

RT75/RT95

with Powershift Transmission

Operator's Manual



CMW®

Issue 1.0



054- 127

Overview



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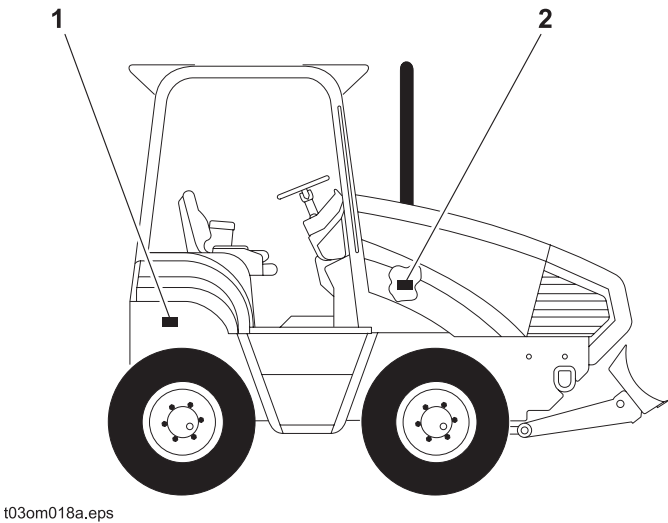
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Serial Number Location

Record serial numbers and date of purchase in spaces provided. RT75/RT95 (1) and engine serial numbers (2) are located as shown.



Date of manufacture	
Date of purchase	
RT75/RT95 serial number	
Engine serial number	
Front attachment serial number	
Rear attachment serial number	
Trailer serial number	

Intended Use



The RT75 and RT95 are riding trenchers designed to install buried service lines of various sizes using a variety of Ditch Witch attachments.

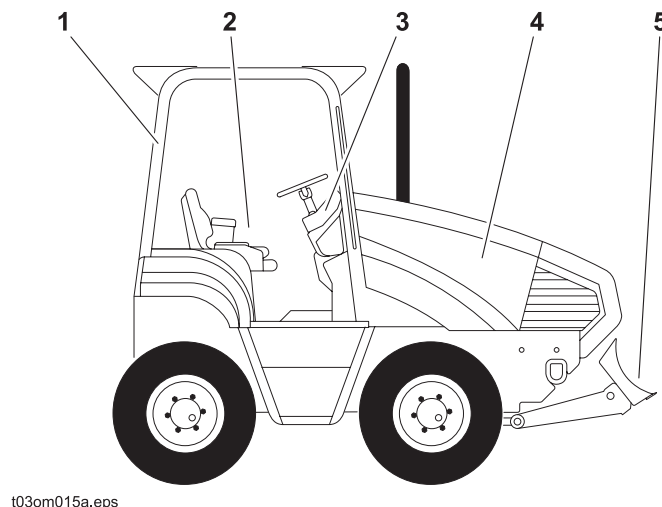
Attachment	Max. trench width	Max. trench depth*
M910 trencher	24" (610 mm)	100" (2.5 m)
M912 offset trencher	24" (610 mm) center	96" (2.4 m)
	12" (305 mm) offset	96" (2.4 m)

*dependent on tire option

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

The RT75 and RT95 should be used with genuine Ditch Witch chain, teeth, and sprockets. They should be operated, serviced, and repaired only by persons familiar with their particular characteristics and acquainted with the relevant safety procedures.

Unit Components

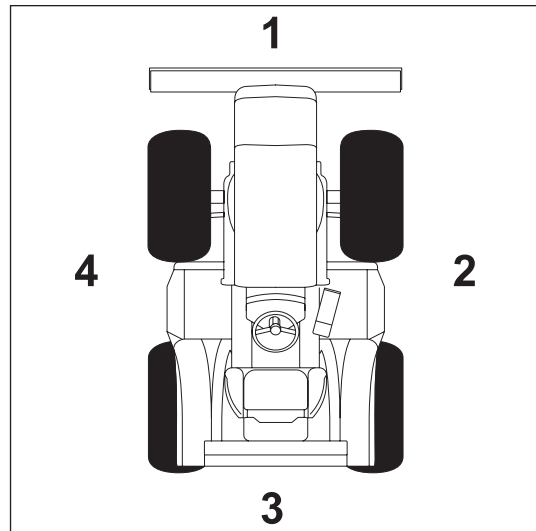


- | | |
|---|------------------------------|
| 1. Rollover Protective Structure (ROPS) | 4. Engine compartment |
| 2. Operator station | 5. Backfill blade (optional) |
| 3. Control consoles | |

Operator Orientation

- | | |
|------------------|-----------------|
| 1. Front of unit | 3. Rear of unit |
| 2. Right of unit | 4. Left of unit |

Right and left sides of machine are determined by facing front of unit while seated at the controls.



About This Manual

This manual contains information for the proper use of this machine. See **Operation Overview** for basic operating procedures. Cross references such as “See page 50” will direct you to detailed procedures.

Bulleted Lists

Bulleted lists provide helpful or important information or contain procedures that do not have to be performed in a specific order.

Numbered Lists

Numbered lists contain illustration callouts or list steps that must be performed in order.

Foreword



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

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

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

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

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

Thank you for buying and using Ditch Witch equipment.

RT75/RT95 Powershift Operator's Manual

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Part number 054-127

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Safety

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Guidelines

Follow these guidelines before operating any jobsite equipment:

- Complete proper training and read operator's manual before using equipment.
- Contact One-Call (888-258-0808) and any utility companies which do not subscribe to One-Call. Have all underground pipes and cables located and marked before operating equipment. If you damage a utility, contact utility company.
- Classify jobsite based on its hazards and use correct tools and machinery, safety equipment, and work methods for jobsite.
- Mark jobsite clearly and keep spectators away.
- Wear personal protective equipment.
- Review jobsite hazards, safety and emergency procedures, and individual responsibilities with all personnel before work begins. Safety videos are available from your Ditch Witch dealer.
- Replace missing or damaged safety shields and safety signs.
- Use equipment carefully. Stop operation and investigate anything that does not look or feel right.
- Do not operate unit where flammable gas is present.
- Contact your Ditch Witch dealer if you have any question about operation, maintenance, or equipment use.

Safety Alert Classifications

These classifications and the icons defined on the following pages work together to alert you to situations which could be harmful to you, jobsite bystanders or your equipment. When you see these words and icons in the book or on the machine, carefully read and follow all instructions. **YOUR SAFETY IS AT STAKE.**



Watch for the three safety alert levels: **DANGER**, **WARNING** and **CAUTION**. Learn what each level means.

 **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

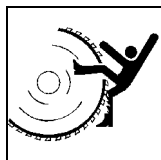
 **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Watch for two other words: **NOTICE** and **IMPORTANT**.

NOTICE can keep you from doing something that might damage the machine or someone's property. It can also alert you against unsafe practices.

IMPORTANT can help you do a better job or make your job easier in some way.

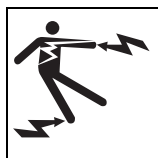
Safety Alerts

**⚠ DANGER**

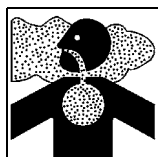
Moving digging teeth will kill you or cut off arm or leg. Stay away.

**⚠ DANGER**

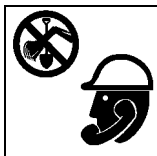
Turning shaft will kill you or crush arm or leg. Stay away.

**⚠ DANGER**

Electric shock. Contacting electric lines will cause death or serious injury. Know location of lines and stay away.

**⚠ DANGER**

Deadly gases. Lack of oxygen or presence of gas will cause sickness or death. Provide ventilation.

**⚠ WARNING**

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

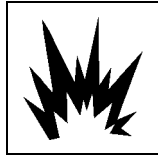
**⚠ WARNING**

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

**⚠ WARNING**

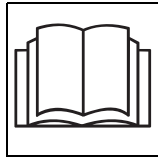
Moving parts could cut off hand or foot. Stay away.

Safety Alerts



⚠ WARNING

Explosion possible. Serious injury or equipment damage could occur. Follow directions carefully.



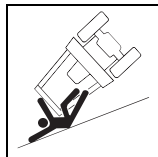
⚠ WARNING

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



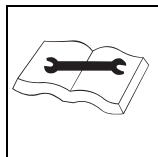
⚠ WARNING

Fall possible. Riders can fall from machine and be injured or killed. Only operator is allowed on machine.



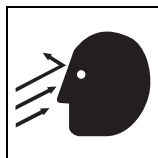
⚠ WARNING

Rollover possible. If machine rolls over, you could be thrown from seat and killed or crushed. Wear seat belt.



⚠ WARNING

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



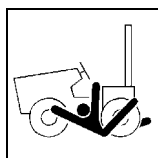
⚠ WARNING

Looking into fiber optic cable could result in permanent vision damage. Do not look into ends of fiber optic or unidentified cable.



⚠ WARNING

Fluid or air pressure could pierce skin and cause injury or death. Stay away.



⚠ WARNING

Runaway possible. Machine could run over you or others. Learn how to use all controls. Start and operate only from operator's position.



⚠ WARNING

Fire or explosion possible. Fumes could ignite and cause burns. No smoking, no flame, no spark.



**⚠ WARNING**

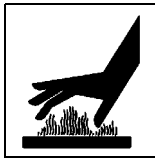
Moving traffic - hazardous situation. Death or serious injury could result. Avoid moving vehicles, wear high visibility clothing, post appropriate warning signs.

**⚠ WARNING**

Hot pressurized cooling system fluid could cause serious burns. Allow to cool before servicing.

**⚠ CAUTION**

Flying objects may cause injury. Wear hard hat and safety glasses.

**⚠ CAUTION**

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

**⚠ CAUTION**

Exposure to high noise levels may cause hearing loss. Wear hearing protection.

**⚠ CAUTION**

Fall possible. Slips or trips may result in injury. Keep area clean.

**⚠ CAUTION**

Battery acid may cause burns. Avoid contact.

**⚠ CAUTION**

Improper handling or use of chemicals may result in illness, injury, or equipment damage. Follow instructions on labels and in material safety data sheets (MSDS).

Emergency Procedures

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

EMERGENCY SHUTDOWN - Turn ignition switch to stop position or push remote engine stop button (if equipped).



Electric Strike Description

When working near electric cables, remember the following:

- Electricity follows all paths to ground, not just path of least resistance.
- Pipes, hoses, and cables will conduct electricity back to all equipment.
- Low voltage current can injure or kill. Almost one-third of work-related electrocutions result from contact with less than 440 volts.

Most electric strikes are not noticeable, but indications of a strike include:

- power outage
- smoke
- explosion
- popping noises
- arcing electricity

If any of these occur, assume an electric strike has occurred.

If an Electric Line is Damaged

If you suspect an electric line has been damaged and you are **on tractor**, DO NOT MOVE. Remain on tractor and take the following actions. The order and degree of action will depend upon the situation.

- Warn people nearby that an electric strike has occurred. Instruct them to leave the area and contact utility.
- Raise attachments and drive from immediate area.
- Contact utility company to shut off power.
- Do not return to jobsite or allow anyone into area until given permission by utility company.

If you suspect an electric line has been damaged and you are **off tractor**, DO NOT TOUCH TRACTOR. Take the following actions. The order and degree of action will depend upon the situation.

- LEAVE AREA. The ground surface may be electrified, so take small steps with feet close together to reduce the hazard of being shocked from one foot to the other. For more information, contact your Ditch Witch dealer.
- Contact utility company to shut off power.
- Do not return to jobsite or allow anyone into area until given permission by utility company.

If a Gas Line is Damaged

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

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



If a Fiber Optic Cable is Damaged

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

If Machine Catches on Fire

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

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

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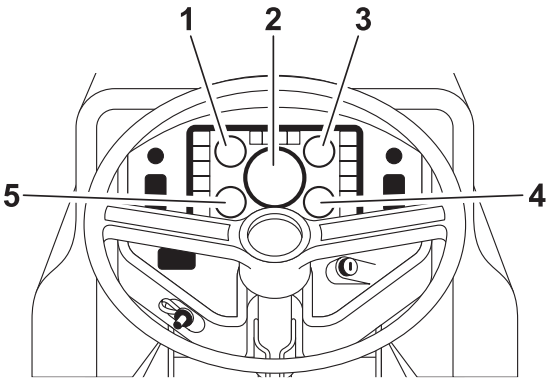
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Center Console

Gauges



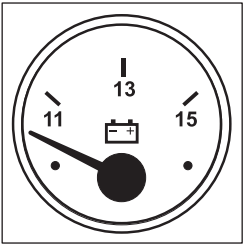
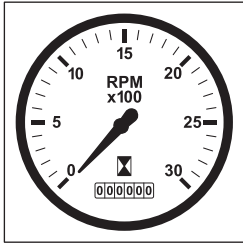
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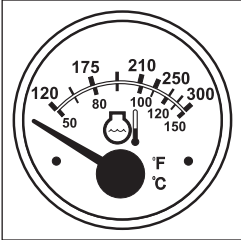
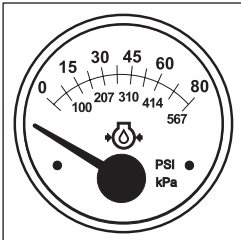
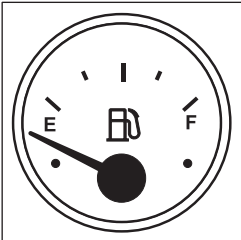
1. Voltmeter

2. Tachometer/Hourmeter

3. Engine temperature gauge
4. Engine oil pressure gauge

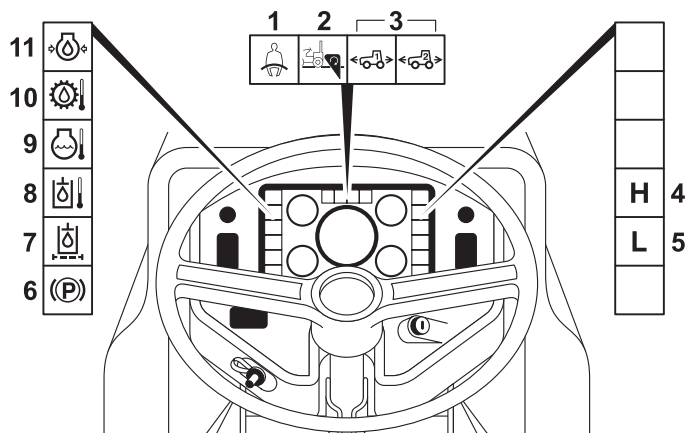
5. Fuel gauge

Item	Description	Notes
1. Voltmeter  c00ic064c.eps	Displays system voltage.	Should show 12-14V with engine running.
2. Tachometer/Hourmeter  c00ic048c.eps	Displays engine speed and records engine operating time.	Use engine operating times to schedule service.

Item	Description	Notes
3. Engine temperature gauge  c00ic066c.eps	Displays engine coolant temperature. Engine temperature indicator will light and alarm will sound if temperature is too high.	Normal temperature is 180°-220° F (82°-104° C). If temperature is high: • Turn off engine and let it cool. • Check cooling system for low fluid level, seal damage, or leaks.
4. Engine oil pressure gauge  c00ic067c.eps	Displays engine oil pressure. Indicator will light and alarm will sound if pressure is too low.	Normal operating pressure is 15-50 psi (105-345 kPa). If pressure is low: • Check oil level. • If pressure is still low, consult engine manual.
5. Fuel gauge  c00ic065c.eps	Displays fuel level in tank.	Use only #2 diesel fuel. RT75 fuel tank holds 30 gal (114 L). RT95 fuel tank holds 38 gal (144 L).

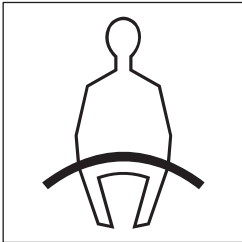


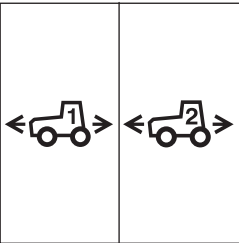
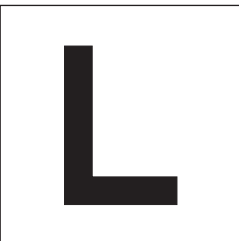
Indicators



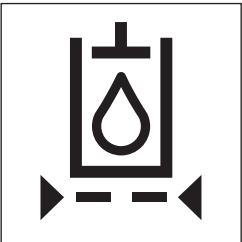
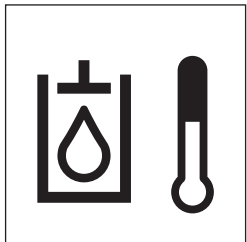
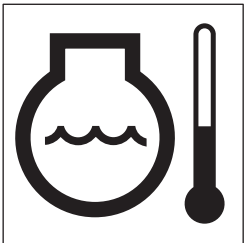
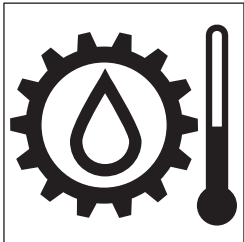
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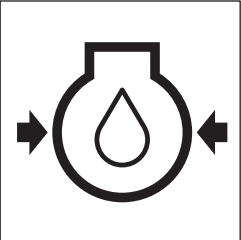
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|---|---|
| 1. Operator presence indicator | 7. Hydraulic filter restriction indicator |
| 2. Attachment speed/direction indicator | 8. Hydraulic fluid temperature indicator |
| 3. Ground drive indicators | 9. Engine temperature indicator |
| 4. High speed indicator | 10. Transmission temperature indicator |
| 5. Low speed indicator | 11. Engine oil pressure indicator |
| 6. Parking brake indicator | |

Item	Description	Notes
1. Operator presence indicator  c00ic068c.eps	Lights when operator is in seat.	IMPORTANT: This indicator is part of the the start interlock system. All four start interlock indicators must be on to start engine.

Item	Description	Notes
2. Attachment speed/direction indicator  c00ic069c.eps	Lights when attachment speed/direction control is in neutral.	IMPORTANT: This indicator is part of the the start interlock system. All four start interlock indicators must be on to start engine.
3. Ground drive indicators  c00ic070c.eps	Light when ground drive hand and foot controls are in neutral.	IMPORTANT: These indicators are part of the the start interlock system. All four start interlock indicators must be on to start engine.
4. High speed indicator  c00ic062c.eps	Lights when transmission is in high.	
5. Low speed indicator  c00ic063c.eps	Lights when transmission is in low.	
6. Parking brake indicator  c00ic060c.eps	Lights when parking brake is engaged.	

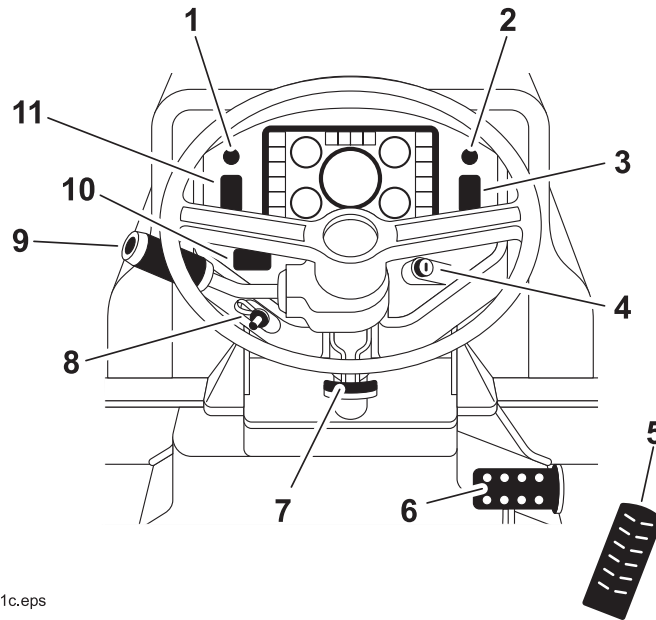


Item	Description	Notes
7. Hydraulic filter restriction indicator  c00ic024h.eps	Lights when hydraulic filter is restricted. May also light in cold weather.	When indicator lights, change filter. Run tractor at low engine speed until hydraulic fluid warms. Indicator will turn off after hydraulic fluid warms.
8. Hydraulic fluid temperature indicator  c00ic023h.eps	Lights and alarm sounds if hydraulic fluid overheats.	• Turn off engine and let it cool. • Check hydraulic fluid level. • Check front of hydraulic fluid cooler for debris.
9. Engine temperature indicator  c00ic059c.eps	Lights and alarm sounds if engine temperature is too high.	• Turn off engine and let it cool. • Check for low engine oil level, seal damage, or leaks. • Check oil cooler for dirt and debris.
10. Transmission temperature indicator  c00ic102c.eps	Lights and alarm sounds if transmission overheats.	• Turn off engine and let it cool. • Check cooling system and transmission fluid level for low fluid level, seal damage, or leaks..

Item	Description	Notes
11. Engine oil pressure indicator  c00ic049c.eps	Lights and alarm sounds when oil pressure falls below 8-12 psi (.5-.8 bar). Light will come on briefly when engine is started.	If light remains on: • Turn off engine. • Check oil level. • If pressure is still low, consult engine manual.

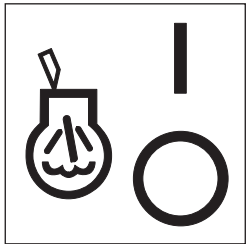


Controls

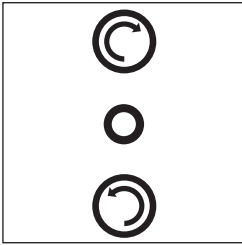
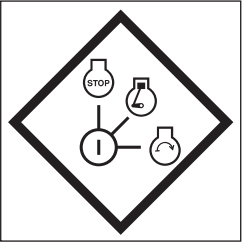
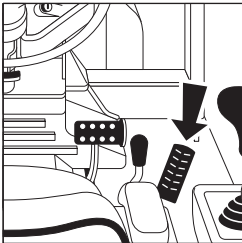
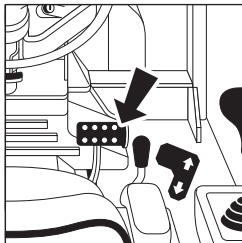


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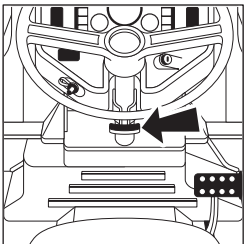
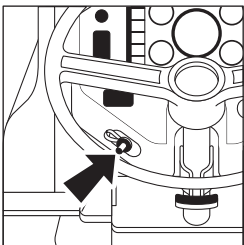
- | | |
|---------------------------------|--|
| 1. Cold start switch | 7. Steering column tilt control |
| 2. Horn | 8. Auxiliary outlet |
| 3. Drilling attachment control* | 9. F-N-R lever |
| 4. Ignition switch | 10. Hydraulic ground drive motor control |
| 5. Foot throttle | 11. Reel carrier control* |
| 6. Service brake | *optional |

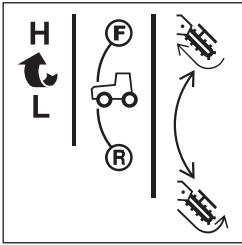
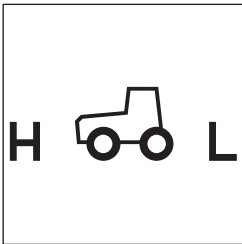
Item	Description	Notes
1. Cold start switch 	To start cold engine: • Turn key to on position. • Press top of switch for 10-20 seconds. • Start engine.	

c00ic064h.eps

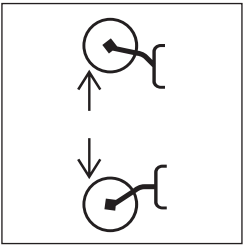
Item	Description	Notes
2. Horn  c00ic044h.eps	To sound horn, press.	
3. Drilling attachment control  c00ic218h.eps	To rotate clockwise, press top. To rotate counterclockwise, press bottom.	IMPORTANT: Always rotate clockwise during drilling and backreaming. Rotate counterclockwise only to dislodge a dry bore bit or reamer that has siezed in the bore hole. For more information about drilling attachment, see page 83.
4. Ignition switch  c00ic217h.eps	To start engine, insert key and turn clockwise. To stop engine, turn counterclockwise.	IMPORTANT: If engine does not start on first attempt, check that all interlock requirements have been met, return switch to STOP, and try again.
5. Foot throttle  c00ic103c.eps	To increase engine speed, press. To reduce engine speed, release.	IMPORTANT: - With dig/drive control in dig, increasing engine speed also increases digging chain speed. - With dig/drive control in drive, increasing engine speed also increases ground drive speed.
6. Service brake  c00ic093c.eps	To stop tractor, press. To move tractor, release.	



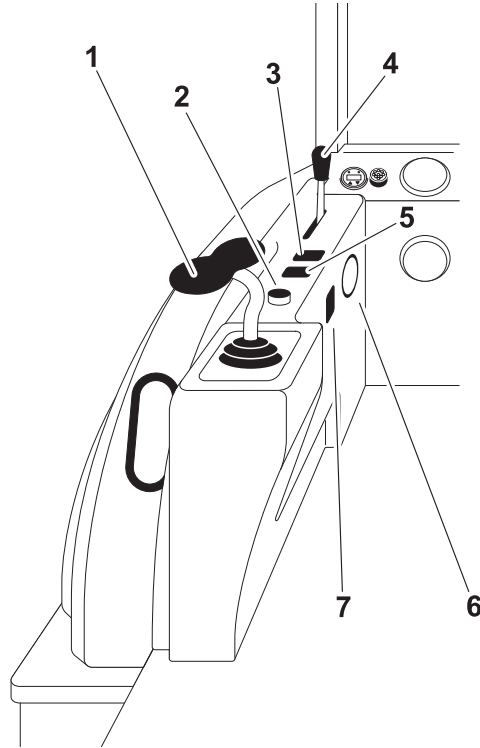
Item	Description	Notes
7. Steering column tilt control  c00ic094c.eps	To adjust tilt, pull. To secure steering column in position, release.	IMPORTANT: Tilt steering column up before pivoting operator's seat.
8. Auxiliary outlet  c00ic095c.eps	Provides power for other equipment.	Power output is 12V, 5A.

Item	Description	Notes
9. F-N-R lever  c00ic105c.eps	Performs multiple functions determined by the dig/drive control. When dig/drive control is in dig: - To start forward digging chain motion, lift up and push forward. - To stop digging chain, move to center . - To start reverse digging chain motion, lift up and pull back. When dig/drive control is in drive: - To travel forward, lift up and push forward . - To stop, move to center. - To travel in reverse, lift up and pull back . To change dig or drive speeds: - For high speed, rotate to H. - For low speed, rotate to L.	IMPORTANT: When driving, stop tractor before shifting between forward and reverse.
10. Hydraulic ground drive motor control  c00ic096c.eps	To select high speed, press left. High speed indicator will light. To select low speed, press right. Low speed indicator will light.	



Item	Description	Notes
11. Reel carrier control  c00ic205h.eps	To raise, press top. To lower, press bottom.	

Right Console

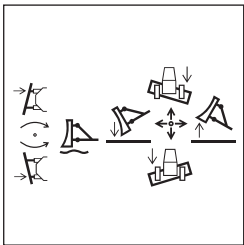
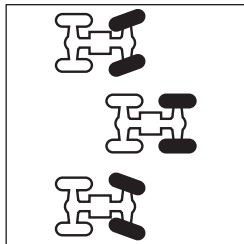
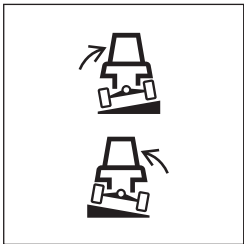
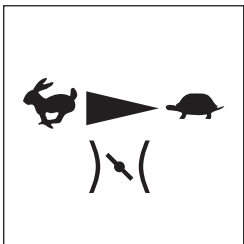


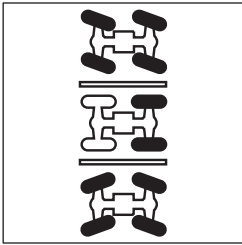
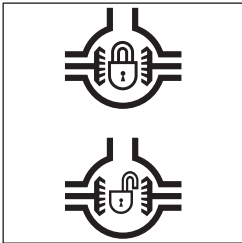
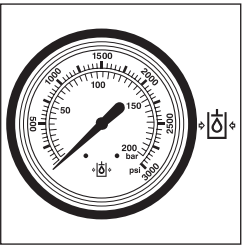
t13om096c.eps

- | | |
|--------------------------------|-------------------------------------|
| 1. Backfill blade control | 5. Steer select control* |
| 2. Rear steer adjustment knob* | 6. Axle lock control |
| 3. Frame tilt switch* | 7. Auxiliary circuit pressure gauge |
| 4. Throttle | |

*optional

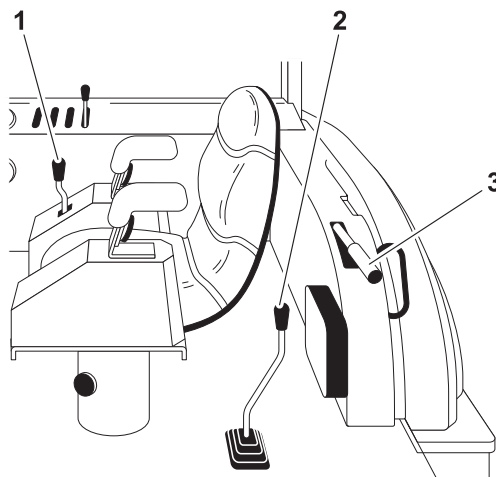


Item	Description	Notes
1. Backfill blade  c00ic181h.eps	To lower, move forward. To float, move forward to end. To raise, move backward. To tilt right side down, move right. To tilt left side down, move left. To angle left, twist left. To angle right, twist right.	
2. Reel steer adjustment knob  c00ic097c.eps	To turn rear wheels to the left, turn counterclockwise. To center wheels, center knob. To turn rear wheels to the right, turn clockwise.	IMPORTANT: For rear steer to function, steer select control must be in the center position.
3. Frame tilt switch  c00ic182h.eps	To tilt right, press right side. To tilt left, press left side.	
4. Throttle  c00ic183h.eps	To increase speed, move left. To decrease speed, move right.	

