



Trencher
Dingo[®] Attachment
Model No. 22459—210000001 & Up

Operator's Manual



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Introduction

Thank you for purchasing a Toro product.

All of us at Toro want you to be completely satisfied with your new product, so feel free to contact your local Authorized Service Dealer for help with service, genuine replacement parts, or other information you may require.

Whenever you contact your Authorized Service Dealer or the factory, always know the model and serial numbers of your product. These numbers will help the Service Dealer or Service Representative provide exact information about your specific product. You will find the model and serial number plate at the location shown in Figure 1.

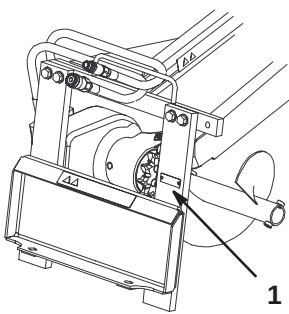


Figure 1

1. Model and serial number plate

For your convenience, write the product model and serial numbers in the space below.

Model No: _____
Serial No. _____

Read this manual carefully to learn how to operate and maintain your product correctly. Reading this manual will help you and others avoid personal injury and damage to the product. Although we design, produce and market safe, state-of-the-art products, you are responsible for using the product properly and safely. You are also responsible for training persons, who you allow to use the product, about safe operation.

The warning system in this manual identifies potential hazards and has special safety messages that help you and others avoid personal injury, 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 the recommended precautions are not followed.

Warning signals a hazard that may cause serious injury or death if the recommended precautions are not followed.

Caution signals a hazard that may cause minor or moderate injury if the recommended precautions are not followed.

Two other words are also used to highlight information. **Important** calls attention to special mechanical information, and **Note** emphasizes general information worthy of special attention.

Safety

Improper use or maintenance by the operator or owner can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety alert  symbol, which means CAUTION, WARNING, or DANGER—"personal safety instruction." Failure to comply with the instruction may result in personal injury or death.



Danger



If you dig around buried power, gas, and/or telephone lines, you may cut them causing shock and/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 the trencher 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 your 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 detailed 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 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.



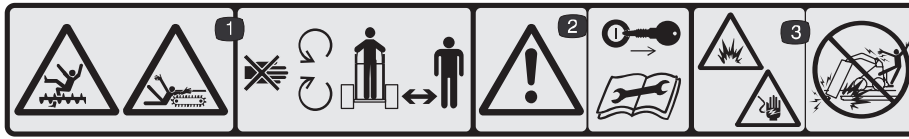
Caution



Hydraulic couplers, hydraulic lines/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 and 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	35 in. (89 cm)
Length	65 in. (165.1 cm)
Height	24 in. (61 cm)
Weight with 3 ft. boom	390 lb. (177 kg)
Trench depth with a 3 ft. boom	0–42 in. (0–107 cm) 36 in. (91 cm) at a 65 degree angle
Trench depth with a 2 ft. boom	0–29 in. (0–74 cm) 24 in. (61 cm) at a 65 degree angle
Trench width	4–12 in. (10–31 cm)
Trenching angle	0–90 degrees
Auger diameter	12.5 in. (31.8 cm)
Auger speed	117 RPM at 11 GPM (42 LPM), 92% eff.
Torque	664 ft.-lb. (900 N·m) at 3000 psi. (207 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.

Important

If your traction unit has a rear operator's platform, the trencher is rated for use with the counterweight. Do not use it without the counterweight or the traction unit will become unstable.

Installation

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

Loose Parts

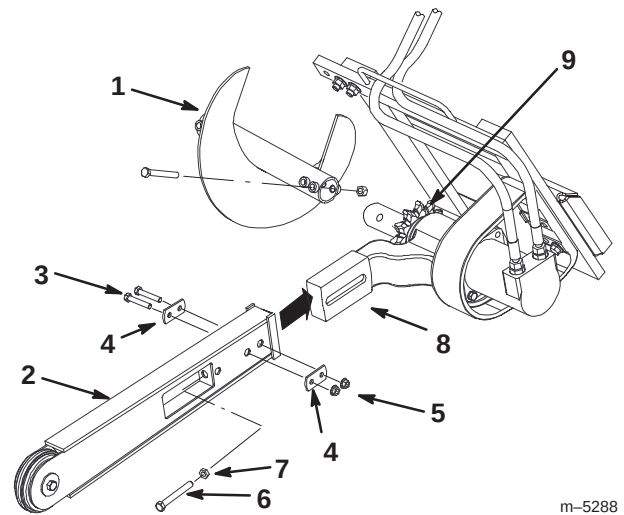
Note: A digging chain must be purchased separately and is required for this trencher.

DESCRIPTION	QTY.	USE
Trencher head	1	Assemble onto the trencher
36 in. (91.4 cm) trencher boom (purchased separately—purchase a 36 in. (91.4 cm) boom for digging trenches more than 24 in. (60.9 cm) deep)	1	
24 in. (60.9 cm) trencher boom (purchased separately—purchase a 24 in. (60.9 cm) boom for digging trenches less than 24 in. (60.9 cm) deep)	1	
Digging chain (purchased separately)	1	
Safety bar (purchased separately)	1	

Assembling the Trencher

Installing the Trencher Boom and Digging Chain

1. Raise the trencher about 6 inches off of 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. 2). Save the bolt and nut for future use.
4. Remove the 2 bolts, nuts, and double washers from the sides of the boom (Fig. 2).



m-5288

Figure 2

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

5. Loosen the adjusting bolt and jam nut (Fig. 2).
6. Slide the boom over the arm on the drive head.
7. Install the 2 bolts, nuts, and double washers removed in step 4 through the boom and arm, but do not tighten them.

8. If the chain is not connected, connect the links by pressing or hammering the clevis pin supplied with the chain through the links.

Important To avoid bending the chain links, place blocks under and between the links when hammering the clevis pin through.

9. Secure the clevis pin with the cotter pin supplied with the chain.
10. 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.
11. 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.
12. Thread the adjustment bolt into the boom and turn it in until there is 1-1/2 to 2-1/2 inches (3.8 to 6.3 cm) of slack in the chain on the bottom span.
13. Thread the jam nut down the adjusting bolt and tighten it securely against the boom.
14. Torque the 2 bolts and nuts securing the boom to 135 to 165 ft.-lb. (183 to 223 N·m).

Installing the Safety Bar

1. Remove the 3 bolts, washers, and flange nuts from the upper left corner of the trencher frame (Fig. 3).

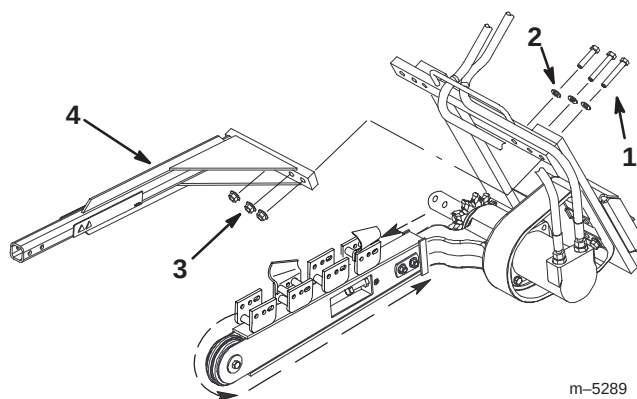


Figure 3

- | | |
|------------|----------------|
| 1. Bolts | 3. Flange nuts |
| 2. Washers | 4. Safety bar |
-
2. Using the fasteners removed in step 1, install the trencher safety bar as illustrated in Figure 3.
 3. Torque the bolts and nuts to 190 to 230 ft.-lb. (257 to 311 N·m).

Installing the Spoils Auger

Before operating the trencher, install and position the spoils auger to work correctly with the digging chain configuration you are using. Failure to position the spoils auger correctly may damage the trencher.

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

Note: Refer to Figure 4 when performing this procedure.

Note: To change the width of cut, refer to Reconfiguring the Digging Chain, page 12.

- 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.

- 8 in. (20 cm) chain configuration

Using the end of the auger with one hole, connect the auger to the inner hole on the shaft.

- 10 or 12 in. (25 or 30 cm) chain configuration

Using the end of the auger with one hole, connect the auger to the outer hole on the shaft.

