

RT95

with Hydrostatic Transmission

Operator's Manual



Overview



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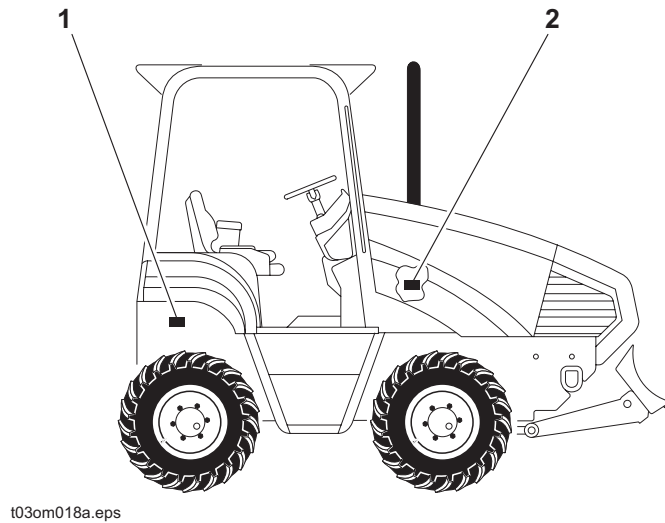
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Serial Number Location

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



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

Intended Use



The RT95 is a riding trencher designed to install buried service lines of various sizes using a variety of Ditch Witch attachments.

Attachment		Max. width/diameter	Max. depth*
H910 trencher		24" (610 mm)	100" (2.5 m)
H911 trencher		24" (610 mm)	96" (2.4 m)
H732 plow		3" (80 mm)	30" (760 mm)
H932 plow		3" (80 mm)	36" (915 mm)
H952 combo			
	trencher	12" (305 mm)	70" (1.8 m)
	plow	3" (76 mm)	36" (915 mm)
H940 saw		6" (150 mm)	30" (760 mm)
A920 backhoe		24" (610 mm)	109" (2.4 m)

*dependent on tire option

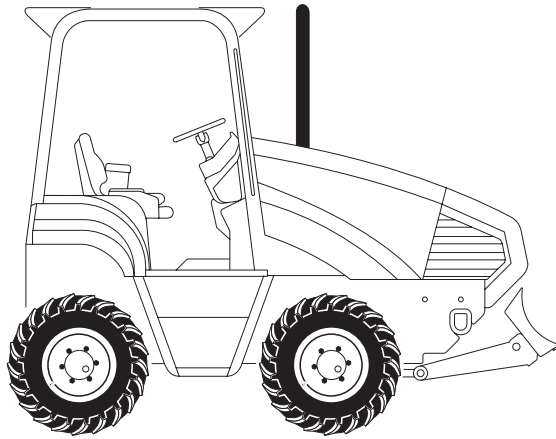
These units are designed for operation in temperatures typically experienced in earth moving and construction work environments. Provisions may be required to operate in extreme temperatures. Contact your Ditch Witch dealer. Use in any other way is considered contrary to the intended use.

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

Equipment Modification

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

Unit Components

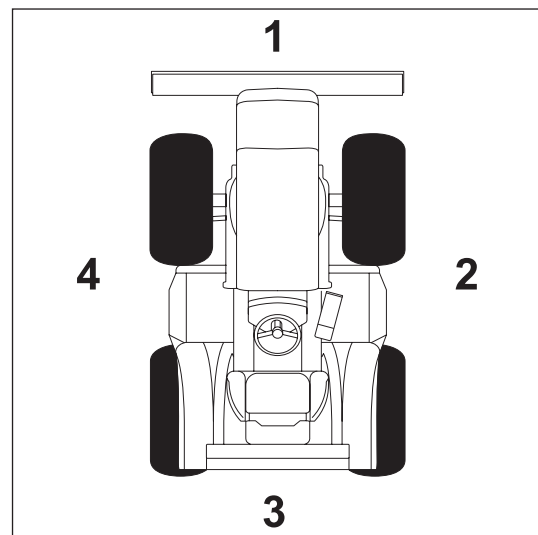


- | | |
|---|------------------------------|
| 1. Rollover Protective Structure (ROPS) | 4. Engine compartment |
| 2. Operator station | 5. Backfill blade (optional) |
| 3. Control consoles | |

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.



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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.

RT95 Hydrostat Tier 3 Operator's Manual

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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 your local One-Call (811 in USA) or the One-Call referral number (888-258-0808 in USA and Canada) to have underground utilities located before digging. Also contact any utilities that do not participate in the One-Call service.
- 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 may be 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.

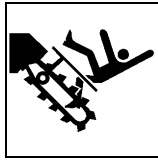
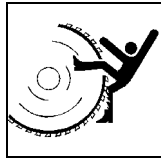
 **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

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**

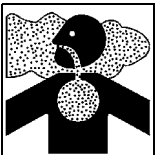
Moving digging teeth will kill you or cut off arm or leg. Stay away.

**⚠ DANGER**

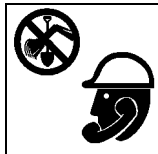
Turning shaft will kill you or crush arm or leg. Stay away.

**⚠ 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**

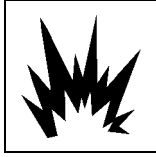
Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

**⚠ WARNING**

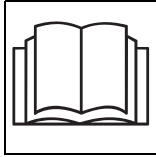
Crushing weight could cause death or serious injury. Use proper procedures and equipment or stay away.

**⚠ WARNING**

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



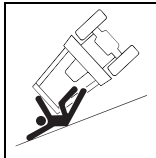
⚠ WARNING Explosion possible. Serious injury or equipment damage could occur. Follow directions carefully.



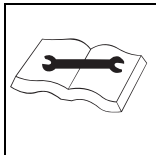
⚠ WARNING Incorrect procedures could result in death, injury, or property damage. Learn to use equipment correctly.



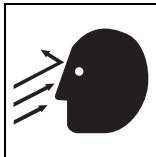
⚠ WARNING Fall possible. Riders can fall from machine and be injured or killed. Only operator is allowed on machine.



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



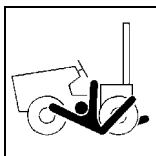
⚠ WARNING Improper control function could cause death or serious injury. If control does not work as described in instructions, stop machine and have it serviced.



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



⚠ WARNING Pressurized fluid or air 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



⚠ WARNING

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



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

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

Electric Strike Description



⚠ DANGER

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

When working near electric cables, remember the following:

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

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

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

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

If an Electric Line is Damaged

If you suspect an electric line has been damaged and you are **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



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



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



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

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

If a Fiber Optic Cable is Damaged

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

If Machine Catches on Fire

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

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

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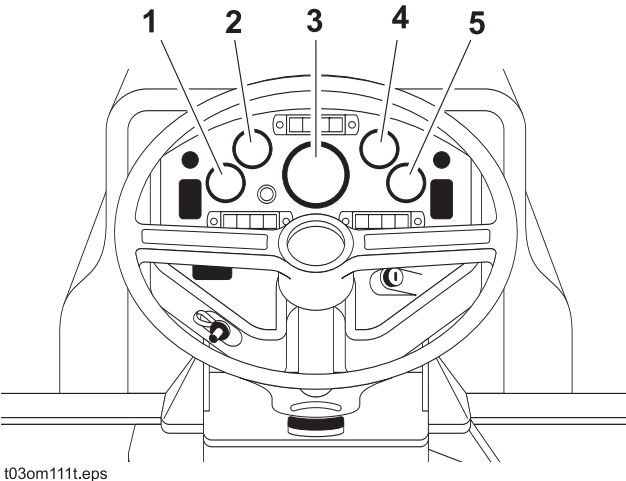
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Center Console

Gauges



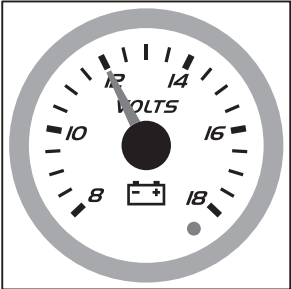
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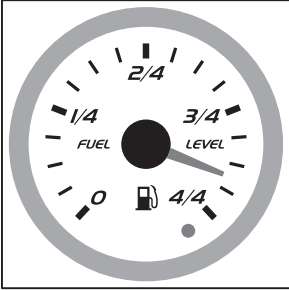
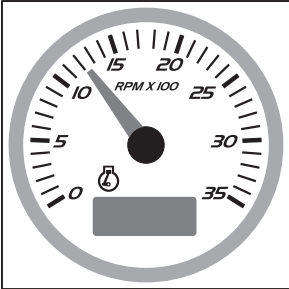
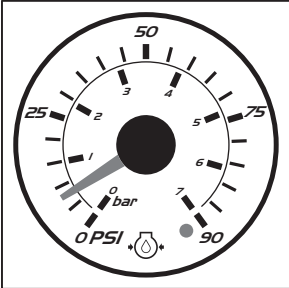
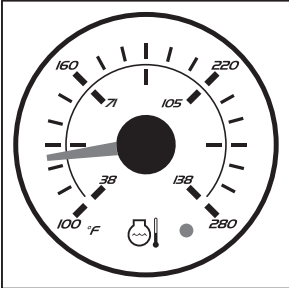
1. Voltmeter

2. Fuel gauge

3. Tachometer/Hourmeter
4. Engine oil pressure gauge

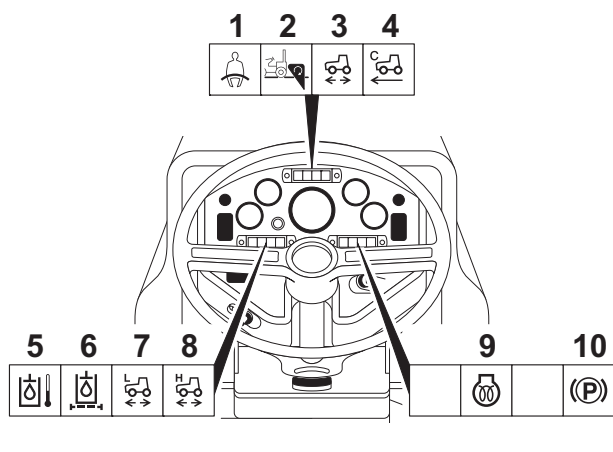
5. Engine temperature gauge

Item	Description	Notes
1. Voltmeter  c00ic141a.eps	Displays system voltage.	Should show 12-14V with engine running.

