability Data section of the traction unit *Operator's Manual*.

Orientation	Stability Rating
Front Uphill 	C
Rear Uphill 	D
Side Uphill 	C

Warning

If you exceed the maximum recommended slope, the traction unit could tip, possibly crushing you or bystanders.

Do not drive the traction unit on a slope steeper than the maximum recommended slope.

Operation

Refer to your traction unit *Operator's Manual* for complete instructions on installing attachments onto the traction unit and connecting hydraulic hoses.

Important Always use the traction unit to lift and move the attachment.

Checking the Bearing Case Lube Level

Before operating the trencher, ensure that the bearing case is filled with gear lube.

1. Clean the area around the bearing case fill hole plug (Fig. 3).
2. Remove the plug from the bearing case fill hole (Fig. 3).
3. Look in the hole; the level should be up to the bottom of the hole; if it is not, add gear lube until it comes out the hole.
4. Replace the plug and torque it to 67 to 83 ft-lb. (91 to 112 N·m).

Digging with the Trencher

1. Start the engine.
2. Pull the auxiliary hydraulics lever to the reference bar to engage the trencher.
3. Slowly lower the trencher to the ground so that the boom and chain are parallel to the ground.
4. Begin inserting the nose of the boom and chain into the ground by slowly raising the trencher a few inches off the ground while tilting the nose down into the ground gradually.
5. Once the trencher boom is in the ground at a 45- to 60-degree angle, slowly lower the trencher until the spoils auger is just above the ground.
6. Ensure that all parts of the trencher are functioning correctly.
7. Slowly move the traction unit rearward to extend the trench.

   Note: If you move too fast, the trencher will stall. If it stalls, raise it slightly, slowly drive forward, or reverse the chain direction momentarily.
8. When finished, raise the trencher and boom out of the trench by tilting the attachment rearward, then stop the trencher by shifting the auxiliary hydraulics lever into neutral.

Tips for Trenching

- Clean the area of trash, branches, and rocks before trenching to prevent equipment damage.
- Always begin trenching with the slowest ground speed possible. Increase the speed if conditions permit.
- Always use full throttle (maximum engine speed) when trenching.
- Always trench backward (i.e., in reverse).
- Never transport the trencher with the loader arms raised. Keep the arms lowered and the trencher tilted up.
- When trenching, the spoils auger should just clear the original ground surface to obtain maximum soil removal.
- Trench at a 45 to 60 degree angle for best results.
- You can dig a trench faster by periodically adjusting the loader arms to control the depth of the trencher and prevent it from bottoming out.
- If the trencher binds in the soil, push the auxiliary hydraulics lever fully forward to reverse the chain direction. Once the chain is loose, pull the lever rearward again and continue trenching.
- If you need the finished trench to be cleaner than what is possible with the trencher, you can purchase a crumber from your dealer. The crumber mounts onto the trencher and scrapes the trench clean as you run the trencher.

Transporting the Trencher on a Trailer

- Place the trencher on a trailer or truck capable of carrying it.
- Securely tie the trencher to the trailer or truck using tie straps appropriate for the weight of the trencher and for highway use.

Maintenance

Recommended Maintenance Schedule

Maintenance Service Interval	Maintenance Procedure
8 hours	• Grease all fittings. • Check the teeth and replace any that are worn or damaged. • Tighten the bolt and nut securing the spoils auger.
25 hours	• Adjust the digging chain tension. • Check the condition of the bearing case lube. • Check the boom for wear.
200 hours	• Change the bearing case lube.
Storage Service	• Grease all fittings. • Adjust the digging chain tension. • Paint any chipped surfaces.

Caution

If you leave the key in the ignition switch, someone could accidently start the engine and seriously injure you or other bystanders.

Remove the key from the ignition and disconnect the wire from the spark plug before you do any maintenance. Set the wire aside so that it does not accidentally contact the spark plug.

Greasing the Trencher

Grease all grease fittings every 8 operating hours and immediately after every washing with a general-purpose grease.

1. Clean the grease fittings with a rag.
2. Connect a grease gun to each fitting (Fig 2).

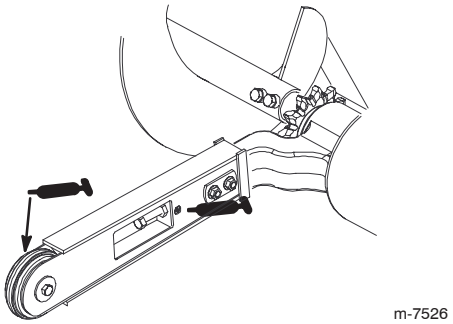


Figure 2

3. Pump grease into the fittings until grease begins to ooze out of the bearings.
4. Wipe up any excess grease.

Servicing the Bearing Case Lube

Check the bearing case lube every 25 operating hours for dirt or other contaminants. Change the gear case lube every 200 operating hours

Lube type: SAE 90–140 API service GL-4 or GL-5

Refill capacity: 1 pint (1/2 l).