Item	Description	Notes
5. Steer select switch  c00ic098c.eps	To select crab steering, press top. To select rear steering, move to center. To select coordinated steering, press bottom.	
6. Axle lock control  c00ic099c.eps	To lock rear axle, press top. To unlock rear axle, press bottom.	IMPORTANT: After pressing switch to unlock axle, It may be necessary to move tractor 6' (2 m) in reverse to fully unlock.
7. Auxiliary circuit pressure gauge  c00ic191h.eps	Displays auxiliary circuit pressure.	Maximum operating pressure is 2550 psi (172 bar).

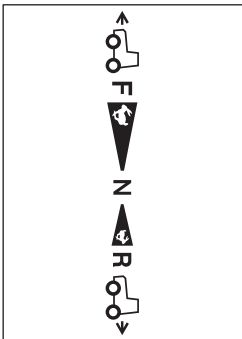
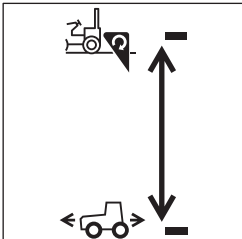


Power Train



t13om097c.eps

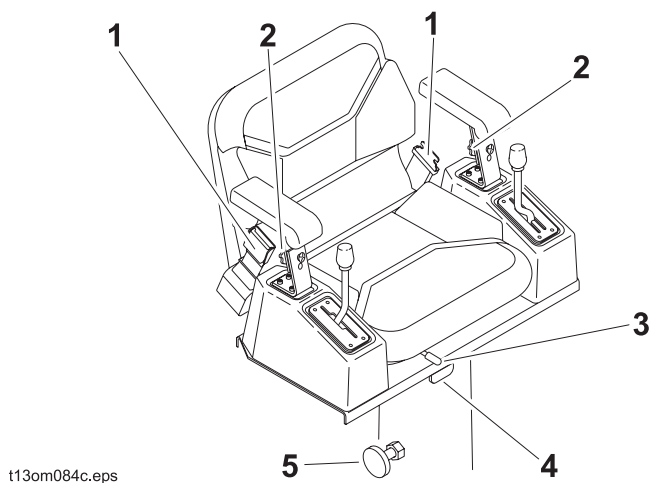
- | | |
|----------------------------|------------------|
| 1. Speed/direction control | 3. Parking brake |
| 2. Dig/drive control | |

Item	Description	Notes
1. Ground drive hand control  c00ic083c.eps	To go forward, push. To go backward, pull. To go faster in either direction, move farther from neutral. To stop, return to center.	
2. Dig/drive control  c00ic104c.eps	Selects dig or drive settings. - To select dig, move forward. Use this position for trenching. - To select drive, move back. Use this position for driving.	IMPORTANT: Before changing between dig and drive settings, do the following: - Stop tractor. - Twist F-N-R lever into the center or neutral position. - Move hand throttle to low idle.

Item	Description	Notes
3. Parking brake  c00ic060c.eps	To set, push. To release, pull.	



Seat



- | | |
|-------------------------------|--------------------------------|
| 1. Seat belt | 4. Seat pivot control |
| 2. Armrest adjustment control | 5. Seat height adjustment lock |
| 3. Seat slide control | |

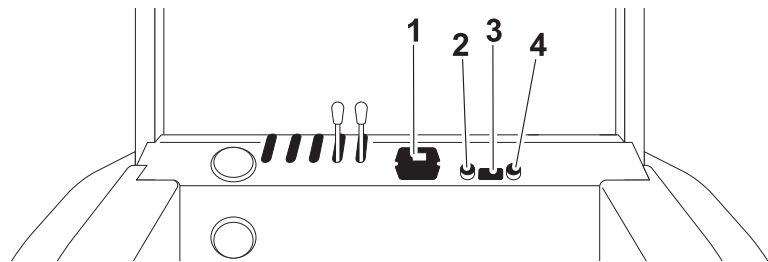
Item	Description	Notes
1. Seat belt	To fasten, insert latch into buckle. Adjust until seat belt is low and tight. To release, lift top of buckle.	
2. Armrest adjustment control	To raise or lower armrests: - Remove knob. - Adjust armrest to desired position. - Replace knob.	
3. Seat slide control	To slide seat forward or backward, pull, then adjust seat. To lock seat in place, release.	

Item	Description	Notes
4. Seat pivot control	To pivot seat to the right, pull. To lock seat in position, release. To return seat to front-facing position, swing seat left.	Seat pivots only to the right and can be locked in any position from 0-90°. IMPORTANT: Drive tractor with operator's seat facing front. Operate rear attachments with seat pivoted.
5. Seat height adjustment lock	To lock seat height, turn clockwise. To unlock seat height, turn counterclockwise.	



Rear Console

Optional Controls

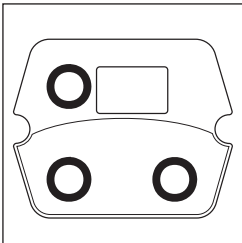
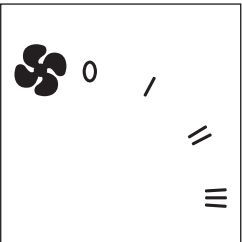


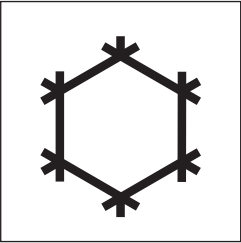
t130m098c.eps

1. Trench Depth Meter

2. Fan speed control
3. Air conditioning control

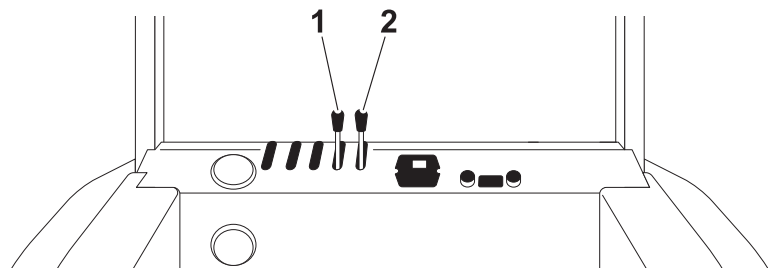
4. Climate control selector

Item	Description	Notes
1. Trench Depth Meter  c00ic201h.eps	Measures and records trench depth.	For more information, see page 90.
2. Fan speed control  c00ic190h.eps	For higher air conditioning fan speed, turn clockwise. For lower air conditioning fan speed, turn counterclockwise.	IMPORTANT: This control works only when air conditioning is turned on.

Item	Description	Notes
3. Air conditioning control  c00ic189h.eps	To turn air conditioning on, press top. To turn air conditioning off, press bottom.	
4. Climate control selector  c00ic188h.eps	For warmer air, turn clockwise. For cooler air, turn counterclockwise.	

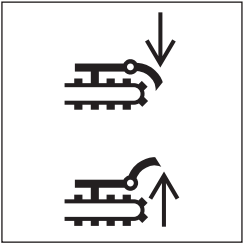
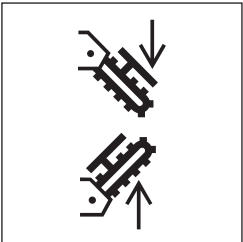


Trencher Controls

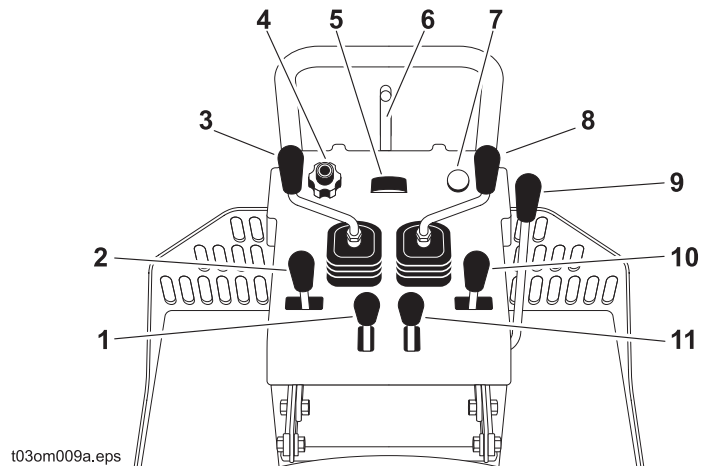


t13om099c.eps

1. Trench cleaner lift control*
2. Boom lift control
- *optional

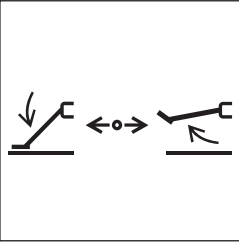
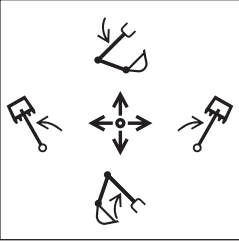
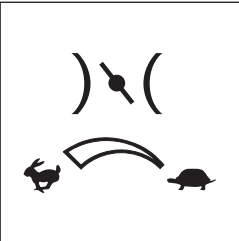
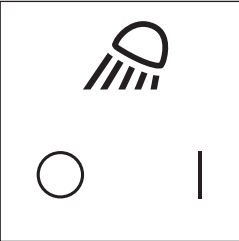
Item	Description	Notes
1. Trench cleaner lift control  c00ic199h.eps	To lower, push. To raise, pull.	
2. Boom lift control  c00ic200h.eps	To lower, push. To raise, pull.	

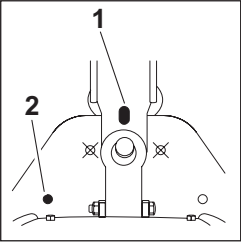
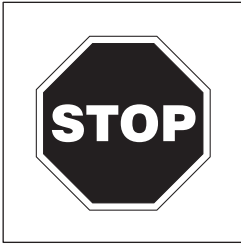
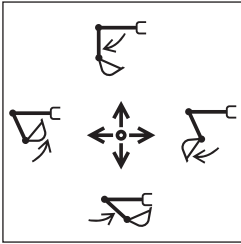
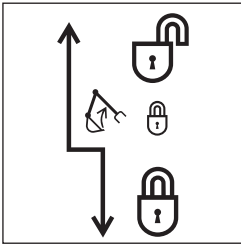
Backhoe Console



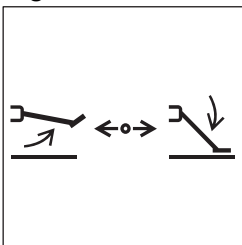
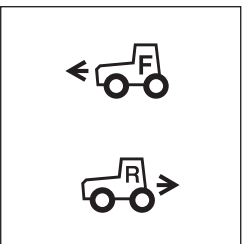
- | | |
|----------------------------------|---------------------------------|
| 1. Remote backfill blade control | 7. Remote engine stop switch |
| 2. Left stabilizer control | 8. Bucket/dipper control |
| 3. Boom/Swing control | 9. Stow lock control |
| 4. Remote throttle | 10. Right stabilizer control |
| 5. Work light switch* | 11. Remote ground drive control |
| 6. Swing lock pin | |
- *optional

Item	Description	Notes
1. Remote backfill blade control c00ic210h.eps	To lower, push. To raise, pull.	

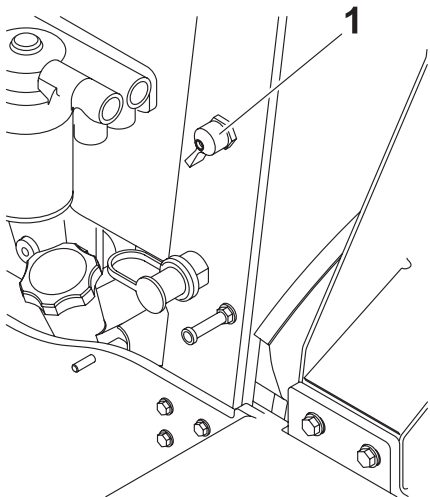
Item	Description	Notes
2. Left stabilizer control  c00ic211h.eps	To lower, push out. To raise, pull in.	
3. Boom/Swing control  c00ic212h.eps	To swing boom left, move left. To swing boom right, move right. To raise boom, pull. To lower boom, push.	Control can perform more than one action at a time. By "feathering" the control, operator can combine backhoe operations. NOTICE: Do not operate with backhoe in the stowed (upright) position. Component failure could occur.
4. Remote throttle  c00ic087c.eps	To increase engine speed, turn counterclockwise. To decrease engine speed, turn clockwise. To lock, push button, pull up, then release button. To unlock, push button, then push down.	
5. Work light switch  c00ic086c.eps	To turn on, press right. To turn off, press left.	

Item	Description	Notes
6. Swing lock pin  c00ic234h.eps	To lock: - Engage stow lock. - Insert swing lock pin into hole (1). To release: - Remove pin and store in hole (2). - Release stow lock.	This pin locks boom from swinging during transport. NOTICE: Do not store pin in holes marked with an "X." Backhoe could swing and destroy pin.
7. Remote engine stop switch  c00ic085c.eps	Stops engine immediately.	IMPORTANT: - Except in an emergency, move throttle to idle before using stop switch. - For normal engine shutdown, use ignition switch.
8. Bucket/dipper control  c00ic213h.eps	To open bucket, move right. To close bucket, move left. To move dipper in, pull. To move dipper out, push.	Control can perform more than one action at a time. By "feathering" the control, operator can combine backhoe operations.
9. Stow lock control  c00ic215h.eps	To lock: - Raise boom fully. - Pull stow lock handle. - Lower boom slightly to engage lock. - Insert swing lock pin. To unlock: - Remove swing lock pin. - Raise boom slightly. - Push stow lock handle to release lock.	Use this control to lock boom in the up position. NOTICE: Always install swing lock pin during transport. NOTICE: When unlocked, store swing lock pin in holder located on left stabilizer support.



Item	Description	Notes
10. Right stabilizer control  c00ic088c.eps	To lower, push out. To raise, pull in.	
11. Remote ground drive control  c00ic216h.eps	To move tractor forward, push. To move tractor backward, pull.	NOTICE: • Ensure that backfill blade and stabilizers are raised before operating this control. • Do not move more than 30' (10 m) at a time.

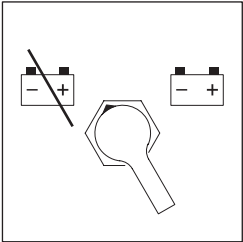
Battery



t13om085c.eps



- 1. Battery disconnect switch

Item	Description	Notes
1. Battery disconnect switch  c00ic097h.eps	To connect, move left. To disconnect, move right.	

Operation Overview

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Drilling 48

Digging with Backhoe 49

Leaving Jobsite..... 49



Planning

1. Gather information about jobsite. See page 52.
2. Inspect jobsite. See page 53.
3. Classify jobsite. See page 54.
4. Select chain and teeth to match your soil type, if necessary. See page 90.
5. Check supplies and prepare equipment. See page 56.
6. Haul equipment to jobsite. See page 68.

Trenching

1. Start unit. See page 58.
2. Position tractor and controls. See page 74.
3. Begin trenching. See page 76.
4. Engage optional Trench Depth Meter if desired. See page 90.
5. Complete the installation. See page 94.
6. Shut down tractor. See page 62.

Drilling

1. Start unit. See page 58.
2. Dig approach trench and target trench. See page 85.
3. Assemble drill string and position tractor. See page 85.
4. Begin drilling. See page 86.
5. Use drill string guide as needed. See page 86.
6. Add rod. See page 87.
7. Backream. See page 87.
8. Shut down tractor. See page 62.
9. Disassemble joints. See page 88.

Digging with Backhoe

1. Start unit. See page 58.
2. Set stabilizers and unstow backhoe. See page 80.
3. Excavate. See page 81.
4. Stow backhoe properly. See page 82.
5. Shut down tractor. See page 62.

Leaving Jobsite

1. Backfill if necessary. See page 94.
2. Rinse equipment. See page 94.
3. Stow tools. See page 94.
4. Haul equipment from jobsite. See page 68.



Prepare

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- Review Job Plan 52
- Notify One-Call Services 52
- Arrange for Traffic Control 52
- Plan for Emergency Services 52

Inspect Site 53

- Identify Hazards 53

Classify Jobsite 54

- Inspect Jobsite 54
- Select a Classification 54
- Apply Precautions 55

Check Supplies and Prepare Equipment 56

- Supplies 56
- Fluid Levels 56
- Condition and Function 56
- Accessories 56



Gather Information

A successful job begins before you dig. The first step in planning is reviewing information already available about the job and jobsite.

Review Job Plan

Review blueprints or other plans. Check for information about existing or planned structures, elevations, or proposed work that may be taking place at the same time.

Notify One-Call Services

Call area One-Call or similar services and have existing lines located and marked. Call any utilities in your area that do not subscribe to One-Call.

Arrange for Traffic Control

If working near a road or other traffic area, contact local authorities about safety procedures and regulations.

Plan for Emergency Services

Have the telephone numbers for local emergency and medical facilities on hand. Check that you will have access to a telephone.

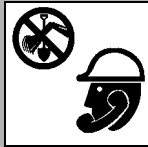
Inspect Site

Inspect jobsite before transporting equipment. Check for the following:

- changes in elevation such as hills or other open trenches
- obstacles such as buildings, railroad crossings, or streams
- signs of utilities (See "Inspect Jobsite" on page 54.)
- traffic
- access
- soil type and condition

Identify Hazards

Identify safety hazards and classify jobsite. See "Classify Jobsite" on page 54.



WARNING

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



NOTICE:

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

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

Classify Jobsite

Inspect Jobsite

- Follow U.S. Department of Labor regulations on excavating and trenching (Part 1926, Subpart P) and other similar regulations.
- Contact One-Call (888-258-0808) and any utility companies which do not subscribe to One-Call.
- Inspect jobsite and perimeter for evidence of underground hazards, such as:
 - “buried utility” notices
 - utility facilities without overhead lines
 - gas or water meters
 - junction boxes
 - drop boxes
 - light poles
 - manhole covers
 - sunken ground
- Have an experienced locating equipment operator sweep area within 20 feet (6 m) to each side of trench path. Verify previously marked line and cable locations.
- Mark location of all buried utilities and obstructions.
- Classify jobsite.

Select a Classification

Jobsites are classified according to underground hazards present.

If working . . .	then classify jobsite as . . .
within 10' (3 m) of a buried electric line	electric
within 10' (3 m) of a natural gas line	natural gas
in sand, granite, or concrete which is capable of producing crystalline silica (quartz) dust	crystalline silica (quartz) dust
within 10' (3 m) of any other hazard	other

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

Apply Precautions

Once classified, precautions appropriate for jobsite must be taken.

Electric Jobsite Precautions

Use one or both of these methods.

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

Natural Gas Jobsite Precautions

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

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



Crystalline Silica (Quartz) Dust Precautions

Follow OSHA or other guidelines for exposure to crystalline silica when trenching, sawing or drilling through material that might produce dust containing crystalline silica (quartz).

Other Jobsite Precautions

You may need to use different methods to safely avoid other underground hazards. Talk with those knowledgeable about hazards present at each site to determine which precautions should be taken or if job should be attempted.

Check Supplies and Prepare Equipment

Supplies

- fuel
- keys
- personal protective equipment, such as hard hat and safety glasses

Fluid Levels

- fuel
- hydraulic fluid
- battery charge
- engine oil

Condition and Function

- digging chain and teeth
- brake pads and disc
- fan belts
- light bulbs
- filters (air, oil, hydraulic)
- tires and tracks
- pumps and motors
- hoses and valves
- signs, guards, and shields

Accessories

Fire Extinguisher

If required, mount a fire extinguisher near the power unit but away from possible points of ignition. The fire extinguisher should always be classified for both oil and electric fires. It should meet legal and regulatory requirements.

Drive

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Start Unit 58

Drive 60

• Special Steering61

Shut Down 62



Start Unit

Before operating tractor, read engine manufacturer's starting and operating instructions. Follow instructions for new engine break-in.

**WARNING**

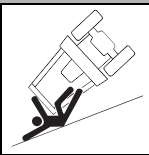
Runaway possible. Machine could run over you or others. Learn how to use all controls. Start and operate only from operator's position.

**WARNING**

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

NOTICE:

- Read operator's manual before operating equipment. Follow instructions carefully. Contact Ditch Witch dealership for operation information or demonstration.
- Wear hard hat, safety glasses, and other protective equipment required by job. Do not wear jewelry or loose clothing that can catch on controls.

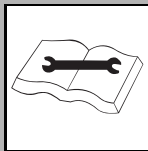
**WARNING**

Rollover possible. If machine rolls over, you could be thrown from seat and killed or crushed. Wear seat belt.

1. Fasten and adjust seatbelt.
2. Check that speed/direction control and F-N-R lever are in neutral.
3. Move hand throttle to idle.
4. Check that parking brake is engaged.
5. If starting in cold weather, turn ignition switch to on position and press and release cold start button.
6. Turn ignition switch. Warning alarm will sound. Indicators will light.

IMPORTANT:

- If engine does not crank, check start interlock display. See page 22 for start interlock information.
- If engine turns but does not start within 10 seconds, allow starter to cool before trying to start again.



WARNING

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

NOTICE:

- If warning alarm does not sound, have machine serviced.
- Machine will not start if start interlock requirements are not met. See page 22 for start interlock information.

7. Run engine at half-throttle or less for five minutes before operating tractor. During warmup, check that all controls work properly.

IMPORTANT: Transmission fluid must warm to operating temperature or tractor will operate sluggishly.



Drive

**WARNING**

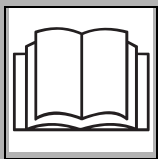
Moving traffic – hazardous situation. Death or serious injury could result. Avoid moving vehicles, wear high visibility clothing, post appropriate warning signs.

NOTICE:

- Drive carefully in congested areas. Know machine's clearance and turning radius.
- Keep attachments low when operating on slope. Drive slowly and cautiously.
- Tractor will freewheel if engine power is lost. Apply service brake to stop tractor.

EMERGENCY SHUTDOWN: Turn ignition switch to STOP.

1. Turn on lights and warning flasher as needed.
2. Tilt steering wheel column to desired operating position.
3. Raise backfill blade and all attachments.
4. Engage service brake.
5. Release parking brake and verify parking brake indicator is off.
6. Move dig/drive control to drive position.
7. Ensure hand throttle is at low idle and axle lock is off.

**WARNING**

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

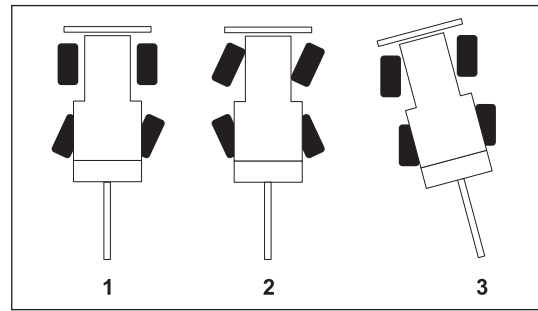
IMPORTANT: Hand throttle must be in low idle when driving.

8. Rotate F-N-R lever to 1 (low).
9. Move F-N-R lever to move forward or reverse.
10. Disengage service brake.
11. Press foot throttle to increase tractor speed.

Special Steering

Your Ditch Witch equipment allows you to maneuver four ways when driving: normal steering, rear steering (1), coordinated steering (2), and crab steering (3).

NOTICE: Do not use rear steer, coordinated steer, or crab steer when trenching boom is in the ground.



Rear Steer

Use rear steer to maneuver the rear of the tractor closer to or farther from objects.

1. Move steer select control to rear steer position.
2. Slowly move tractor forward.
3. Use steering wheel to control front wheels. Use rear steer adjustment knob to control rear wheels.

Coordinated Steer

Use coordinated steering to turn a tight circle around a jobsite obstacle or in similar conditions.

1. Move steer select control to coordinated position.
2. Slowly move tractor forward.
3. Use steering wheel to control both front and rear wheels in coordination.



Crab Steer

Use crab steering to maneuver along edge of jobsite or in similar conditions. Also use when backfilling a trench. This moves the rear of the tractor away from the trench.

1. Move steer select control to crab position.
2. Slowly move tractor forward.
3. Use steering wheel to control both front and rear wheels.

Shut Down

1. When job is complete, apply service brake.
2. Move F-N-R lever to neutral or move speed/direction hand control to neutral.
3. Tilt steering column up.
4. Engage parking brake and verify parking brake indicator is on.
5. Release service brake.
6. Lower all attachments to ground and let machine idle for three minutes to cool.
7. Turn ignition switch to STOP. If leaving machine unattended, remove key.
8. For maintenance or storage, turn battery disconnect switch to disconnect position.

Transport

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- Procedure 64

Tie Down 66

- Points 66
- Procedure 66

Haul 68

- Procedure 68

Tow 71

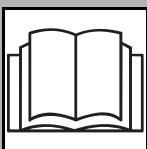
- Procedure 71



Lift



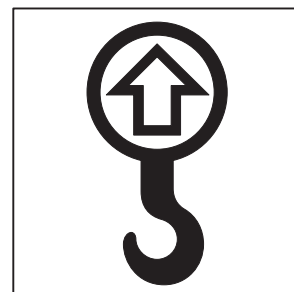
WARNING Crushing weight. If load falls or moves it could kill or crush you. Use proper procedures and equipment or stay away.



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

Points

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

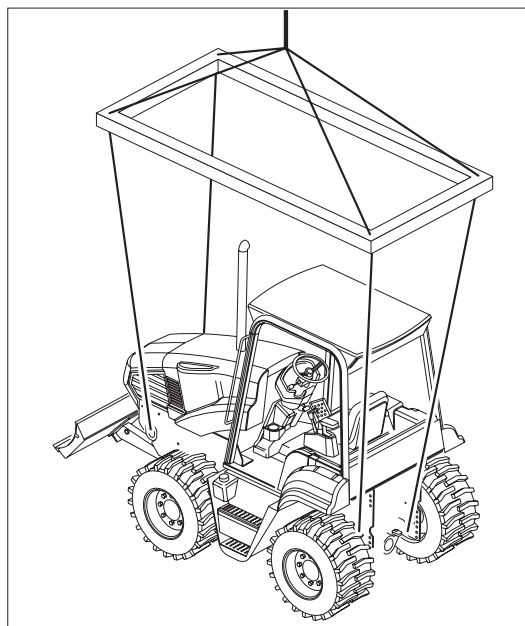


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Procedure

Tractor

Use a crane capable of supporting the equipment's size and weight. See "Specifications" on page 143. Use indicated lift points. Do not attempt to lift tractor with attachments installed.

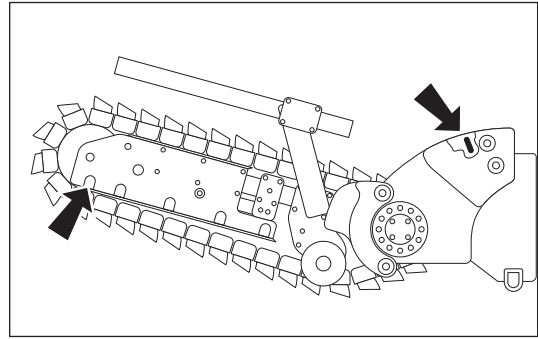


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Centerline Trencher

Use crane capable of supporting the equipment's size and weight. See page 152 or measure and weigh equipment before lifting.

NOTICE: Do not lift tractor with installed attachment.

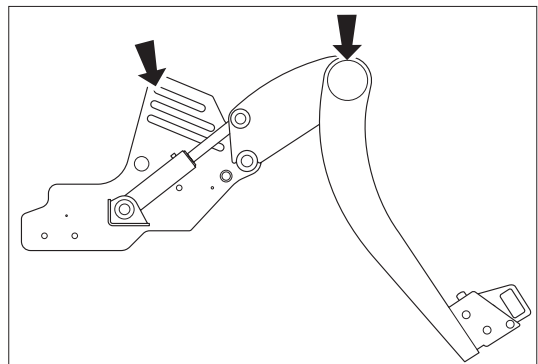


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Reel Carrier

Use crane capable of supporting the equipment's size and weight. See page 160 or measure and weigh equipment before lifting.

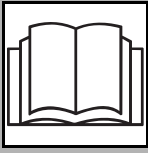
NOTICE: Do not lift tractor with installed attachment.