Item	Description	Notes
2. Fuel gauge  c00ic142a.eps	Displays fuel level in tank.	RT95 fuel tank holds 38 gal (144 L).
3. Tachometer/Hourmeter  c00ic143a.eps	Displays engine speed and records engine operating time.	Use engine operating times to schedule service.
4. Engine oil pressure gauge  c00ic028t.eps	Displays engine oil pressure. Indicator will light and alarm will sound if pressure is too low.	Normal operating pressure is 15-50 psi (1.03 - 3.45 bar). If pressure is low: • Check oil level. • If pressure is still low, consult engine manual.
5. Engine temperature gauge  c00ic027t.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.



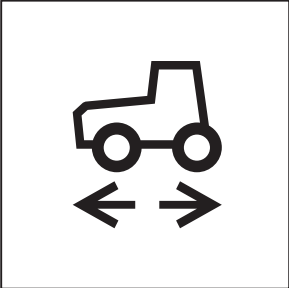
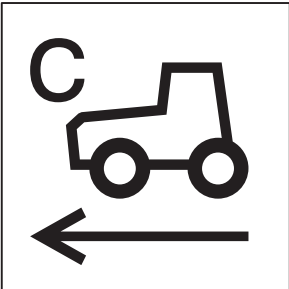
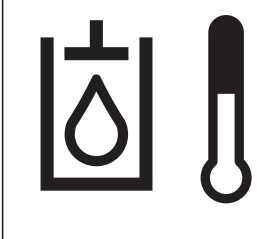
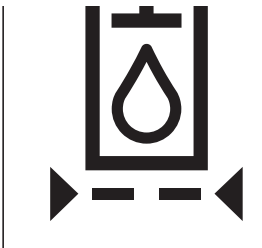
Indicators



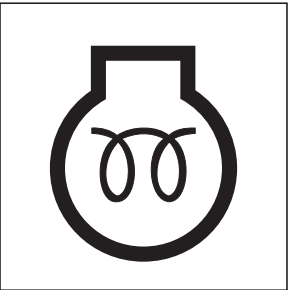
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|--|---|
| 1. Operator presence indicator | 6. Hydraulic filter restriction indicator |
| 2. Attachment speed/direction indicator | 7. Low speed indicator |
| 3. Ground drive indicators | 8. High speed indicator |
| 4. Cruise control indicator | 9. Cold start wait indicator |
| 5. Hydraulic fluid temperature indicator | 10. Parking brake indicator |

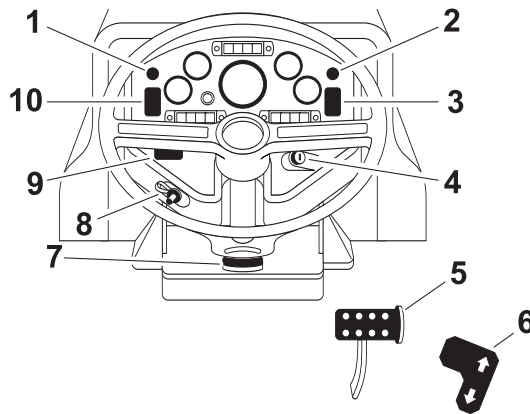
Item	Description	Notes
1. Operator presence indicator  c00ic068c.eps	Lights when operator is in seat.	IMPORTANT: This indicator is part of the the start interlock system. All four start interlock indicators must be on to start engine.
2. Attachment speed/direction indicator  c00ic069c.eps	Lights when 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.

Item	Description	Notes
3. Ground drive indicators  c00ic147a.eps	Lights 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. Cruise control indicator  c00ic030t.eps		IMPORTANT: These indicators are part of the the start interlock system. All four start interlock indicators must be on to start engine
5. 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.
6. 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 may turn off after hydraulic fluid warms.



Item	Description	Notes
7. Low speed indicator  c00ic150a.eps	Lights when transmission is in low.	
8. High speed indicator  c00ic151a.eps	Lights when transmission is in high.	
9. Cold start wait indicator  c00ic180h.eps	Lights when intake air pre-heater is operating. Wait until light goes off before starting engine.	See page 66 for more information.
10. Parking brake indicator  c00ic060c.eps	Lights when parking brake is engaged.	

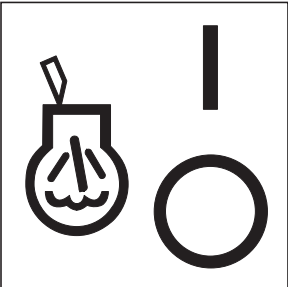
Controls

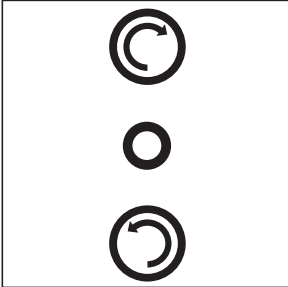
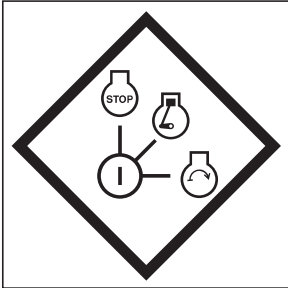
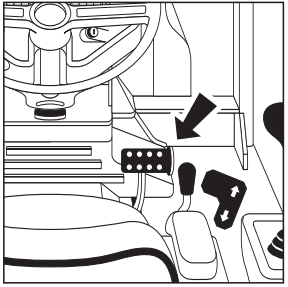


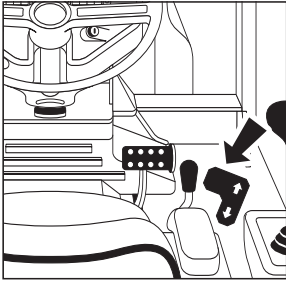
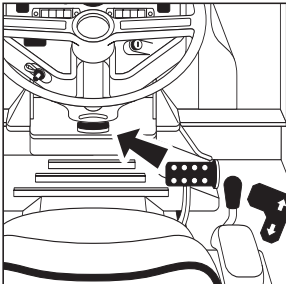
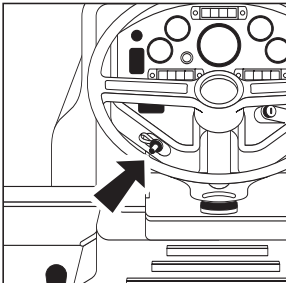
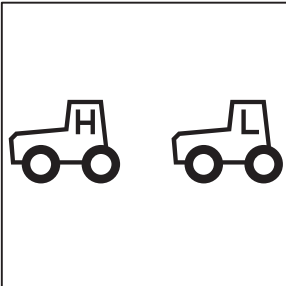
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|---------------------------------|---|
| 1. Cold start switch | 6. Ground drive foot control |
| 2. Horn | 7. Steering column tilt control |
| 3. Drilling attachment control* | 8. Auxiliary outlet |
| 4. Ignition switch | 9. Hydraulic ground drive motor control |
| 5. Service brake | 10. Reel carrier control* |

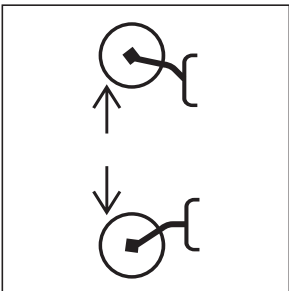
*optional

Item	Description	Notes
1. Cold start switch  c00ic064h.eps	To start cold engine: • Turn key to on position. • Press switch for up to 30 seconds. • Continue pressing cold start switch and start engine.	See Engine Manufacturer's manual for more information.

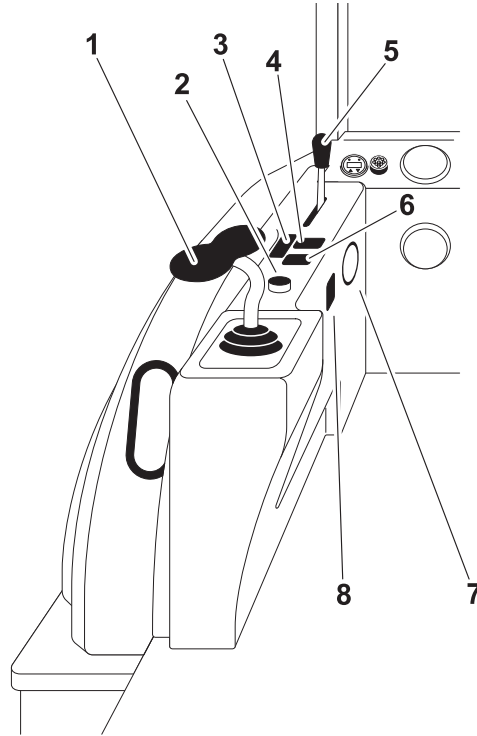
Item	Description	Notes
2. Horn  c00ic044h.eps	To sound horn, press.	
3. Drilling attachment control  c00ic218h.eps	To rotate clockwise, press top. To rotate counterclockwise, press bottom.	IMPORTANT: Always rotate clockwise during drilling and backreaming. Rotate counterclockwise only to dislodge a dry bore bit or reamer that has siezed in the bore hole. For more information about drilling attachment, see page 111.
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. Service brake  c00ic008t.eps	To stop tractor, press. To move tractor, release.	

Item	Description	Notes
6. Ground drive foot control  c00ic007t.eps	To move tractor forward, push top of pedal. To move tractor backward, push bottom of pedal. To increase speed in either direction, push pedal farther from center. To reduce speed in either direction, release pedal.	Pedal should automatically return to neutral when released.
7. Steering column tilt control  c00ic009t.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  c00ic010t.eps	Provides power for other equipment.	Power output is 12V, 5A.
9. Hydraulic ground drive motor control  c00ic146a.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
10. Reel carrier control  c00ic205h.eps	To raise, press top. To lower, press bottom.	