Checking the Bearing Case Lube

1. Clean the area around the gear case fill hole plug (Fig. 3).

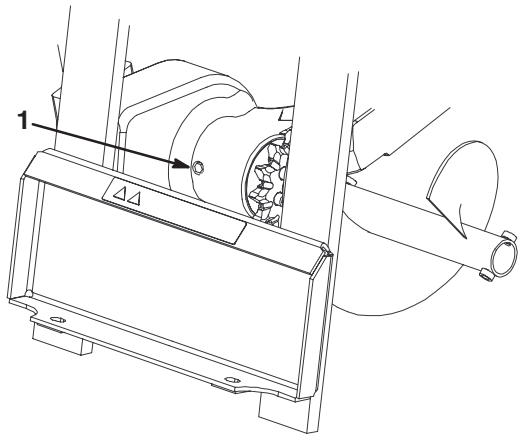


Figure 3

1. Gear case fill hole plug

2. Remove the plug from the gear case fill hole (Fig. 3).
3. Tilt the trencher back until a small amount of oil runs out, catching it on a piece of white paper.
4. If the lube is dirty, refer to Troubleshooting on page 20.
5. Replace the plug and torque it to 15 to 17 ft-lb. (20 to 23 N·m).

Changing the Bearing Case Lube

1. Clean the area around the bearing case fill hole plug (Fig. 3).
2. Remove the plug from the bearing case fill hole (Fig. 3).
3. Lift the trencher until the boom is vertical, draining the lube through the fill hole and into a pan.
4. Return the trencher to the ground.
5. Fill the bearing case with gear lube until it comes out of the fill hole.
6. Replace the plug and torque it to 15 to 17 ft-lb. (20 to 23 N·m).

Adjusting the Digging Chain Tension

Adjust the digging chain every 25 operating hours. With the trencher parallel to the ground, ensure that there are 1-1/2 to 2-1/2 inches (4 to 6 cm) between the bottom of the boom and the top of the bottom chain span. If not, adjust the chain using the following procedure:

Important Do not overtighten the chain. Excess chain tension may damage drive components.

1. Inspect the bottom of the boom for wear; if it is worn, do the following:

   A. Remove the 2 bolts and nuts securing the boom to the trencher arm (Fig. 4).

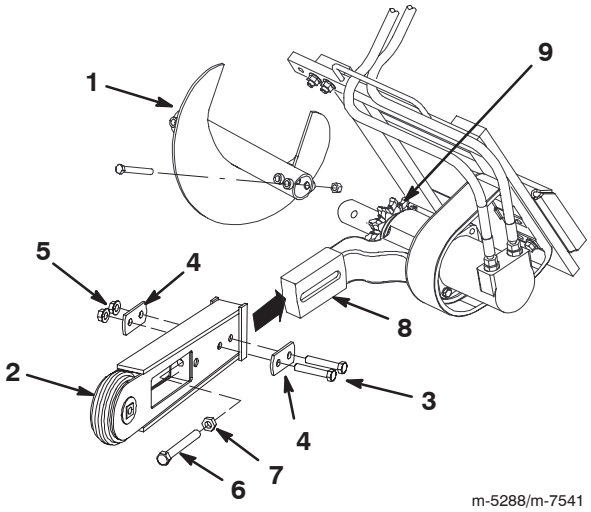


Figure 4

1. Spoils auger
2. Boom
3. Bolts
4. Double washer
5. Nuts
6. Adjusting bolt
7. Jam nut
8. Arm on the drive head
9. Drive sprocket

   B. Loosen the jam nut on the adjusting bolt in the boom (Fig. 4).

   C. Loosen the adjusting bolt until you can remove the chain from the boom (Fig. 4).

   D. Remove the chain from the drive sprocket.

   E. Remove the boom, rotate it so that the bottom becomes the top (or if you have already rotated it once, replace it), and install the boom again.

   F. Replace the nuts, bolts, and washers securing the boom.

   G. Install the chain over the drive sprocket and front roller.

   H. Skip to step 4 to complete the adjustment.

2. Loosen the 2 bolts and nuts securing the boom to the trencher arm (Fig. 4).
3. Loosen the jam nut securing the adjustment bolt (Fig. 4).
4. Turn the adjustment bolt in or out as needed to achieve the desired tension.
5. Tighten the jam nut.
6. Torque the 2 bolts and nuts securing the boom to 135 to 165 ft-lb. (183 to 223 N·m).

Rotating the Boom

Inspect the bottom of the boom for wear and rotate it when it becomes worn.

1. Raise the trencher a few inches above the ground.
2. Stop the engine and remove the key.
3. Remove the bolt and nut securing the spoils auger and remove the auger (Fig. 4).

   Note: Save the bolt and nut for future use.
4. Remove the 2 bolts, nuts, and double washers from the sides of the boom (Fig. 4).
5. Loosen the jam nut on the adjusting bolt in the boom (Fig. 4).
6. Loosen the adjusting bolt until you can remove the chain from the boom (Fig. 4).
7. Remove the chain from the drive sprocket.
8. Remove the boom, rotate it over so the bottom becomes the top (or if you have already rotated the boom once, replace it), and install the boom again.
9. Replace the nuts, bolts, and washers securing the boom.
10. Install the 2 bolts, nuts, and double washers removed in step 4 through the boom and arm, but do not tighten them.
11. Loop the digging chain over the auger drive shaft and onto the drive sprocket, ensuring that the digging teeth point forward on the upper span.
12. Set the upper span of the chain into place on the trencher boom, then wrap the chain around the roller at the end of the boom.