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Tie Down

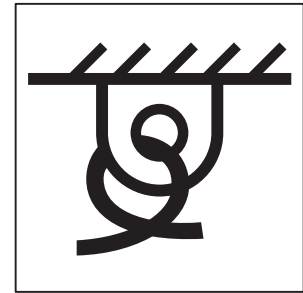


WARNING

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

Points

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

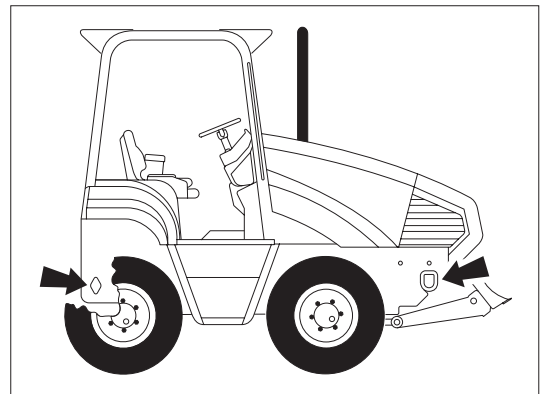


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Procedure

Tractor

Attach chains at front and rear tiedown points. Make sure chains are tight before transporting unit.

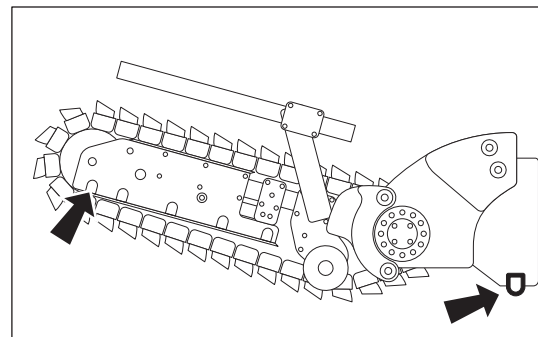


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Centerline Trencher

Lower trencher to trailer deck and chain at attachment frame and through boom. Make sure chains are tight before transporting.

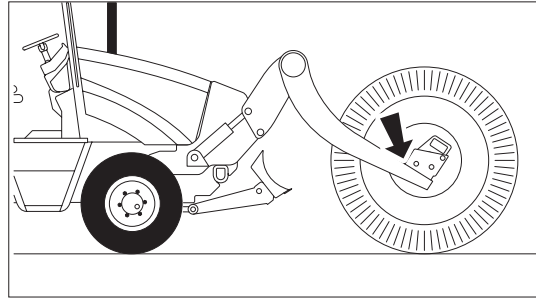
IMPORTANT: If trencher is equipped with a trench cleaner, ensure that trench cleaner shoe is fully up and extra bolt (found in operator's manual compartment) is installed in appropriate hole for additional support.



t120m070h.eps

Reel Carrier

Lower reel carrier to lowest position and tie down at attachment arms. Make sure chains are tight before transporting.



t13om010c.eps



Haul

**⚠ WARNING**

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

NOTICE:

- Read trailer operator's manual before loading or transporting your machine. Incorrectly loaded machine can slip or cause trailer sway.
- Attach trailer to tow vehicle before loading or unloading.
- Park, load, and unload trailer on level ground.
- Check that unit and trailer do not exceed size or weight regulations.
- Ensure that tow vehicle has proper tow capacity rating.
- Ten to fifteen percent of total vehicle weight (equipment plus trailer) must be on tongue to help prevent trailer sway.
- Connect safety chains to tow vehicle. Attach left chain to right side of tow vehicle and vice versa to cradle hitch. Do not connect to pintle hook or hitch ball.
- Connect breakaway switch cable to tow vehicle. Do not connect to pintle hook or hitch ball.

Procedure

Inspect Trailer

1. Check hitch for wear and cracks. Lubricate if needed.
2. Check battery for 12V charge.
3. Inspect lights for cleanliness and correct operation. Inspect reflectors and replace if needed.
4. Check tire pressure. Check lug nut torque with a torque wrench. Adjust if needed.
5. Ensure trailer brakes are adjusted to come on in synchronization with tow vehicle brakes.
6. Check ramps and trailer bed for cracks.

Load

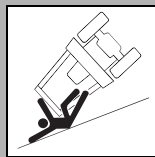


WARNING

Crushing weight. If load falls or moves it could kill or crush you. Use proper procedures and equipment or stay away.

NOTICE:

- Attach trailer to tow vehicle before loading or unloading.
- Load and unload trailer on level ground.
- Put manual transmission into first or reverse gear or automatic transmission into park. Turn off ignition. Set parking brake.
- Block trailer wheels.
- Incorrect loading can cause trailer swaying.



WARNING

Rollover possible. If machine rolls over, you could be thrown from seat and killed or crushed. Wear seat belt.

1. Fasten and adjust seat belt.
2. Tilt steering column down.
3. Start tractor. See page 58 for proper start-up procedures.
4. Raise attachments, but keep them low.
5. Release parking brake and verify that parking brake indicator is off.
6. Move dig/drive control to dig position.
7. With F-N-R lever in neutral, twist to 1 (low).
8. Release service brake.
9. Slow engine to low throttle and slowly drive tractor onto trailer.
10. Position tractor on trailer deck for proper weight distribution.
11. Engage parking brake and verify that parking brake indicator is on.
12. Lower attachments to trailer bed and turn tractor off. See page 62 for proper shutdown procedures.
13. Attach chains to tractor and attachments where tiedown decals are located. See page 66.



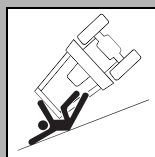
Unload

**WARNING**

Crushing weight. If load falls or moves it could kill or crush you. Use proper procedures and equipment or stay away.

NOTICE:

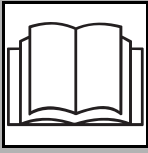
- Attach trailer to tow vehicle before loading or unloading.
- Load and unload trailer on level ground.
- Put manual transmission into first or reverse gear or automatic transmission into park. Turn off ignition. Set parking brake.
- Block trailer wheels.
- Incorrect loading can cause trailer swaying.

**WARNING**

Rollover possible. If machine rolls over, you could be thrown from seat and killed or crushed. Wear seat belt.

1. Lower trailer or ramps.
2. Check that parking brake is engaged and verify that parking brake indicator is on.
3. Check that speed/direction hand control is in neutral.
4. Check that dig/drive control is still in dig position and that F-N-R lever is still in neutral and set at 1 (low).
5. Remove chains from tiedowns.
6. Fasten and adjust seat belt.
7. Tilt steering column down.
8. Start tractor. See page 58 for proper start-up procedures.
9. Raise attachments, but keep them low.
10. Release parking brake and verify that parking brake indicator is off.
11. Slow engine to low throttle and slowly back unit down trailer or ramps.

Tow



⚠ WARNING

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

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

- Do not tow for more than 200 yd (180 m).
- Tow at less than 1 mph (1.6 kph).
- Steering will be very difficult.

Procedure

1. Engage parking brake.
2. Block front and rear tires to prevent unit from rolling.
3. Attach tow line to all available tiedown points facing towing vehicle.
4. Move dig/drive control to 2 (drive).
5. Move F-N-R lever to neutral.
6. Fasten and adjust seatbelt.
7. Remove blocks.
8. Apply service brake.
9. Disengage parking brake.
10. Use service brake to control unit.





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Setup

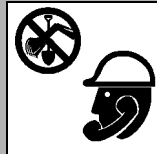
EMERGENCY SHUTDOWN - Turn ignition switch to STOP.



⚠ WARNING

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

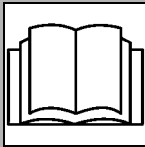
NOTICE: Use attachments or counterweights to make front and rear loads balance when all attachments are raised. Contact your Ditch Witch dealer about counterweighting for your equipment.



⚠ WARNING

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

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



⚠ WARNING

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



1. Fasten and adjust seatbelt.
2. Start tractor. See page 58 for start-up procedures.
3. Drive to starting point. Move in line with planned trench. See page 60 for driving procedures.
4. Apply service brake.
5. Engage parking brake and verify parking brake indicator is on.
6. Release service brake.
7. Move F-N-R lever to neutral.
8. Move dig/drive control to dig position.
9. Twist F-N-R lever to 1 (low).
10. Lower reel carrier to lowest position possible, if equipped.

NOTICE: Use extreme caution when operating reel carrier on sloped surfaces.

11. Lower backfill blade.
12. Tilt steering column up.
13. Turn seat to the work position.
14. Engage axle lock.
15. Lower boom to just above ground.
16. Check that boom is in line with planned trench.

Operation

**⚠ WARNING**

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

NOTICE: Cutting or drilling concrete containing sand or rock containing quartz may result in exposure to silica dust. Use respirator, water spray or other means to control dust. Silica dust can cause lung disease and is known to the State of California to cause cancer.

**⚠ DANGER**

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

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

**⚠ WARNING**

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

NOTICE:

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

**⚠ CAUTION**

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

**⚠ DANGER**

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

NOTICE:

- Ensure parking brake is engaged and parking brake indicator is on.
- Machine might jerk when digging starts. Allow 3 feet (1 m) between digging teeth and obstacle.
- Keep everyone at least 6 feet (2 m) from machine, attachments, and their range of movement.
- Do not stall tractor or digging chain while backfilling or digging for more than 10 seconds or transmission may overheat.



1. Move hand throttle to half open.
2. Move F-N-R lever forward. DIGGING CHAIN WILL MOVE.
3. Lift trench cleaner, if equipped.
4. Slowly lower digging boom to desired trench depth.
5. Increase engine speed to full throttle.
6. Raise backfill blade.
7. Apply service brake.
8. Release parking brake and verify parking brake indicator is off.
9. Twist F-N-R lever to 2 (high), if desired.
10. Move speed/direction hand control to desired speed.

IMPORTANT: For cruise control operation, see page 114.

11. Release service brake.
12. If using trench cleaner, return speed/direction control to neutral. Raise boom slightly, then lower trench cleaner completely. This ensures trench cleaner will lock in place.

NOTICE:

- Do not have trench cleaner in working position when starting a trench.
- Do not back up with trench cleaner in working position.
- Do not use trench cleaner in conditions where large rocks can get between chain and cleaner.

13. If using trench cleaner, lower boom to trench depth and push speed/direction hand control forward to trenching speed.
14. When trench is complete, apply service brake.
15. Move speed/direction hand control to neutral.
16. Adjust throttle to low idle.
17. Raise boom and trench cleaner.
18. As boom clears top of trench, move F-N-R lever to neutral.
19. Turn seat to the drive position.
20. Tilt steering column to desired operating position.
21. Drive away from work site. See page 60 for driving procedures.
22. To disengage axle lock, drive tractor in reverse 6' (2 m).
23. Shut down tractor. See page 62 for proper shutdown procedures.

Operating Tips

- Operate engine at full throttle when working.
- For best production, maintain engine speed at 2400-2650 rpm.
- Sight along center of hood to a stake driven beyond end of trench line for straight trench.
- Use correct length boom. See your Ditch Witch dealer for more information.
- Do not make sharp turns. Lower boom to full depth when turning.
- If an object becomes lodged in chain, move attachment speed/direction control to neutral and raise boom slightly. Reverse chain direction. If object must be removed manually, turn engine off and engage parking brake.
- When cutting asphalt, start trench in soil at edge of road and use shortest possible boom at full depth.

Backhoe

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Setup

1. Move attachment speed/direction control to neutral position.
2. Apply service brake.
3. Move ground drive control to neutral position.
4. Shift gearbox control to 1 (low).
5. Lower rear attachment to 6" (150 mm) above ground.
6. Check that backfill blade is straight and lower it to ground.
7. Decrease engine speed to low throttle.
8. Move to backhoe operator's station.
9. Lower stabilizers enough to lift front tires.

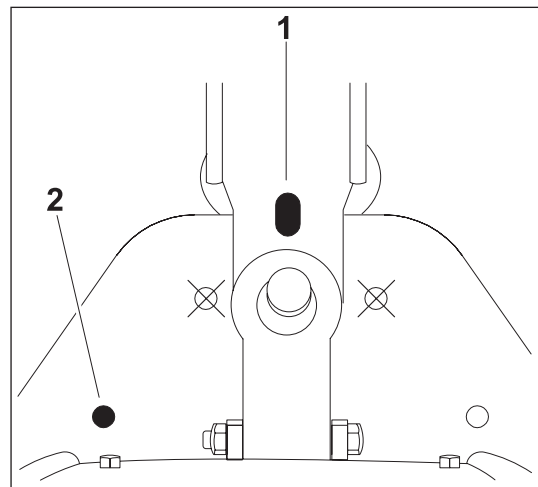
IMPORTANT: For more information about stabilizer controls, see **(cross ref)**.

10. Remove swing lock pin from hole (1) and store in hole (2).
11. Raise boom to release tension on stow lock.
12. Release stow lock by pushing handle forward.

IMPORTANT: For more information about stow lock, see **(cross ref)**.

13. Adjust engine speed to 1/2 to 3/4 throttle for digging.

NOTICE: Engine speed affects speed of backhoe operation.

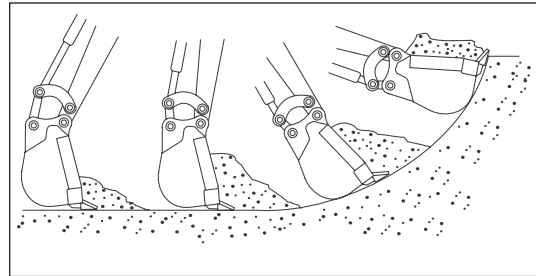


Operation

Use boom/swing control and bucket/dipper control to dig hole or trench.

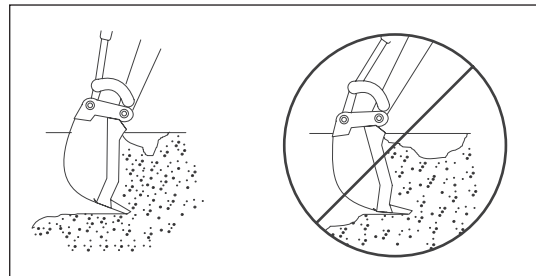
IMPORTANT: For more information about backhoe controls, see **(cross ref)**.

- Keep dipper and boom at right angles as much as possible for maximum power.
- Keep bucket in line with dipper as much as possible.



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- Position bucket so teeth cut soil. As soil is cut, curl bucket under dipper.
- Move dipper and bucket together. Increasing engine speed will not increase backhoe force.



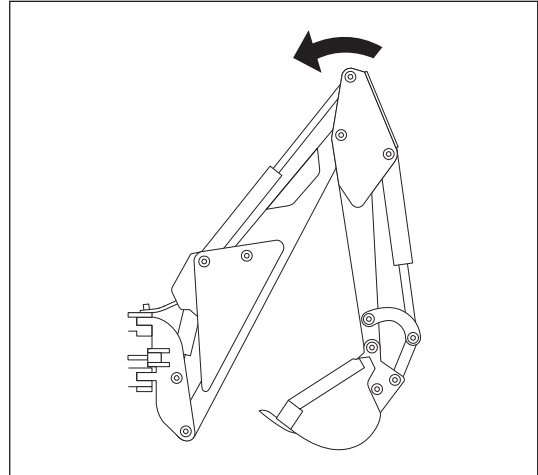
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Stowing

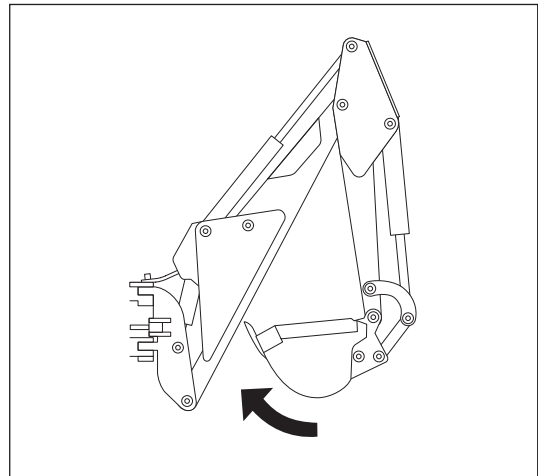
NOTICE: Before returning to tractor operator station, raise stabilizers, return remote throttle to low idle, and stow and lock boom

1. When hole or trench is complete, lift boom while keeping dipper pointed at ground.



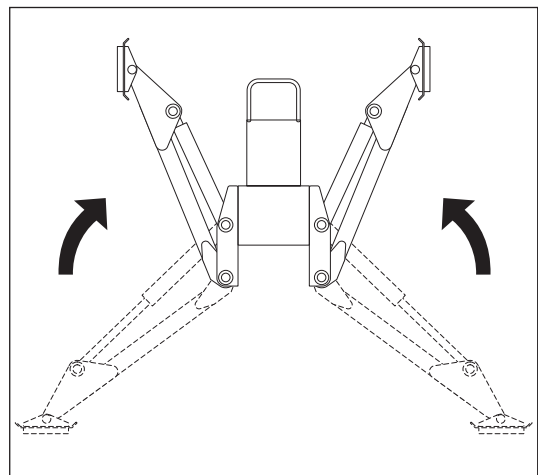
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2. Curl bucket closed and move dipper fully toward boom.
3. Lift boom to highest position and latch stow lock.
4. Lower boom slightly to engage lock.
5. Engage swing lock. See page 80.



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6. Raise stabilizers.
7. Return remote throttle to low idle.



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Drill

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- Target Trench (2). 85
- Drill Pipe and Equipment. 85

Drill 86

- Using Drill String Guide. 86

Add Rod 87

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Disassemble Joints. 88





DANGER Turning shaft will kill you or crush arm or leg. Stay away.

NOTICE: Keep everybody at least 10 ft (3 m) away from drill pipe during operation. Do not straddle trench or drill pipe while drilling.

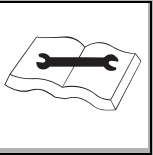


WARNING Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

NOTICE: Set up warning barriers and keep people away from equipment and jobsite while drilling.



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



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

NOTICE: Do not tape or tie down switch or lever.

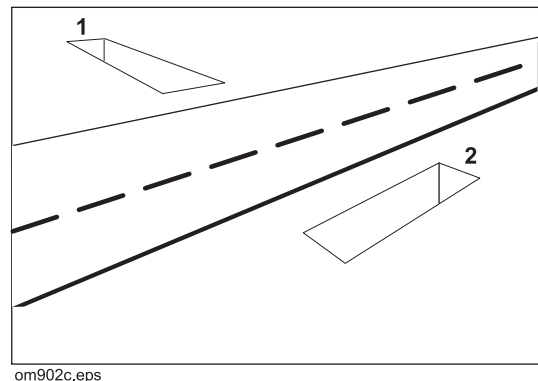
Prepare Jobsite and Equipment

Approach Trench (1)

1. Mark path where you intend to drill.
2. Dig an approach trench (1) along the intended drill path.

IMPORTANT: The approach trench should be at least:

- deep enough for pipe to lay flat and enter soil at correct angle
- 20' (6 m) long
- 4" (100 mm) wide



Target Trench (2)

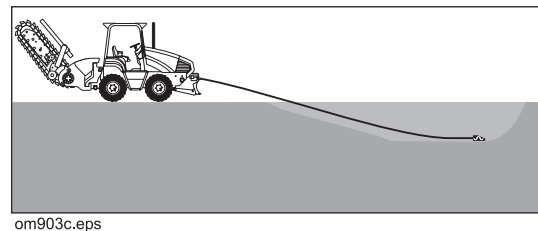
1. Select a completion point for the drilling project.
2. Dig a target trench (2) **across** the anticipated completion point.

IMPORTANT: The actual length of the target trench depends on soil conditions and length of pipe sections. Make it deep enough for drill bit to enter slightly above the trench floor.

Drill Pipe and Equipment

1. Assemble at least 20' (6 m), but not more than 30' (9 m), of drill rod.

NOTICE: More than 10-15' (3-4.5 m) of drill rod out of the trench increases the tendency of drill rod to bend.



2. Install drill bit to the cutting end of the drill string.
3. Put drill string in approach trench.
4. Move tractor to the approach trench and align the drilling attachment with the intended bore path.
5. Turn off engine.
6. Attach drill string to drilling attachment.

Drill

IMPORTANT: For location and description of drilling controls see **(cross ref)**.

EMERGENCY SHUTDOWN: Release drilling control and turn ignition switch to STOP.

1. Start tractor's engine and begin clockwise (forward) rotation.
2. Slowly advance tractor while maintaining clockwise rotation.

NOTICE:

- Drilling too quickly causes bit to drift off course and may bend drill rod. After drill path is established, speed may be slightly increased.
- If drill rod starts to bend, stop forward movement of unit and back the unit slightly until rod straightens. Do not drill with bent rod.
- If drill rod hits an obstruction, rotate drill string counterclockwise to back up slightly.

Using Drill String Guide



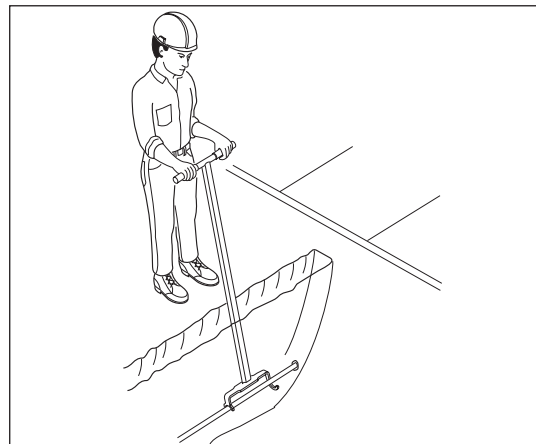
⚠ DANGER

Turning shaft will kill you or crush arm or leg. Stay away.

NOTICE: Keep everybody at least 10 ft (3 m) away from drill rod during operation. Do not straddle trench or drill rod while drilling.

Use drill string guide to align drill string as it enters the soil. When using drill string guide, follow these guidelines:

- Use only approved Ditch Witch drill string guide (p/n 179-737).
- Stand only on the **left** side of the approach trench.
- Keep drill string guide at least 3' (1 m) behind bit.
- Use drill string guide to control only the first 5' (1.5 m) of the bore path.
- After drilling 5' (1.5 m), stop unit and remove drill string guide.
- **Do not** use drill string guide during backreaming or any time the drill string is being pulled back.



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Add Rod

1. Stop drilling attachment.
2. Back up tractor 6" (150 mm) to loosen drill rod in ground.
3. Disconnect drill rod from drilling attachment.
4. Move tractor away from bore.
5. Add one drill rod to continue bore.



Backream

After drill bit enters target trench, the bore hole may be enlarged by changing the drill bit to a backreamer and drawing it back through the initial bore.

1. Turn tractor ignition switch to STOP.
2. Replace drill bit with backreamer.
3. Start tractor engine and begin clockwise rotation.

IMPORTANT: Always rotate clockwise during backreaming. Rotate counterclockwise only to dislodge a dry bore bit or reamer that has siezed in the bore hole.

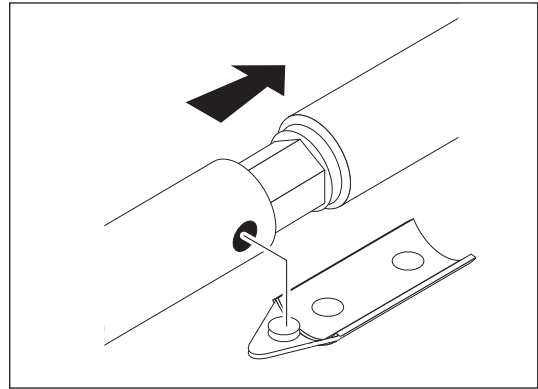
4. Slowly back up tractor while maintaining rotation.
5. When backreamer exits the bore hole, stop rotation immediately.

IMPORTANT:

- Do not try to increase hole size too much in one pass. Several passes using successively larger reamers will save wear on machine.
- During backreaming, keep drill string straight. Sharp bends in the drill rod at the motor coupling can cause rod failure.

Disassemble Joints

1. Press tab through hole in female side of joint using special tool or screwdriver.
2. Pull rods apart.



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Systems and Equipment

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- Chain Selection91

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Trench Depth Meter

Trench Depth Meter (TDM) is an optional electronic system for measuring and recording trench depth. TDM also displays productivity and distance while trenching. Two lines of information are displayed on the LED screen. If the system detects error conditions, diagnostic codes will be displayed on the second line.

IMPORTANT: For more information about TDM see the TDM Operator Manual (p/n 054-117).

Chain, Teeth, and Sprockets

Chain and Tooth Maintenance

- Always replace sprockets at the same time you replace the digging chain. Sprockets and chain are designed to work together. Replacing one without the other will cause premature wear of the new part.
- Keep digging teeth sharp. Using dull, worn teeth will decrease production and increase shock load to other trencher components. It can also cause chain stretch, which leads to premature chain wear and failure.
- Maintain the proper amount of tension on the digging chain. Overtightening will cause chain stretch and loss of machine performance. For correct tightening procedure, see page 112.
- Use the tooth pattern most appropriate for your digging conditions. If you move to a different soil type, contact your Ditch Witch dealer for information about the most effective chain type and tooth pattern.

Chain Types

Chain type	Features
4-pitch	standard chain
2-pitch	more teeth for smoother cutting
alternating side bar	prevents spoil compaction on chain
bolt-on adapters	allow easy configuration changes
Shark Chain II	versatile, virtually maintenance-free
combination	provides pick and shovel effect

Chain Selection

These charts are meant as a guideline only. No one chain type works well in all conditions. See your Ditch Witch dealer for soil conditions and chain recommendations for your area. Ask for the latest Chain, Teeth, and Sprockets Parts Catalog.

- 1 = best
- 2 = better
- 3 = good
- 4 = not recommended

Chain	Sandy Soil	Soft Soil	Medium Soil	Hard Soil	Rocky Soil	Sticky Soil
4-pitch cup tooth	3	1	2	3	4	1
2-pitch cup tooth	2	3	1	1	3	4
bolt-on adaptor, 2-pitch	4	4	3	2	1	4
bolt-on adaptor/cup tooth combo	4	3	2	1	2	4
Shark Chain II	4	3	2	1	1	4
alternating side bar	4	4	4	4	4	1



Soil	Description
sandy soil	sugar sand, blow sand, or other soils where sand is the predominant component
soft soil	sandy loam
medium soil	loams, loamy clays
hard soil	packed clays, gumbo, all compacted soils
rocky soil	chunk rock, glacial till, cobble, rip rap, gravel
sticky soil	gumbo, sticky clays

Optional Equipment

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

RT75/RT95 Tractor

Equipment	Description
dual batteries	provide more cranking power for cold starting
backup alarm	for use with low visibility situations
light kit	mounts to ROPS and includes work lights and hazard light
cab kit	enclosed cab for extreme weather conditions
A/C-heater kit (RT95 only)	climate control system for units with cabs
heater kit	heater-only systems for units with cabs
auxiliary step kit (RT95 only)	additional step for moving from operator's station to backhoe station

M910/M912 Trencher

Equipment	Description
booms	several boom length options are available
hydraulic trench cleaner	removes spoils from the trench floor
long auger extensions	for conditions that require spoils to be moved farther from the trench

Complete the Job

Chapter Contents

Restore Jobsite 94

- Backfilling 94

Rinse Equipment 94

Stow Tools 94

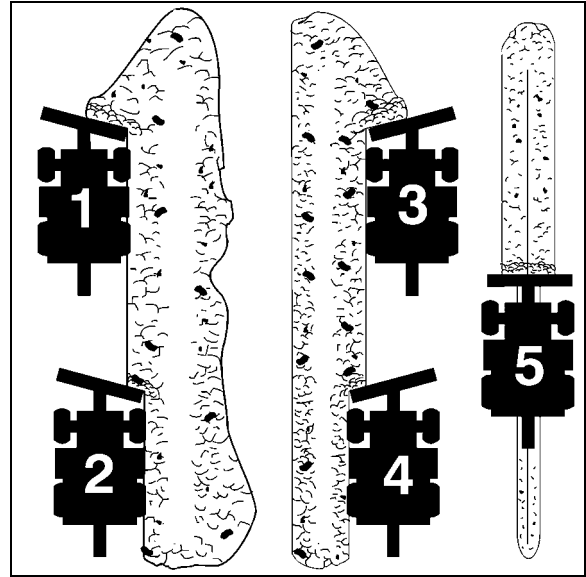


Restore Jobsite

After product is installed, return spoils to the trench with backfill blade.

Backfilling

1. Position unit at end of trench, several feet from spoils. Aim tractor at outer edge of spoils.
2. Adjust backfill blade to fit land contour.
3. Move outer edge of spoils toward trench. Take two or more passes at spoils rather than moving all spoils at once.
4. Repeat on other side of trench, if necessary.
5. Engage float and make final pass over trench.



Rinse Equipment

Spray water onto equipment to remove dirt and mud.

NOTICE: Do not spray water onto operator's console. Electrical components could be damaged. Wipe down instead.

Stow Tools

Make sure all tools and accessories are loaded on trailer.