Right Console

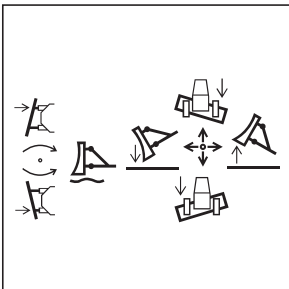
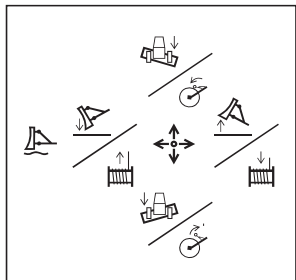
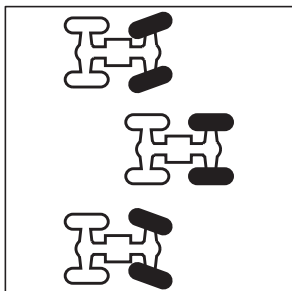


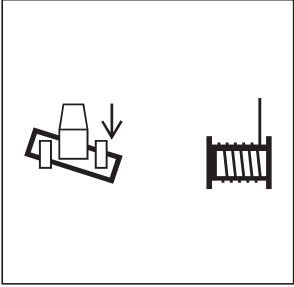
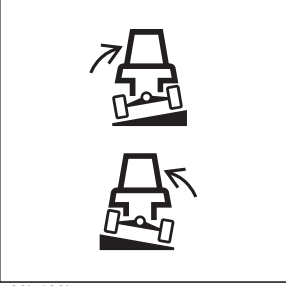
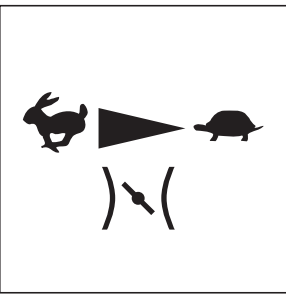
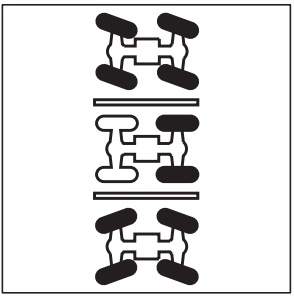
t13om086c.eps

- | | |
|--|-------------------------------------|
| 1. Backfill blade/reel winder* control | 5. Throttle |
| 2. Rear steer adjustment knob* | 6. Steer select control* |
| 3. Reel winder selector switch | 7. Auxiliary circuit pressure gauge |
| 4. Frame tilt switch* | 8. Axle lock control |

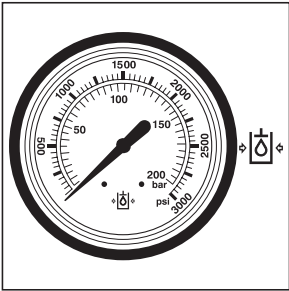
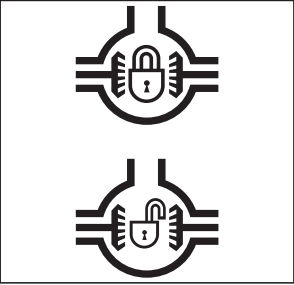
*optional



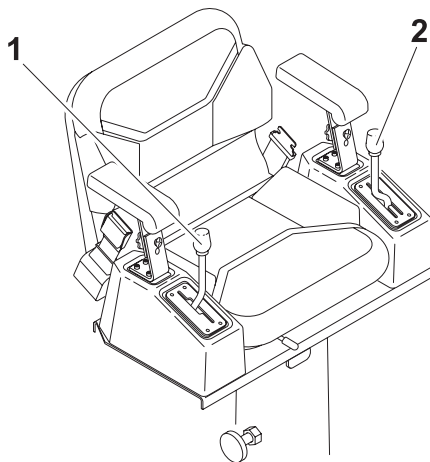
Item	Description	Notes
1. Backfill blade/reel winder control  c00ic181h.eps	Backfill blade mode: - To lower, move forward. - To float, move forward to end. - To raise, move backward. - To tilt right side down, move right. - To tilt left side down, move left. - To angle left, twist left. - To angle right, twist right.	IMPORTANT: Control works in this mode when reel winder selector switch is in backfill blade position. NOTICE: Ensure that intended function is selected before operating.
 c00ic207h.eps	Reel winder mode: - To unwind, move forward. - To wind, move backward. - To lower reel winder arm, move right. - To raise reel winder arm, move left.	IMPORTANT: Control works in this mode when reel winder selector switch is in reel winder position. For more information on reel winder operation, see page 95. NOTICE: Ensure that intended function is selected before operating. NOTICE: Do not continue to push lift control after tire makes contact with reel.
2. Rear 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.

Item	Description	Notes
3. Reel winder selector switch  c00ic206h.eps	For reel winder function, press right. For backfill blade function, press left.	IMPORTANT: Backfill blade control converts to reel winder function when reel winder is selected. NOTICE: Ensure that intended function is selected before operating. IMPORTANT: For more information on reel winder operation see page 95.
4. Frame tilt switch  c00ic182h.eps	To tilt right, press top. To tilt left, press bottom.	
5. Throttle  c00ic183h.eps	To increase speed, move left. To decrease speed, move right.	
6. Steer select switch  c00ic098c.eps	To select crab steering, press top. To select rear steering, move to center. To select coordinated steering, press bottom.	



Item	Description	Notes
7. Auxiliary circuit pressure gauge  c00ic191h.eps	Displays auxiliary circuit pressure.	Maximum operating pressure is 2550 psi (172 bar).
8. 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.

Seat Deck

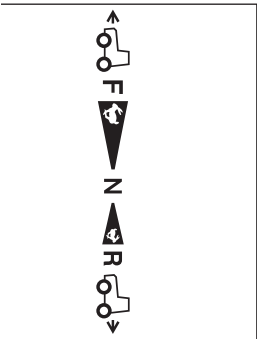


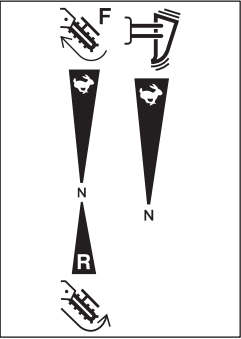
t130m083c.eps



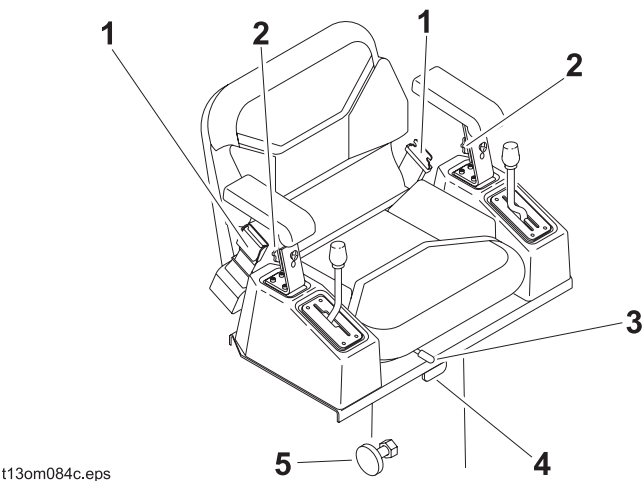
1. Ground drive hand control

2. Attachment speed/direction control

Item	Description	Notes
1. Ground drive hand control  c083c.eps	To go forward, push. To go backward, pull. To go faster in either direction, move farther from neutral. To stop, return to center.	Lever does not automatically return to neutral when released.

Item	Description	Notes
2. Attachment speed/direction control  c00ic084c.eps	To rotate attachment forward or to start plow vibrator box, push. To rotate attachment backward, pull. To go faster in either direction, move farther from center. To stop attachment rotation or plow vibrator box, move to neutral.	NOTICE: When operating plow, do not pull control to reverse.

Seat



1. Seat belt

2. Armrest adjustment control

3. Seat slide control
4. Seat pivot control

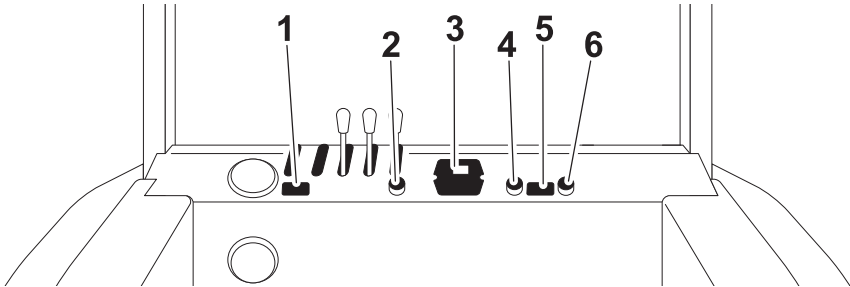
5. Seat height adjustment lock

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. If desired, 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



t13om087c.eps



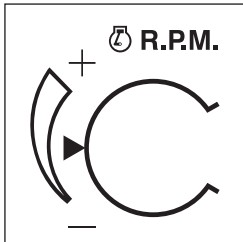
1. Cruise control selector

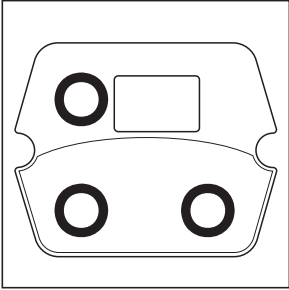
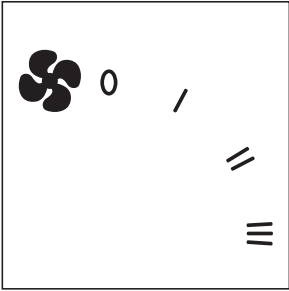
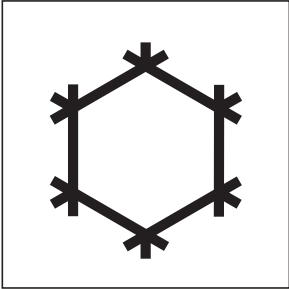
2. Cruise control RPM control

3. Trench Depth Meter
4. Fan speed control

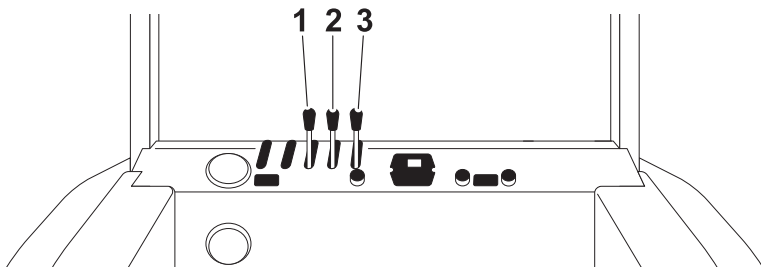
5. Air conditioning control

6. Climate control selector

Item	Description	Notes
1. Cruise control selector  c00ic186h.eps	To turn on, press once. To turn off, press again.	Turn on cruise control only when: - gearbox shift control is in low - ground drive is in neutral For more information about cruise control, see page 118.
2. Cruise control RPM control  c00ic187h.eps	To increase engine speed while using cruise control, turn clockwise. To decrease engine speed while using cruise control, turn counterclockwise.	This typically decreases ground drive speed temporarily. This typically increases ground drive speed temporarily. For more information about cruise control, see page 118.