    Important Do not overtighten the chain. Excess chain tension may damage drive components.
13. Thread the adjustment bolt into the boom and turn it in until there is 1-1/2 to 2-1/2 inches (4 to 6 cm) of slack in the chain on the bottom span.
14. Thread the jam nut down the adjusting bolt and tighten it securely against the boom.
15. Torque the 2 bolts and nuts securing the boom to 135 to 165 ft-lb. (183 to 223 N·m).

Replacing the Digging Teeth

Due to the high amount of wear placed on the digging teeth, you will need to replace them periodically.

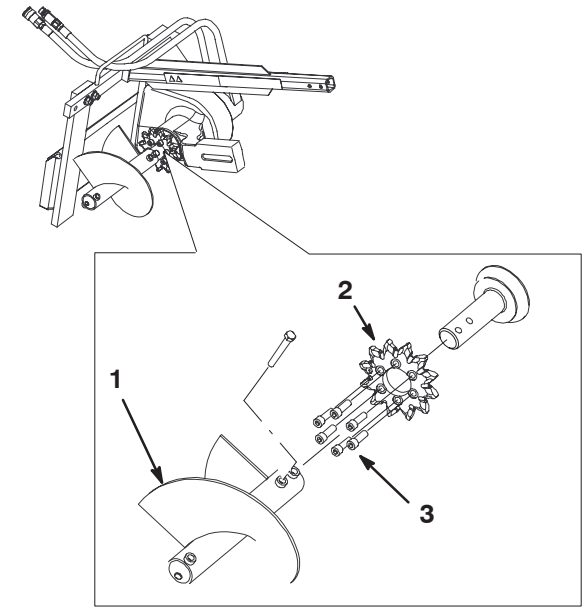
To replace a single tooth, remove the bolts securing the tooth to remove it, then install a new tooth in the same position. Torque the bolts that secure the teeth to 27 to 33 ft-lb. (37 to 45 N·m).

Replacing the Drive Sprocket

Overtime, the drive sprocket will wear, especially when used in sandy or clay soil. When this happens, the digging chain will begin to slip. If the chain slips, replace the drive sprocket, as follows:

1. Raise the trencher a few inches above the ground.
2. Stop the engine and remove the key.
3. Remove the spoils auger (Fig. 5).
4. Loosen the 2 bolts and nuts securing the boom to the trencher arm (Fig. 4).
5. Loosen the jam nut on the adjusting bolt in the boom (Fig. 4).
6. Loosen the adjusting bolt until you can remove the chain from the boom (Fig. 4).
7. Remove the chain from the drive sprocket.
8. Remove the 6 bolts securing the drive sprocket (Fig. 5).
9. Remove and discard the drive sprocket (Fig. 5).
10. Clean the sprocket mounting surface on the trencher.
11. Slide the new sprocket onto the shaft as illustrated in Figure 5.

    Important The arrow on the sprocket face should be visible from the right side of the trencher and should point clockwise; if not, turn the sprocket around.



m-5296/m-7540

Figure 5

1. Spoils auger
2. Drive sprocket
3. Bolts

12. Thread the 6 bolts into the sprocket finger tight (Fig. 5).

13. Slowly begin tightening the bolts progressing around the sprocket until all the bolts are torqued to 95 to 115 ft-lb. (129 to 155 N·m).

Important Tighten each bolt only half way first, working your way around the 6 bolts, then return to each bolt in turn and torque them to the specifications given in step 13.

14. Loop the chain over the auger drive shaft and onto the drive sprocket, ensuring that the teeth point forward on the upper span.

15. Set the upper span of the chain into place on the trencher boom, then wrap the chain around the roller at the end of the boom.

16. Thread the adjustment bolt into the boom and turn it in until there is 1-1/2 to 2-1/2 inches (4 to 6 cm) of slack in the chain on the bottom span.

17. Thread the jam nut down the adjusting bolt and tighten it securely against the boom.

18. Torque the 2 bolts and nuts securing the boom to 135 to 165 ft-lb. (183 to 223 N·m).

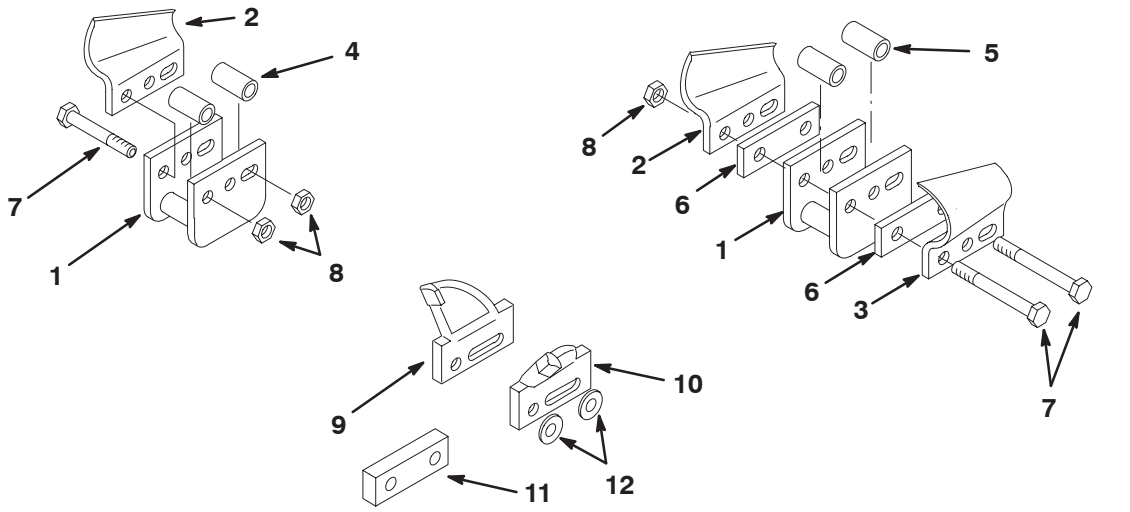
19. Install the spoils auger; refer to Installing the Spoils Auger on page 10.