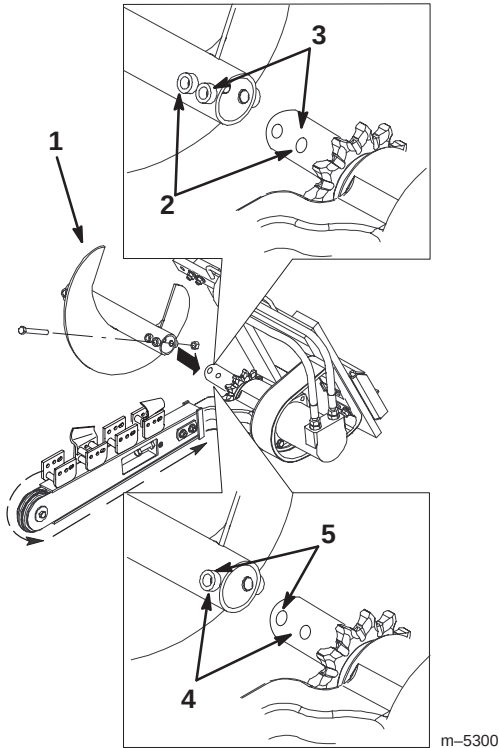


Figure 4

- | | |
|--|---|
| 1. Auger | 4. Connect these holes for a 8 in. (20 cm) chain |
| 2. Connect these holes for a 4 in. (10 cm) chain | 5. Connect these holes for a 10 or 12 in. (25 or 30 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).

Checking the Bearing Case Lube Level

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

1. Clean the area around the bearing case fill hole plug (Fig. 7).

2. Remove the plug from the bearing case fill hole (Fig. 7).
3. Look in the hole, the level should be up to the bottom of the hole; if not add gear lube until it comes out of the hole.
4. Replace the plug and torque it to 67 to 83 ft.-lb. (91 to 112 N·m).

Operation

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

Digging with the Trencher

1. If your traction unit has a speed selector, set it to the slow (turtle position), then start the engine.
2. Pull the auxiliary hydraulics lever to the operator grip 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 moving the auxiliary hydraulics lever into neutral.

Offsetting the Trencher

You can move the trencher to the right side of the trencher frame to allow you to trench close to buildings and other obstacles.

1. Lower the trencher to the ground, stop the engine, and disconnect the hydraulic lines from the trencher.



Warning



Hydraulic fluid escaping under pressure can penetrate 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.

2. Remove the 6 bolts securing the trencher head to the frame (Fig. 5).

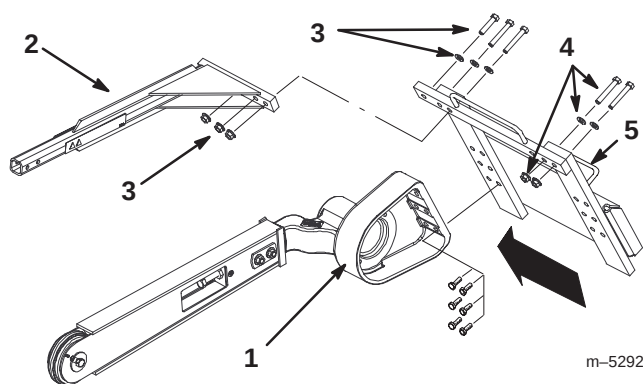


Figure 5

- | | |
|--|--|
| 1. Trencher head (simplified for illustrative purposes) | 4. Bolts, nuts, and washers moved from the right side to the left. |
| 2. Safety bar | 5. Side hose guide |
| 3. Bolts, nuts and washers moved from the left side to the right | |
3. Move the frame to the left, aligning the holes in the right side of the frame with those in the head.
 4. Attach the head to the frame with the 6 bolts removed previously (Fig. 5).
 5. Torque the bolts to 190 to 230 ft.-lb. (257 to 311 N·m).
 6. Remove the 3 bolts, washers, and flange nuts from the safety bar and remove the bar (Fig. 5).
 7. Remove the 2 short bolts, washers, and flange nuts securing the right side of the upper frame and move them to the corresponding holes on the left (Fig. 5).
 8. Install the safety bar over the trencher chain using the 3 bolts, washers, and flange nuts removed previously (Fig. 5).
 9. Torque all 5 bolts and nuts to 190 to 230 ft.-lb. (257 to 311 N·m).

10. Move the hoses from the hose guide on top of the trencher to the hose guide on the left side (Fig. 5).

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 speed if conditions permit.
- Always use full throttle (maximum engine speed) when trenching.
- Always trench backwards (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 will be able to dig a trench faster by controlling the depth with periodic adjustments of the loader arms.
- If your traction unit has a speed selector, set it to the slow (turtle position).
- If your traction unit has a flow divider, adjust it to approximately the 10 o'clock position.
- 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.
- To improve the quality of trenches less than 24 in. (60.9 cm) deep, use a 24 in. (60.9 cm) boom on 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
200 hours	• Change the bearing case lube.
Storage Service	• Grease all fittings. • Adjust the digging chain tension. • Paint chipped surfaces



Caution



If you leave the key in the ignition switch, someone could accidentally 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.

Grease Type: General-purpose grease.

1. Clean the grease fittings with a rag.
2. Connect a grease gun to each fitting (Fig 6).

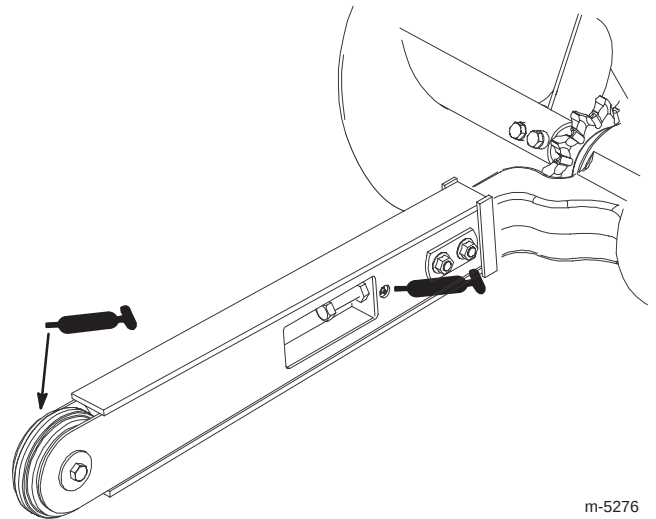


Figure 6

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. 7).

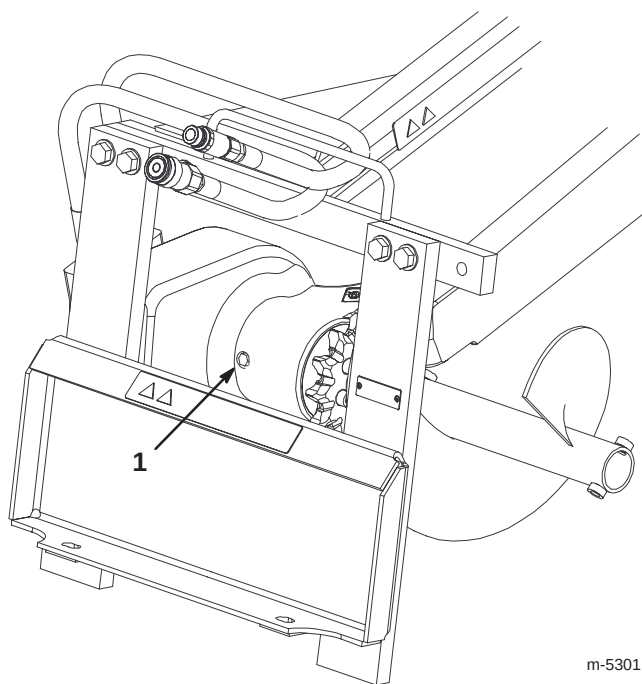


Figure 7

1. Gear case fill hole plug
2. Remove the plug from the gear case fill hole (Fig. 7).
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 the Bearing Case Lube is Contaminated section in Troubleshooting, page 28, to determine a course of action.
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. 7).

2. Remove the plug from the bearing case fill hole (Fig. 7).
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 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 (3.8 to 6.3 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 over tighten the chain. Excess chain tension may damage drive components.