Service

Chapter Contents

Lubrication Overview 96

Recommended Lubricants/Service Key 96

- Approved Coolant98
- Engine Oil Temperature Chart.98

10 Hour 99

50 Hour 113

250 Hour 120

500 Hour 125

1000 Hour 129

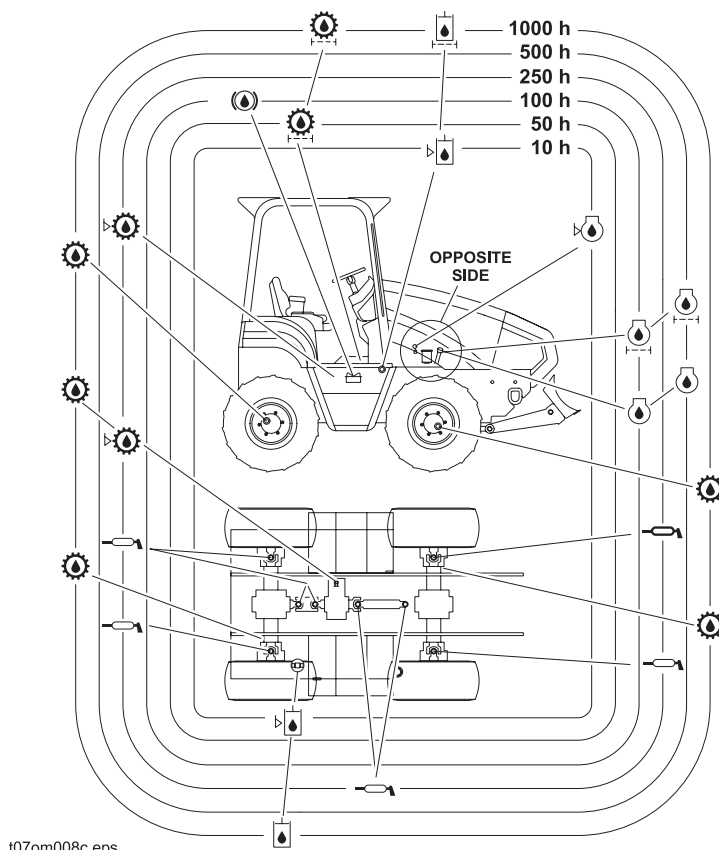
2000 Hour. 135

5000 Hour. 136

As Needed 137



Lubrication Overview



Recommended Lubricants/Service Key

Item	Description
 DEO	John Deere Plus-50® or equivalent multi-viscosity diesel engine oils meeting ACEA specification E4/E5. Other multi-viscosity diesel engine oils meeting API classifications CI++0, CH-4, or ACEA E3 may be used, but only with 250 hour change intervals.
 MPG	Multipurpose grease meeting ASTM D217 and NLGI 5
 EPG	Extreme pressure grease meeting ASTM D217 and NLGI 5
 MPL	Multipurpose gear oil meeting API service classification GL-5 (SAE 80W90)
 THF	Tractor hydraulic fluid, similar to Phillips 66 HG, Mobilfluid 423, Chevron Tractor Hydraulic Fluid, Texaco TDH Oil, or equivalent
 BRAKE	Brake fluid meeting or exceeding DOT 3 specifications
PTF	Powershift transmission fluid: Shell Donnax TA. Type C-3 multipurpose, heavy-duty torque converter fluid for use in off-highway powershift transmissions
 DEAC	Diesel engine Antifreeze/Coolant meeting ASTM D4985 with SCAs meeting John Deere JDM H24A2
	Check level of fluid or lubricant
	Check condition
	Filter
	Change, replace, adjust, service, or test



Proper lubrication and maintenance protects Ditch Witch equipment from damage and failure. Service intervals listed are for minimum requirements. In extreme conditions, service machine more frequently. Use only recommended lubricants. Fill to capacities listed in “Fluid Capacities” on page 179 or page 183.

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

NOTICE:

- Use only genuine Ditch Witch parts, filters, approved lubricants, TJC, and approved coolants to maintain warranty.
- Use the “Service Record” on page 167 to record all required service to your machine.

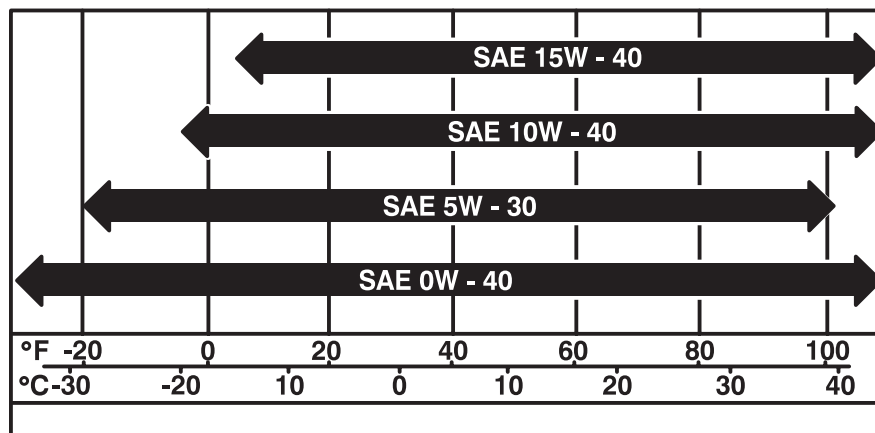
Approved Coolant

This unit was filled with John Deere Cool-Gard coolant before shipment from factory. Add only John Deere Cool-Gard (p/n 255-006) or any fully-formulated, ethylene glycol based, low-silicate, heavy-duty diesel engine coolant meeting ASTM specification D5345 (prediluted) or D4985 (concentrate) and containing supplemental coolant additives (SCAs) meeting John Deere specification JDM H24A2.

NOTICE: Do not use water or high-silicate automotive-type coolant. This will lead to engine damage or premature engine failure.

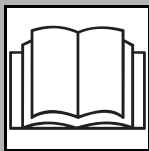
NOTICE: Do not mix heavy-duty diesel engine coolant and automotive-type coolant. This will lead coolant breakdown and engine damage.

Engine Oil Temperature Chart



t13om093c.eps

Temperature range anticipated before next oil change



WARNING

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

NOTICE:

- Unless otherwise instructed, all service should be performed with engine off.
- Refer to engine manufacturer's manual for engine maintenance instructions.
- Before servicing equipment, lower unstowed attachments to ground.

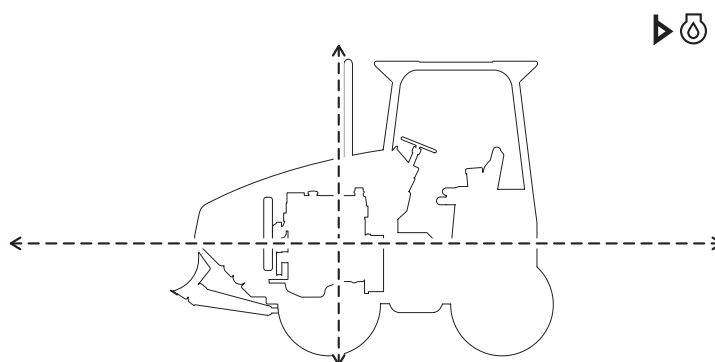
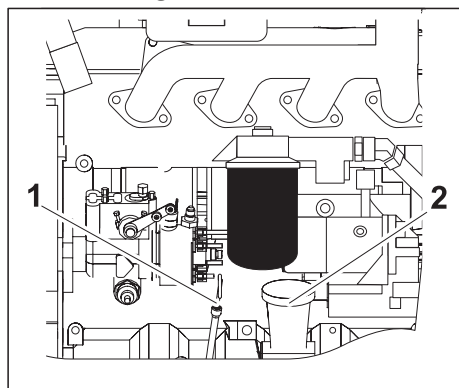
10 Hour

Location	Task	Notes
TRACTOR	Check engine oil	DEO
	Check air filter indicator and clean dust trap	
	Check water separators and fuel filter	
	Check hydraulic fluid	THF
	Check hydraulic reservoir fill and strainer	
	Check hydraulic hoses	
	Check coolant level	DEAC
	Check hoses	
	Check radiator fins	
	Check tire pressure	
	Check wheel lug nuts	295 ft•lb (400 N•m)
TRENCHER	Lube trencher tail roller	EPG
	Lube trencher pivot	EPG
	Lube headshaft pivot	EPG
	Lube trencher auger bearings	EPG
	Lube trencher auger shaft	EPG
	Check trencher auger bolts	
	Check digging chain	
	Check digging chain tension	
	Check trencher gearbox oil	MPL
	Lube headshaft bearing	
	Check boom mounting bolts	250 ft•lb (339 N•m)
	Check attachment mounting bolts	200 ft•lb (271 N•m)
	Check personnel restraint bar bolts	350 ft•lb (475 N•m)



Tractor

Check Engine Oil Level

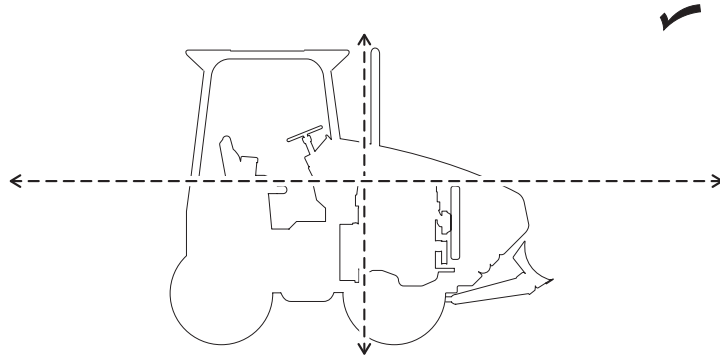
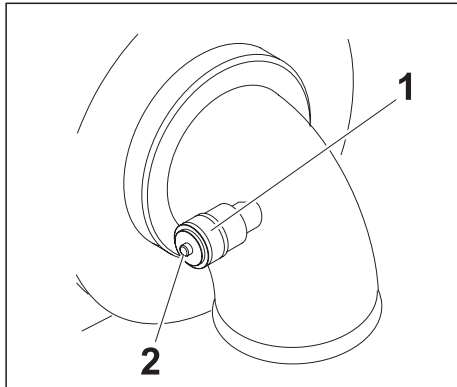


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Check engine oil at dipstick (1) before operation and every 10 hours thereafter. Add DEO at fill (2) as necessary to keep oil level at highest line on dipstick.

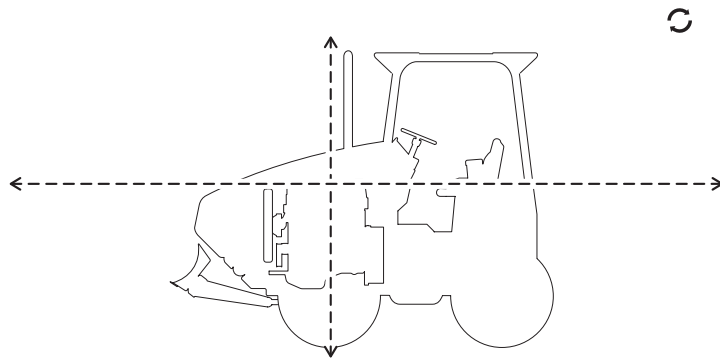
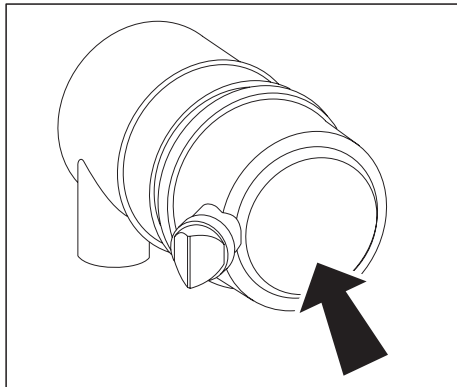
IMPORTANT: If adding oil before the initial oil change at 250 hours, add only SAE 10W30. After 250 hours, see page 96 for DEO specifications.

Check Air Filter Indicator and Clean Dust Trap



t13om013c.eps

Check air filter indicator (1) and clean dust trap every 10 hours. Red band indicates filter must be changed. Push button (2) to re-set indicator.

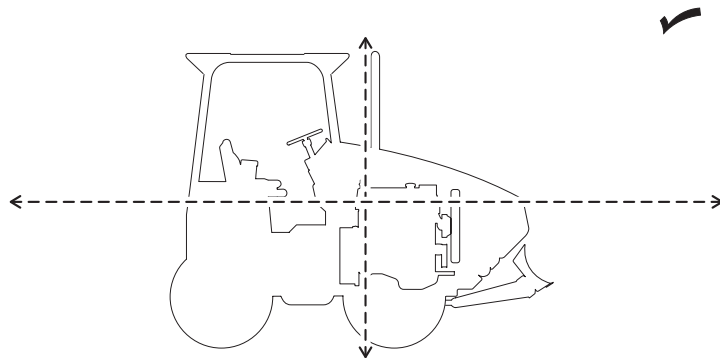
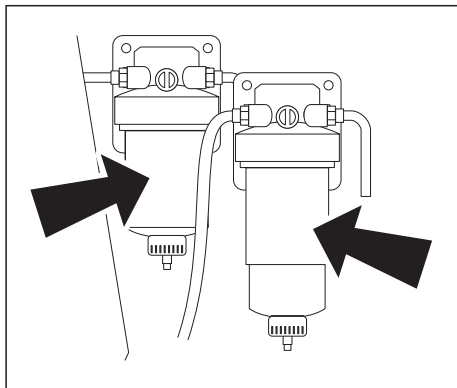


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Clean dust from trap by blowing with low-pressure air every 10 hours.

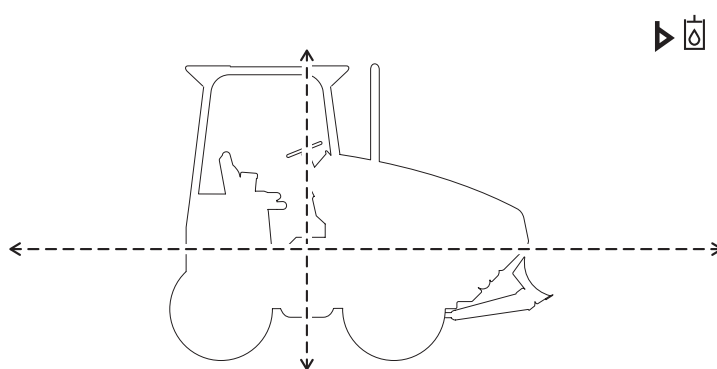
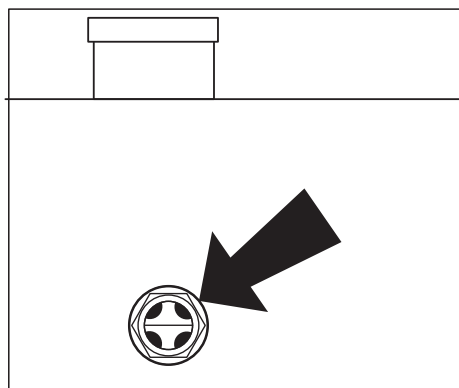


Check Water Separators and Fuel Filter



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Check water separators and fuel filter every 10 hours. Drain at plug as needed until water is removed and fuel runs from drain.

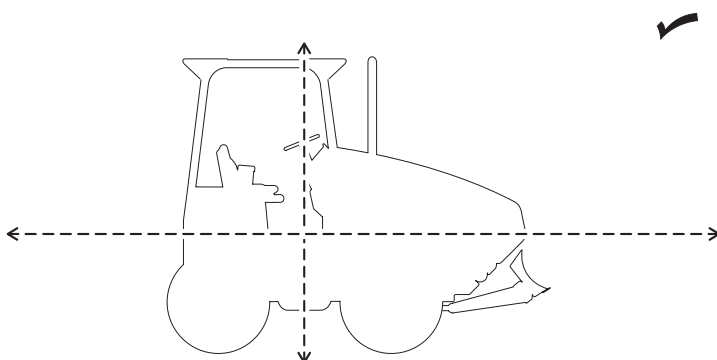
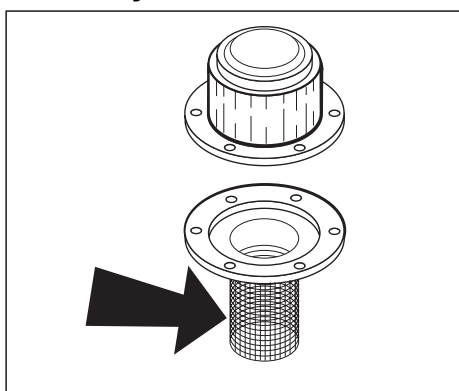
Check Hydraulic Fluid

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With frame level, check fluid at sight glass every 10 hours. Add THF at fill as necessary. Fluid capacity up to sight glass is 24 gal (91 L).

Clean dust from cap by blowing with low-pressure air.

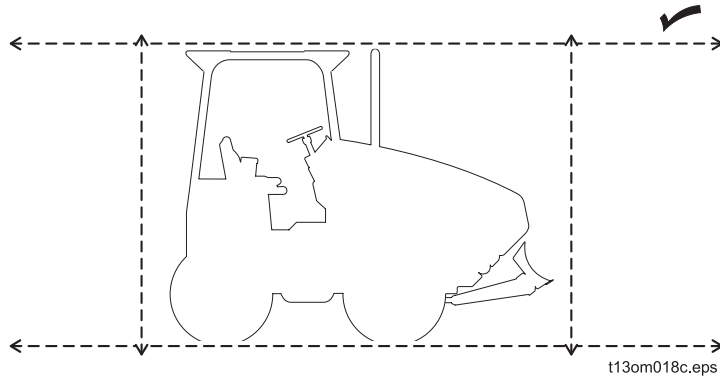
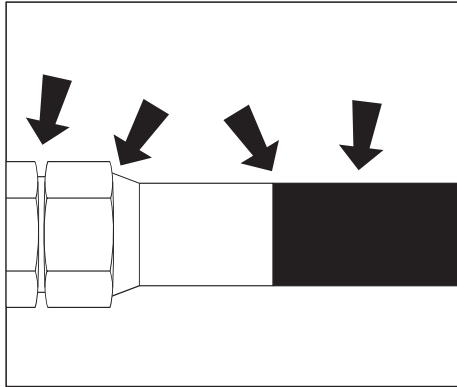
IMPORTANT: Do not open unless adding hydraulic fluid.

Check Hydraulic Reservoir Fill and Strainer

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Check hydraulic reservoir fill and strainer on operator's station step every 10 hours. Wipe away any dirt or debris.

Check Hydraulic Hoses



Check all hydraulic hoses every 10 hours.



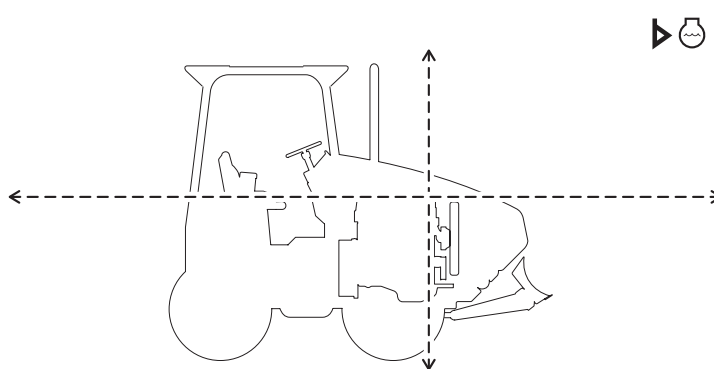
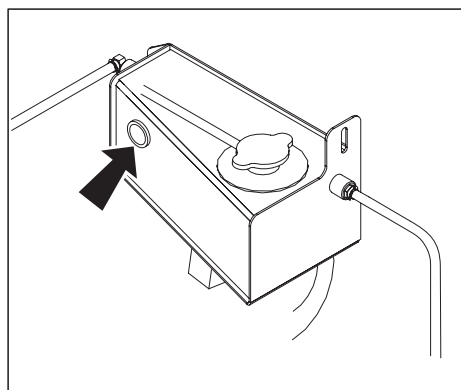
⚠ WARNING

Fluid or air pressure could pierce skin and cause injury or death. Stay away.

NOTICE: Escaping pressurized fluid can cause injury or pierce skin and poison.

- Before disconnecting a hydraulic line, turn engine off and operate all controls to relieve pressure. Lower, block, or support any raised component with a hoist. Cover connection with heavy cloth and loosen connector nut slightly to relieve residual pressure. Catch all fluid in a container.
- Before using system, check that all connections are tight and all lines are undamaged.
- Fluid leaks can be hard to detect. Use a piece of cardboard or wood, rather than hands, to search for leaks.
- Wear protective clothing, including gloves and eye protection.
- If you are injured, seek immediate medical attention from a doctor familiar with this type of injury.

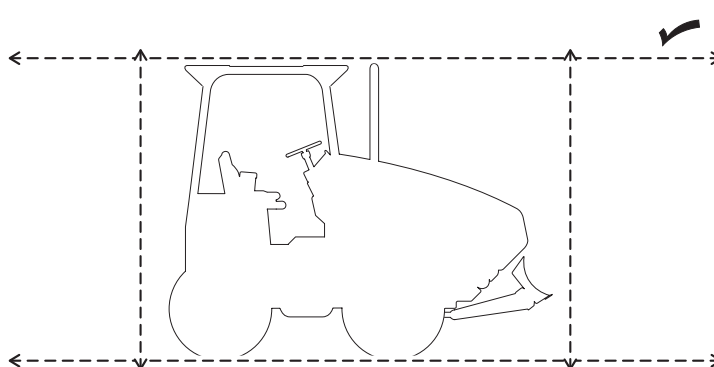
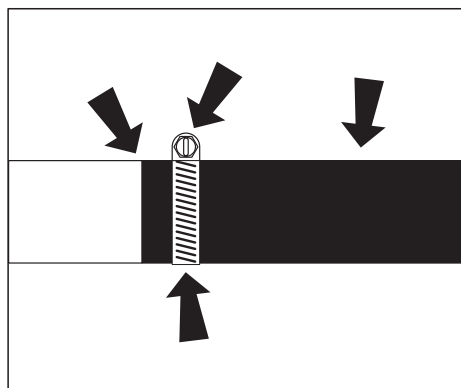


Check Coolant Level

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With engine cool, check coolant level in auxiliary tank sight glass every 10 hours. Maintain level so that coolant is visible in sight glass and no higher than bottom of fill neck. If low, add approved coolant. Do not overfill.

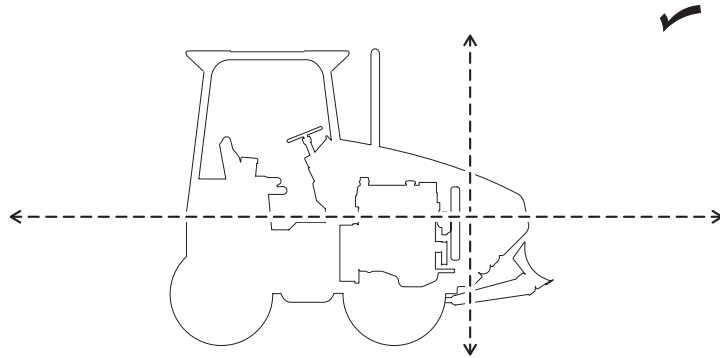
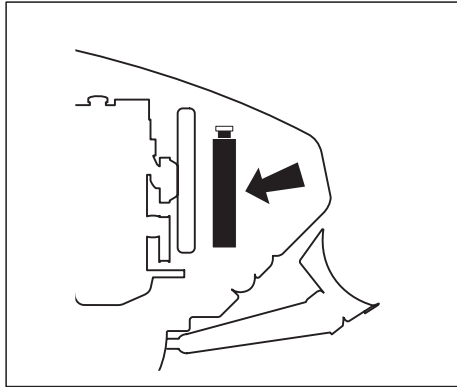
IMPORTANT: See page 98 for information on approved coolants.

Check Hoses

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Check all hoses every 10 hours.

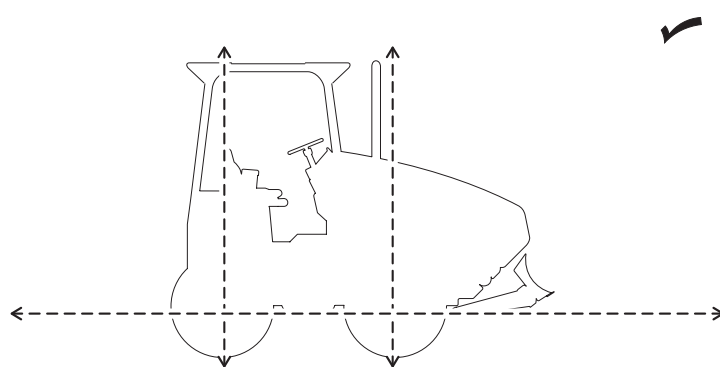
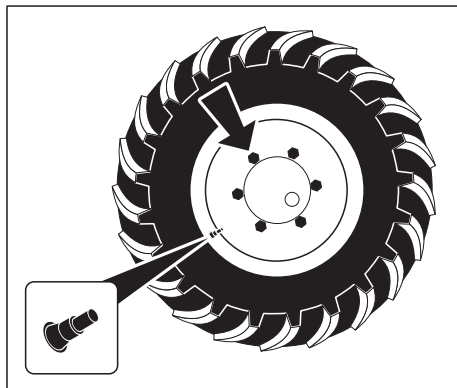
Check Radiator Fins



t13om021c.eps

Check radiator for dirt, grass, and other foreign matter every 10 hours. Clean out with compressed air or spray wash if required. Be careful not to damage fins with high pressure air or water. Check more often if operating in dusty or grassy conditions.

Check Tire Pressure



t13om022c.eps



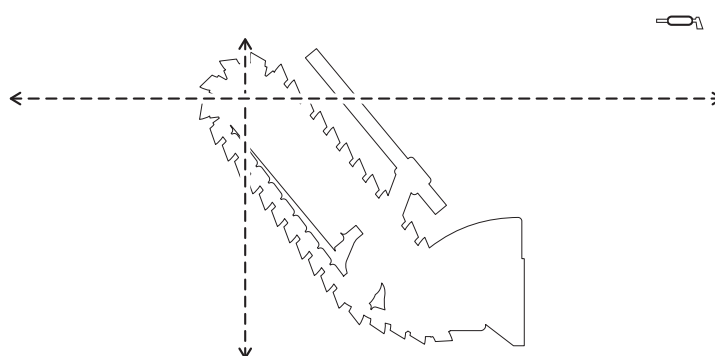
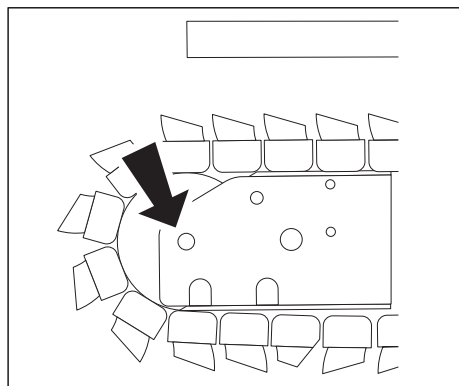
Check tire pressure every 10 hours.

Tire option	Maximum pressure
31 x 15.50-15 8-ply bar lug	40 psi (2.8 bar)
35 x 19-16.1 12-ply bar lug	55 psi (3.8 bar)

Check tightness of wheel lug nuts (1) every 10 hours. Tighten lugnuts to 295 ft•lb (400 N•m).

Trencher

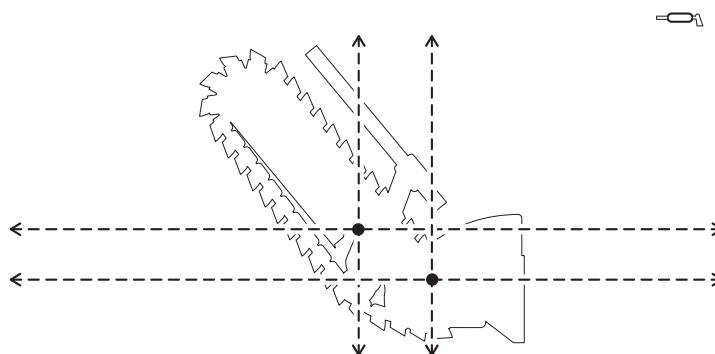
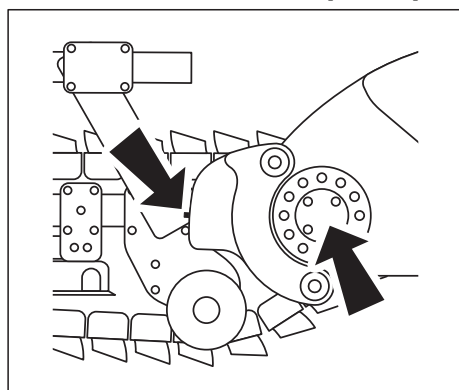
Lube Trencher Tail Roller



t13om023c.eps

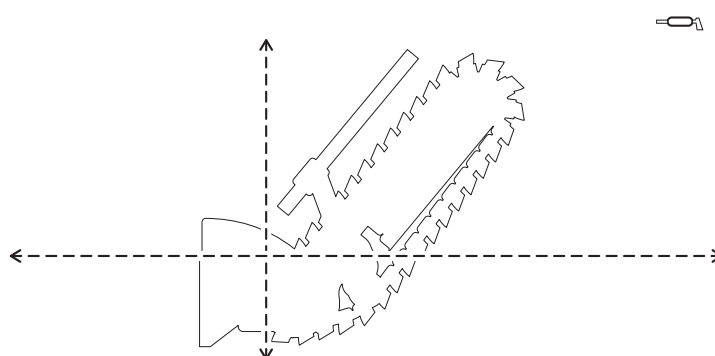
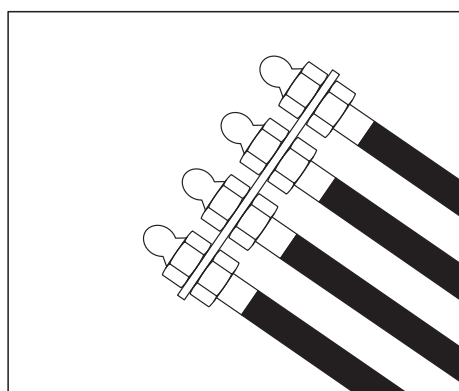
Wipe zerks clean and lube every 10 hours with EPG. Lube roller zerks on both sides of boom.