Reconfiguring the Chain

You can set up the chain in different configurations, depending on the width of the trench desired and the soil conditions at the work site. The chain has 24 links, and each link can have digging teeth fastened to it and is referred to as a tooth position. At each tooth position, the teeth are fastened in various configurations with spacers and tubes to vary the width of cut. The tooth configurations are arranged along the chain to maximize digging efficiency.

There are two types of teeth, cupped and triangular rock teeth. Cupped teeth are designed to cut through and remove soil. Triangular rock teeth cut rock and other hard ground. The teeth are cupped or angled differently depending on the side of the chain to which they are fastened (left or right).

The teeth are fastened to the chain links with bolts, nuts, tubes, and spacers of varying sizes. Figure 6 illustrates the various components of several tooth configurations. The tables on the pages following Figure 6 illustrate the possible chain configurations, detailing which tooth configuration should be installed at each tooth position around the chain for each chain configuration. Each table lists the configurations out to 24 positions.



m–4407, 4408, 4409, 4449

Figure 6

1. Chain link
2. Left, cupped tooth
3. Right, cupped tooth
4. Short tube
5. Long tube
6. Spacer for 6 in. (15 cm), double cupped configuration.
7. Bolt
8. Nut
9. Left triangular rock tooth
10. Right triangular rock tooth
11. Spacer for 6 in. (15 cm), triangular rock tooth configuration
12. Washer (for use with triangular rock teeth only)

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1. Select the chain configuration you want to install from the chain configuration tables contained on the following pages and obtain all the necessary parts.

2. Lower the loader arms, stop the engine, and remove the key.

3. Remove the unneeded teeth and other hardware from the links on the top span of the chain.

Note: When removing teeth, keep the components of each tooth set together so that you can assemble them later.

4. Install each tooth set across the top span from front to back, in the order listed in the appropriate chain configuration table.

Note: Install the tooth configuration illustrated for tooth position 1 first, followed by the configuration for tooth position 2, and so on.

5. Torque the bolts to 27 to 33 ft-lb. (37 to 45 N·m).

6. When all positions are installed on the top span, start the engine, raise the trencher slightly off the ground using the loader arms, and slowly run the chain forward to expose a new section of chain.

7. Stop the engine and remove the key.

8. Repeat steps 3 through 7 until all the chain positions have been changed.

Setting the Spoils Auger Width

Install and position the spoils auger to work correctly with the digging chain configuration you are using. Failing to position the spoils auger correctly may damage the trencher.

1. To install and position the auger, use the bolt and nut that you previously removed from the auger to secure it in the correct holes, as described in the following list:

Note: Refer to Figure 7 when performing this procedure.

Note: To change the width of cut, refer to Reconfiguring the Digging Chain on page 9.

- 4 in. (10 cm) chain configuration

  Using the hole closest to the auger blade in the end of the auger with two holes, connect the auger to the inner hole on the shaft.

- 6 in. (15 cm) chain configuration

  Using the hole farthest from the auger blade in the end of the auger with two holes, connect the auger to the inner hole on the shaft.

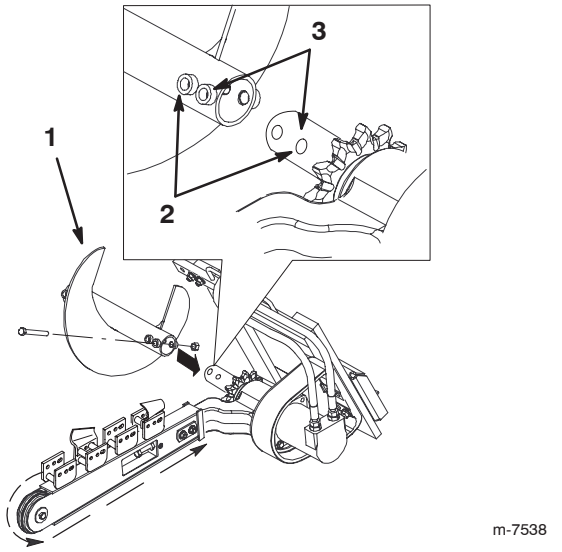


Figure 7

1. Auger
2. Connect these holes for a 4 in. (10 cm) chain
3. Connect these holes for a 6 in. (15 cm) chain

2. Torque the bolt and nut to 75 ft-lb. (101 N·m).

Storage

1. Before long term storage, brush the dirt from the attachment.

2. Check the condition of the digging chain. Adjust and lubricate the chain. Replace any worn or damaged teeth.

3. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged or worn.