1. Inspect the bottom of the boom for wear, if it is worn, complete the following:
 - A. Remove the 2 bolts and nuts securing the boom to the trencher arm (Fig. 2).
 - B. Loosen the jam nut on the adjusting bolt in the boom (Fig. 2).
 - C. Loosen the adjusting bolt until you can remove the chain from the boom (Fig. 2).
 - D. Remove the chain from the drive sprocket.
 - E. Remove the boom, flip it over so the bottom becomes the top (or if you have already flipped 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. 2).
3. Loosen the jam nut securing the adjustment bolt (Fig. 2).
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).

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 securing 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 soils. 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. 8).
4. Loosen the 2 bolts and nuts securing the boom to the trencher arm (Fig. 2).
5. Loosen the jam nut on the adjusting bolt in the boom (Fig. 2).
6. Loosen the adjusting bolt until you can remove the chain from the boom (Fig. 2).
7. Remove the chain from the drive sprocket.

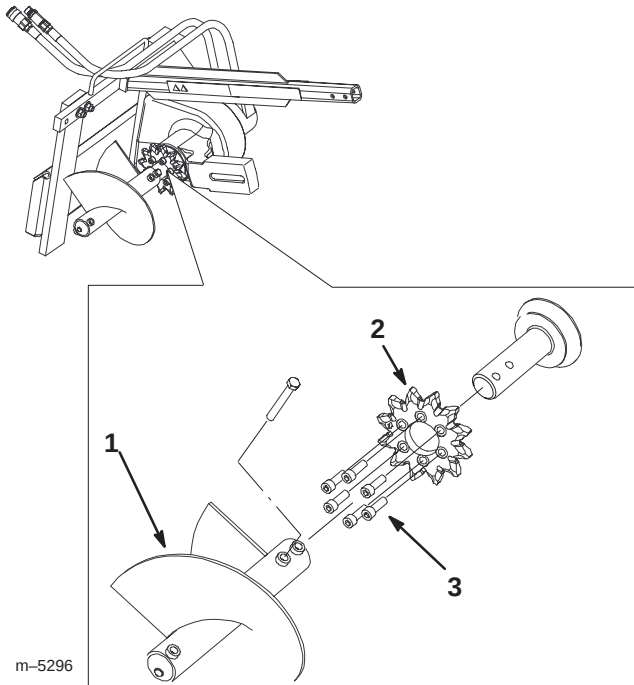


Figure 8

- | | |
|-------------------|----------|
| 1. Spoils auger | 3. Bolts |
| 2. Drive sprocket | |

8. Remove the six bolts securing the drive sprocket (Fig. 8).
9. Remove and discard the drive sprocket (Fig. 8).
10. Clean the sprocket mounting surface on the trencher.
11. Slide the new sprocket onto the shaft as illustrated in Figure 8.

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

12. Thread the six bolts into the sprocket finger tight (Fig. 8).
13. Slowly begin tightening the bolts progressing around the sprocket until all 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 six 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 (3.8 to 6.3 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, page 6.

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. Paint is available from your 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.

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. Depending on the size of

boom you purchased, you will either have a chain with 24 links (24 in. (60.9 cm) boom) or 32 links (36 in. (91.4 cm) boom). 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 placed along the chain in an order that maximizes 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 which side of the chain they are intended to be fastened (i.e., either left or right).

The teeth are fastened to the chain links using bolts, nuts, tubes, and spacers of varying sizes. Figure 9 illustrates the various components of several tooth configurations. The tables on the pages following Figure 9 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 32 positions. If you are changing the configuration of a 24 link chain, ignore the positions 25 through 32 in the tables.

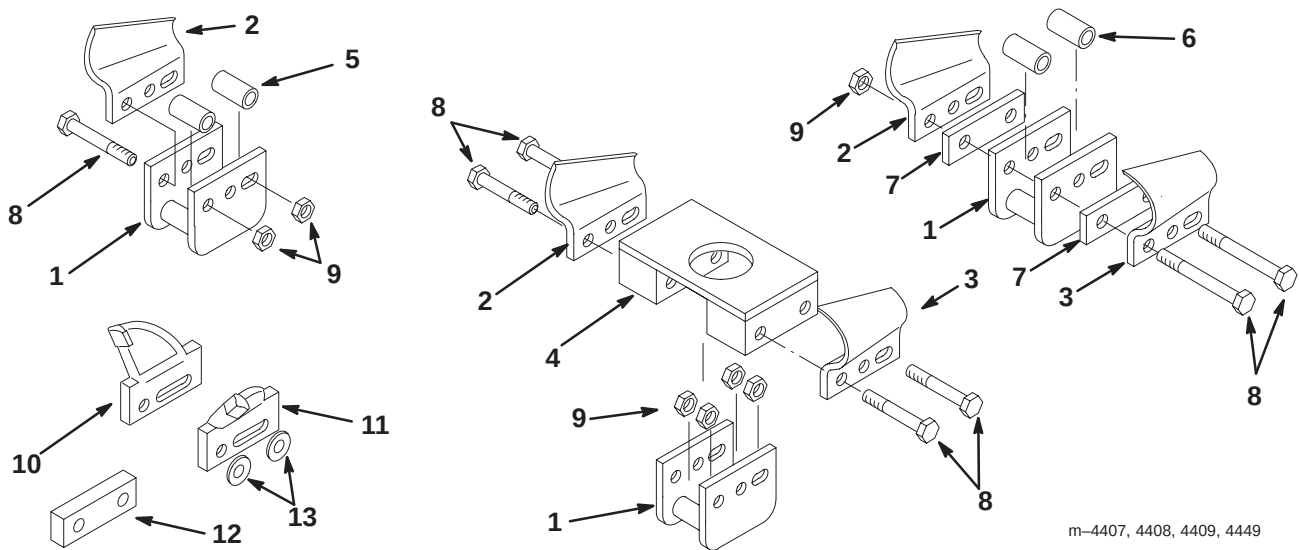


Figure 9

- | | | | |
|---|---|---------------------------------|---|
| 1. Chain link | 5. Short tube | 8. Bolt | 12. Spacer for 6 in. (15 cm), triangular rock tooth configuration |
| 2. Left, cupped tooth | 6. Long tube | 9. Nut | 13. Washer (for use with triangular rock teeth only) |
| 3. Right, cupped tooth | 7. Spacer for 6 in. (15 cm), double cupped configuration. | 10. Left triangular rock tooth | |
| 4. Large spacer—comes in 3 sizes for 8 in. (20 cm), 10 in. (25 cm), and 12 in. (30 cm) cutting width) | | 11. Right triangular rock tooth | |

To reconfigure the chain, complete the following procedure:

1. Select the chain configuration you want to install from the chain configuration tables contained on the following pages and obtain all 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 you can assemble them later.

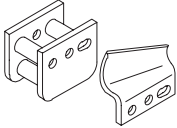
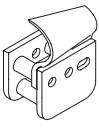
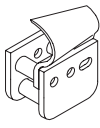
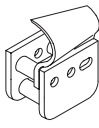
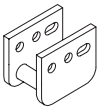
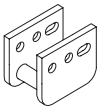
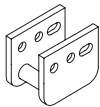
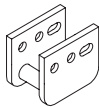
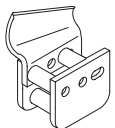
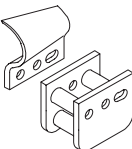
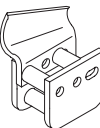
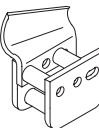
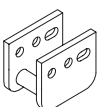
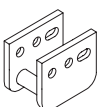
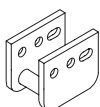
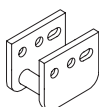
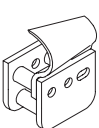
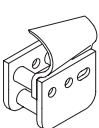
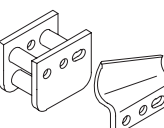
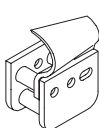
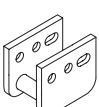
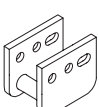
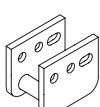
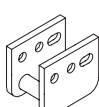
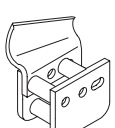
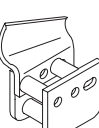
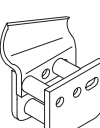
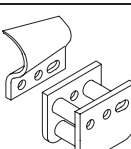
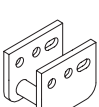
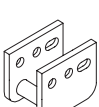
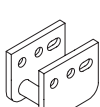
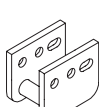
4. Install each tooth set across the top span from front to back, in the order listed in the appropriate chain configuration table.