Item	Description	Notes
3. Trench Depth Meter  c00ic201h.eps	Measures and records trench depth.	For more information, see page 119.
4. 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.
5. Air conditioning control  c00ic189h.eps	To turn air conditioning on, press top. To turn air conditioning off, press bottom.	
6. Climate control selector  c00ic188h.eps	For warmer air, turn clockwise. For cooler air, turn counterclockwise.	

Trencher Controls



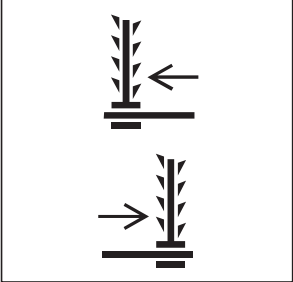
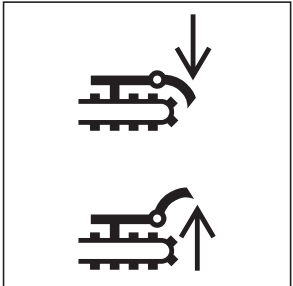
t13om088c.eps

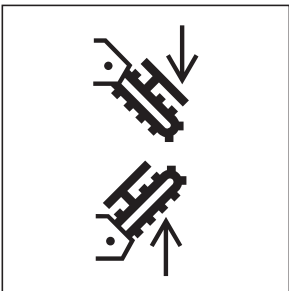


1. Trencher slide control*

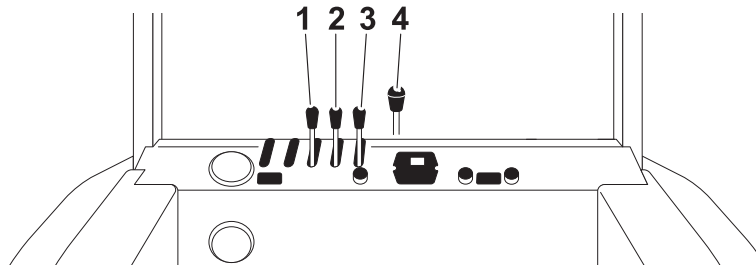
2. Trench cleaner lift control*
3. Boom lift control

*optional

Item	Description	Notes
1. Trencher slide control  c00ic198h.eps	To slide trencher right, push. To slide trencher left, pull.	IMPORTANT: If slide sticks: - Lower trencher to ground. - Operate trencher slide until trencher moves slightly. - Raise trencher and slide it into position.
2. Trench cleaner lift control  c00ic199h.eps	To lower, push. To raise, pull.	

Item	Description	Notes
3. Boom lift control  c00ic200h.eps	To lower, push. To raise, pull.	

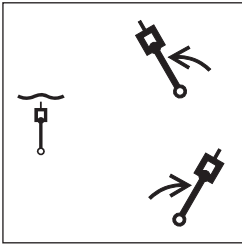
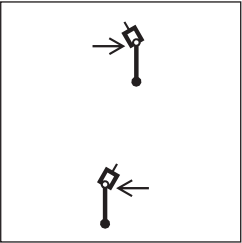
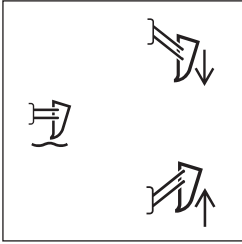
Plow Controls



t13om089c.eps

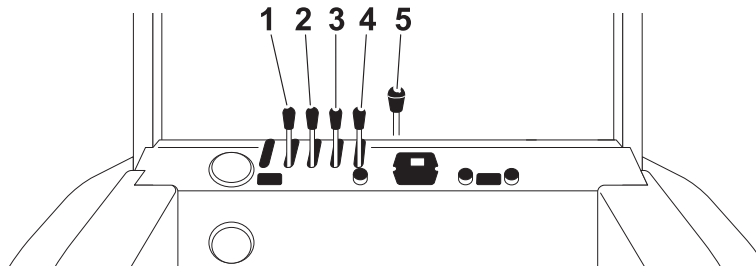


- | | |
|------------------------|----------------------|
| 1. Plow swing control | 3. Plow lift control |
| 2. Blade steer control | 4. Stow lock control |

Item	Description	Notes
1. Plow swing control  c00ic202h.eps	To swing left, pull. To swing right, push. To float, push to end.	NOTICE: - If soil conditions allow, operate in float position. - Lower plow into ground before moving control to float position. - Do not raise plow with control in float position.
2. Blade steer control  c00ic203h.eps	To steer right, push. To steer left, pull.	
3. Plow lift control  c00ic204h.eps	To raise, pull. To lower, push. To float, push to end.	NOTICE: - If soil conditions allow, operate in float position. - Lower plow into ground before moving control to float position.

Item	Description	Notes
4. Stow lock control	To lock: • Raise plow fully. • Pull stow lock handle. • Lower plow slightly to engage lock. To unlock: • Raise plow slightly. • Push stow lock handle to release lock.	Use this control to lock plow in the up position.

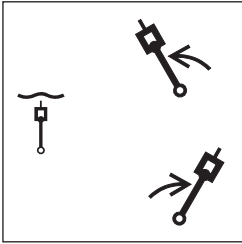
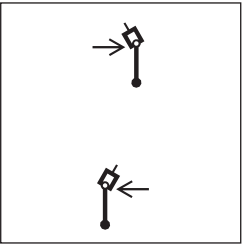
Combo Controls

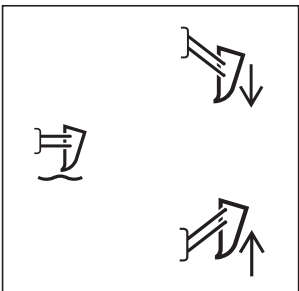
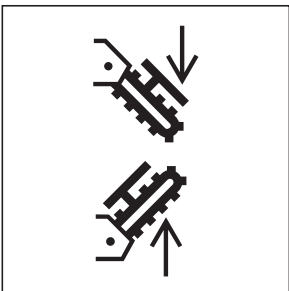


t130m090c.eps

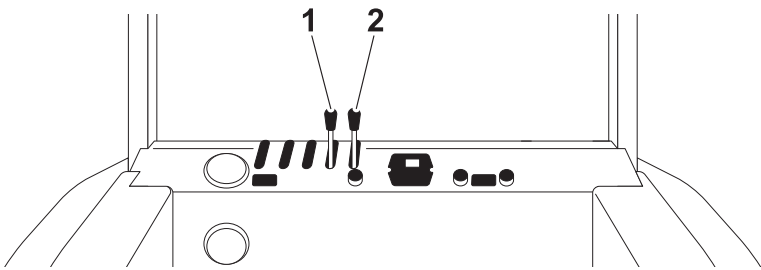


- | | |
|------------------------|---------------------------|
| 1. Plow swing control | 4. Boom lift control |
| 2. Blade steer control | 5. Plow stow lock control |
| 3. Plow lift control | |

Item	Description	Notes
1. Plow swing control  c00ic202h.eps	To swing left, pull. To swing right, push. To float, push to end.	NOTICE: • If soil conditions allow, operate in float position. • Lower plow into ground before moving control to float position. • Do not raise plow with control in float position.
2. Blade steer control  c00ic203h.eps	To steer right, push. To steer left, pull.	

Item	Description	Notes
3. Plow lift control  c00ic204h.eps	To raise, pull. To lower, push. To float, push to end.	NOTICE: • If soil conditions allow, operate in float position. • Lower plow into ground before moving control to float position.
4. Boom lift control  c00ic200h.eps	To lower, push. To raise, pull.	
5. Plow stow lock control	To lock: • Raise plow fully. • Pull stow lock handle. • Lower plow slightly to engage lock. To unlock: • Raise plow slightly. • Push stow lock handle to release lock.	Use this control to lock plow in the up position.

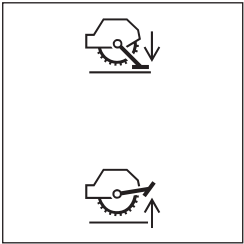
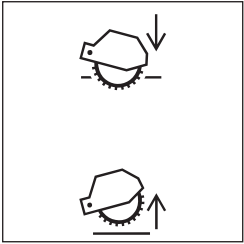
Saw Controls



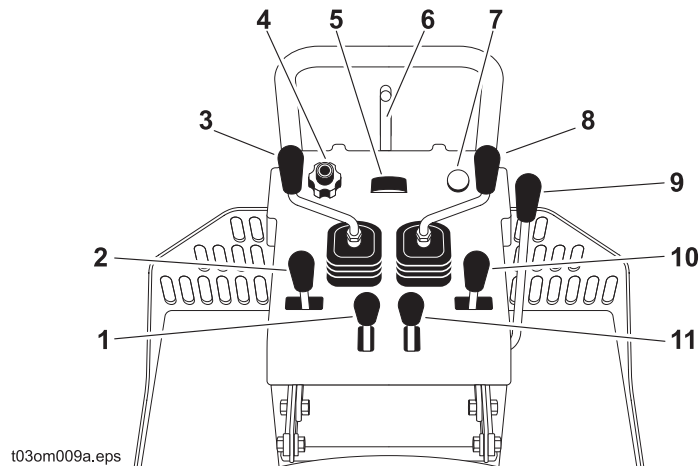
t13om091c.eps



1. Stabilizer lift control
2. Saw lift control

Item	Description	Notes
1. Stabilizer lift control  c00lc208h.eps	To lower, push. To raise, pull.	
2. Saw lift control  c00lc209h.eps	To lower, push. To raise, pull.	