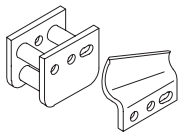
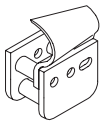
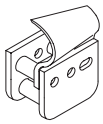
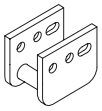
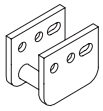
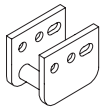
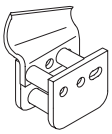
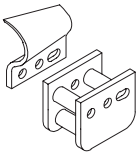
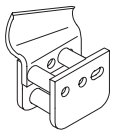
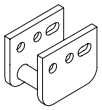
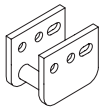
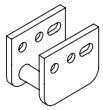
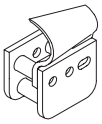
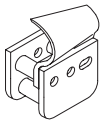
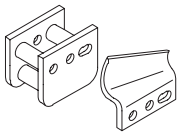
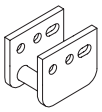
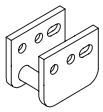
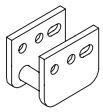
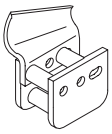
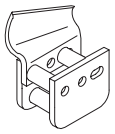
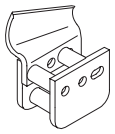
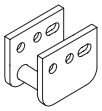
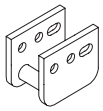
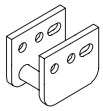
4. Ensure that all hydraulic couplers are connected together to prevent contamination of the hydraulic system.

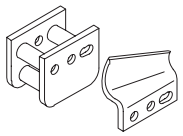
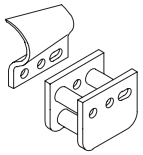
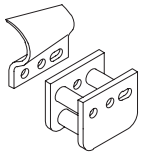
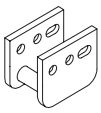
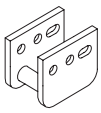
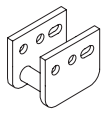
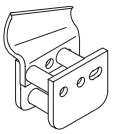
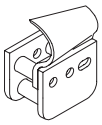
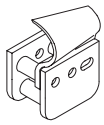
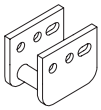
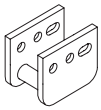
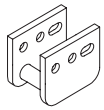
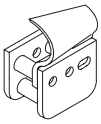
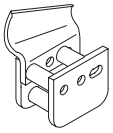
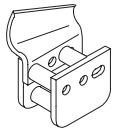
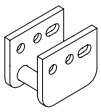
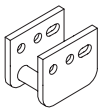
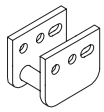
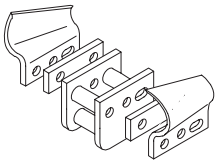
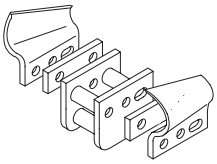
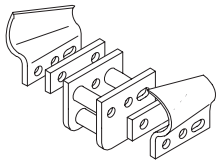
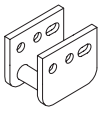
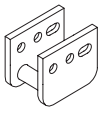
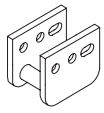
5. Paint all scratched or bare metal surfaces with paint available from an Authorized Service Dealer.

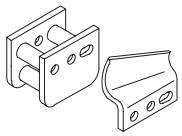
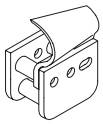
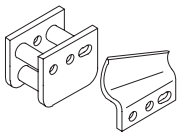
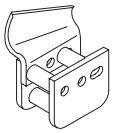
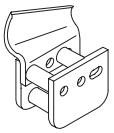
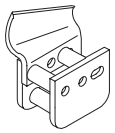
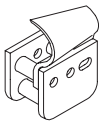
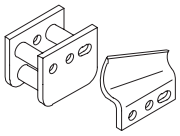
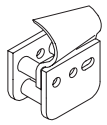
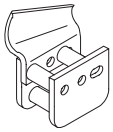
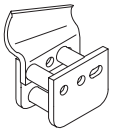
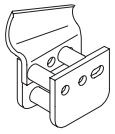
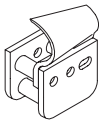
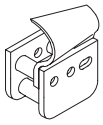
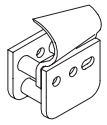
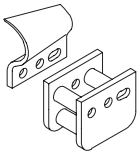
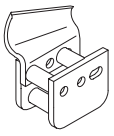
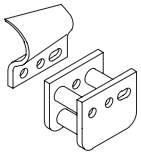
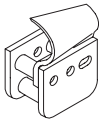
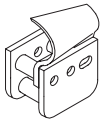
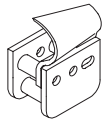
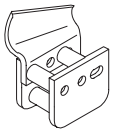
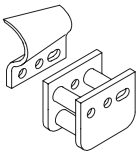
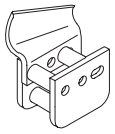
6. Store the trencher in a clean, dry garage or storage area. Cover the trencher to protect it and keep it clean.