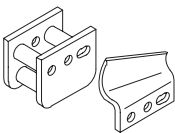
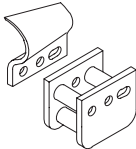
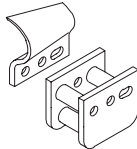
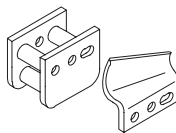
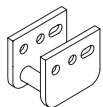
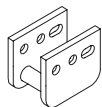
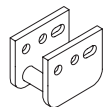
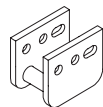
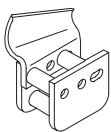
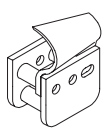
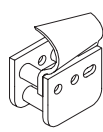
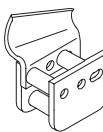
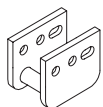
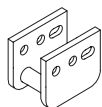
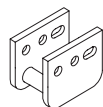
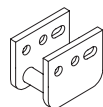
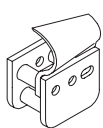
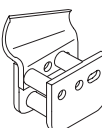
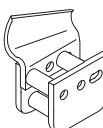
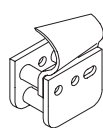
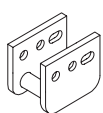
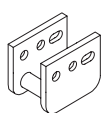
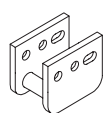
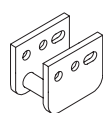
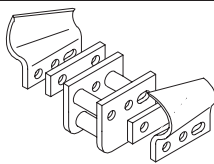
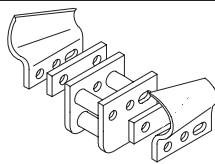
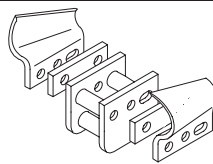
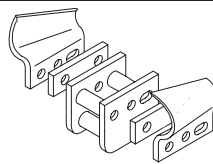
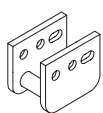
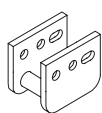
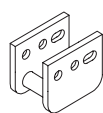
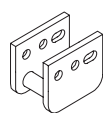
Note: Install the tooth configuration illustrated for tooth position 1 first, followed by the configuration for tooth position 2, and so on.

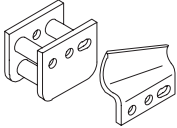
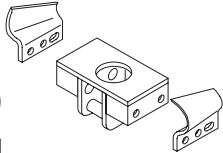
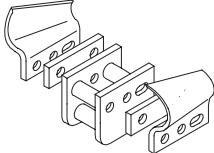
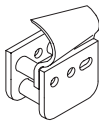
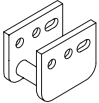
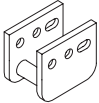
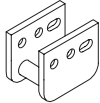
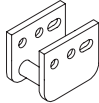
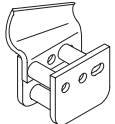
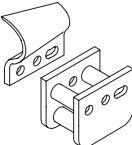
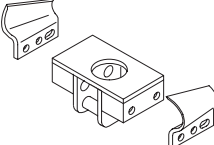
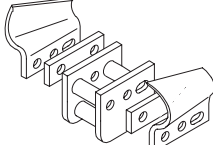
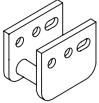
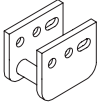
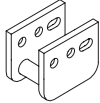
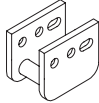
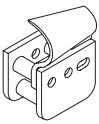
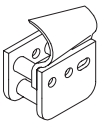
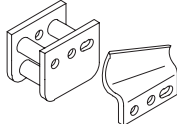
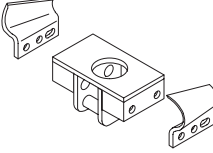
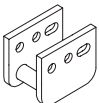
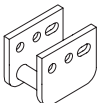
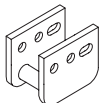
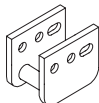
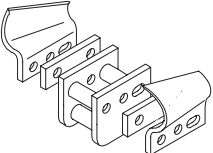
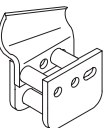
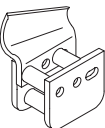
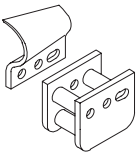
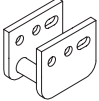
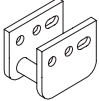
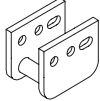
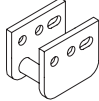
5. Torque the bolts to 27 to 33 ft.-lb. (37 to 45 N·m).
6. When all positions are installed on the top span, start the engine, raise the trencher slightly off the ground using the loader arms, and slowly run the chain forward to expose a new section of chain.
7. Stop the engine and remove the key.
8. Repeat steps 3 through 7 until all chain positions have been changed.

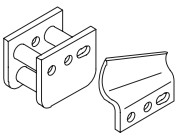
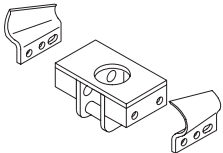
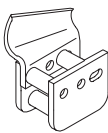
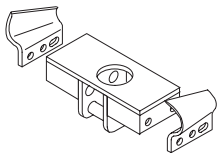
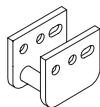
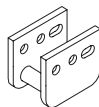
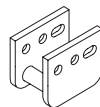
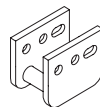
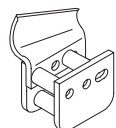
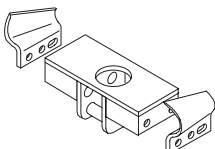
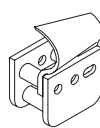
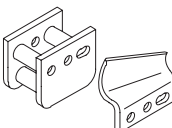
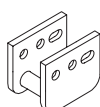
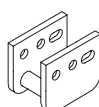
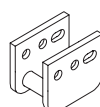
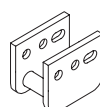
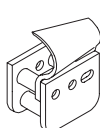
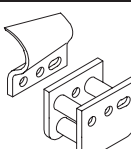
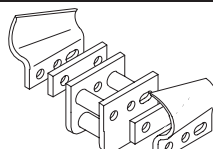
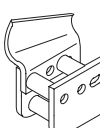
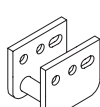
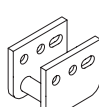
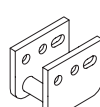
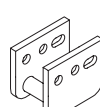
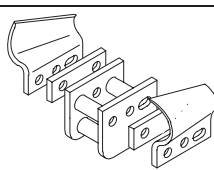
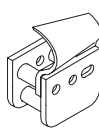
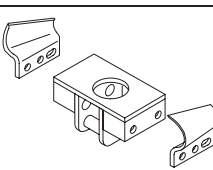
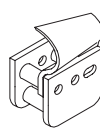
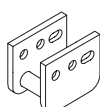
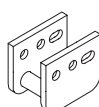
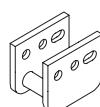
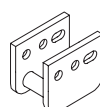
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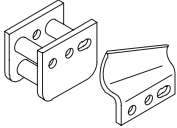
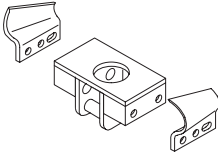
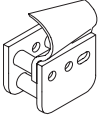
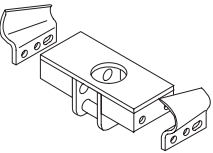
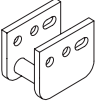
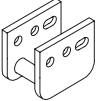
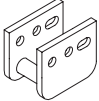
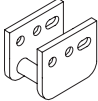
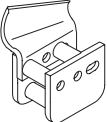
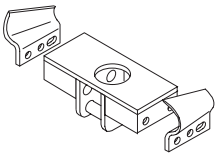
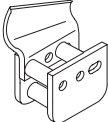
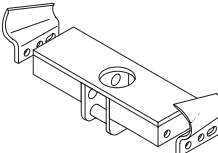
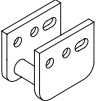
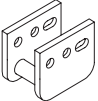
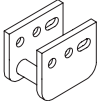
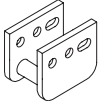
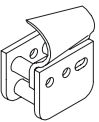
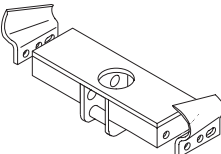
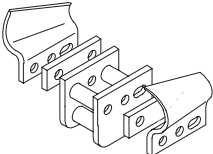
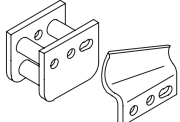
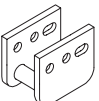
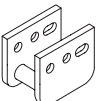
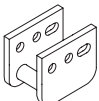
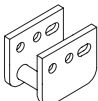
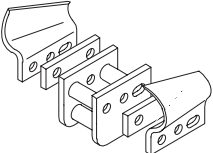
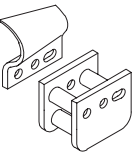
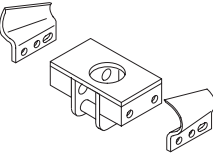
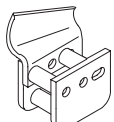
Soil Type	Trench Width	Page
Typical	4 in. (10 cm)	14
	6 in. (15 cm)	15
	8 in. (20 cm)	16
	10 in. (25 cm)	17
	12 in. (30 cm)	18
Sand or Loose	4 in. (10 cm)	19
	6 in. (15 cm)	20
	8 in. (20 cm)	21
	10 in. (25 cm)	22
	12 in. (30 cm)	23
Hard or Rocky	4 in. (10 cm)	24
	6 in. (15 cm)	25
Rock	4 in. (10 cm)	26
	6 in. (15 cm)	27