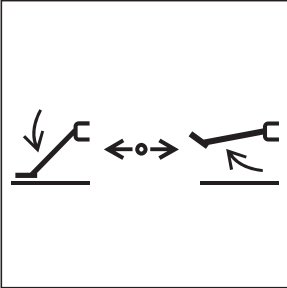
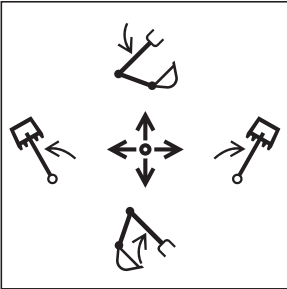
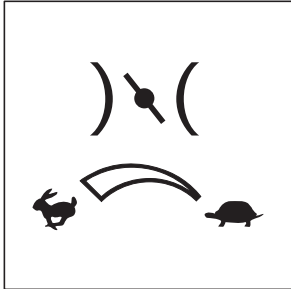
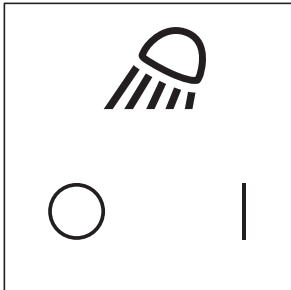
Backhoe Console



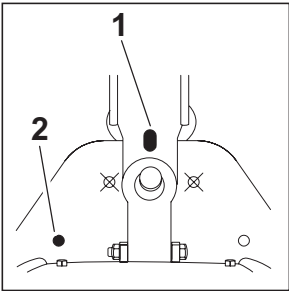
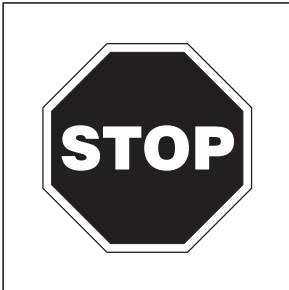
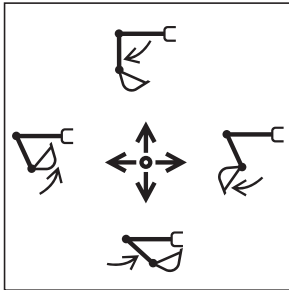
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|----------------------------------|---------------------------------|
| 1. Remote backfill blade control | 7. Remote engine stop switch |
| 2. Left stabilizer control | 8. Bucket/dipper control |
| 3. Boom/Swing control | 9. Stow lock control |
|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

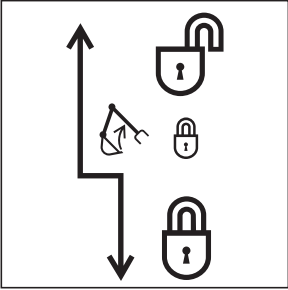
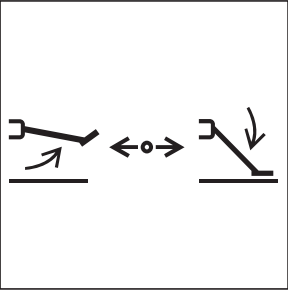
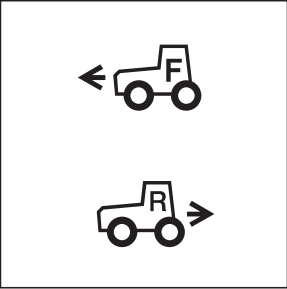
*optional

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.	

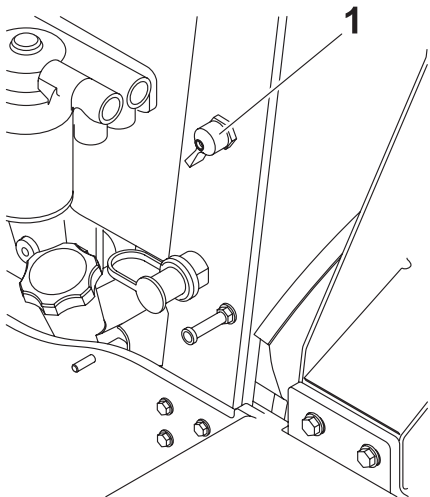


Item	Description	Notes
6. Swing lock pin  c00ic234h.eps	To lock: - Engage stow lock. - Insert swing lock pin into hole (1). To release: - Remove pin and store in hole (2). - Release stow lock.	This pin locks boom from swinging during transport. NOTICE: Do not store pin in holes marked with an "X." Backhoe could swing and destroy pin.
7. Remote engine stop switch  c00ic085c.eps	Stops engine immediately.	IMPORTANT: 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.

Item	Description	Notes
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 use stowlock and install swing lock pin during transport. NOTICE: When unlocked, store swing lock pin in holder located on left stabilizer support.
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.

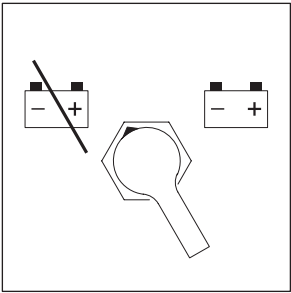


Battery



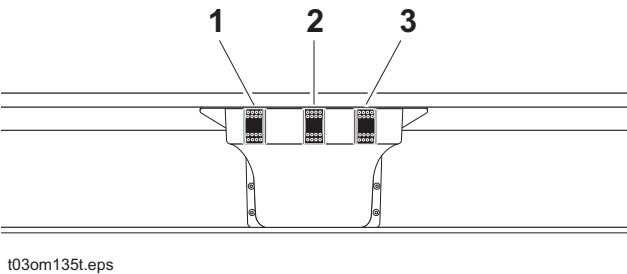
t13om085c.eps

- 1. Battery disconnect switch

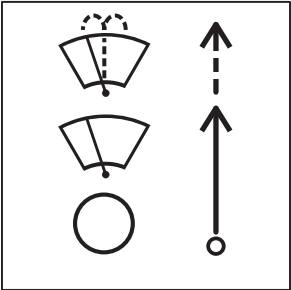
Item	Description	Notes
1. Battery disconnect switch  The diagram shows a lever with a handle and a circular head. The head has two positions: one with a diagonal line through it (disconnected) and one without (connected). To the left of the lever is a battery symbol with a minus sign and a plus sign. To the right is another battery symbol with a minus sign and a plus sign. The lever is shown moving from the disconnected position to the connected position. c00ic097h.eps	To connect, move right. To disconnect, move left.	

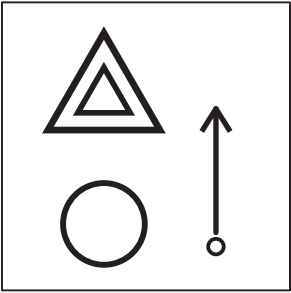
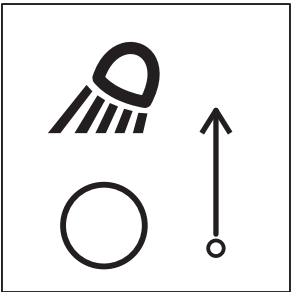
Cab (Option)

Controls



- 1. Windshield wiper control
- 2. Caution/Warning light control
- 3. Exterior light switch

Item	Description	Notes
1. Windshield wiper control  c00ic033t.eps	To wipe windshield, press top. To wash windshield, press top again. To stop, press bottom.	

Item	Description	Notes
2. Caution/Warning light control  c00ic031t.eps	To turn on caution/warning lights, press top. To turn off, press bottom.	
3. Exterior light switch  c00ic032t.eps	To turn on exterior lights, press top. To turn off, press bottom.	

Operation Overview

Chapter Contents

Planning..... 56

Trenching..... 56

Plowing 56

Sawing

Drilling 57

Digging with Backhoe 58

Leaving Jobsite..... 58



Planning

1. Gather information about jobsite. See page 60.
2. Inspect jobsite. See page 61.
3. Classify jobsite. See page 62.
4. Select chain and teeth to match your soil type, if necessary. See page 120.
5. Check supplies and prepare equipment. See page 64.
6. Haul equipment to jobsite. See page 78.

Trenching

1. Start unit. See page 66.
2. Position tractor and controls. See page 82.
3. Begin trenching. See page 85.
4. Engage optional cruise control if desired. See page 118.
5. Engage optional Trench Depth Meter if desired. See page 119.
6. Complete the installation. See page 82.
7. Shut down tractor. See page 68.

Plowing

1. Start unit. See page 66.
2. Position tractor and controls. See page 88.
 - offset plowing - page 94
 - coordinated plowing - page 94
 - crabbing - page 94
3. Attach product. See page 89.
4. Begin plowing. See page 91.
5. Engage cruise control if desired. See page 118.
6. Complete the installation. See page 92.
7. Shut down tractor. See page 68.

Sawing

1. Start unit. See page 66.
2. Before first use and after replacing bits, check bit clearance. See page 101.
3. Position tractor and controls. See page 101.
4. Begin sawing. See page 103.
5. Engage optional cruise control if desired. See page 118.
6. Engage optional Trench Depth Meter if desired. See page 119.
7. Complete the installation. See page 104.
8. Shut down tractor. See page 68.



Drilling

1. Start unit. See page 66.
2. Dig approach trench and target trench. See page 113.
3. Assemble drill string and position tractor. See page 113.
4. Begin drilling. See page 114.
5. Use drill string guide as needed. See page 114.
6. Add rod. See page 115.
7. Backream. See page 115.
8. Shut down tractor. See page 68.
9. Disassemble joints. See page 116.