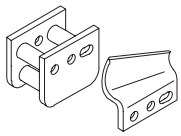
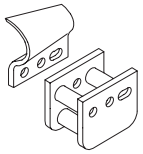
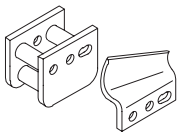
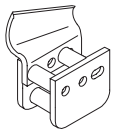
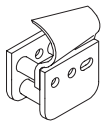
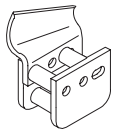
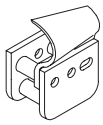
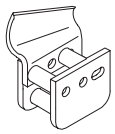
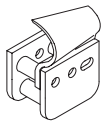
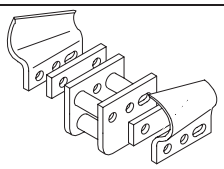
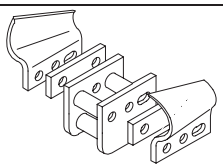
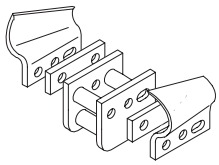
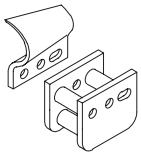
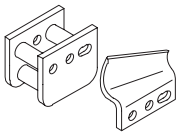
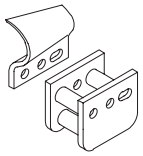
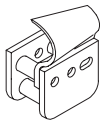
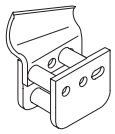
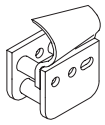
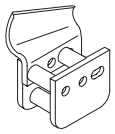
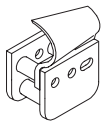
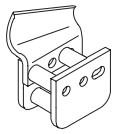
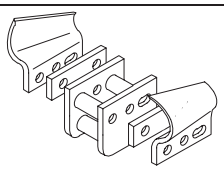
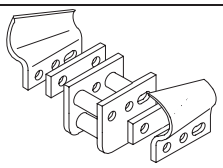
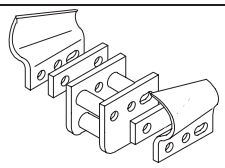
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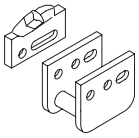
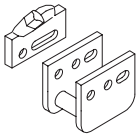
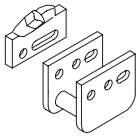
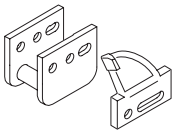
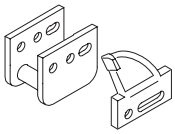
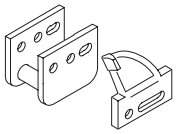
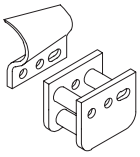
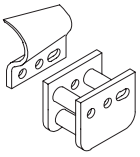
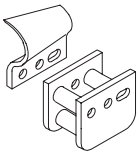
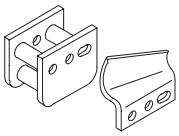
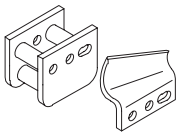
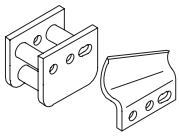
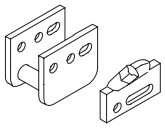
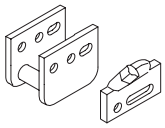
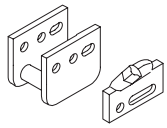
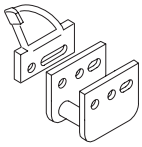
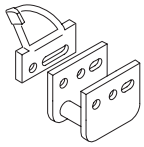
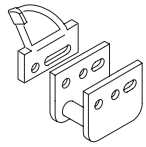
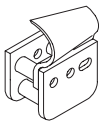
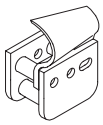
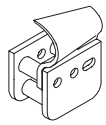
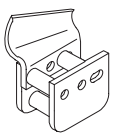
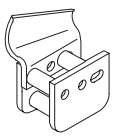
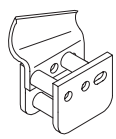
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Typical	4 in. (10 cm)	12
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Sand or Loose	4 in. (10 cm)	14
	6 in. (15 cm)	15
Hard or Rocky	4 in. (10 cm)	16
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Rock	4 in. (10 cm)	18
	6 in. (15 cm)	19