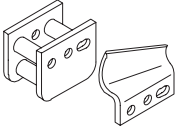
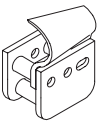
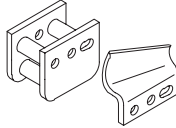
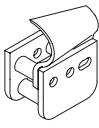
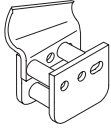
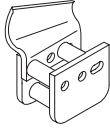
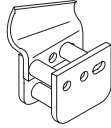
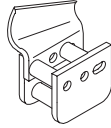
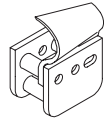
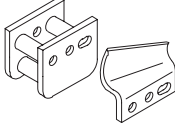
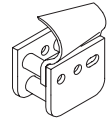
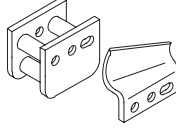
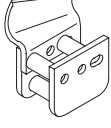
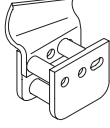
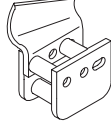
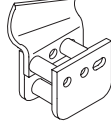
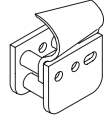
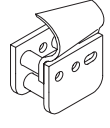
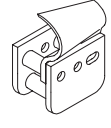
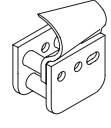
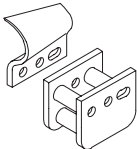
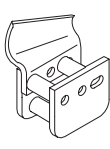
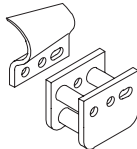
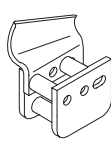
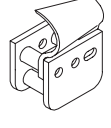
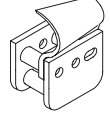
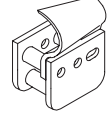
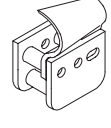
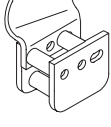
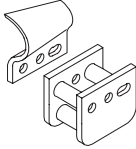
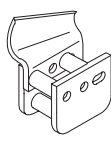
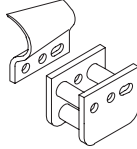
Typical Soil, 4 in. (10 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9 	17 	25 
2 	10 	18 	26 
3 	11 	19 	27 
4 	12 	20 	28 
5 	13 	21 	29 
6 	14 	22 	30 
7 	15 	23 	31 
8 	16 	24 	32 

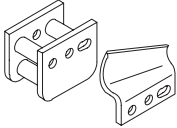
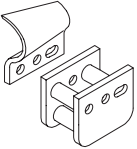
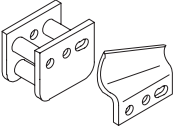
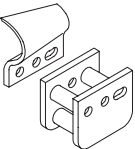
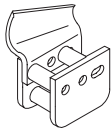
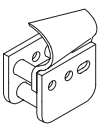
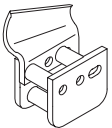
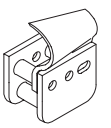
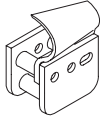
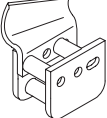
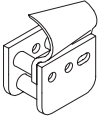
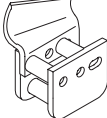
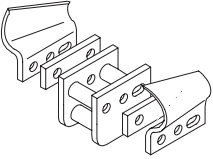
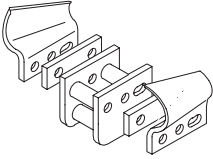
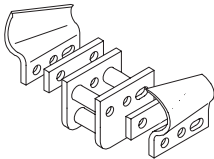
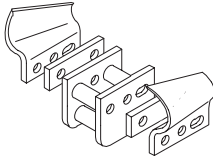
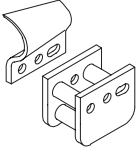
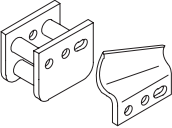
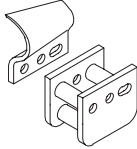
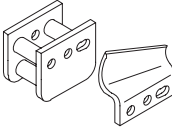
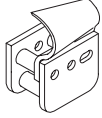
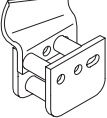
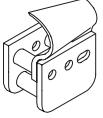
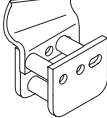
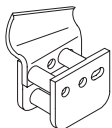
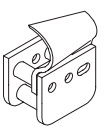
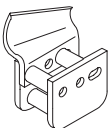
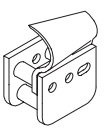
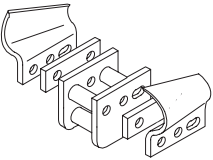
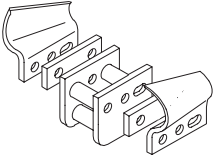
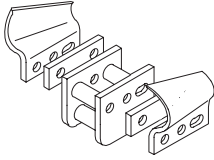
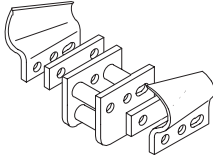
Typical Soil, 6 in. (15 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9 	17 	25 
2 	10 	18 	26 
3 	11 	19 	27 
4 	12 	20 	28 
5 	13 	21 	29 
6 	14 	22 	30 
7  6 in. (15 cm) double cupped	15  6 in. (15 cm) double cupped	23  6 in. (15 cm) double cupped	31  6 in. (15 cm) double cupped
8 	16 	24 	32 