Digging with Backhoe

1. Start unit. See page 66.
2. Set stabilizers and unstow backhoe. See page 108.
3. Excavate. See page 109.
4. Stow backhoe properly. See page 110.
5. Shut down tractor. See page 68.

Leaving Jobsite

1. Backfill if necessary. See page 124.
2. Rinse equipment. See page 124.
3. Stow tools. See page 124.
4. Haul equipment from jobsite. See page 77.

Prepare

Chapter Contents

Gather Information 60

- Review Job Plan 60
- Notify One-Call Services 60
- Arrange for Traffic Control 60
- Plan for Emergency Services 60

Inspect Site 61

- Identify Hazards 61

Classify Jobsite 62

- Inspect Jobsite 62
- Select a Classification 62
- Apply Precautions 63

Check Supplies and Prepare Equipment 64

- Supplies 64
- Fluid Levels 64
- Condition and Function 64
- Accessories 64



Gather Information

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

Review Job Plan

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

Notify One-Call Services

Contact your local One-Call (811 in USA) or the One-Call referral number (888-258-0808 in USA and Canada) to have underground utilities located before digging. Also contact any utilities that do not participate in the One-Call service.

Arrange for Traffic Control

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

Plan for Emergency Services

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

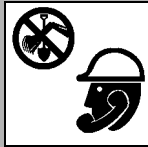
Inspect Site

Inspect jobsite before transporting equipment. Check for the following:

- changes in elevation such as hills or other open trenches
- obstacles such as buildings, railroad crossings, or streams
- signs of utilities (See "Inspect Jobsite" on page 62.)
- traffic
- access
- soil type and condition

Identify Hazards

Identify safety hazards and classify jobsite. See "Classify Jobsite" on page 62.



WARNING

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



NOTICE:

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

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

Classify Jobsite

Inspect Jobsite

- Follow U.S. Department of Labor regulations on excavating and trenching (Part 1926, Subpart P) and other similar regulations.
- Contact your local One-Call (811 in USA) or the One-Call referral number (888-258-0808 in USA and Canada) to have underground utilities located before digging. Also contact any utilities that do not participate in the One-Call service.
- Inspect jobsite and perimeter for evidence of underground hazards, such as:
 - “buried utility” notices
 - utility facilities without overhead lines
 - gas or water meters
 - junction boxes
 - drop boxes
 - light poles
 - manhole covers
 - sunken ground
- Have an experienced locating equipment operator sweep area within 20' (6 m) to each side of trench path. Verify previously marked line and cable locations.
- Mark location of all buried utilities and obstructions.
- Classify jobsite.

Select a Classification

Jobsites are classified according to underground hazards present.

If working . . .	then classify jobsite as . . .
within 10' (3 m) of a buried electric line	electric
within 10' (3 m) of a natural gas line	natural gas
in sand, 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.

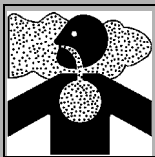
Natural Gas Jobsite Precautions

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



WARNING

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

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

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
- 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

Chapter Contents

Start Unit 66

Drive 68

Shut Down 68



Start Unit

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

**⚠ WARNING**

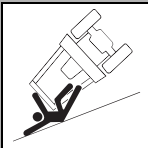
Runaway possible. Machine could run over you or others. Learn how to use all controls. Start and operate only from operator's position.

**⚠ 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.

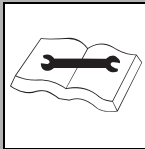
**⚠ WARNING**

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 ground drive control and attachment speed/direction control are in neutral.
3. Move throttle to idle.
4. Check that parking brake is engaged.
5. If starting in weather where temperature is below 32° F (0° C), press top of optional cold start switch and release.
6. Turn ignition switch to start tractor. Warning alarm will sound. Indicators will light.

IMPORTANT:

- If engine does not crank, check start interlock display. See page 24 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 24 for start interlock information.

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



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.
- Apply service brake to stop tractor.

EMERGENCY SHUTDOWN: Turn ignition switch to STOP.

The ground drive foot pedal and ground drive speed/direction control lever can override each other. This override feature is intended to be used while trenching/plowing/sawing. While driving or backfilling, use only the foot pedal to control speed and direction. While trenching/plowing/sawing, use hand lever to set digging travel speed. Temporary adjustments to digging travel speed can be made while trenching/plowing/sawing using the foot pedal. Temporary adjustments may be necessary if digging conditions change for a short distance. For example, if digging conditions toughen, depress the reverse foot pedal to slow down digging speed. When original condition resumes, release foot pedal to return to original speed.

1. Fasten and adjust seatbelt.
2. Turn on lights and warning flasher as needed.
3. Tilt steering wheel column to desired operating position.
4. Raise backfill blade and all attachments.
5. Release parking brake and verify parking brake indicator is off.
6. Move gearbox control to 2 (high).
7. Adjust throttle.
8. Move ground drive control to forward or reverse.

Shut Down

1. When job is complete, move ground drive control to neutral.
2. Tilt steering wheel column up.
3. Engage parking brake and verify parking brake indicator is on.
4. Lower all attachments to ground and let machine idle for three minutes to cool.
5. Turn ignition switch to STOP. If leaving machine unattended, remove key.
6. For maintenance or long-term storage, turn battery disconnect switch to disconnect position.

Transport

Chapter Contents

Lift 70

- Points 70
- Procedure 70

Tie Down 73

- Points 73
- Procedure 73

Haul 77

- Procedure 77

Tow 80

- Procedure 80



Lift

**WARNING**

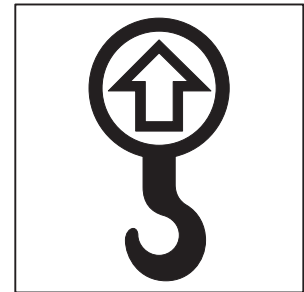
Crushing weight. If load falls or moves it could kill or crush you. Use proper procedures and equipment or stay away.

**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.

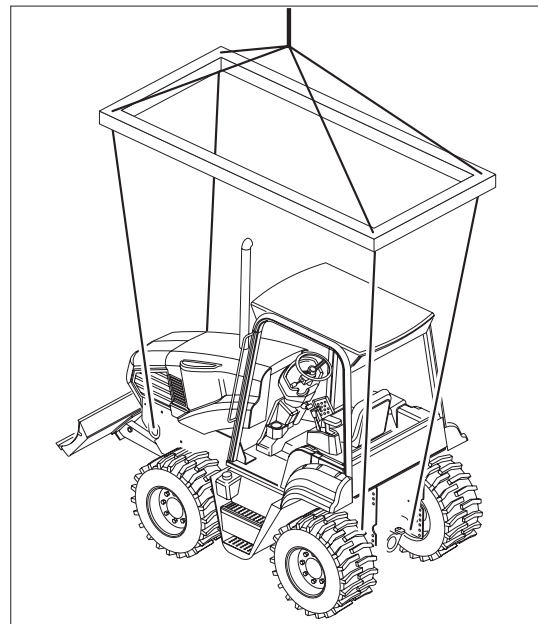


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Procedure

Tractor

Use a crane capable of supporting the equipment's size and weight. See "Specifications" on page 179. Use indicated lift points. Do not attempt to lift tractor with attachments installed.

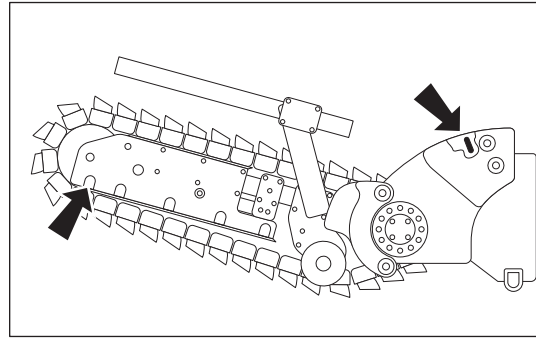


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Centerline Trencher

Use crane capable of supporting the equipment's size and weight. See page 183 or measure and weigh equipment before lifting.

NOTICE: Do not lift tractor with installed attachment.

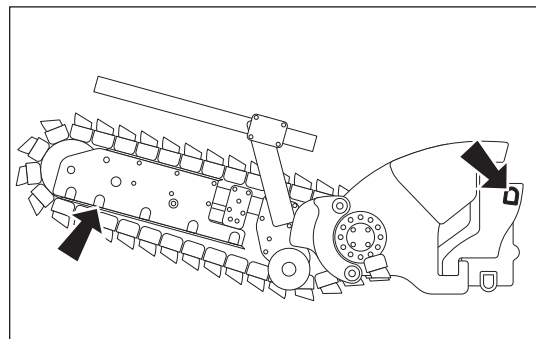


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Traversing Trencher

Use crane capable of supporting the equipment's size and weight. See page 185 or measure and weigh equipment before lifting.

NOTICE: Do not lift tractor with installed attachment.

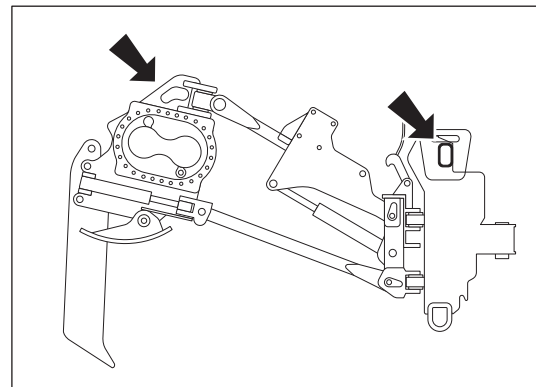


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Plow

Use crane capable of supporting the equipment's size and weight. See page 187 or measure and weigh equipment before lifting.

NOTICE: Do not lift tractor with installed attachment.