Lube Trencher Pivot (M910)



t13om024c.eps

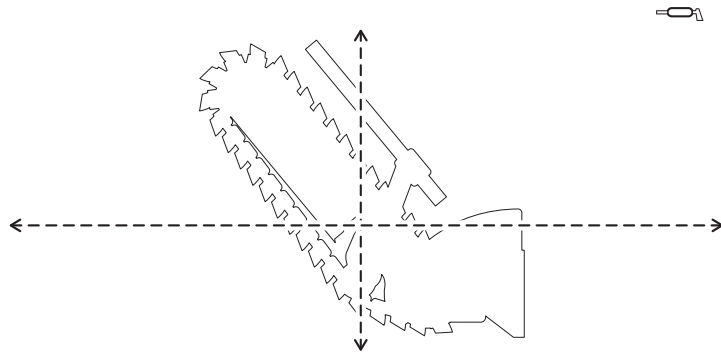
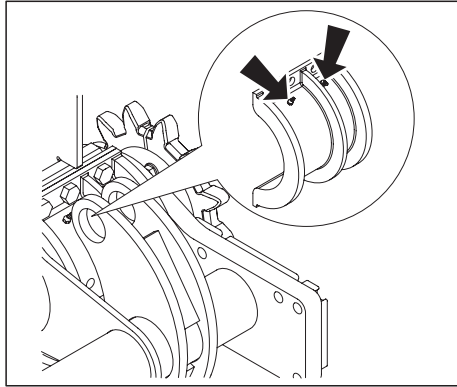
Wipe five zerks located on right of trencher pivot clean and lube every 10 hours with EPG.



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Wipe four zerks located on left of trencher pivot clean and lube every 10 hours with EPG.

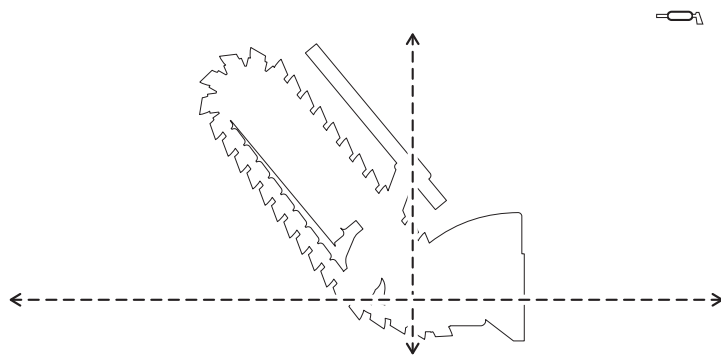
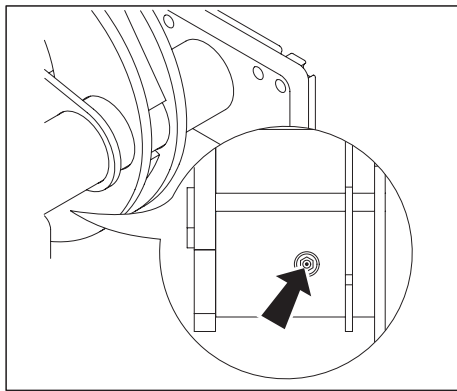
Lube Trencher Pivot (M912)



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Wipe two zerks located on top of pivot cap clean and lube every 10 hours with EPG.

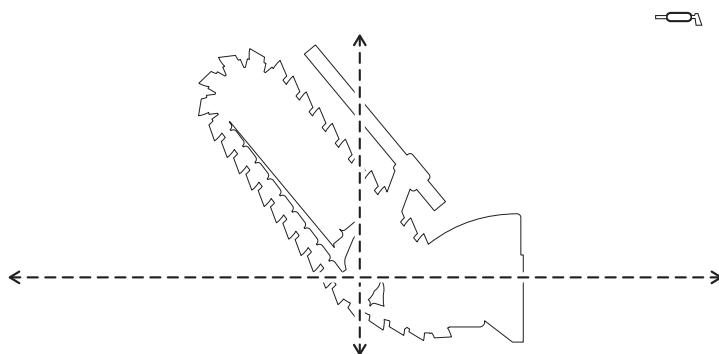
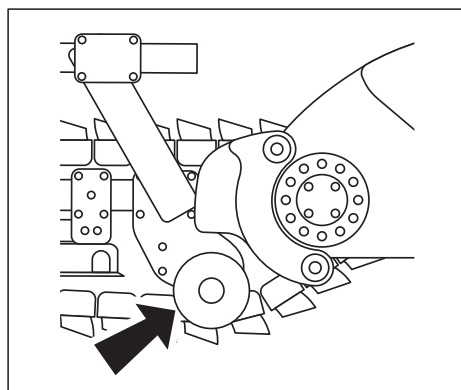
Lube Headshaft Pivot



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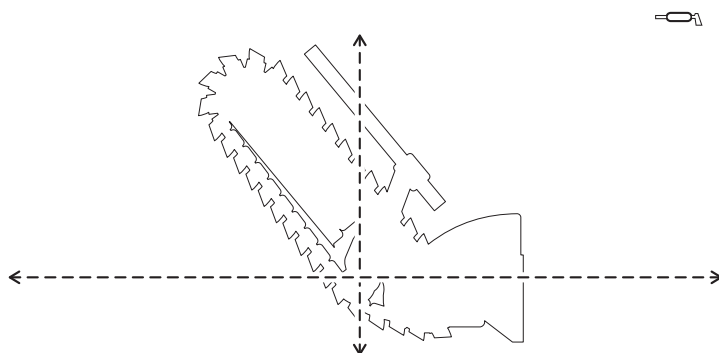
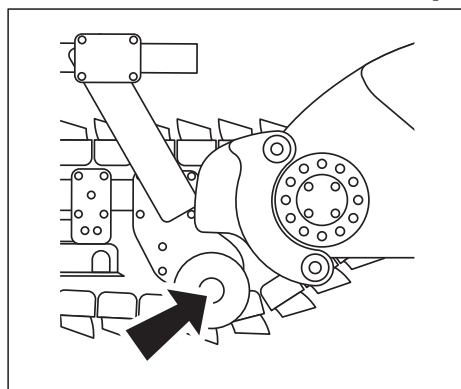
Wipe zerk clean and lube headshaft pivot every 10 hours with EPG.



Lube Trencher Auger Bearings

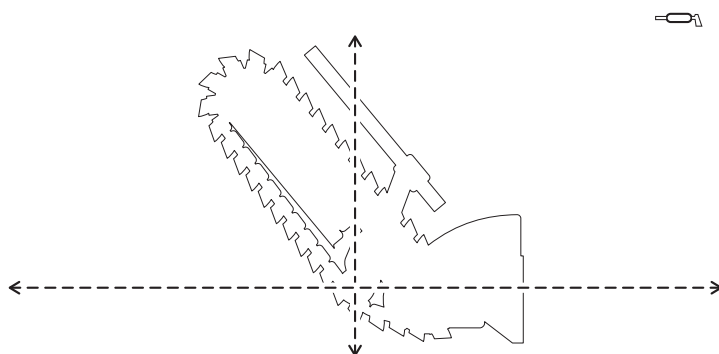
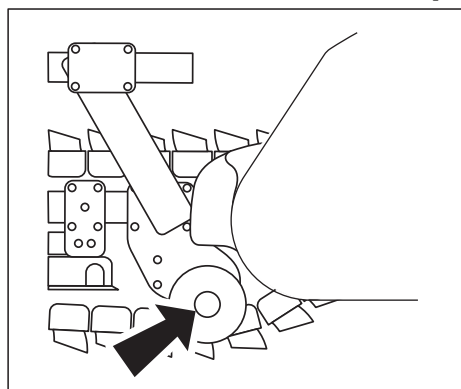
t13om026c.eps

Lube two auger bearing zerks (one on each side) every 10 hours with EPG.

Lube Trencher Auger Shaft (M910)

t13om027c.eps

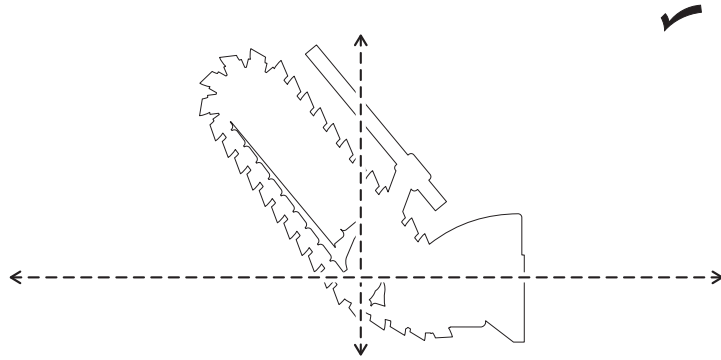
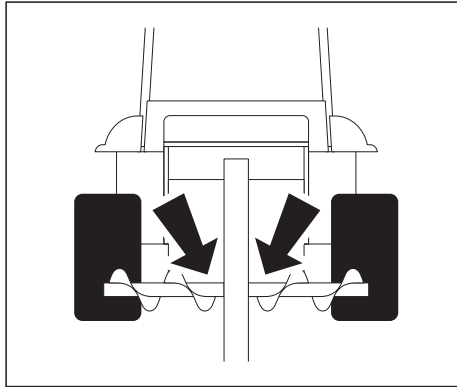
Lube four auger shaft zerks (two on each side) every 10 hours with EPG.

Lube Trencher Auger Shaft (M912)

t13om102c.eps

Lube four auger shaft zerks (two on each side) every 10 hours with EPG.

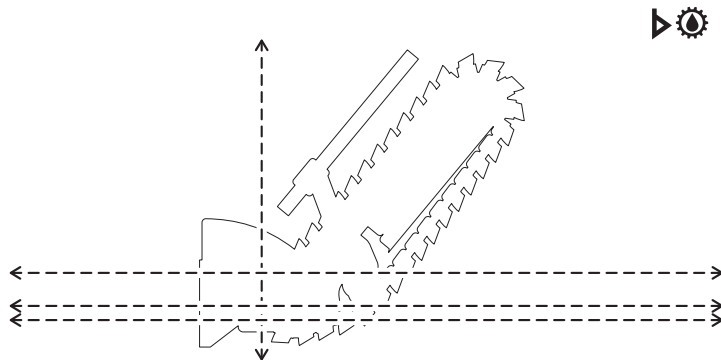
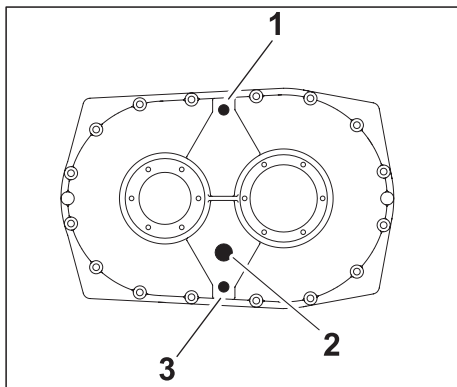
Check Trencher Auger Bolts



t13om028c.eps

Check trencher auger bolts every 10 hours. For optimal spoils delivery, adjust augers to match terrain and digging depth.

Check Trencher Gearbox Oil

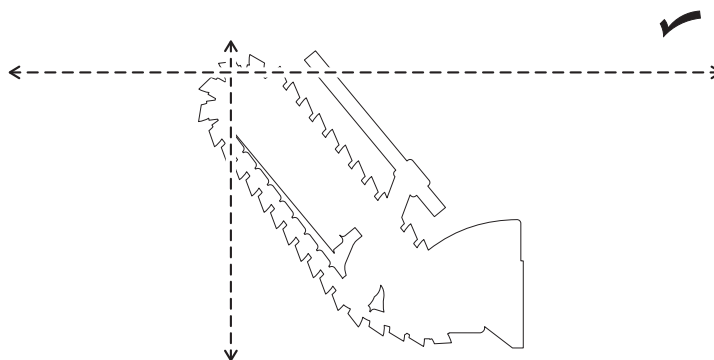
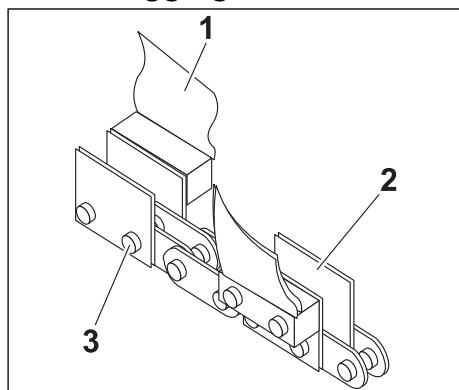


t13om103c.eps

Check oil at sight glass (2) every 10 hours. Keep oil level at center of sight glass. If necessary, add MPL at fill plug (1).



Check Digging Chain Teeth and Bits



t13om029c.eps

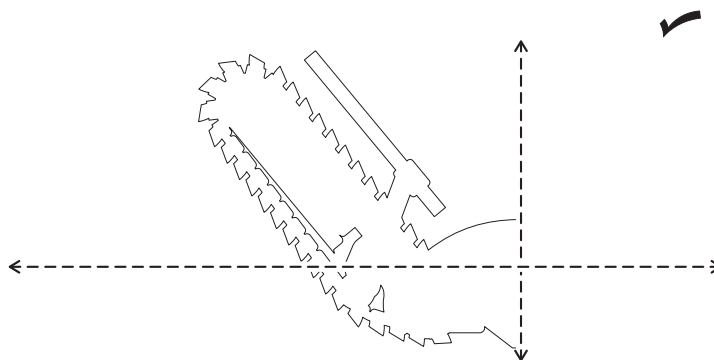
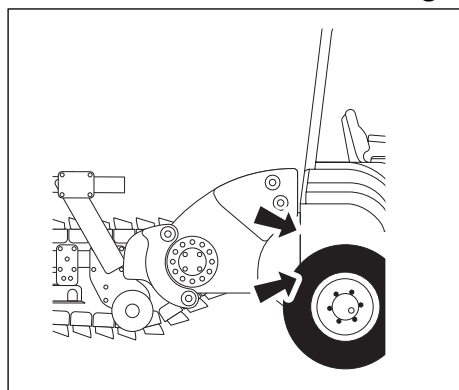
Check teeth (1) for wear every 10 hours. Replace worn teeth, using Ditch Witch replacement parts and maintaining original tooth pattern.

For more efficient digging, contact your Ditch Witch dealer for information about the tooth pattern best suited to your jobsite.

If using rock chain bits, check that bits rotate freely. Clean chain and check bits after each use. Replace bit when carbide cap or insert is worn or adapter can be damaged.

Check chain every 10 hours. Replace worn or broken chains. If sidebars (2) are bent or loose on chain pins (3), chain spacers should be used to join sidebars.

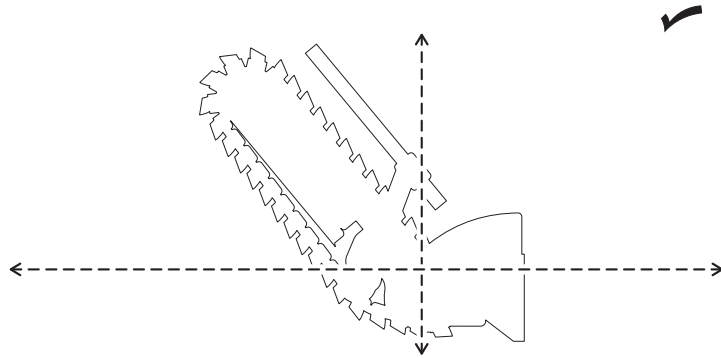
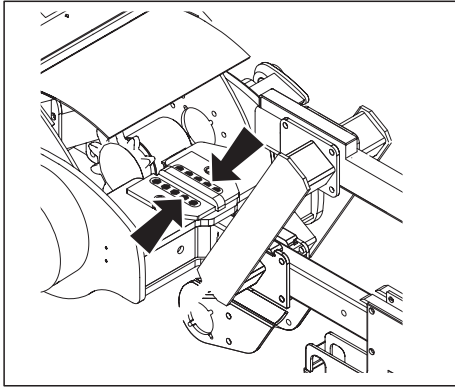
Check Attachment Mounting Bolts



t13om031c.eps

Check bolts every 10 hours and torque as necessary to keep bolts and other fasteners tight. Check for looseness or wear. Apply Loctite 271[®] adhesive. Check that bolts are torqued to 200 ft•lb (271 N•m).

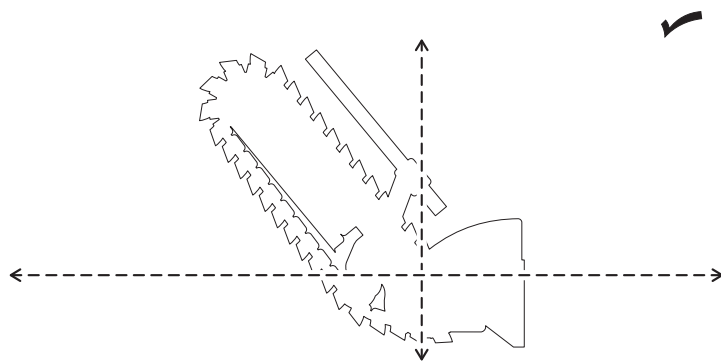
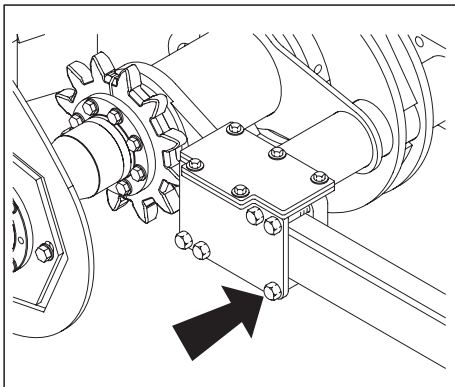
Check Boom Mounting Bolts (M910)



t13om104c.eps

Check 10 bolts (5 on each side) every 10 hours and torque as necessary to 250 ft•lb (28 N•m). Check for looseness or wear.

Check Boom Mounting Bolts (M912)

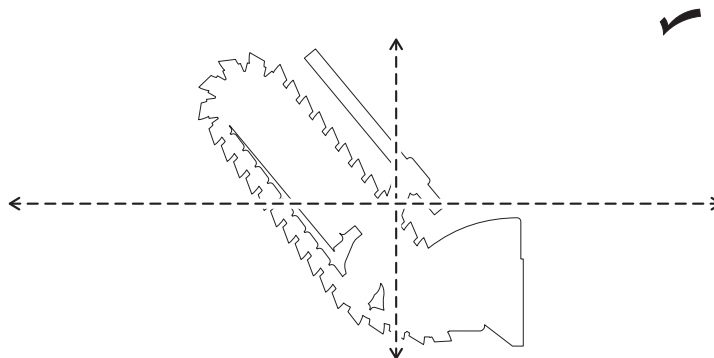
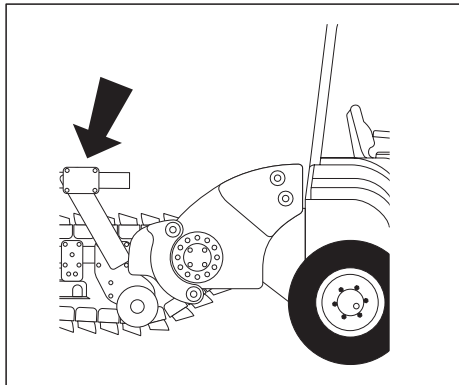


t13om105c.eps

Check bolts every 10 hours and torque as necessary to 250 ft•lb (28 N•m). Check for looseness or wear.



Check Personnel Restraint Bar/Trench Cleaner

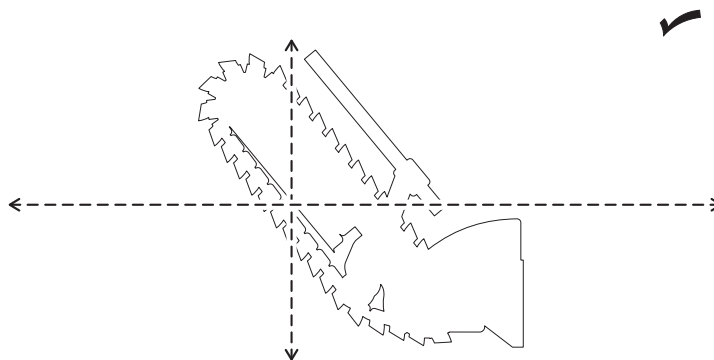
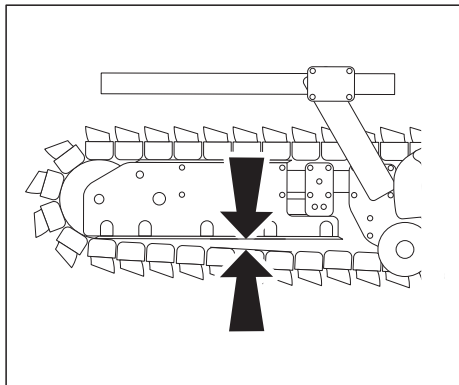


t13om032c.eps

Check 6 bolts that mount restraint bar/trench cleaner to arm every 10 hours and torque as necessary to keep bolts tight. Check for looseness or wear. Apply Loctite 271[®] adhesive.

Check that bolts holding personnel restraint bar/trench cleaner to arm are torqued to 350 ft•lb (475 N•m). Bolts mounting arm to boom should be torqued to 400 ft•lb (542 N•m).

Check Digging Chain Tension



t13om033c.eps

Check digging chain tension every 10 hours. With boom horizontal, measure distance from bottom of boom to chain. When properly adjusted, distance should be 4.5 - 5.5" (114 - 140 mm).

To tighten chain, loosen six bolts on trencher boom and pump EPG into cylinder. To relieve chain tension, loosen plug on grease cylinder.


WARNING

Fluid pressure could pierce skin and cause injury or death. Stay away.

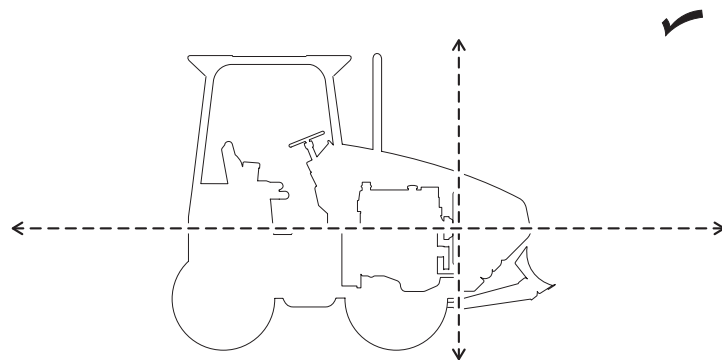
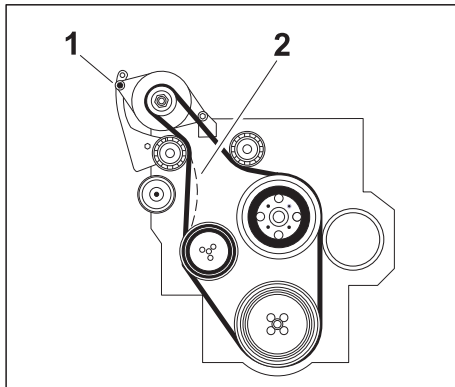
NOTICE: Service digging boom grease cylinder only while standing on opposite side of boom. Wear gloves and safety glasses, and cover fitting with cloth when relieving pressure in cylinder.

50 Hour

Location	Task	Notes
TRACTOR	Check drive belt	
	Check hydraulic reservoir breather	
	Check fuel tank breather	
	Check cab air filter	
	Change transmission fluid and filter (initial)	
TRENCHER	Lube attachment driveshaft u-joints	EPG

Tractor

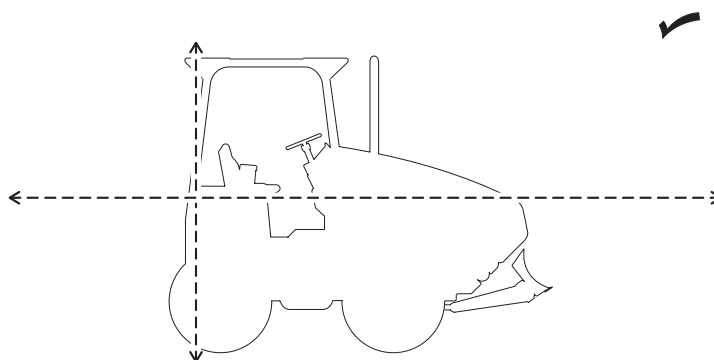
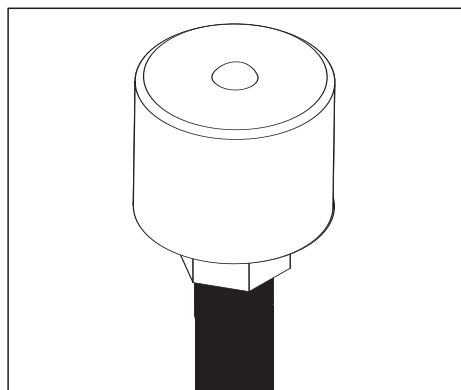
Check Drive Belt



t13om044c.eps

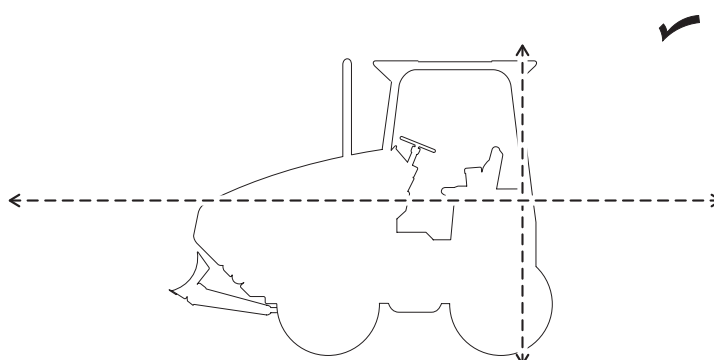
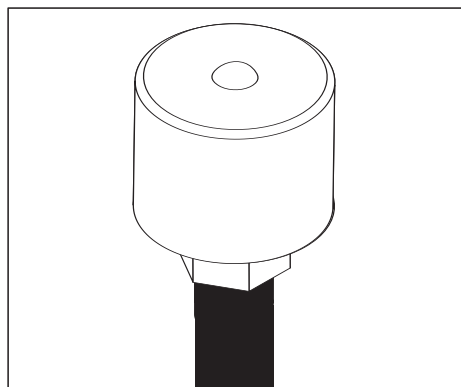
Check belt every 50 hours for damage or wear. Replace worn belt. Belt is properly tensioned when long span (2) moves about 1/2" (13 mm) when pushed. If needed, loosen alternator bolts (1) and adjust idler pulley.



Check Hydraulic Reservoir Breather

t13om045c.eps

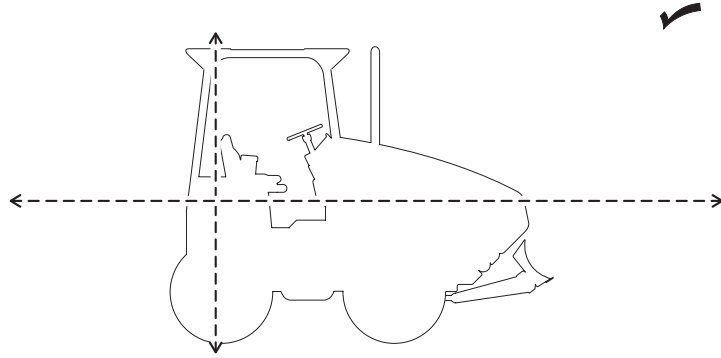
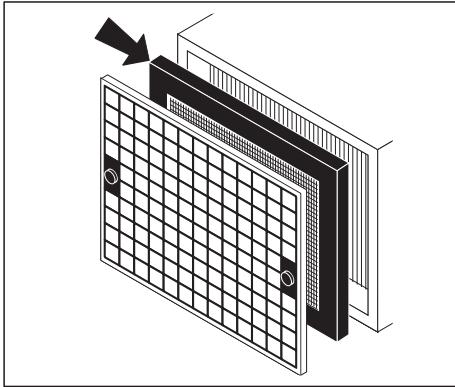
Check hydraulic reservoir breather every 50 hours. Ensure breather is not clogged. Remove dust around breather as needed by blowing with low-pressure air. When breather element becomes clogged, remove and clean or replace.

Check Fuel Tank Breather

t13om046c.eps

Check fuel tank breather every 50 hours. Ensure breather is not clogged. Remove dust around breather as needed by blowing with low pressure air. When breather element becomes clogged, remove and clean or replace.

Check Cab Air Filter

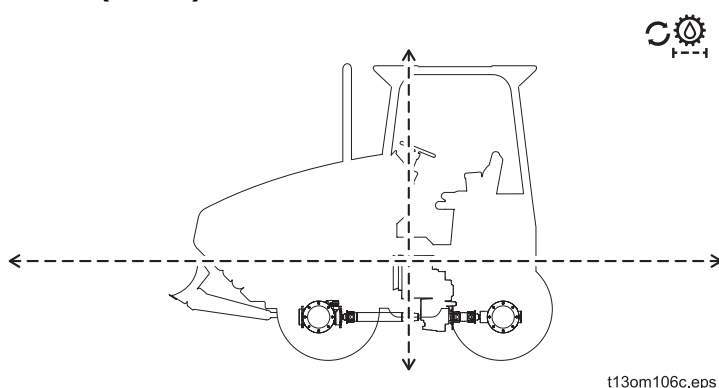
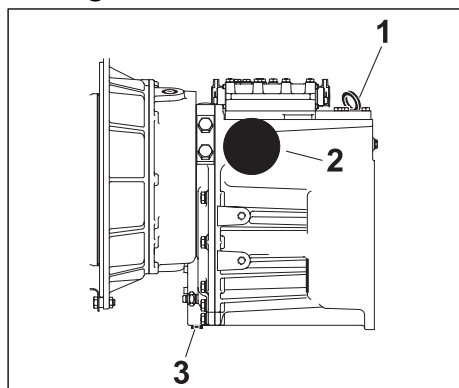


t13om047c.eps

Check filter every 50 hours for wear or holes. Check more often if working in dusty conditions.