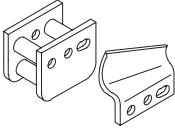
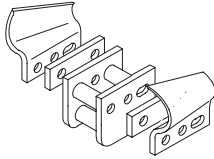
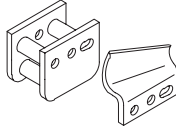
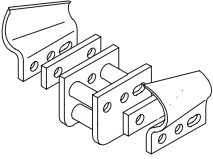
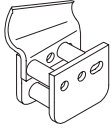
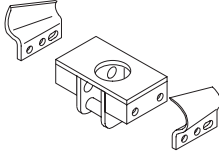
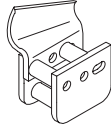
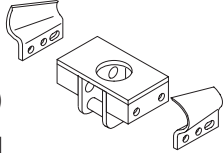
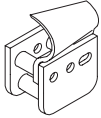
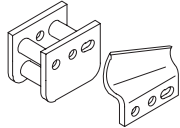
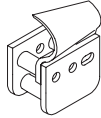
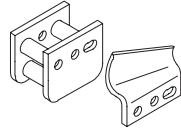
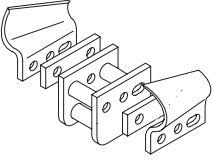
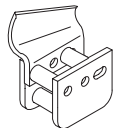
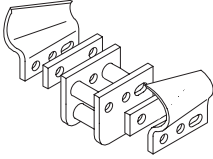
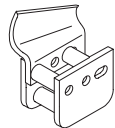
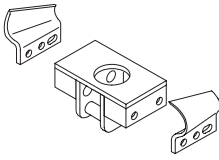
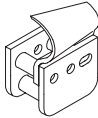
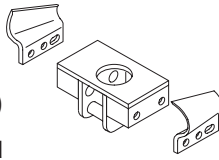
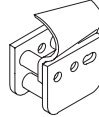
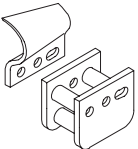
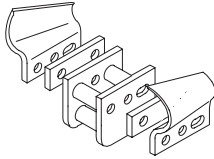
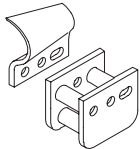
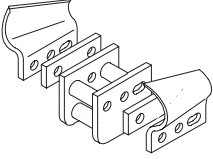
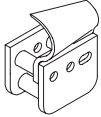
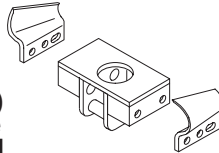
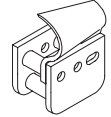
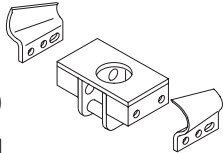
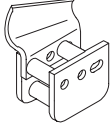
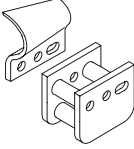
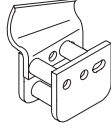
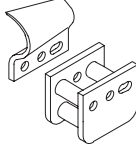
Typical Soil, 8 in. (20 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9  8 in. (20 cm) double cupped	17  6 in. (15 cm) double cupped	25 
2 	10 	18 	26 
3 	11 	19  8 in. (20 cm) double cupped	27  6 in. (15 cm) double cupped
4 	12 	20 	28 
5 	13 	21 	29  8 in. (20 cm) double cupped
6 	14 	22 	30 
7  6 in. (15 cm) double cupped	15 	23 	31 
8 	16 	24 	32 

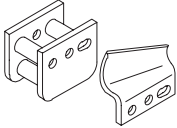
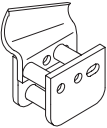
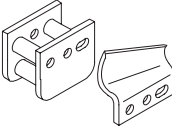
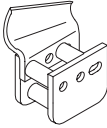
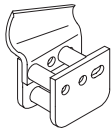
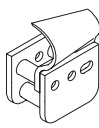
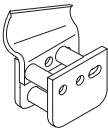
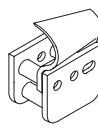
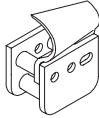
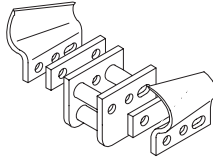
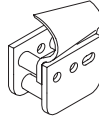
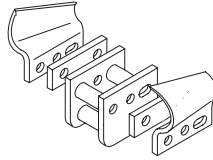
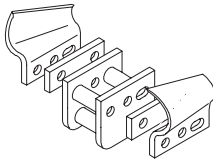
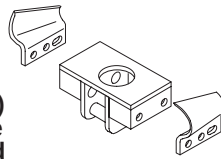
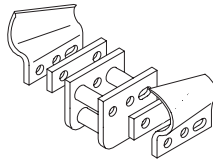
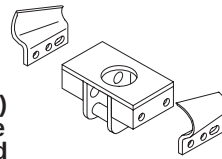
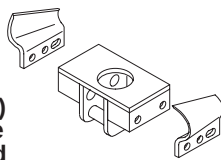
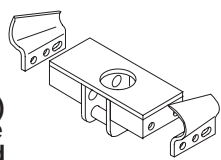
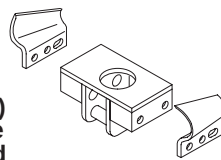
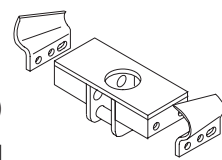
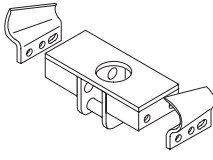
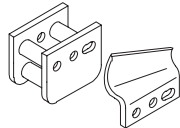
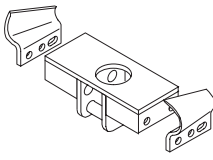
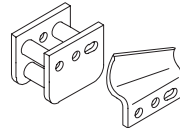
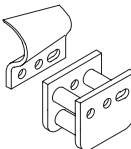
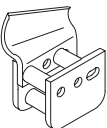
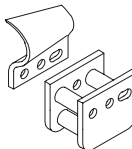
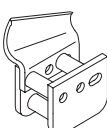
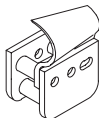
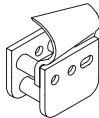
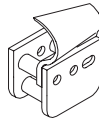
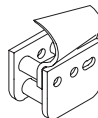
Typical Soil, 10 in. (25 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9  8 in. (20 cm) double cupped	17 	25  10 in. (25 cm) double cupped
2 	10 	18 	26 
3 	11  10 in. (25 cm) double cupped	19 	27 
4 	12 	20 	28 
5 	13 	21  6 in. (15 cm) double cupped	29 
6 	14 	22 	30 
7  6 in. (15 cm) double cupped	15 	23  8 in. (20 cm) double cupped	31 
8 	16 	24 	32 

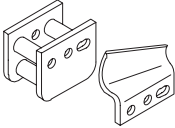
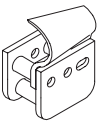
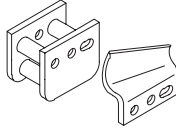
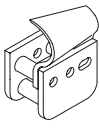
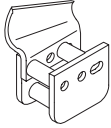
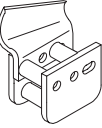
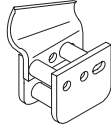
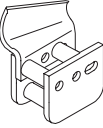
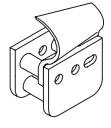
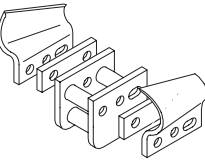
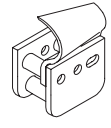
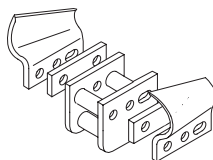
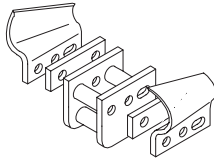
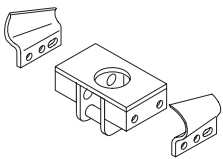
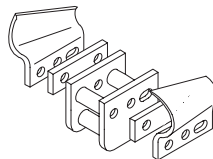
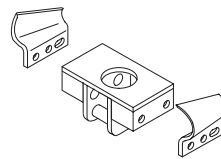
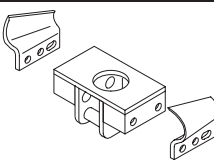
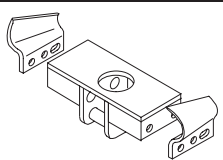
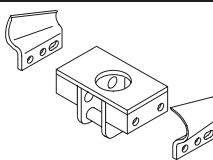
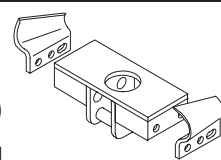
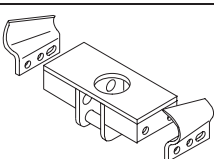
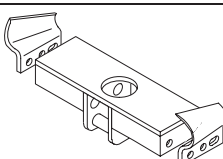
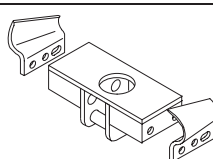
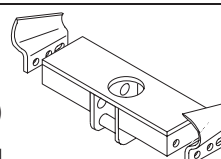
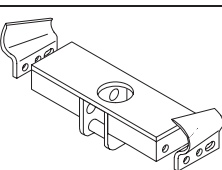
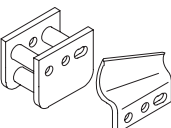
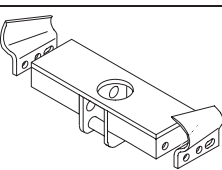
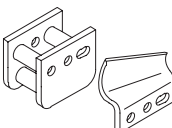
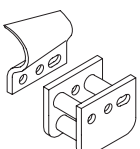
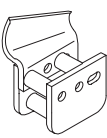
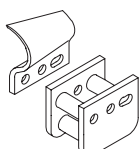
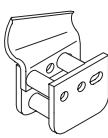
Typical Soil, 12 in. (30 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9  8 in. (20 cm) double cupped	17 	25  10 in. (25 cm) double cupped
2 	10 	18 	26 
3 	11  10 in. (25 cm) double cupped	19 	27  12 in. (30 cm) double cupped
4 	12 	20 	28 
5 	13  12 in. (30 cm) double cupped	21  6 in. (15 cm) double cupped	29 
6 	14 	22 	30 
7  6 in. (15 cm) double cupped	15 	23  8 in. (20 cm) double cupped	31 
8 	16 	24 	32 