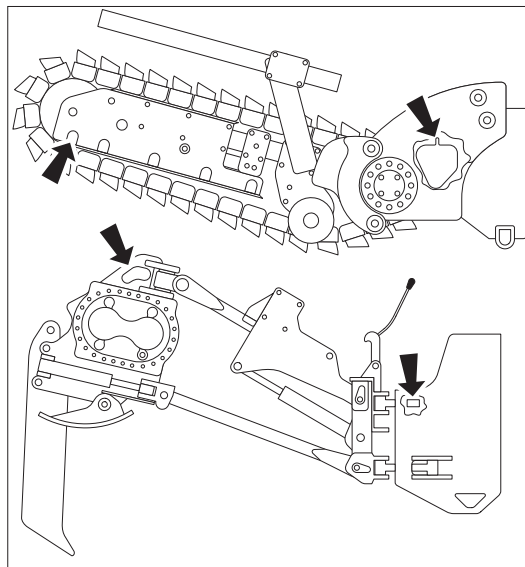
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Combo

Use crane capable of supporting the equipment's size and weight. See page 189 or measure and weigh equipment before lifting.

NOTICE: Do not lift tractor with installed attachment.

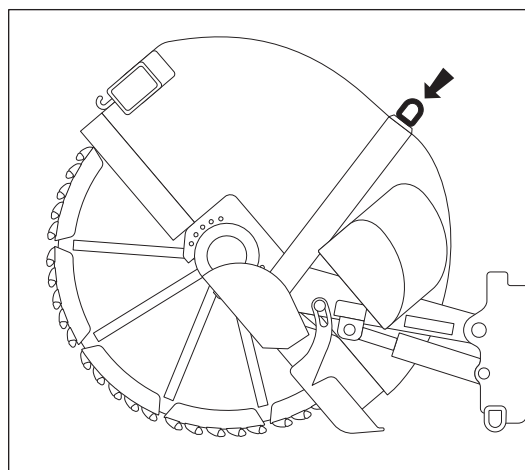


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Saw

Use crane capable of supporting the equipment's size and weight. See page 193 or measure and weigh equipment before lifting.

NOTICE: Do not lift tractor with installed attachment.

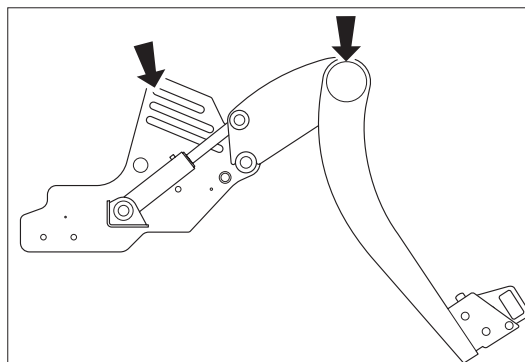


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Reel Carrier

Use crane capable of supporting the equipment's size and weight. See page 199 or measure and weigh equipment before lifting.

NOTICE: Do not lift tractor with installed attachment.



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Tie Down

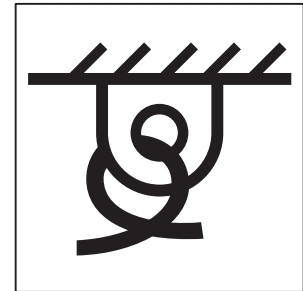


⚠ WARNING

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.

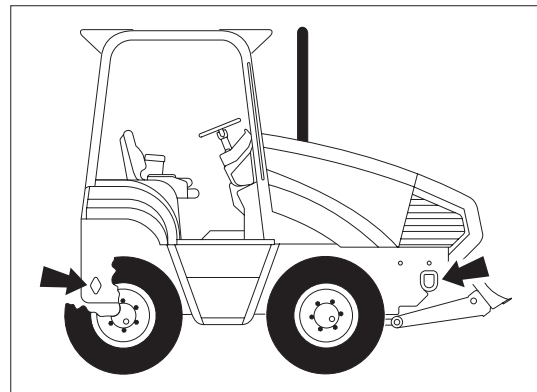


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Procedure

Tractor

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

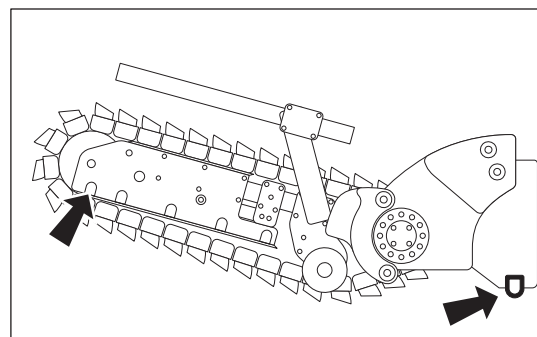


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Centerline Trencher

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.

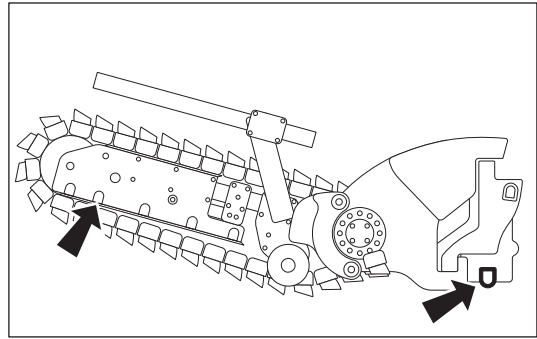


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Traversing Trencher

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.



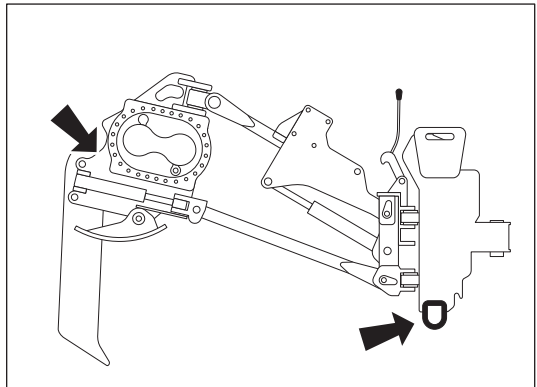
t12om071h.eps

Plow

Lower plow to trailer deck and chain at attachment frame and vibrator box. Make sure chains are tight before transporting.

NOTICE:

- Engage attachment stow lock and swing lock devices in addition to securing at tiedowns.
- Unsecured plow can swing outside the trailer and become a traffic hazard. Lower plow and chain to trailer deck before hauling.



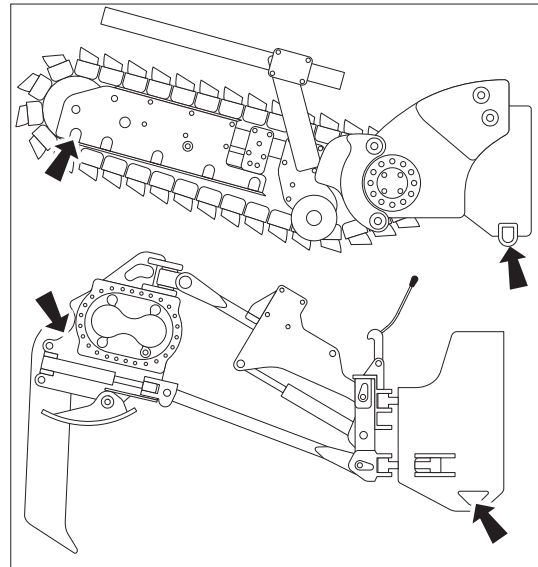
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Combo

Lower attachment to trailer deck and chain at attachment frame and vibrator box. Make sure chains are tight before transporting.

NOTICE:

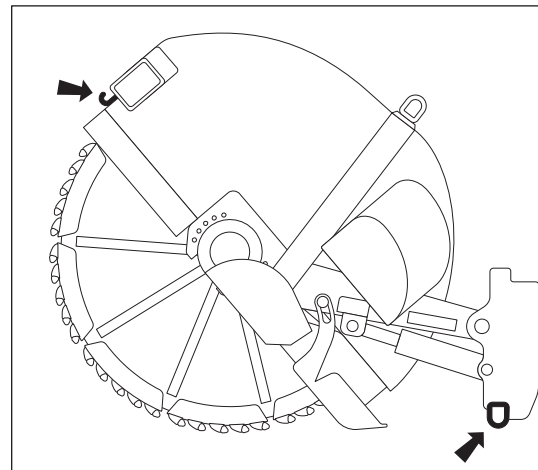
- Engage attachment stow lock and swing lock devices in addition to securing at tiedowns.
- Unsecured plow can swing outside the trailer and become a traffic hazard. Lower plow and chain to trailer deck before hauling.
- If trencher is equipped with a trench cleaner, ensure that trench cleaner shoe is fully up and extra bolt (found in operator's manual compartment) is installed in appropriate hole for additional support.



t13om009c.eps

Saw

Lower saw to trailer deck and chain at attachment frame and at hook on rear of saw. Make sure chains are tight before transporting.

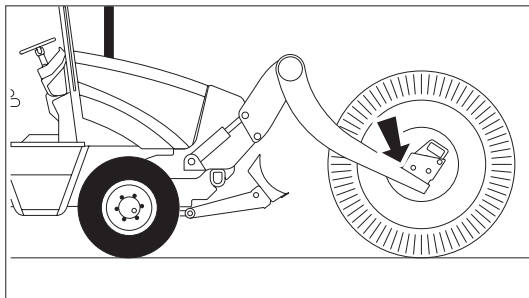


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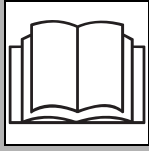
Reel Carrier

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.

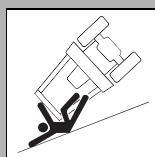
Load

**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 66 for proper start-up procedures.
4. Raise attachments, but keep them low.
5. Move attachments to center position and check that they are not in float.
6. Release parking brake and verify that parking brake indicator is off.
7. Move hydraulic motor switch to low.
8. Move gearbox control to 1 (low).
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 66 for proper shutdown procedures.
13. Attach chains to tractor and attachments where tiedown decals are located. See page 73.