Change Transmission Fluid and Filter (Initial)



t13om106c.eps

Change transmission fluid and filter (2) after first 50 hours of operation. Change more frequently if working in dusty conditions.

To change:

1. While fluid is warm, remove drain plug (3), screen, and filter (2).
2. Drain fluid and reinstall plug, screen, and new filter.
3. Refill with approximately 6 qt (5.6 L) of PTF at fill (1).
4. Start engine and run at low idle with transmission in neutral.
5. Cycle transmission from forward to reverse several times.
6. Check fluid level at dipstick. Add PTF as necessary to keep fluid at the appropriate line on the dipstick according to the table below.

Oil temperature	Condition	Line on dipstick
50-86°F (10-30°C)	engine at low idle a few minutes after startup	COLD
176-212°F (80-100°C)	normal operating temperature	HOT

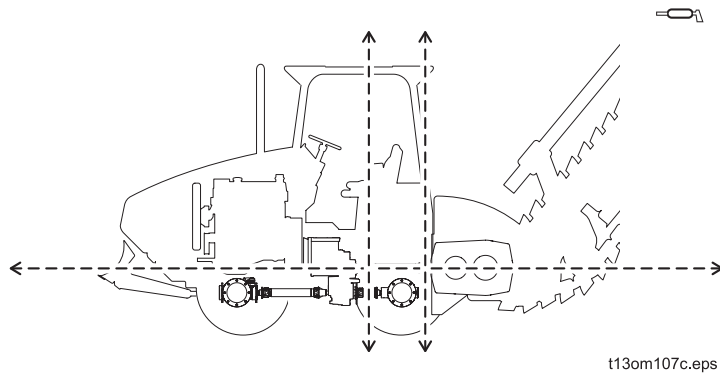
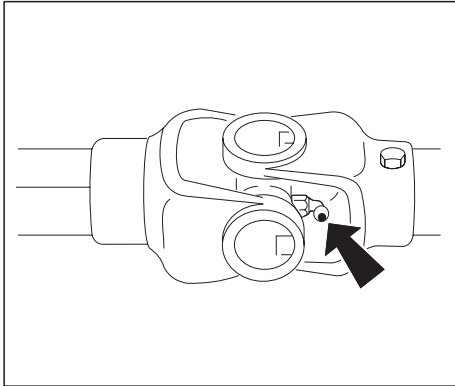
IMPORTANT: If transmission fluid temperature falls between the two ranges listed, fluid level should fall proportionally between the COLD and HOT lines on the dipstick.

NOTICE:

- Transmission damage can occur if oil is not maintained to the correct level.
- Use only Ditch Witch-approved Shell Donnax TA transmission fluid. Do not substitute any other transmission fluid.

Trencher

Lube Attachment Driveshaft U-Joints

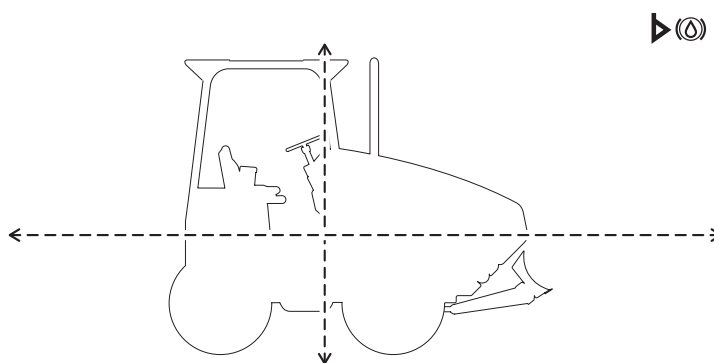
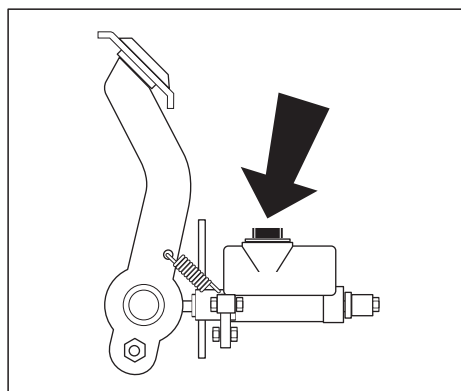


Lube attachment driveshaft u-joints every 50 hours with 3-4 shots of EPG.



100 HOUR SERVICE

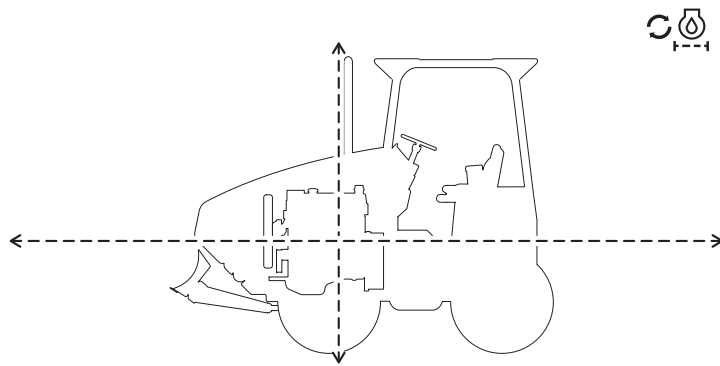
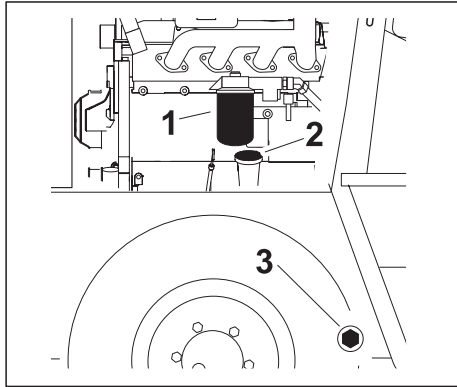
Location	Task	Notes
TRACTOR	Check brake fluid	BRAKE
	Change engine oil and filter Initial	DEO

Tractor**Check Brake Fluid**

t130m051c.eps

Check brake fluid every 100 hours of operation. Check brake fluid more frequently if working in dusty conditions. Refill with DOT 3 brake fluid.

Change Engine Oil and Filter (Initial)



t13om052c.eps

Change engine oil and filter after first 100 hours of operation.

To change:

1. While oil is warm, remove drain plug (3). Drain oil and replace plug.
2. Remove filter (1) and replace with new filter each time oil is changed. Refill with DEO at fill neck (2).

NOTICE:

- Regular oil change interval is 500 hours only if using John Deere Plus-50[®] or ACEA E4/E5.
- Oil change interval is 250 hours when using alternative oils meeting API service classifications CI-4, CH-4, or ACEA E3.
- See "Recommended Lubricants" for more information about DEO specifications.

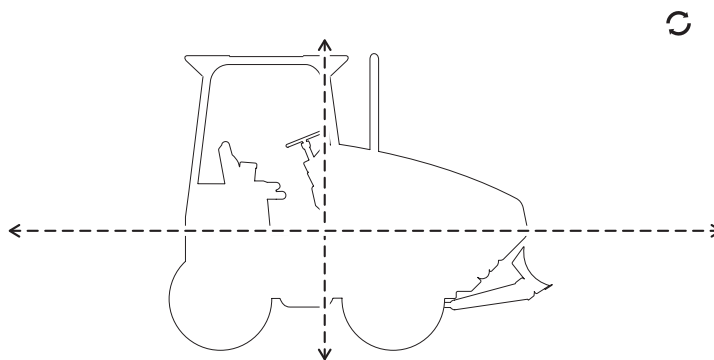
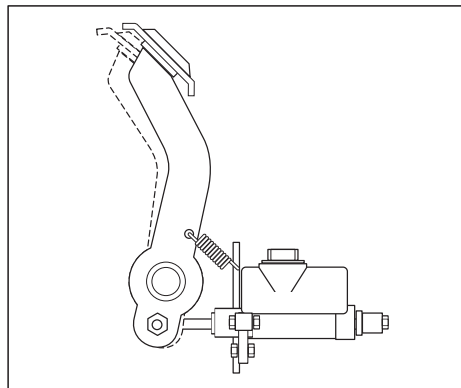


250 Hour

Location	Task	Notes
TRACTOR	Adjust service brake	
	Lube driveshaft U-joints	EPG
	Lube axle spindle pins	EPG
	Check transfer case oil	MPL
	Check differential oil	MPL
	Lube planetary wheel ends	MPL
	Change cab air filter	
	Check transmission fluid	PTF

Tractor

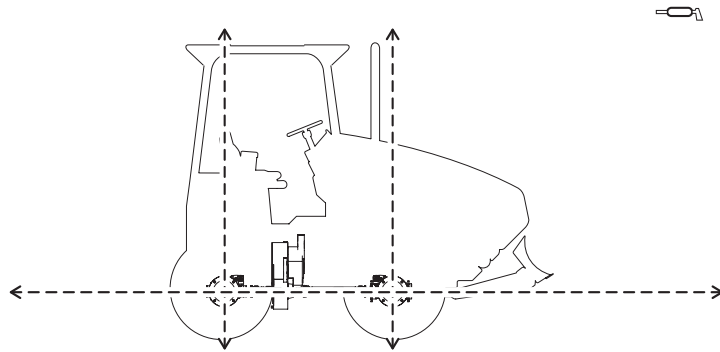
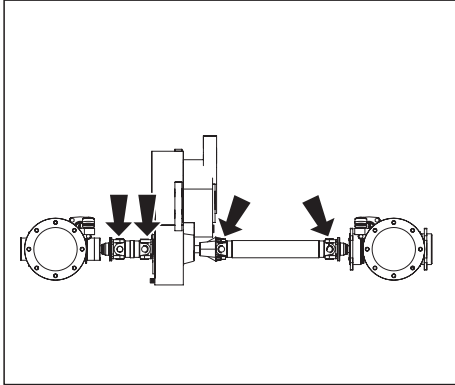
Adjust Service Brake



t130m055c.eps

Adjust service brake after 250 hours of operation. When properly adjusted, there is 1/4-1/2" (6-13 mm) free play in pedal.

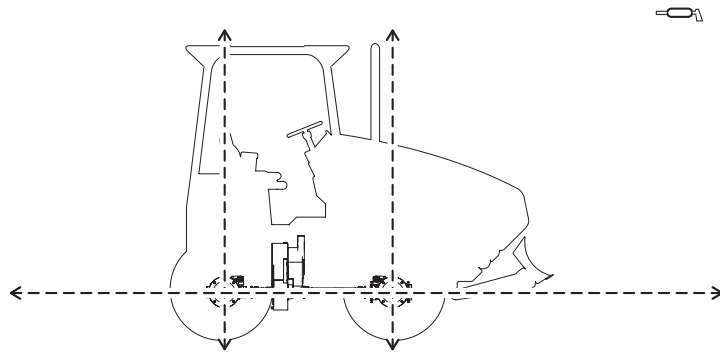
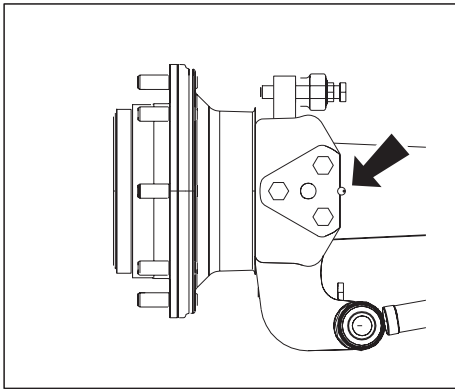
Lube Driveshaft U-joints



t13om056c.eps

Lube driveshaft U-joints every 250 hours with 3-4 shots of EPG.

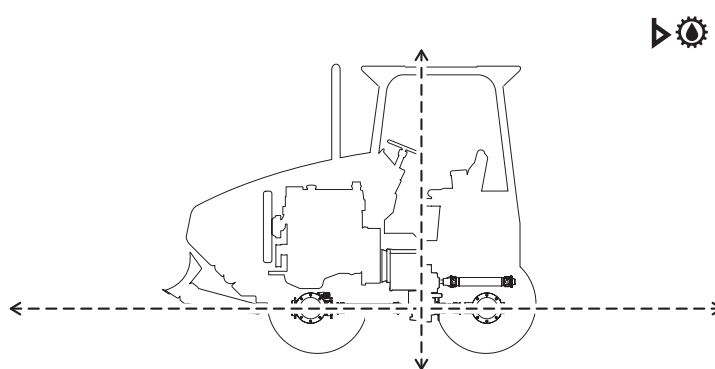
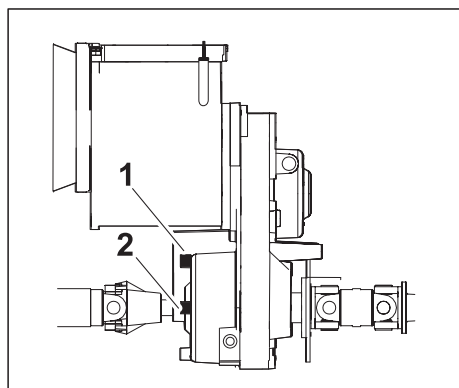
Lube Axle Spindle Pins



t13om057c.eps

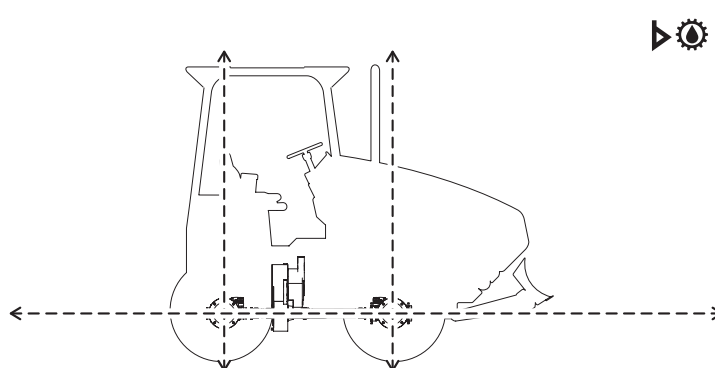
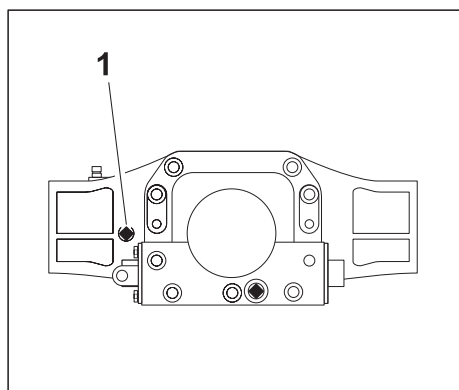
Lube axle spindle pins every 250 hours with 3-4 shots of EPG.



Check Transfer Case Oil

t13om108c.eps

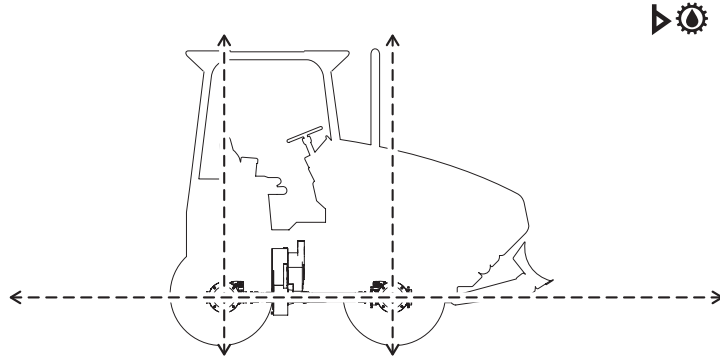
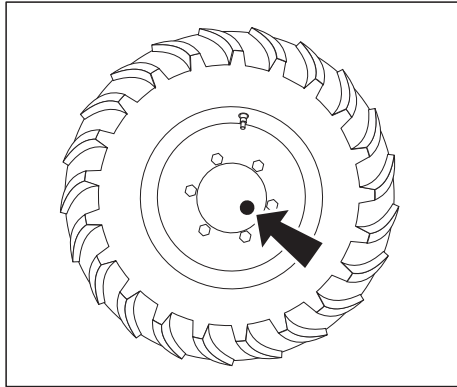
Check oil level at plug (2) every 250 hours. Add MPL as needed at fill (1) until level with plug (2).

Check Differential Oil

t13om059c.eps

Check oil level at fill (1) every 250 hours. Add MPL as needed.

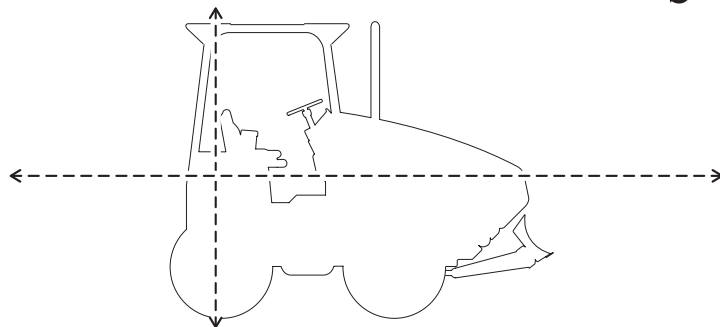
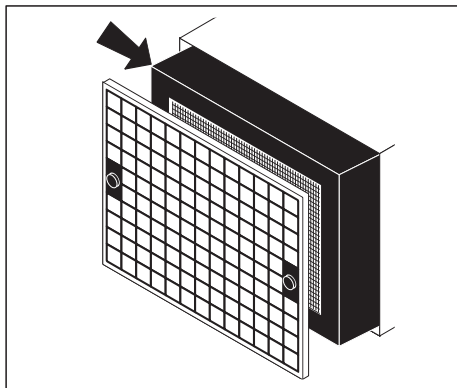
Lube Planetary Wheel Ends



t13om060c.eps

Check oil level in planetary wheel ends every 250 hours. Add MPL as needed.

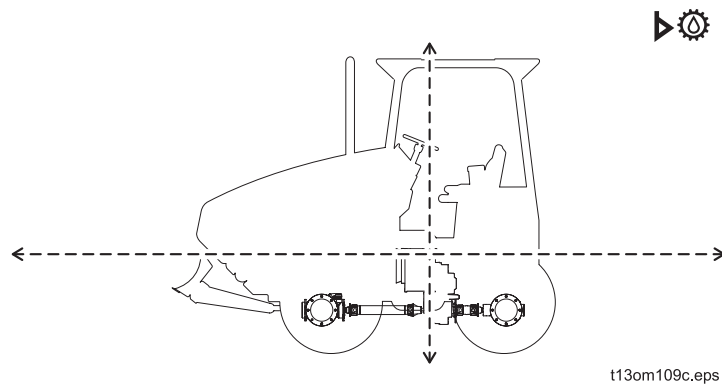
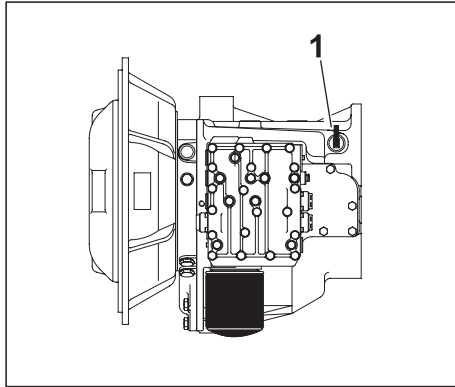
Change Cab Air Filter



t13om062c.eps

Change filter every 250 hours. Change more often if working in dusty conditions.



Check Transmission Fluid**NOTICE:**

- Transmission damage can occur if fluid is not maintained to the correct level.
- Use only Ditch Witch-approved Shell Donnax TA transmission fluid. Do not substitute any other transmission fluid.

Check transmission fluid at dipstick (1) before operation and every 250 hours thereafter. Follow these steps:

1. Start engine and run at low idle for 3-5 minutes or until transmission fluid reaches 50-86°F (10-30°C).
2. With engine running, transmission in neutral, and fluid at this temperature, fluid level should be at the COLD line on the dipstick.
3. Add PTF at fill (1) as necessary to keep fluid level at COLD line on dipstick.

IMPORTANT:

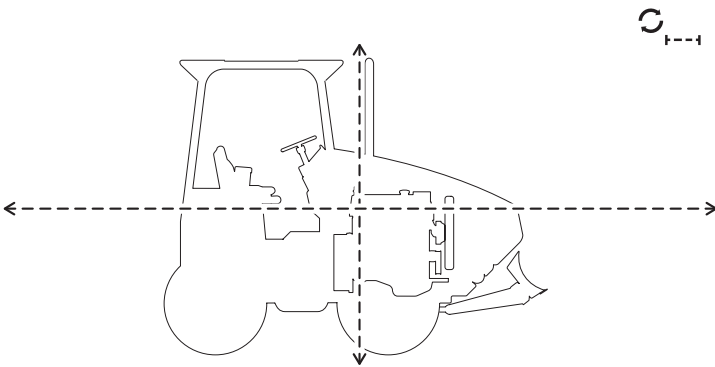
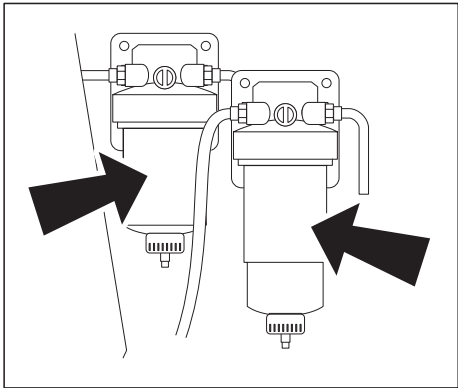
- With transmission fluid at normal operating temperature, (176-212°F/80-100°C), fluid level should be at the HOT line on the dipstick.
- If transmission fluid temperature falls between the two ranges listed, fluid level should fall proportionally between the COLD and HOT lines on the dipstick.

500 Hour

Location	Task	Notes
TRACTOR	Change fuel filters	
	Change engine oil and filter	DEO
	Change hydraulic fluid and filter	THF
	Check radiator SCA level	

Tractor

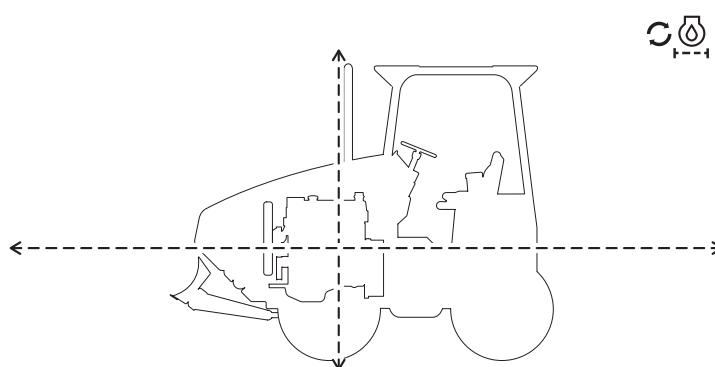
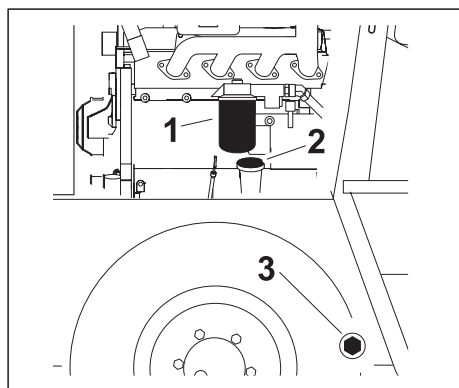
Change Fuel Filters



t13om063c.eps



Change fuel filters (shown) every 500 hours.

Change Engine Oil and Filter

t13om052c.eps

Regular engine oil and filter change interval is 500 hours only if using John Deere Plus-50[®] or ACEA E4/E5.

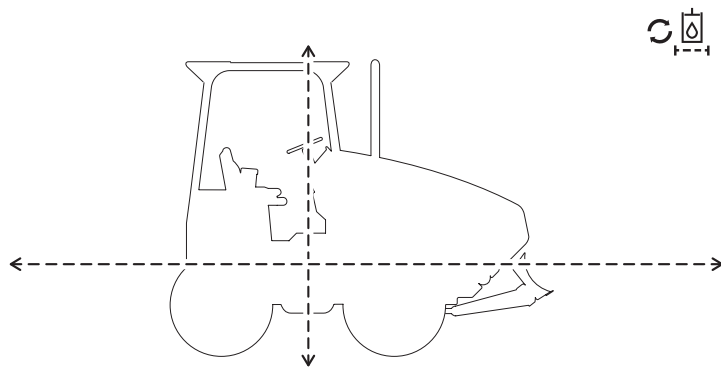
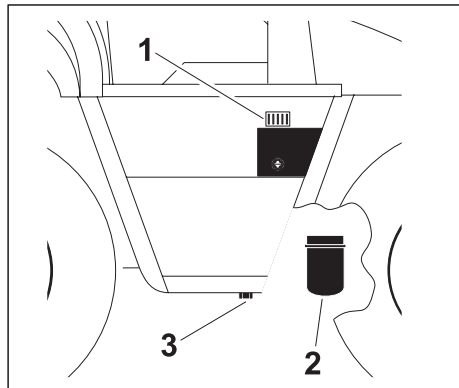
To change:

1. While oil is warm, remove drain plug (3). Drain oil and replace plug.
2. Remove filter (1) and replace with new filter each time oil is changed. Refill with DEO at fill neck (2).

NOTICE:

- Regular oil change interval is 500 hours only if using John Deere Plus-50[®] or ACEA E4/E5.
- Oil change interval is 250 hours when using alternative oils meeting API service classifications CI-4, CH-4, or ACEA E3.
- See "Recommended Lubricants" for more information about DEO specifications.

Change Hydraulic Fluid and Filter



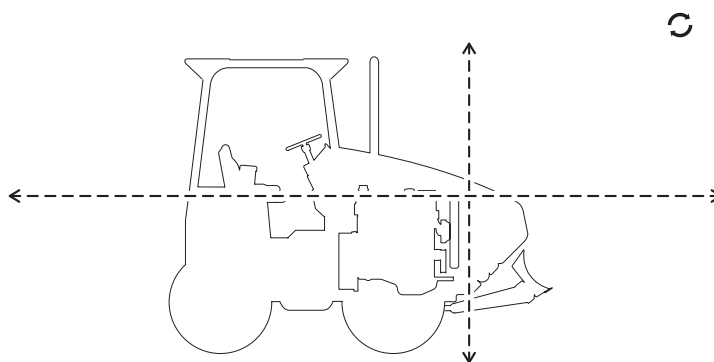
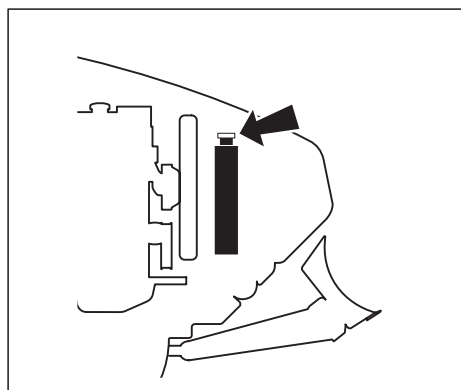
t13om064c.eps

Change hydraulic fluid and filter every 500 hours. Change hydraulic fluid and filter every 250 hours if jobsite temperature exceeds 100°F (38°C) more than 50% of the time.

To change:

1. Remove drain plug (3).
2. Drain fluid and replace plug.
3. Change filter (2).
4. Refill with THF at fill (1).



Test Radiator SCA Level

t13om065c.eps

Test SCA level every 500 hours using 3-Way Heavy Duty Coolant Test Kit (p/n 256-032). If SCA levels do not fall within appropriate range, replenish with a heavy-duty coolant conditioner such as John Deere coolant conditioner (p/n 256-033).

IMPORTANT:

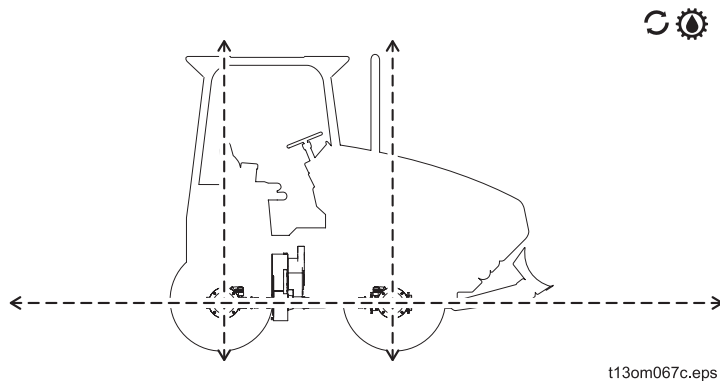
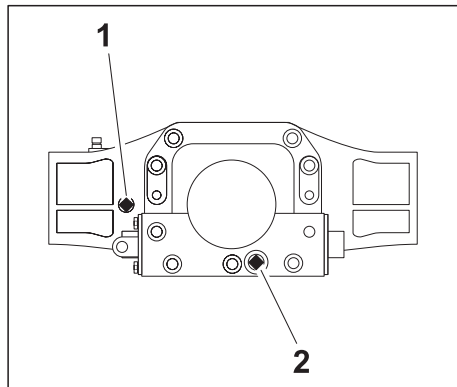
- Always check expiration date on 3-Way Heavy Duty Coolant Test Kit. An expired kit will not give accurate readings.
- See page 98 for more information on approved coolants.