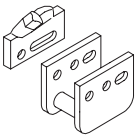
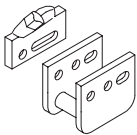
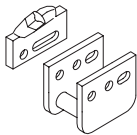
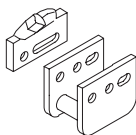
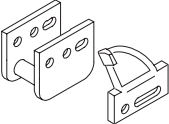
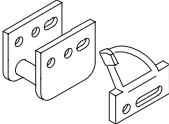
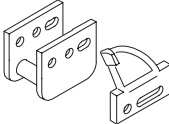
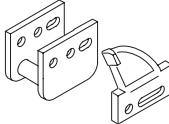
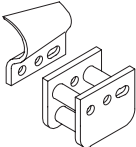
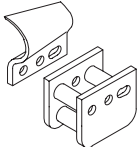
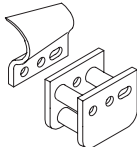
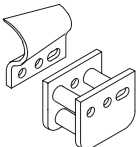
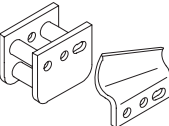
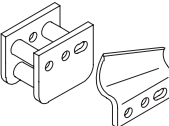
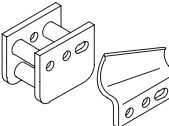
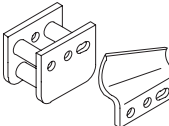
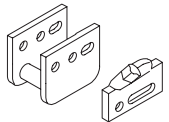
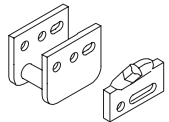
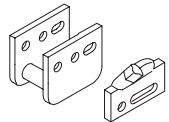
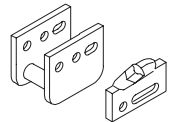
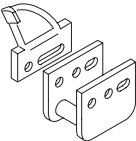
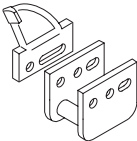
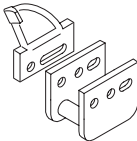
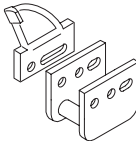
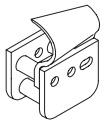
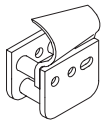
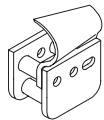
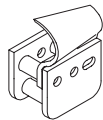
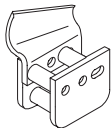
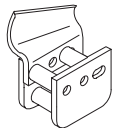
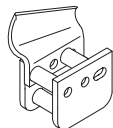
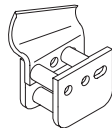
Sand and Loose Soil, 4 in. (10 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9 	17 	25 
2 	10 	18 	26 
3 	11 	19 	27 
4 	12 	20 	28 
5 	13 	21 	29 
6 	14 	22 	30 
7 	15 	23 	31 
8 	16 	24 	32 

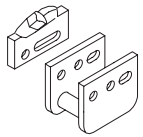
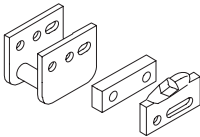
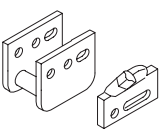
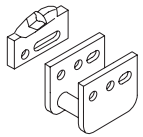
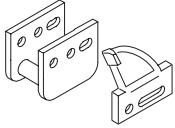
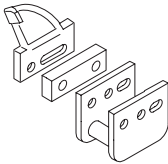
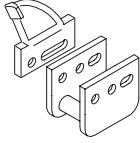
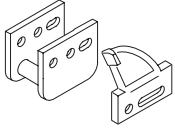
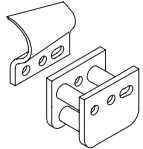
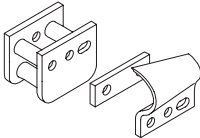
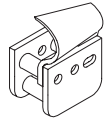
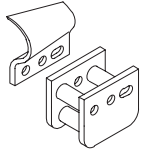
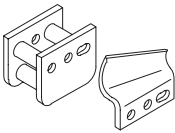
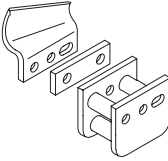
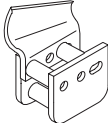
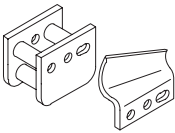
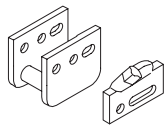
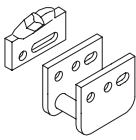
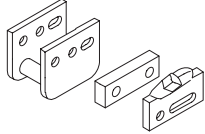
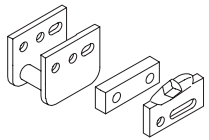
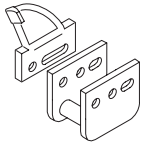
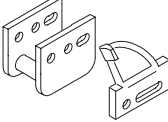
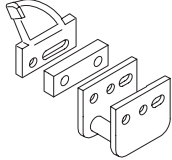
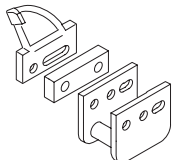
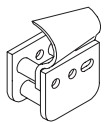
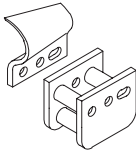
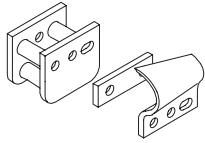
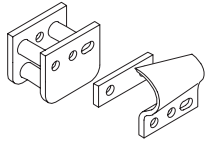
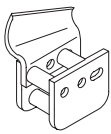
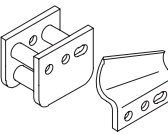
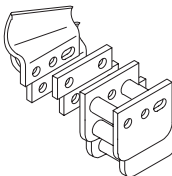
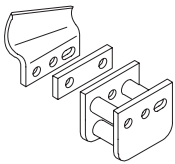
Sand and Loose Soil, 6 in. (15 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9 	17 	25 
2 	10 	18 	26 
3 	11 	19 	27 
4  6 in. (15 cm) double cupped	12  6 in. (15 cm) double cupped	20  6 in. (15 cm) double cupped	28  6 in. (15 cm) double cupped
5 	13 	21 	29 
6 	14 	22 	30 
7 	15 	23 	31 
8  6 in. (15 cm) double cupped	16  6 in. (15 cm) double cupped	24  6 in. (15 cm) double cupped	32  6 in. (15 cm) double cupped

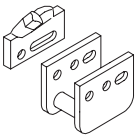
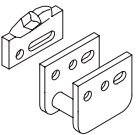
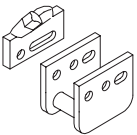
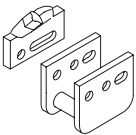
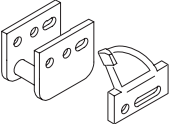
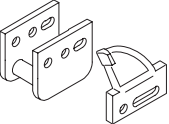
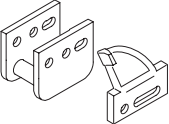
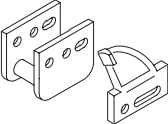
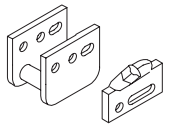
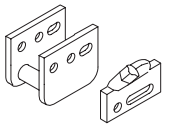
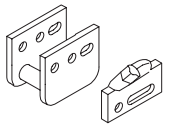
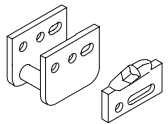
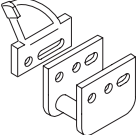
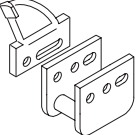
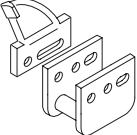
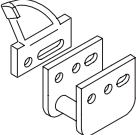
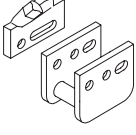
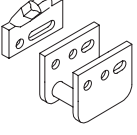
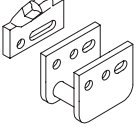
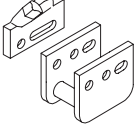
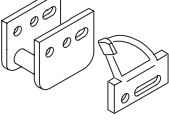
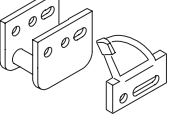
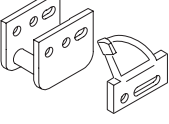
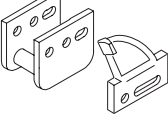
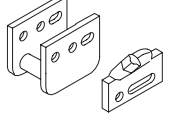
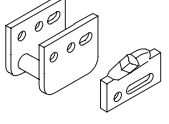
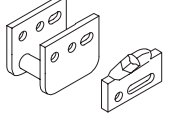
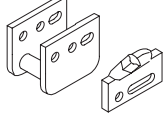
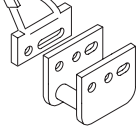
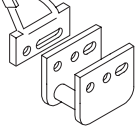
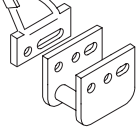
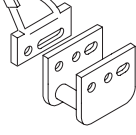
Sand and Loose Soil, 8 in. (20 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9 	17 	25 
2 	10 	18 	26 
3 	11 	19 	27 
4 	12 	20 	28 
5 	13 	21 	29 
6 	14 	22 	30 
7 	15 	23 	31 
8 	16 	24 	32 