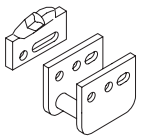
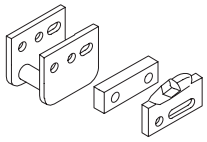
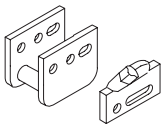
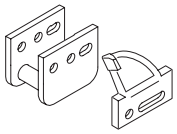
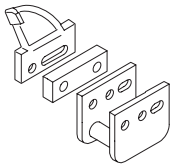
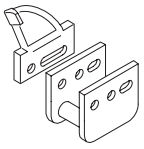
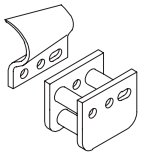
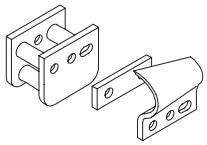
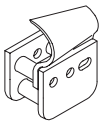
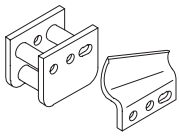
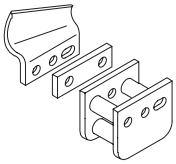
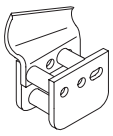
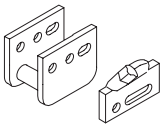
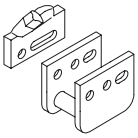
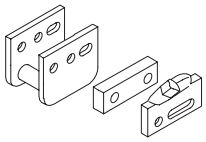
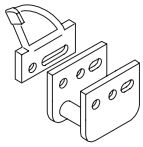
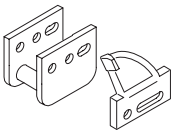
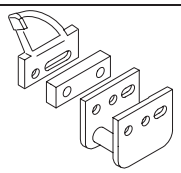
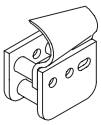
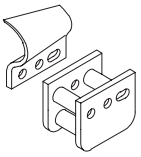
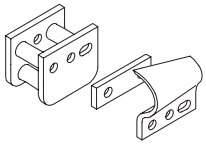
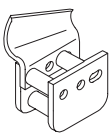
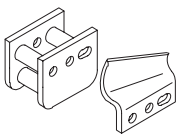
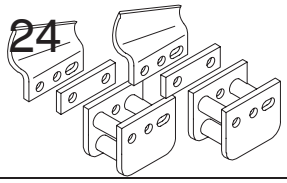
Typical Soil, 4 in. (10 cm) Trench		
Tooth Position and Configuration	**Tooth Position and Configuration**	**Tooth Position and Configuration**
1 	9 	17 
2 	10 	18 
3 	11 	19 
4 	12 	20 
5 	13 	21 
6 	14 	22 
7 	15 	23 
8 	16 	24 

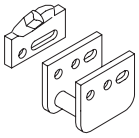
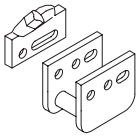
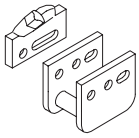
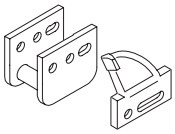
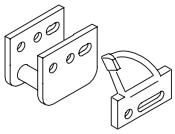
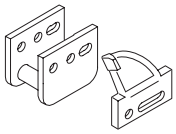
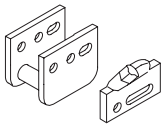
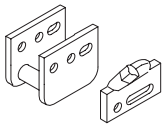
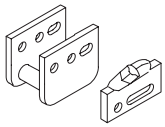
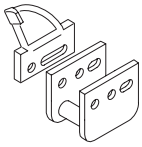
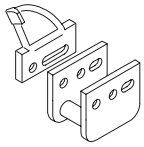
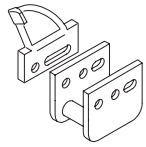
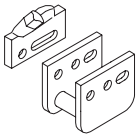
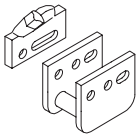
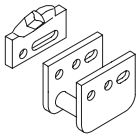
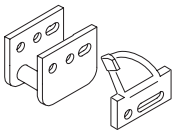
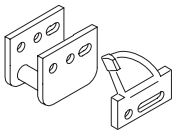
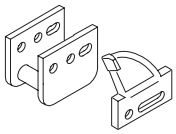
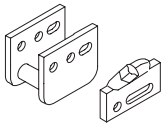
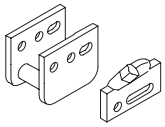
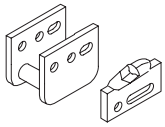
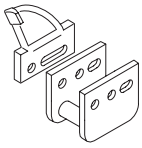
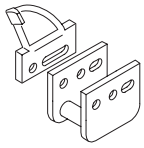
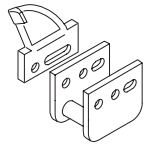
Typical Soil, 6 in. (15 cm) Trench		
Tooth Position and Configuration	**Tooth Position and Configuration**	**Tooth Position and Configuration**
1 	9 	17 
2 	10 	18 
3 	11 	19 
4 	12 	20 
5 	13 	21 
6 	14 	22 
7 **6 in. (15 cm) double cupped** 	15 **6 in. (15 cm) double cupped** 	23 **6 in. (15 cm) double cupped** 
8 	16 	24 