1000 Hour

Location	Task	Notes
TRACTOR	Change differential oil	MPL
	Change transfer case oil	MPL
	Change planetary wheel end oil	MPL
	Adjust parking brake	
	Change transmission fluid and filter	PTF
TRENCHER	Change trencher gearbox oil	MPL
	Lube attachment driveshaft slip yoke	EPG

Tractor

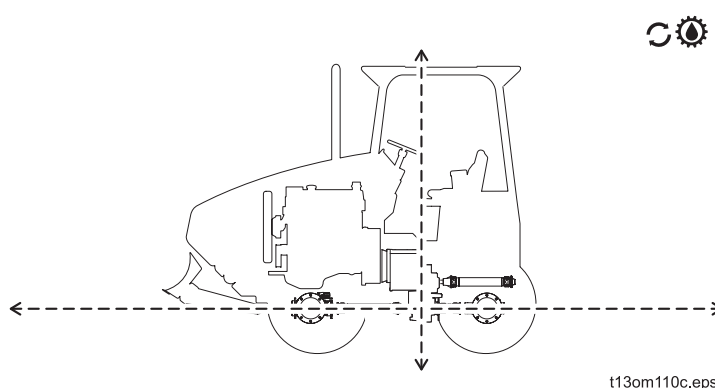
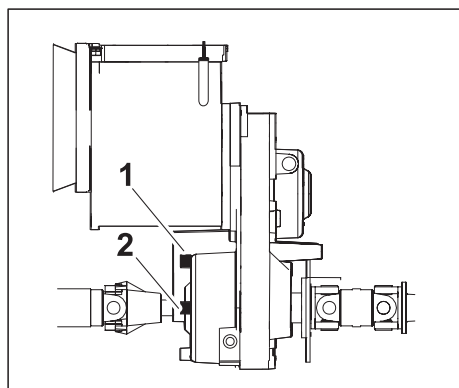
Change Differential Oil



Change differential oil every 1000 hours.

To change:

1. Remove drain plug (2).
2. Drain fluid and replace plug.
3. Fill with MPL at fill (1).

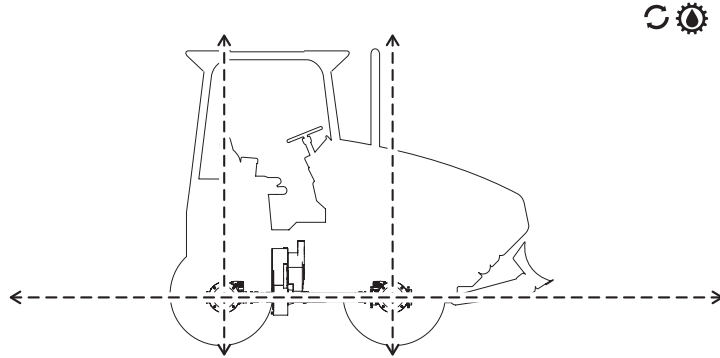
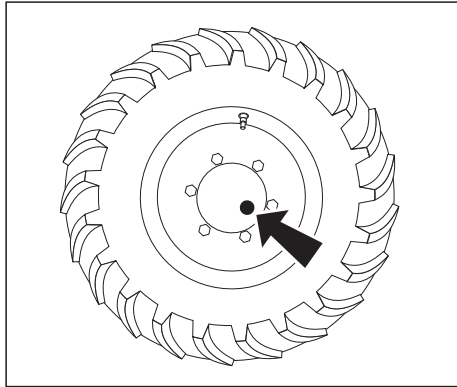
Change Transfer Case Oil

Change transfer case oil every 1000 hours.

To change:

1. Remove drain plug (3).
2. Drain oil and replace plug.
3. Fill with MPL at fill (1) until level with plug (2).

Change Planetary Wheel End Oil

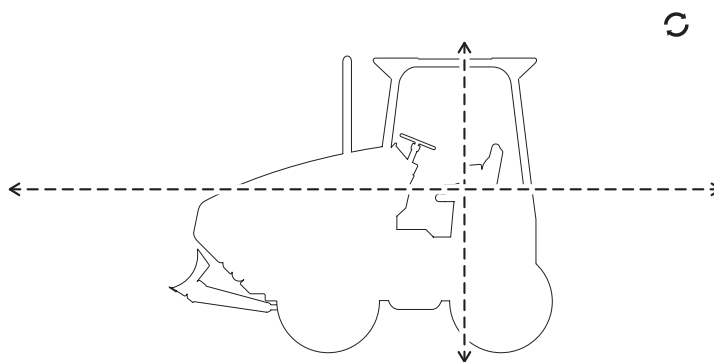
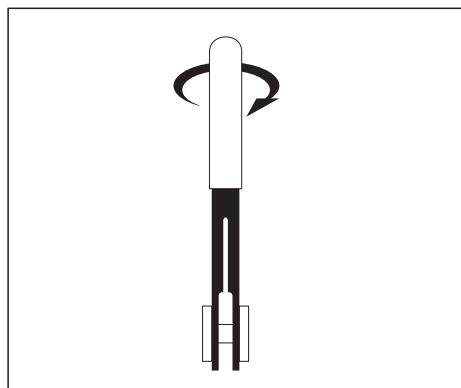


Change wheel end oil every 1000 hours.

To change:

1. Position wheel with plug at bottom.
2. Remove plug.
3. Drain oil.
4. Reposition wheel with plug at midway position.
5. Fill with MPL to plug opening.
6. Replace plug.



Adjust Parking Brake

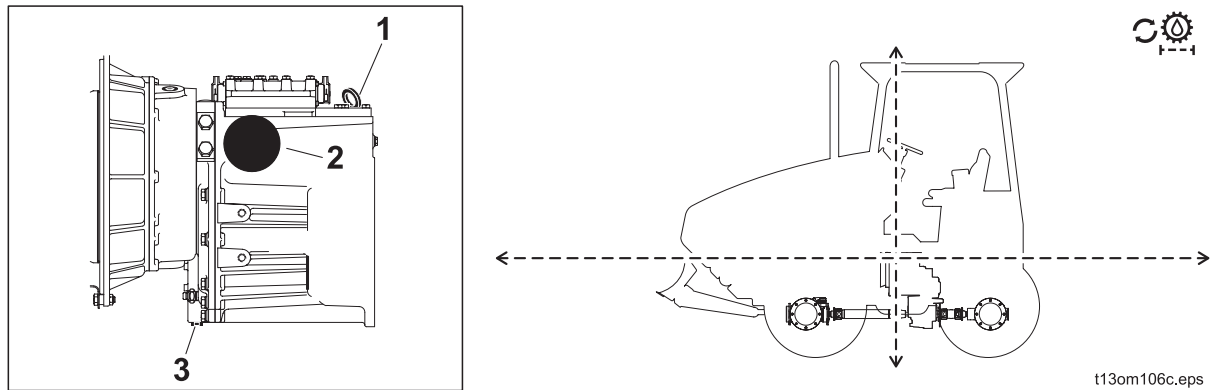
t13om070c.eps

Adjust parking brake every 1000 hours.

To adjust:

1. Release parking brake.
2. Remove orange sleeve.
3. Twist lever clockwise to tighten.
4. Engage parking brake to test tension. If tension is too tight, the brake lever will not engage fully. Repeat steps 1-3 as necessary.
5. Replace orange sleeve.

Change Transmission Fluid and Filter



Change transmission fluid and filter (2) every 1000 hours.

To change:

1. While fluid is warm, remove drain plug (3), screen, and filter (2).
2. Drain fluid and reinstall plug, screen, and new filter.
3. Refill with approximately 6 qt (5.6 L) of PTF at fill (1).
4. Start engine and run at low idle with transmission in neutral.
5. Cycle transmission from forward to reverse several times.
6. Check fluid level at dipstick. Add PTF as necessary to keep fluid at the appropriate line on the dipstick according to the table below.



Oil temperature	Condition	Line on dipstick
50-86°F (10-30°C)	engine at low idle a few minutes after startup	COLD
176-212°F (80-100°C)	normal operating temperature	HOT

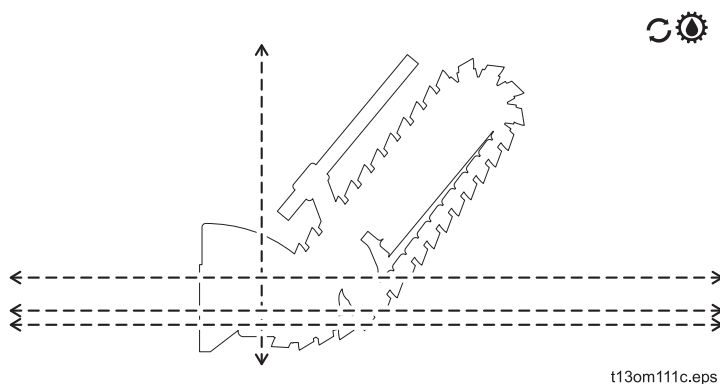
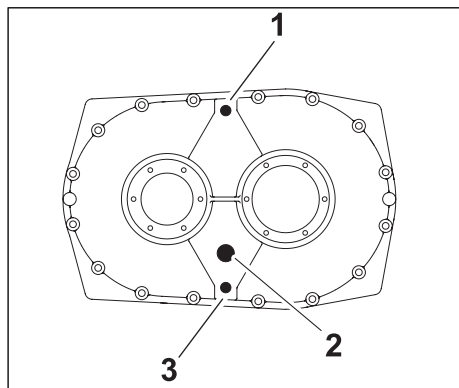
IMPORTANT: If transmission fluid temperature falls between the two ranges listed, fluid level should fall proportionally between the COLD and HOT lines on the dipstick.

NOTICE:

- Transmission damage can occur if oil is not maintained to the correct level.
- Use only Ditch Witch-approved Shell Donnax TA transmission fluid. Do not substitute any other transmission fluid.

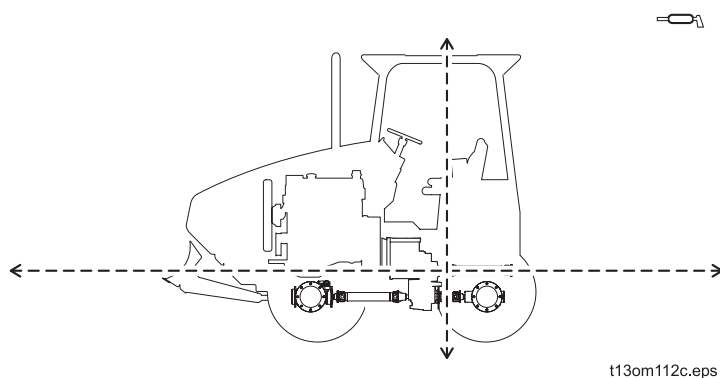
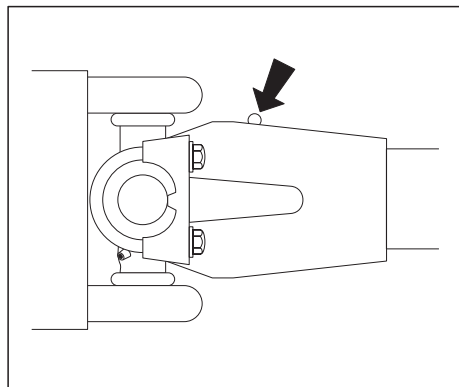
Trencher

Change Trencher Gearbox Oil



Change trencher gearbox oil every 1000 hours. Drain at plug (3). Replace drain plug and fill with MPL at fill (1) to center of sight glass (2).

Lube Attachment Driveshaft Slip Yoke



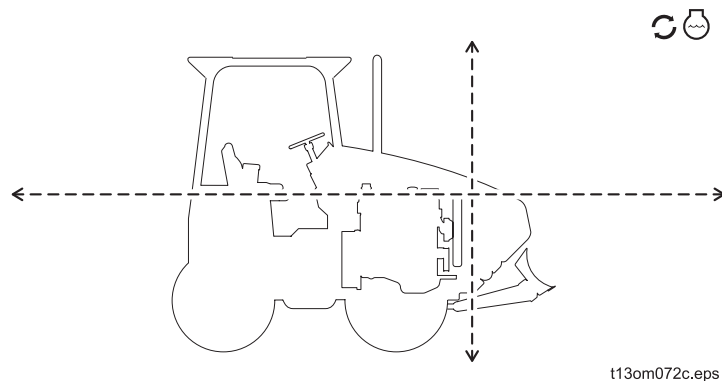
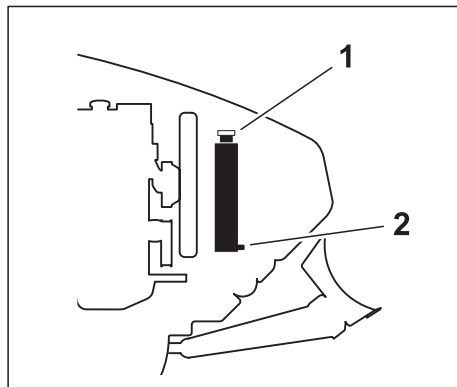
Lube attachment driveshaft slip yoke every 1000 hours with 3-4 shots of EPG.

2000 Hour

Location	Task	Notes
TRACTOR	Change engine coolant	if proper SCA levels are not maintained when using Cool-Gard or if using approved coolant other than Cool-Gard; see "5000 Hour" on page 136 if proper SCA levels are maintained when using Cool-Gard

Tractor

Change Engine Coolant



t13om072c.eps

If proper SCA levels are not maintained when using Cool-Gard or if using approved coolant other than Cool-Gard, drain cooling system at drain (2) every two years or 2000 hours. Refill at fill (1) with approved coolant.

NOTICE:

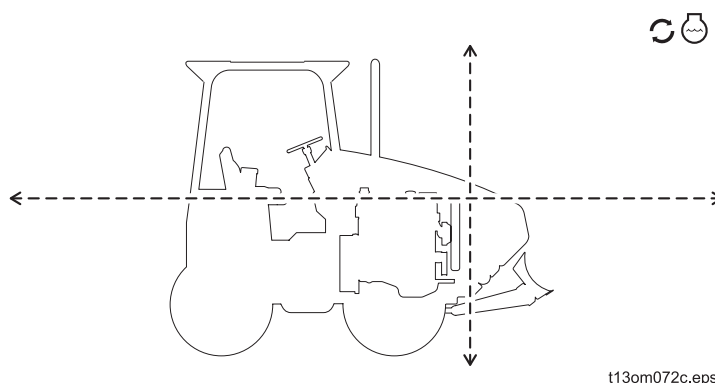
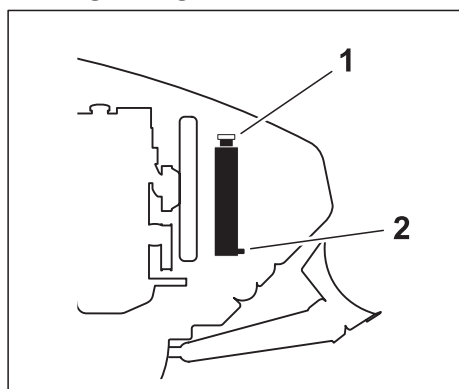
- Coolant change interval depends on coolant used and whether SCA levels are properly maintained. Read note above carefully to ensure coolant is changed at the correct interval.
- The use of non-approved coolant may lead to engine damage or premature engine failure and will void engine warranty.
- See page 98 for list of approved coolants.

5000 Hour

Location	Task	Notes
TRACTOR	Change engine coolant	if proper SCA levels are maintained when using Cool-Gard; see "2000 Hour" on page 135 if proper SCA levels are not maintained when using Cool-Gard or if using approved coolant other than Cool-Gard

Tractor

Change Engine Coolant



If using Cool-Gard with properly maintained SCA levels, drain cooling system at drain (2) every five years or 5000 hours. Refill with Cool-Gard coolant (p/n 255-006).

NOTICE:

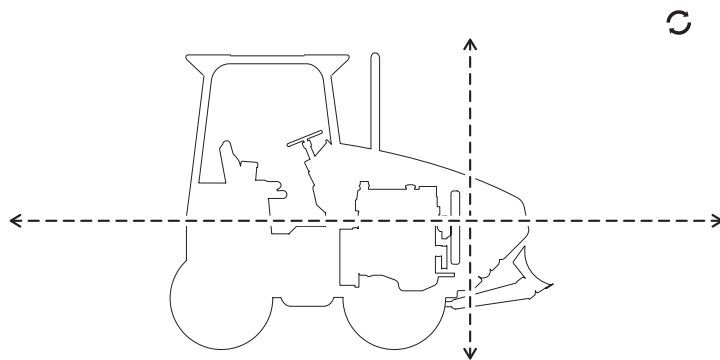
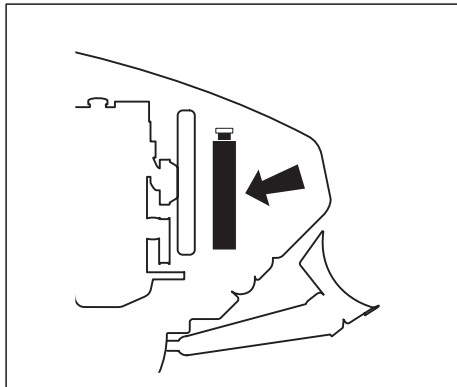
- Coolant change interval depends on coolant used and whether SCA levels are properly maintained. Read note above carefully to ensure coolant is changed at the correct interval.
- The use of non-approved coolant may lead to engine damage or premature engine failure and will void engine warranty.
- See page 98 for list of approved coolants.

As Needed

Location	Task	Notes
TRACTOR	Clean radiator fins	
TRENCHER	Replace digging chain	
BACKHOE	Replace pins and bushings	

Tractor

Clean Radiator Fins



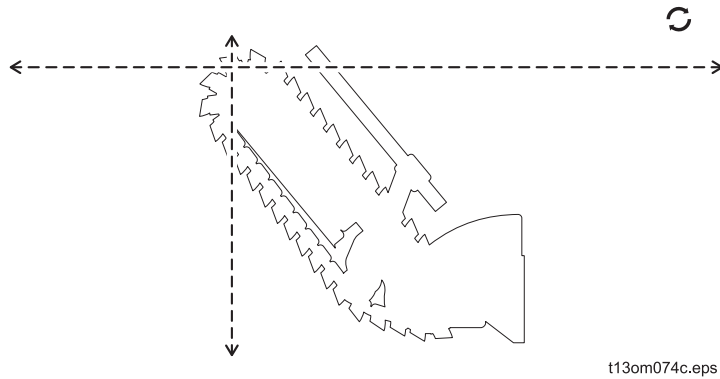
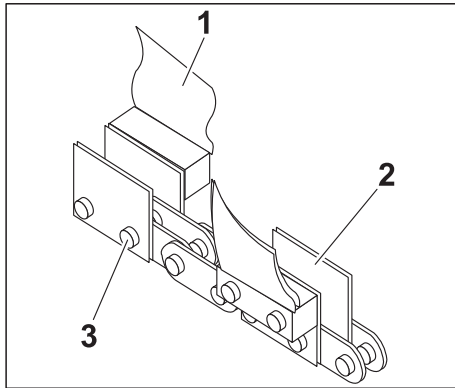
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Clean out radiator fins with compressed air or spray wash if required. Be careful not to damage fins with high-pressure air or water. Check more often if operating in dusty or grassy conditions.

Trencher

Replace Digging Chain



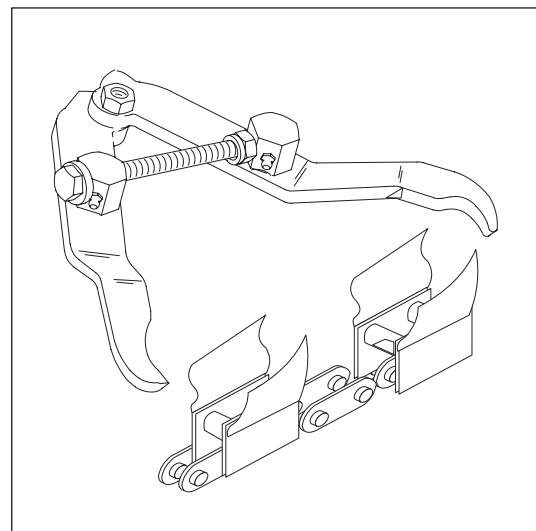
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Visually check digging chains for wear on teeth (1), rollers, and sidebars (2). Check pins (3) and bushing wear by measuring distance between chain pins and comparing it with a new chain.

IMPORTANT: Replace sprockets when a new chain is installed.

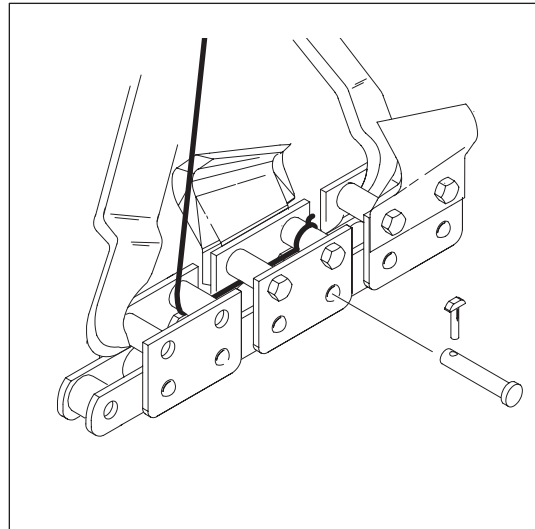
To remove chain:

1. Fasten and adjust seat belt.
2. Start tractor. See page 64 for proper start-up procedures.
3. Move attachment direction/speed control until digging chain connector pin is on top of boom.
4. Lower boom to ground.
5. Engage parking brake and verify parking brake indicator is on.
6. Turn ignition switch to STOP.
7. Secure chain by clamping links on either side of connector pin with chain jaws. Squeeze jaws to reduce pressure on connector pin.



t120m089h.eps

8. Loop cable through links nearest connector pin.



t12om090h.eps



WARNING

Fluid pressure could pierce skin and cause injury or death. Stay away.

NOTICE: Service digging boom grease cylinder only while standing on opposite side of boom. Wear gloves and safety glasses, and cover fitting with cloth when relieving pressure in cylinder.



9. Loosen plug on grease cylinder to relieve chain tension.
10. Stand clear of chain and remove lock key from connector pin. Drive connector pin out of link.



WARNING

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

11. Unclamp links. Slowly release cable and lower chain to ground.
12. Lay chain on ground with teeth down.

To install chain:

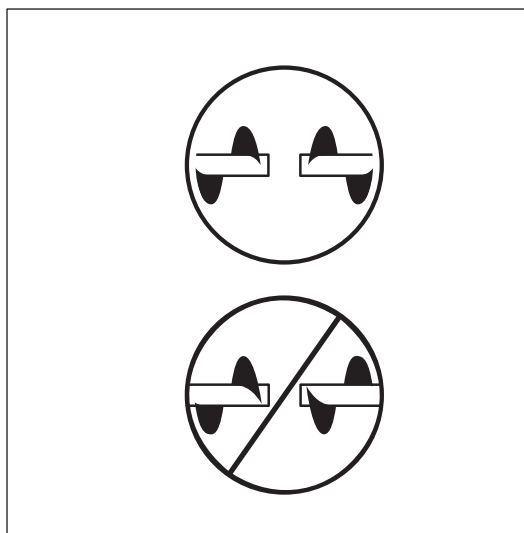
1. Lay chain on ground with teeth down and pointed toward unit.
2. Fasten and adjust seatbelt.
3. Start tractor. See page 64 for start-up procedures.
4. Disengage parking brake and verify parking brake indicator is off.
5. Move ground drive control to reverse.
6. Back unit up until chain extends past head shaft about 1' (305 mm).
7. Move ground drive control to neutral.
8. Lower backfill blade to ground.
9. Lower boom to horizontal position.
10. Engage parking brake and verify parking brake indicator is on.
11. Turn ignition switch to STOP.
12. Pull rear end of chain over and about 10" (260 mm) past tail roller.
13. Use hoist to pull front end of chain over head shaft sprocket.
14. Move chain down boom until chain connector pin and lock key can be installed. Install connector pin and lock key.
15. Tighten chain by pumping EPG into grease cylinder.

Time Augers

Ensure that augers are balanced, as shown. If auger timing is off, unit will bounce from side to side even in normal digging conditions.

To adjust timing:

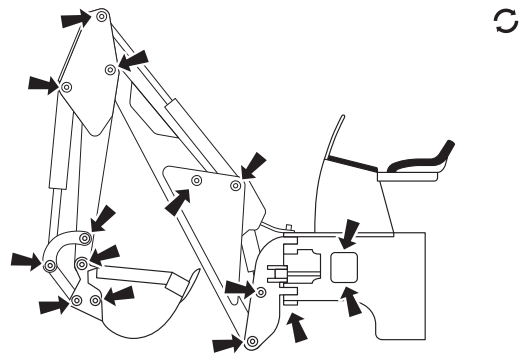
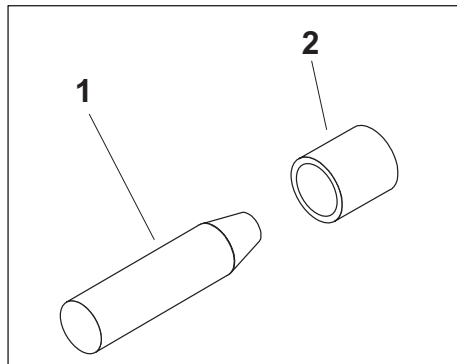
1. Remove bolts holding augers to auger shaft and rotate either auger as needed until augers are balanced.
2. Reinstall bolts and tighten securely.



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Backhoe

Replace Pins and Bushings



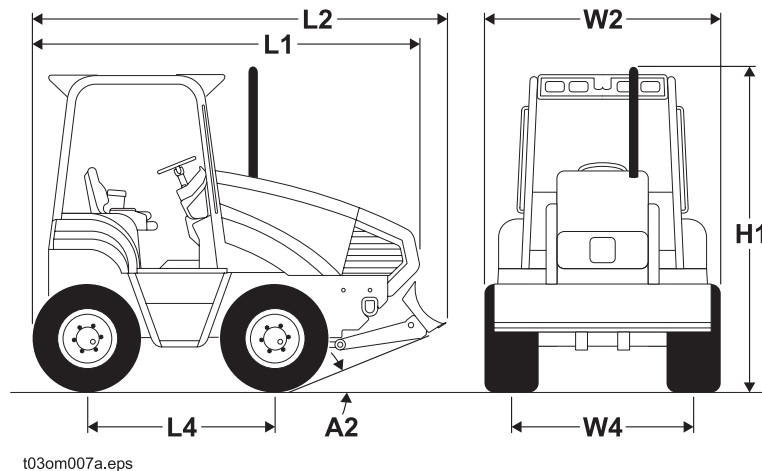
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Replace pins and bushings when worn or damaged.



Specifications

RT75 Tractor



Dimensions (with 31 x 15.50-15 tire)		U.S.	Metric
A2	Angle of approach	20°	20°
H1	Height	108 in	2.7 m
L1	Nose to rear mount length	122 in	3.1 m
L2	Length - transport	131 in	3.3 m
L4	Wheelbase	63 in	1.6 m
W2	Width	71 in	1.8 m
W4	Tread	55 in	1.4 m

Dimensions (with 35 x 19-16.1 tire)		U.S.	Metric
A2	Angle of approach	22°	22°
H1	Height	110 in	2.8 m
L1	Nose to rear mount length	122 in	3.1 m
L2	Length - transport	148 in	3.75 m
L4	Wheelbase	63 in	1.6 m
W2	Width	76 in	1.9 m
W4	Tread	58 in	1.5 m



General

Ditch Witch model RT75 tractor, 4-wheel drive, rigid frame, powershift ground drive through rubber tires, 4-wheel steering, powershift attachment drive, riding unit

Operation (with 31 x 15.50-15 tire)		U.S.	Metric
Forward speeds			
	Low/Low	0.4 mph	.6 km/h
	High/Low	5.3 mph	8.5 km/h
	High/High	7.9 mph	12.6 km/h
Reverse speeds			
	Low/Low	0.4 mph	0.6 km/h
	High/Low	5.3 mph	8.5 km/h
	High/High	7.9 mph	12.6 km/h
Vehicle clearance circle (SAE) wall to wall with backfill blade			
	Front steer only	32 ft	9.8 m
	Coordinated steer	20 ft	6.1 m
Ground clearance		11 in	280 mm
Basic unit weight		6920 lb	3140 kg
Maximum allowable tractor weight		16,000 lb	7257 kg
Front counterweight		2100 lb	950 kg

Operation (with 35 x 19-16.1 tire)		U.S.	Metric
Forward speeds			
	Low/Low	0.6 mph	0.9 km/h
	High/Low	5.8 mph	9.3 km/h
	High/High	8.6 mph	13.8 km/h
Reverse speeds			
	Low/Low	0.5 mph	0.7 km/h
	High/Low	5.8 mph	9.3 km/h
	High/High	8.6 mph	13.8 km/h
Vehicle clearance circle (SAE) wall to wall with backfill blade			
	Front steer only	32 ft	9.8 m
	Front and rear steer	20 ft	6.1 m
Ground clearance		9 in	230 mm
Basic unit weight		6920 lb	3140 kg
Maximum allowable tractor weight		16,000 lb	7257 kg
Front counterweight		2100 lb	953 kg
Backfill Blade (with 31 x 15.50-15 tire)		U.S.	Metric
Blade width		72 in	1.8 m
Blade height		17 in	430 mm
Lift height above ground		17 in	430 mm
Blade drop below ground		15 in	380 mm
Maximum swing angle (left/right)		30°	30°
Tilt angle (up/down)		24°	24°
Backfill Blade (with 35 x 19-16.1 tire)		U.S.	Metric
Blade width		72 in	1.8 m
Blade height		17 in	430 mm
Lift height above ground		19 in	480 mm
Blade drop below ground		13 in	330 mm
Maximum swing angle (left/right)		30°	30°
Tilt angle (up/down)		24°	24°



Power		U.S.	Metric
Engine: John Deere 4045DF27074I, diesel			
Displacement		276 in ³	4.5 L
Bore		4.19 in	106 mm
Stroke		5.00 in	127 mm
Engine manufacturer's gross power rating per SAE J1349		74 hp	55 kW
Estimated net power per SAE J1349		71 hp	53 kW
Rated speed		2500 rpm	2500 rpm
Maximum engine tilt angles*			
	Longitudinal	30°	30°
	Lateral	30°	30°

*Exceeding these operating angles will cause engine damage. This DOES NOT IMPLY machine is stable to maximum angle of safe engine operation.