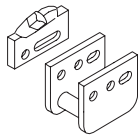
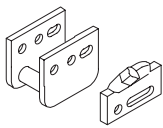
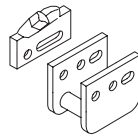
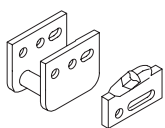
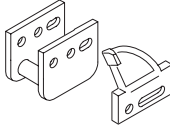
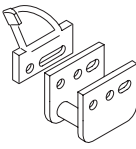
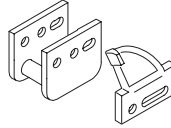
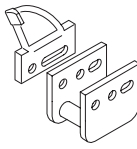
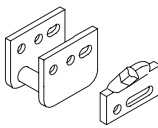
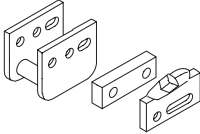
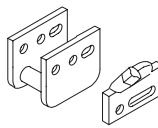
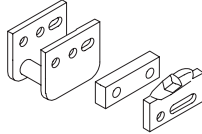
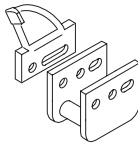
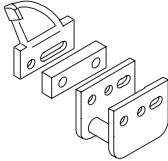
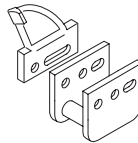
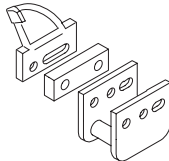
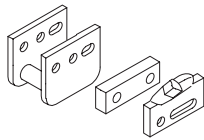
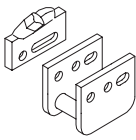
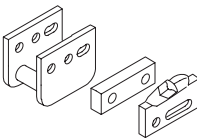
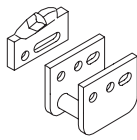
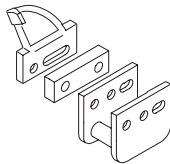
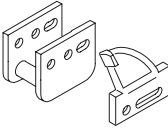
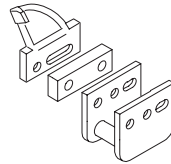
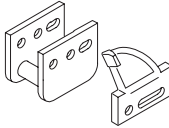
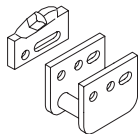
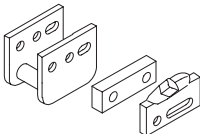
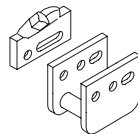
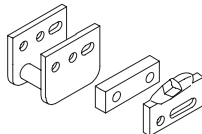
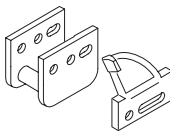
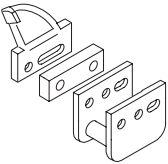
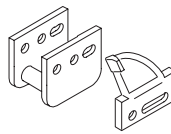
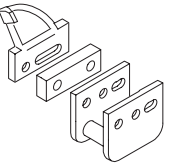
Sand and Loose Soil, 10 in. (25 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9 	17 	25 
2 	10 	18 	26 
3 	11  6 in. (15 cm) double cupped	19 	27  6 in. (15 cm) double cupped
4  6 in. (15 cm) double cupped	12  8 in. (20 cm) double cupped	20  6 in. (15 cm) double cupped	28  8 in. (20 cm) double cupped
5  8 in. (20 cm) double cupped	13  10 in. (25 cm) double cupped	21  8 in. (20 cm) double cupped	29  10 in. (25 cm) double cupped
6  10 in. (25 cm) double cupped	14 	22  10 in. (25 cm) double cupped	30 
7 	15 	23 	31 
8 	16 	24 	32 

Sand and Loose Soil, 12 in. (30 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9 	17 	25 
2 	10 	18 	26 
3 	11  6 in. (15 cm) double cupped	19 	27  6 in. (15 cm) double cupped
4  6 in. (15 cm) double cupped	12  8 in. (20 cm) double cupped	20  6 in. (15 cm) double cupped	28  8 in. (20 cm) double cupped
5  8 in. (20 cm) double cupped	13  10 in. (25 cm) double cupped	21  8 in. (20 cm) double cupped	29  10 in. (25 cm) double cupped
6  10 in. (25 cm) double cupped	14  12 in. (30 cm) double cupped	22  10 in. (25 cm) double cupped	30  12 in. (30 cm) double cupped
7  12 in. (30 cm) double cupped	15 	23  12 in. (30 cm) double cupped	31 
8 	16 	24 	32 

Hard or Rocky Ground, 4 in. (10 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9 	17 	25 
2 	10 	18 	26 
3 	11 	19 	27 
4 	12 	20 	28 
5 	13 	21 	29 
6 	14 	22 	30 
7 	15 	23 	31 
8 	16 	24 	32 

Hard or Rocky Ground, 6 in. (15 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9 	17 	25 
2 	10 	18 	26 
3 	11 	19 	27 
4 	12 	20 	28 
5 	13 	21 	29 
6 	14 	22 	30 
7 	15 	23 	31 
8 	16 	24 	32 

Rock, 4 in. (10 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9 	17 	25 
2 	10 	18 	26 
3 	11 	19 	27 
4 	12 	20 	28 
5 	13 	21 	29 
6 	14 	22 	30 
7 	15 	23 	31 
8 	16 	24 	32 

Rock, 6 in. (15 cm) Trench			
Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration	Tooth Position and Configuration
1 	9 	17 	25 
2 	10 	18 	26 
3 	11 	19 	27 
4 	12 	20 	28 
5 	13 	21 	29 
6 	14 	22 	30 
7 	15 	23 	31 
8 	16 	24 	32 

Troubleshooting

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Chain does not turn.	1. Hydraulic coupler not completely connected 2. Damaged hydraulic coupler 3. An obstruction in a hydraulic hose 4. Auxiliary valve on the traction unit is not opening. 5. Trencher boom end bearing failed 6. Digging chain too tight 7. Sand buildup in tooth root of sprocket 8. Hydraulic motor failure 9. Chain drive failure	1. Check and tighten all couplers. 2. Check/replace couplers 3. Find and remove the obstruction. 4. Repair the valve. 5. Replace the bearing. 6. Adjust the digging chain. 7. Raise trencher and run the chain backwards, then reduce the chain tension. 8. Contact your Authorized Service Dealer. 9. Contact your Authorized Service Dealer.
Does not dig fast enough.	1. Worn teeth 2. Wrong setting on flow divider and speed lever 3. Quick coupler or hose restriction 4. Hydraulic system too hot 5. Relief valve set below specifications	1. Replace any worn teeth. 2. Set the flow divider to the 10:00 position and the speed lever to the turtle position. 3. Check hoses and couplers and repair any problems found. 4. Shutdown and allow the system to cool. 5. Contact your Authorized Service Dealer.
Chain turns in the wrong direction	1. Auxiliary valve lever in wrong position 2. Hydraulic hoses reversed	1. Move auxiliary valve lever to the rearward position. 2. Disconnect hoses and switch positions.
Bearing case lube is contaminated	1. The fill plug is leaking 2. O-ring failure on the motor. 3. Seal failure.	1. Look for moisture around the fill plug. If present, change the oil, and replace the plug and the plug o-ring. 2. Contact your Authorized Service Dealer. 3. Contact your Authorized Service Dealer.