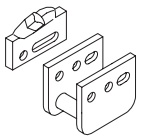
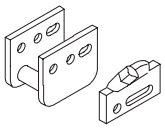
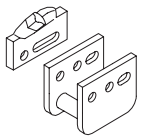
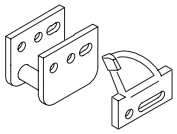
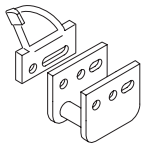
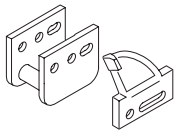
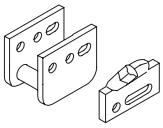
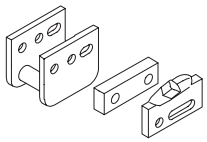
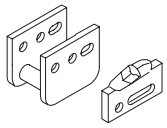
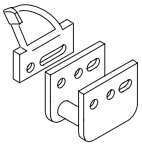
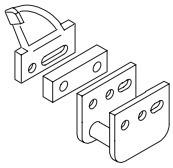
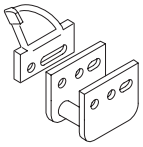
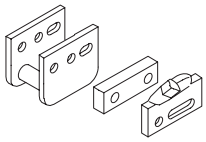
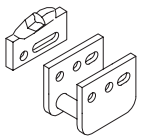
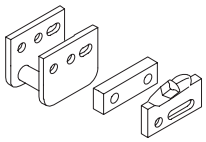
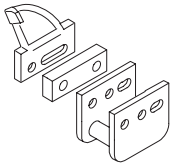
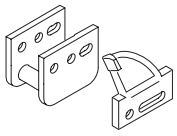
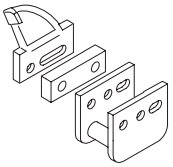
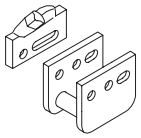
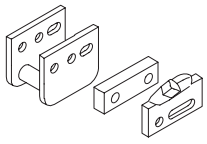
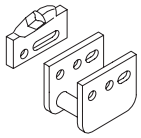
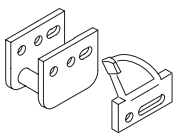
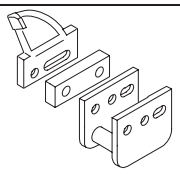
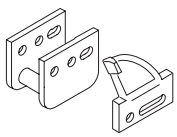
Sand and Loose Soil, 4 in. (10 cm) Trench		
Tooth Position and Configuration	**Tooth Position and Configuration**	**Tooth Position and Configuration**
1 	9 	17 
2 	10 	18 
3 	11 	19 
4 	12 	20 
5 	13 	21 
6 	14 	22 
7 	15 	23 
8 	16 	24 

Sand and Loose Soil, 6 in. (15 cm) Trench		
Tooth Position and Configuration	**Tooth Position and Configuration**	**Tooth Position and Configuration**
1 	9 	17 
2 	10 	18 
3 	11 	19 
4 **6 in. (15 cm) double cupped** 	12 **6 in. (15 cm) double cupped** 	20 **6 in. (15 cm) double cupped** 
5 	13 	21 
6 	14 	22 
7 	15 	23 
8 **6 in. (15 cm) double cupped** 	16 **6 in. (15 cm) double cupped** 	24 **6 in. (15 cm) double cupped** 

Hard or Rocky Ground, 4 in. (10 cm) Trench		
Tooth Position and Configuration	**Tooth Position and Configuration**	**Tooth Position and Configuration**
1 	9 	17 
2 	10 	18 
3 	11 	19 
4 	12 	20 
5 	13 	21 
6 	14 	22 
7 	15 	23 
8 	16 	24 

Hard or Rocky Ground, 6 in. (15 cm) Trench		
Tooth Position and Configuration	**Tooth Position and Configuration**	**Tooth Position and Configuration**
1 	9 	17 
2 	10 	18 
3 	11 	19 
4 	12 	20 
5 	13 	21 
6 	14 	22 
7 	15 	23 
8 	16 	24 

Rock, 4 in. (10 cm) Trench		
Tooth Position and Configuration	**Tooth Position and Configuration**	**Tooth Position and Configuration**
1 	9 	17 
2 	10 	18 
3 	11 	19 
4 	12 	20 
5 	13 	21 
6 	14 	22 
7 	15 	23 
8 	16 	24 

Rock, 6 in. (15 cm) Trench		
Tooth Position and Configuration	**Tooth Position and Configuration**	**Tooth Position and Configuration**
1 	9 	17 
2 	10 	18 
3 	11 	19 
4 	12 	20 
5 	13 	21 
6 	14 	22 
7 	15 	23 
8 	16 	24 

Troubleshooting

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
The chain does not turn.	1. The hydraulic coupler is not completely connected.	1. Check and tighten the hydraulic coupler.
	2. The hydraulic coupler is damaged.	2. Check and replace couplers, if necessary.
	3. There is an obstruction in a hydraulic hose.	3. Find and remove the obstruction.
	4. The auxiliary valve on the traction unit is not opening.	4. Repair the valve.
	5. The trencher boom end bearing failed.	5. Replace the bearing.
	6. The digging chain is too tight.	6. Adjust the digging chain.
	7. There is sand buildup in the tooth root of sprocket.	7. Raise the trencher and run the chain backward, then reduce the chain tension.
	8. The hydraulic motor failed.	8. Contact an Authorized Service Dealer.
	9. The chain drive failed.	9. Contact an Authorized Service Dealer.
The auger does not dig fast enough.	1. The teeth are worn.	1. Replace any worn teeth.
	2. The quick coupler or hose is restricted.	2. Check the hoses and couplers and repair any problems found.
	3. The hydraulic system is too hot.	3. Shut down the system and allow it to cool.
	4. The relief valve is set below specifications.	4. Contact an Authorized Service Dealer.
The chain turns in the wrong direction.	1. The auxiliary valve lever is in the wrong position.	1. Move auxiliary valve lever to the down position.
	2. The hydraulic hoses are reversed.	2. Disconnect the hoses and switch the positions.
The bearing case lube is contaminated.	1. The fill plug is leaking.	1. Look for moisture around the fill plug. If it is present, change the oil, and replace the plug and the plug o-ring.
	2. The O-ring on the motor failed.	2. Contact an Authorized Service Dealer.
	3. The seal failed.	3. Contact an Authorized Service Dealer.