Power Train
Ground drive transmission: powershift
Differentials: planetary front and rear with optional rear steering
Service brake: Disc, foot operated
Parking brake: Disc, hand operated
Tires: 31 x 15.50-15 10-ply bar lug; Inflate to 45 psi (3.1 bar). 35 x 19-16.1 12-ply bar lug; Inflate to 55 psi (3.8 bar).
Attachment drive transmission: powershift with two-speed control of forward and reverse

Hydraulic System	U.S.	Metric
Ground drive pump capacity at 2500 rpm	9.5 gpm	36 L/min
Ground drive pump relief pressure at 2500 rpm	4000 psi	276 bar
Auxiliary pump capacity at 2500 rpm	13 gpm	49 L/min
Auxiliary pump relief pressure at 2500 rpm	2500 psi	172 bar

Fluid Capacities	U.S.	Metric
Fuel tank	30 gal	114 L
Engine oil	7.9 qt	7.5 L
Hydraulic reservoir	11 gal	42 L
Hydraulic system	16.5 gal	62 L
Cooling system	17 qt	16 L
Transmission fluid	9.5 qt	10.5 L

Battery

Group 34H, SAE res. cap 120 min., SAE cold crank @ 0° F (-18° C), 800 amp

Auxiliary power outlet - 12 volt, 10 amp

Vibration Level

Vibration transmitted to the operator's hand/arm and whole body during normal operation does not exceed 15 and .5 meters per second squared respectively.

Operator seat per ISO 7096.

Noise Levels

Operator 91 dBA sound pressure per ISO 6394

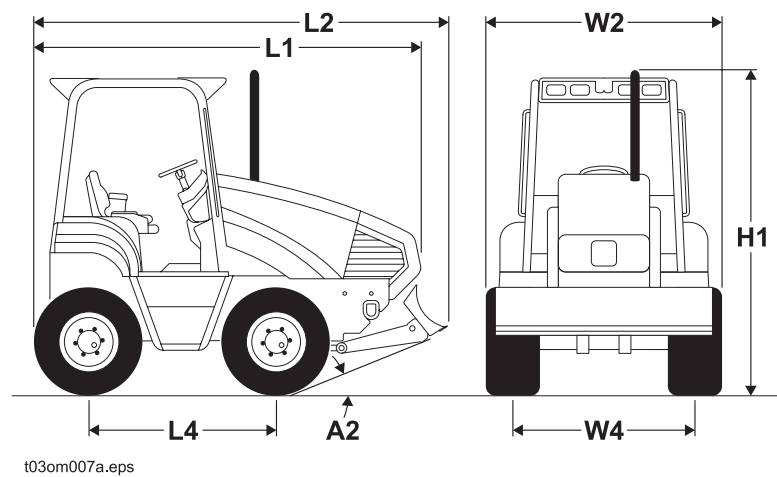
Exterior 107 dBA sound power per ISO 6393.

Unless otherwise specified, all figures are for standard equipment only.

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



RT95 Tractor



Dimensions		U.S.	Metric
A2	Angle of approach	25°	25°
H1	Height	111 in	2.8 m
L1	Nose to rear mount length	128 in	3.2 m
L2	Length - transport	148 in	3.7 m
L4	Wheelbase	73 in	1.8 m
W2	Width	82 in	2.1 m
W4	Tread	64 in	1.6 m

General	
Ditch Witch model RT95 tractor, 4-wheel drive, rigid frame, powershift ground drive through rubber tires, 4-wheel steering, powershift attachment drive, riding unit	

Operation		U.S.	Metric
Forward speeds			
	Low/Low	0.6 mph	0.9 km/h
	High/Low	6.4 mph	10.3 km/h
	High/High	9.5 mph	15.3 km/h
Reverse speeds			
	Low/Low	0.6 mph	0.9 km/h
	High/Low	6.4 mph	10.3 km/h
	High/High	9.5 mph	15.3 km/h
Vehicle clearance circle (SAE) wall to wall with backfill blade			
	Front steer only	31 ft	9 m
	coordinated steer	21 ft	6 m
Ground clearance		14 in	355 mm
Basic unit weight		7980 lb	3620 kg
Maximum allowable tractor weight		18,100 lb	8210 kg
Front counterweight		2100 lb	950 kg

Backfill Blade	U.S.	Metric
Blade width	80 in	2.0 m
Blade height	17 in	430 mm
Lift height above ground	21 in	530 mm
Blade drop below ground	11 in	280 mm
Maximum swing angle (left/right)	30°	30°
Tilt angle (up/down)	24°	24°



Power		U.S.	Metric
Engine: John Deere 4045TF270TF270I, diesel			
Displacement		276 in ³	4.5 L
Bore		4.19 in	106 mm
Stroke		5.00 in	127 mm
Engine manufacturer's gross power per SAE J1349		99 hp	74 kW
Estimated net power per SAE J1349		88 hp	66 kW
Rated speed		2500 rpm	2500 rpm
Maximum engine tilt angles*			
	Longitudinal	30°	30°
	Lateral	30°	30°

*Exceeding these operating angles will cause engine damage. This DOES NOT IMPLY machine is stable to maximum angle of safe engine operation.

Power Train

Ground drive transmission: powershift

Differentials: planetary front and rear with optional rear steering

Service brake: Disc, foot operated

Parking brake: Disc, hand operated

Tires: 38 x 18.00-20 10-ply bar lug flotation; Inflate to 45 psi (3.1 bar).

Attachment drive transmission: powershift with two-speed control of forward and reverse

Hydraulic System	U.S.	Metric
Ground drive pump capacity at 2500 rpm	9.5 gpm	36 L/min
Ground drive pump relief pressure at 2500 rpm	4000 psi	276 bar
Auxiliary pump capacity at 2500 rpm	13 gpm	49 L/min
Auxiliary pump relief pressure at 2500 rpm	2500 psi	172 bar

Fluid Capacities	U.S.	Metric
Fuel tank	38 gal	144 L
Engine oil	16 qt	15 L
Hydraulic reservoir	24 gal	91 L
Hydraulic system	29 gal	110 L
Cooling system	17 qt	16 L
Transmission fluid	10 qt	11 L

Battery

Group 34H, SAE res. cap 120 min., SAE cold crank @ 0° F (-18° C), 800 amp

Auxiliary power outlet - 12 volt, 10 amp

Vibration Level

Vibration transmitted to the operator's hand/arm and whole body during normal operation does not exceed 15 and .5 meters per second squared respectively.

Operator seat per ISO 7096.

Noise Levels

Operator 93 dBA sound pressure per ISO 6394

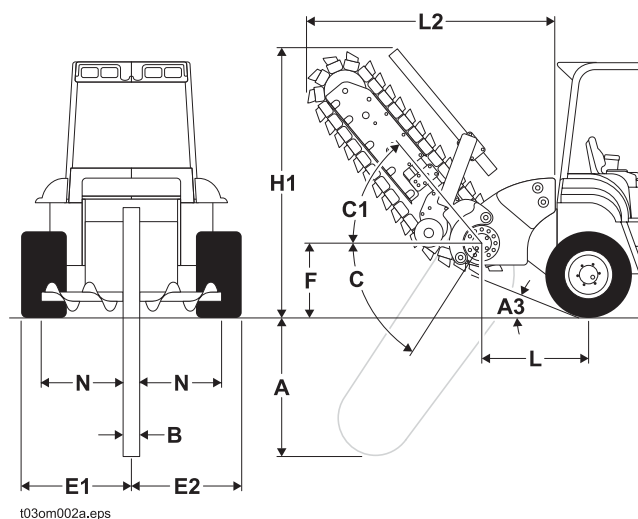
Exterior 109 dBA sound power per ISO 6393.

Unless otherwise specified, all figures are for standard equipment only.

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



M910 Trencher



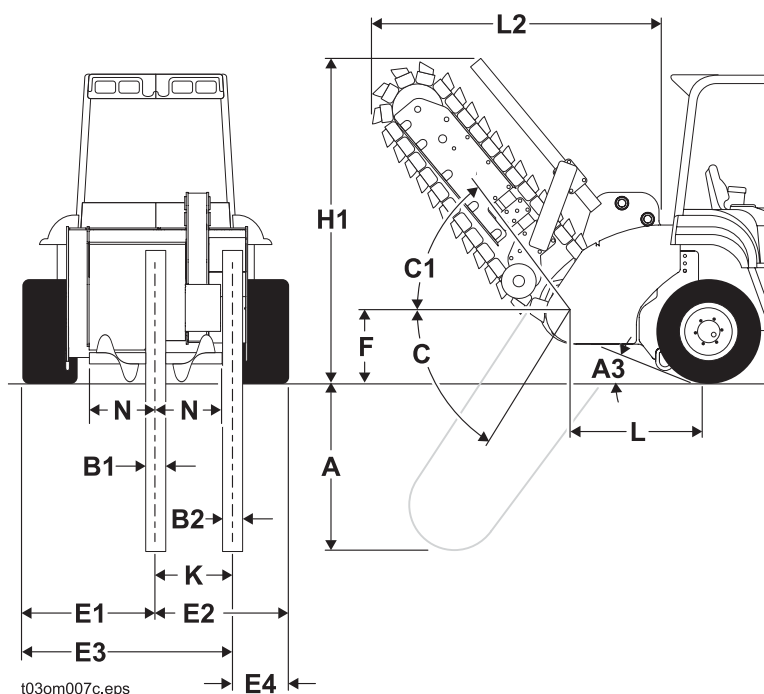
Dimensions		U.S.	Metric
A3	Angle of departure		
	RT75 with 31 x 15.50-15 tires	24°	24°
	RT75 with 35 x 19-16.1 tires	28°	28°
	RT95 with 38 x 18.00-20 tires	28°	28°
A	Trench depth, maximum		
	RT75 with 31 x 15.50-15 tires	100 in	2.54 m
	RT75 with 35 x 19-16.1 tires	97 in	2.46 m
	RT95 with 38 x 18.00-20 tires	94 in	2.4 m
B	Trench width, maximum		
C	Boom travel down		
C1	Boom travel up		
E1	Centerline of trench to outside edge, left		
E2	Centerline of trench to outside edge, right		
F	Headshaft height, digging chain		
	RT75 with 31 x 15.50-15 tires	28 in	710 mm
	RT75 with 35 x 19-16.1 tires	30 in	760 mm
	RT95 with 38 x 18.00-20 tires	32 in	810 mm
H1	Transport height		

Dimensions		U.S.	Metric
	RT75 with 31 x 15.50-15 tires	119 in	3.0 m
	RT75 with 35 x 19-16.1 tires	121 in	3.1 m
	RT95 with 38 x 18.00-20 tires	124 in	3.2 m
L2	Transport length	112 in	2.8 m
L	Headshaft overhang	40 in	1.0 m
N	Soil discharge reach	33 in	840 mm
	Attachment weight	1750 lb	794 kg

Operation		U.S.	Metric
Headshaft speeds			
	Ratio low	156-223 rpm	156-223 rpm
	Ratio standard	171-257 rpm	171-257 rpm
	Ratio high	188-282 rpm	188-282 rpm
Digging chain speeds			
	Ratio low	445-664 ft/min	136-202 m/min
	Ratio standard	487-732 ft/min	148-223 m/min
	Ratio high	535-804 ft/min	163-245 m/min



M912 Offset Trencher



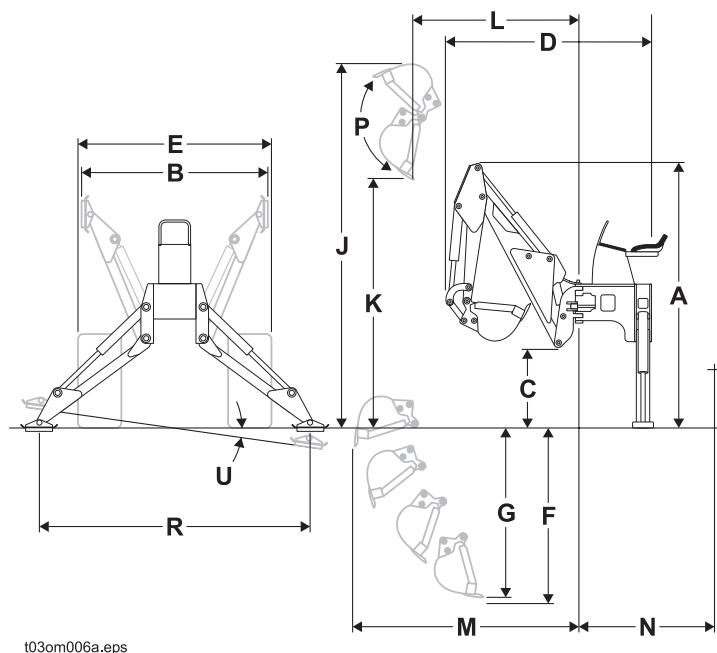
Dimensions		U.S.	Metric
A3	Angle of departure		
	RT75 with 31 x 15.50-15 tires	24°	24°
	RT75 with 35 x 19-16.1 tires	28°	28°
	RT95 with 38 x 18.00-20 tires	28°	28°
A	Trench depth, maximum		
	RT75 with 31 x 15.50-15 tires	100 in	2.54 m
	RT75 with 35 x 19-16.1 tires	99 in	2.51 m
	RT95 with 38 x 18.00-20 tires	97 in	2.47 m
B1	Trench width, center position maximum	24 in	610 mm
B2	Trench width, offset position maximum	12 in	305 mm
C	Boom travel down	65°	65°
C1	Boom travel up	50°	50°
E1	Centerline of trench to outside left edge, center position	40 in	1.0 m
E2	Centerline of trench to outside right edge, center position	34 in	864 mm
E3	Centerline of trench to outside left edge, offset position	67 in	1.7 m

Dimensions		U.S.	Metric
E4	Centerline of trench to outside right edge, offset position	8 in	203 mm
F	Headshaft height, digging chain		
	RT75 with 31 x 15.50-15 tires	28 in	710 mm
	RT75 with 35 x 19-16.1 tires	30 in	760 mm
	RT95 with 38 x 18.00-20 tires	32 in	810 mm
H1	Transport height		
	RT75 with 31 x 15.50-15 tires	119 in	3.0 m
	RT75 with 35 x 19-16.1 tires	121 in	3.1 m
	RT95 with 38 x 18.00-20 tires	124 in	3.2 m
K	Distance between trencher positions	26 in	660 mm
L2	Transport length	112 in	2.8 m
L	Headshaft overhang	40 in	1.0 m
N	Soil discharge reach	33 in	840 mm
	Attachment weight	3600 lb	1633 kg

Operation		U.S.	Metric
Headshaft speeds			
	Ratio extra low	141-211 rpm	141-211 rpm
	Ratio low	155-232 rpm	155-232 rpm
	Ratio standard	171-255 rpm	171-255 rpm
Digging chain speeds			
	Ratio extra low	437-654 ft/min	133-199 m/min
	Ratio low	481-720 ft/min	147-219 m/min
	Ratio standard	530-793 ft/min	162-242 m/min



A720 Backhoe



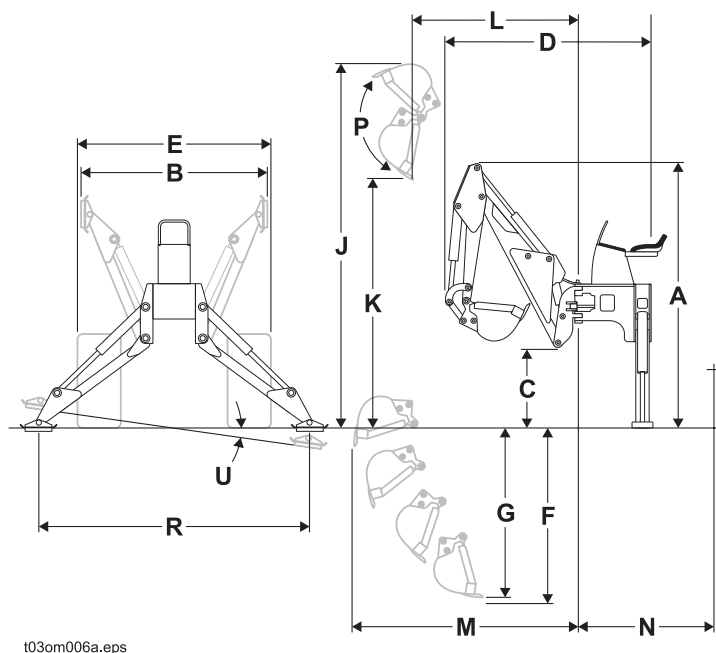
Dimensions		U.S.	Metric
A	Transport height	111 in	2.8 m
C	Ground clearance	27 in	690 mm
D	Backhoe length, stowed	122 in	3.1 m
F	Digging depth, max.	92 in	2.3 m
G	Digging depth, 2 ft (0.6 m) flat bottom	88 in	2.2 m
J	Operating height, fully raised	139 in	3.5 m
K	Loading height	89 in	2.3 m
L	Loading reach	76 in	1.9 m
M	Reach from swing pivot	143 in	3.6 m
N	Swing pivot to centerline axle	55 in	1.4 m
P	Bucket rotation	165°	165°
B	Stabilizer spread, transport	86 in	2.1 m
E	Backhoe or basic unit width	82 in	2.0 m
R	Stabilizer spread, operating	121 in	3.0 m
U	Leveling angle	15°	15°

General		U.S.	Metric
Bucket			
	Width	12-24 in	305-610 mm
	Capacity	1.7-3.5 ft ³	0.05-.1m ³
Backhoe weight with 18 in (686 mm) bucket		2975 lb	1350 kg
Lift capacity, boom over end and swing arc, SAE*			
	@ 48 in (1.2 m)	1050 lb	476 kg
	@ ground level	880 lb	399 kg
	@ 72 in (1.8 m)	1042 lb	473 kg
Lift capacity, dipperstick over end and swing arc, SAE*			
	@ 52 in (1.3 m)	2650 lb	1202 kg
	@ 96 in (2.4 m)	2150 lb	975 kg
Swing arc		180°	180°
Digging force			
	Using bucket cylinder	6600 lb	2994 kg
	Using dipperstick cylinder	4025 lb	1825 kg

*Lift capacities are for a stationary machine supported by stabilizers.



A920 Backhoe



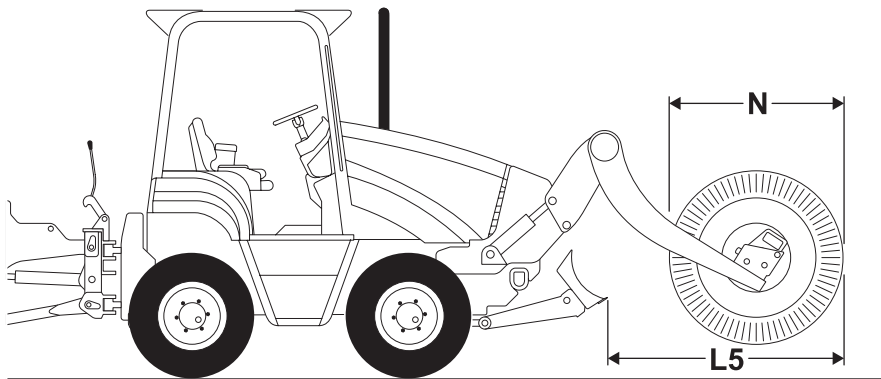
Dimensions		U.S.	Metric
A	Transport height	118 in	3.0 m
C	Ground clearance	29 in	740 mm
D	Backhoe length, stowed	117 in	2.9 m
F	Digging depth, max.	112 in	2.8 m
G	Digging depth, 2 ft (0.6 m) flat bottom	109 in	2.7 m
J	Operating height, fully raised	156 in	3.9 m
K	Loading height	104 in	2.6 m
L	Loading reach	78 in	1.9 m
M	Reach from swing pivot	158 in	4.0 m
N	Swing pivot to centerline axle	57 in	1.4 m
P	Bucket rotation	170°	170°
B	Stabilizer spread, transport	86 in	2.2 m
E	Backhoe or basic unit width	82 in	2.0 m
R	Stabilizer spread, operating	121 in	3.0 m
U	Leveling angle	10°	10°

General		U.S.	Metric
Bucket			
	Width	12-24 in	305-610 mm
	Capacity	1.7-3.5 ft ³	0.05-.1m ³
Backhoe weight with 18 in (686 mm) bucket		3300 lb	1497 kg
Lift capacity, boom over end and swing arc, SAE*			
	@ 48 in (1.2 m)	1170 lb	530 kg
	@ ground level	1250 lb	567 kg
	@ 72 in (1.8 m)	1184 lb	537 kg
Lift capacity, dipperstick over end and swing arc, SAE*			
	@ 52 in (1.3 m)	3184 lb	1444 kg
	@ 96 in (2.4 m)	2242 lb	1017 kg
Swing arc		180°	180°
Digging force			
	Using bucket cylinder	6600 lb	2994 kg
	Using dipperstick cylinder	4475 lb	2030 kg

*Lift capacities are for a stationary machine supported by stabilizers.



RC70 Reel Carrier



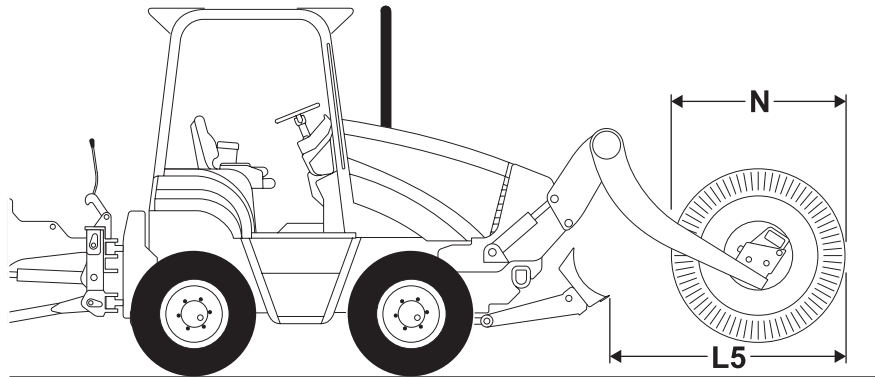
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Dimensions		U.S.	Metric
L5	Distance from backfill blade to outside edge of reel carrier with maximum diameter reel	76 in	1.9 m
N	Maximum reel diameter	84 in	2.1 m
	Internal width	54 in	1.4 m
	Capacity	2000 lb	910 kg
	Attachment weight with six 96 lb (41 kg) counterweights	1600 lb	726 kg

RC70 Counterweight Requirements				
	Reel weight	Back axle*	Front RC weight	Rear weight
RT75 with M910 trencher	0-1000 lb (0-454 kg)	1000 lb (454 kg)	600 lb (272 kg)	1000 lb (454 kg)
	1000-2000 lb (454-908 kg)	1000 lb (454 kg)	0 lb (0 kg)	1000 lb (454 kg)

*Use Tire Ballast and Sealant (TBS). Counterweight requirement for front axle is 0 lb (0 kg).

RC115 Reel Carrier



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Dimensions		U.S.	Metric
L5	Distance from backfill blade to outside edge of reel carrier with maximum diameter reel	76 in	1.9 m
N	Maximum reel diameter	84 in	2.1 m
	Internal width	54 in	1.4 m
	Capacity	2500 lb	1130 kg
	Attachment weight with six 96 lb (41 kg) counterweights	1600 lb	726 kg

RC115 Counterweight Requirements				
	Reel weight	Back axle*	Front RC weight	Rear weight
RT95 with M910 trencher	0-1500 lb (0-680 kg)	800 lb (363 kg)	600 lb (272 kg)	1000 lb (454 kg)
	1500-2500 lb (680-1134 kg)	800 lb (363 kg)	0 lb (0 kg)	1000 lb (454 kg)

*Use Tire Ballast and Sealant (TBS). Counterweight requirement for front axle is 0 lb (0 kg).



Support



Procedure

Notify your dealer immediately of any malfunction or failure of Ditch Witch equipment.

Always give model, serial number, and approximate date of your equipment purchase. This information should be recorded and placed on file by the owner at the time of purchase.

Return damaged parts to dealer for inspection and warranty consideration if in warranty time frame.

Order genuine Ditch Witch replacement or repair parts from your authorized Ditch Witch dealer. Use of another manufacturer's parts may void warranty consideration.

Resources

Publications

Contact your Ditch Witch dealer for publications and videos covering safety, operation, service, and repair of your equipment.

Ditch Witch Training

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

Warranty

Ditch Witch Equipment and Parts Limited Warranty Policy

Subject to the limitations and exclusions herein, free replacement parts will be provided at any authorized Ditch Witch dealership for any Ditch Witch equipment or parts manufactured by The Charles Machine Works, Inc. (CMW) that fail due to a defect in material or workmanship within one (1) year of first commercial use (Exception: 2 years for all SK500 attachments). Free labor will be provided at any authorized Ditch Witch dealership for installation of parts under this warranty during the first year following initial commercial use of the serial-numbered Ditch Witch equipment on which it is installed.

Exclusions from Product Warranty

- Wear-related failure of parts subject to ground contact including, but not limited to, digging teeth, digging chains, sprockets, backhoe buckets, plow blades, drill pipe, drill bits, backreamers, and swivels.
- All incidental or consequential damages.
- All defects, damages, or injuries caused by misuse, abuse, improper installation, alteration, neglect, or uses other than those for which products were intended.
- All defects, damages, or injuries caused by improper training, operation, or servicing of products in a manner inconsistent with manufacturer's recommendations.
- All engines and engine accessories (these are covered by original manufacturer's warranty).
- Tires, belts, and other parts which may be subject to another manufacturer's warranty (such warranty will be available to purchaser).
- All implied warranties not expressly stated herein, including any warranty of fitness for a particular purpose and merchantability.

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

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

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

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

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

For information regarding this limited warranty, contact CMW's Product Support department, P.O. Box 66, Perry, OK 73077-0066, or contact your local Ditch Witch dealer.

First version: 1/91; Latest version: 1/03

**A Note To
Ditch Witch
Equipment Owners:**

If your equipment was purchased through a Ditch Witch dealer, there is no need to read further.

However, if you purchased from any other source, please fill out the form on the reverse side and return it to us.

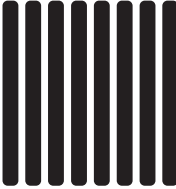
This will enable you to receive updates on this equipment as well as information on new products of interest.

Thanks for using Ditch Witch equipment.

(Please Fold Along This Line And Seal At Bottom With Tape)



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO 23 PERRY OKLAHOMA

POSTAGE WILL BE PAID BY

**The Charles Machine Works, Inc.
P.O. Box 66
Perry, Oklahoma 73077-9989**



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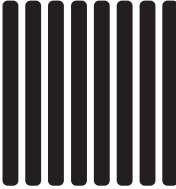
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FIRST CLASS PERMIT NO 23 PERRY OKLAHOMA

POSTAGE WILL BE PAID BY

**The Charles Machine Works, Inc.
P.O. Box 66
Perry, Oklahoma 73077-9989**



Ditch Witch® Registration Card

Please Type or Print All Information

Purchaser's Company Name		
Attention		
Street Address or P.O. Box		
City	County	
State	Zip	Nation
()		
Phone Number With Area Code		
Model	Serial Number	
Attachments/Accessories	Serial Numbers	
Attachments/Accessories	Serial Numbers	
Attachments/Accessories	Serial Numbers	
Name of Ditch Witch Dealership		
Your Signature		

Ditch Witch® Registration Card

Please Type or Print All Information

Purchaser's Company Name		
Attention		
Street Address or P.O. Box		
City	County	
State	Zip	Nation
()		
Phone Number With Area Code		
Model	Serial Number	
Attachments/Accessories	Serial Numbers	
Attachments/Accessories	Serial Numbers	
Attachments/Accessories	Serial Numbers	
Name of Ditch Witch Dealership		
Your Signature		

Service Record

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