Unload

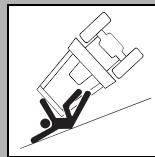


WARNING

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 ground drive controls are in neutral.
4. Remove chains from tiedowns.
5. Fasten and adjust seat belt.
6. Tilt steering column down.
7. Start tractor. See page 66 for proper start-up procedures.
8. Raise attachments, but keep them low and centered.
9. Release parking brake and verify that parking brake indicator is off.
10. 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:

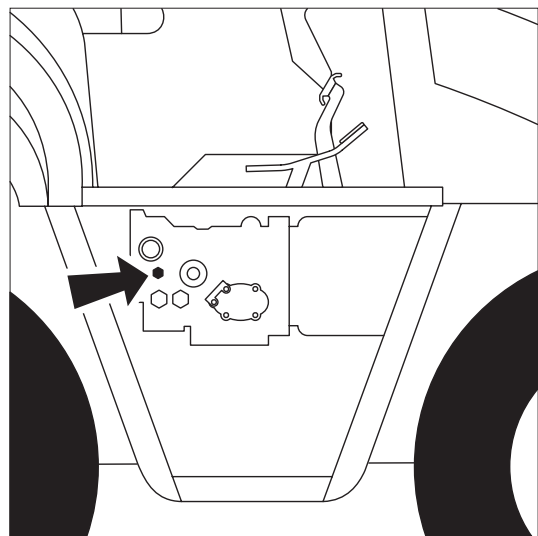
- Do not tow for more than 200 yd (180 m).
- Tow at less than 1 mph (1.6 km/h).
- Steering will be very difficult.

Procedure

1. Engage parking brake.
2. Block front and rear tires to prevent unit from rolling.
3. Attach tow line to all available tie-down points facing towing vehicle.
4. Activate the tow valve (shown).
 - Remove floor plate.
 - Turn tow valve counterclockwise two complete revolutions.

NOTICE: Do not turn tow valve more than two revolutions.

- Replace floor plate.
5. Remove blocks.
 6. Fasten seatbelt and adjust seatbelt.
 7. Apply service brake.
 8. Disengage parking brake.
 9. Use service brake to control unit.
 10. After towing, turn tow valve clockwise two complete revolutions.



t130m011c.eps



Chapter Contents

Setup 82

Operation..... 83

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. If using optional trench cleaner, remove bolt installed for transport.
2. Fasten and adjust seatbelt.
3. Start tractor. See page 66 for start-up procedures.
4. Drive to starting point. Move in line with planned trench. See page 68 for driving procedures.
5. Apply service brake.
6. Engage parking brake and verify parking brake indicator is on.
7. Move gearbox control to 1 (low).
8. Select low hydraulic motor speed.
9. Lower backfill blade.
10. Tilt steering column up.
11. Turn seat to the desired position.
12. Engage axle lock.
13. Lower boom to just above ground.
14. Engage optional Trench Depth Meter, if equipped. See page 119.
15. Check that attachment speed/direction control is in neutral.

16. Check that boom is in line with planned trench.



Operation

**⚠ WARNING**

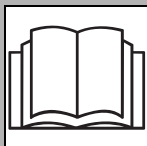
Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

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.

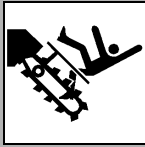
NOTICE:

- 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.

1. Lower backfill blade to reduce shock when trenching begins.
2. If necessary, adjust throttle to low idle.
3. Move attachment speed/direction control to desired speed. DIGGING CHAIN WILL MOVE.



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

NOTICE:

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

4. Increase engine speed to full throttle using hand control.
5. Lift trench cleaner, if equipped.
6. Slowly lower digging boom to desired trench depth.
7. Raise backfill blade.
8. Apply service brake.
9. Release parking brake and verify parking brake indicator is off.
10. Move ground drive control to desired speed.

IMPORTANT: For cruise control operation, see page 118.

11. Operate engine at full throttle when working.
12. If using optional trench cleaner, return ground drive control to neutral when desired trench depth is reached. 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 working position 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.

IMPORTANT:

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

14. Lower boom to trench depth and push ground drive control forward to trenching speed.
15. Always start trenching with ground drive speed set at low. If soil conditions permit optimal digging at higher ground drive speed, select high.
16. 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..
17. When trench is complete, move ground drive control to neutral.
18. Adjust throttle to low idle.
19. Raise boom.
20. As boom clears top of trench, move attachment speed/direction control to neutral.
21. Raise trench cleaner.
22. Swivel seat to the drive position.
23. Tilt steering wheel column down.
24. Disengage axle lock.

IMPORTANT: Drive tractor in reverse 6' (2 m) while turning steering wheel left to right to fully disengage axle lock.

25. Drive a short distance away from work site. See page 68 for driving procedures.
26. Disengage axle lock by driving tractor in reverse 6' (2 m).
27. Shut down tractor. See page 66 for proper shutdown procedures.
28. Return optional trench cleaner to the stowed position.f

Plow

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- Attach Product. 89

Operation 91

- Special Plowing 94

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:

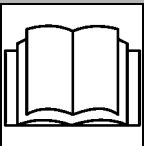
- Plow will swing freely in float.
- Keep everyone at least 6' (2 m) from machine, attachments, and their range of movement.



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.

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.
- Do not operate vibrator unless plow is in the ground.

Position Tractor

IMPORTANT: If material must be at a constant depth, dig starting and target trenches.

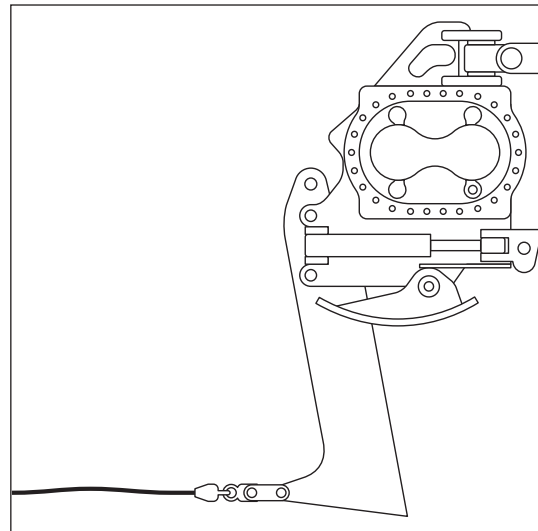
1. Fasten and adjust seat belt.
2. Start tractor. See page 66 for start-up procedures.
3. Drive to starting point. Move in line with planned trench. See page 66 for operating procedures.
4. Engage parking brake and verify parking brake indicator is on.
5. Lower backfill blade.
6. Lower plow to starting point of trench.
7. Turn ignition switch to STOP.



Attach Product

To Pull Product

1. Insert material into pulling grip.
2. Tape grip with duct tape.



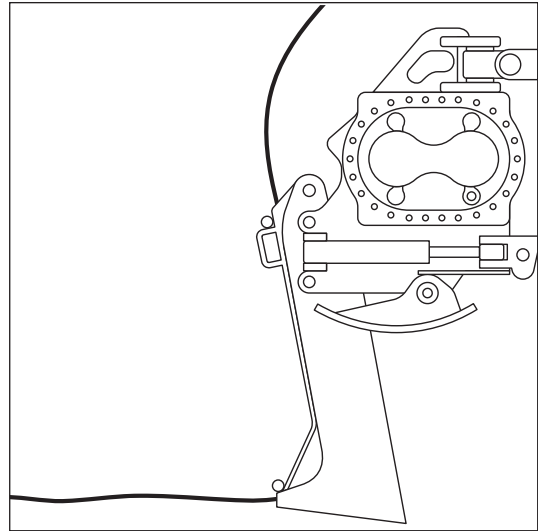
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To Feed Product

IMPORTANT: ROPS-attached cable guide should be a genuine Ditch Witch cable guide manufactured for this purpose.

1. Remove cable guide.
2. Feed cable through tube from top to bottom.
3. Replace cable guide and tighten fasteners.
4. Secure cable.

NOTICE: Keep everyone away from material being installed.



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Operation



⚠ WARNING

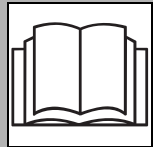
Crushing weight could cause death or serious injury. Use proper procedures and equipment or stay away.



⚠ 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.
- Do not drive backward with plow in the ground.



1. Fasten and adjust seat belt.
2. Start tractor.
3. Adjust throttle to low idle.
4. Check that ground drive control is in neutral.
5. Release parking brake and verify parking brake indicator is off.
6. Move gearbox control to 1 (low).
7. Lower reel carrier to lowest position possible, if equipped.

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

8. Raise backfill blade.
9. Tilt steering wheel column up.
10. Swivel seat to the desired position.
11. Engage axle lock.
12. Move ground drive control forward to plowing speed and lower plow blade into ground.

NOTICE:

- Lower plow into ground before moving plow lift control or plow swing control to float.
- Do NOT move ground drive to reverse with plow blade in the ground.

13. Move plow lift control to float.
14. Move plow swing control to float.
15. Increase engine speed to full throttle.

IMPORTANT: Keep sod cutter edge sharp when plowing in areas with heavy grass cover or surface clutter.

16. Move attachment speed/direction control to full speed forward. PLOW WILL VIBRATE.
17. Reduce attachment speed to a point with the least tractor vibration and the highest ground drive speed possible without tire slippage..

Note: In some soil conditions, changing vibrator weights can improve plow performance. Contact your Ditch Witch dealer for details.

18. Check cable for damage during plowing. Run continuity checks on electric cable and check pipe pressure. Damage can result from improper operation, incorrect blade choice, striking underground obstructions, or other conditions.
19. Adjust vibrator speed if ROPS vibrates excessively.
20. When installation is complete, move plow swing out of float.

21. With vibrator running, raise plow to ground level.

NOTICE: Do not operate vibrator when plow is out of the ground. This will cause excessive vibration resulting in rapid wear, and possible damage to the unit and product being installed.

22. Move attachment speed/direction control to neutral.
23. Swivel seat to the drive position.
24. Engage parking brake and verify parking brake indicator is on.
25. Lower backfill blade.
26. Turn ignition switch to STOP and remove product from plow.
27. Tilt steering column down and start tractor.
28. Swing plow to center position and engage swing lock and stow lock.
29. Raise backfill blade.
30. Disengage axle lock.

IMPORTANT: Drive tractor in reverse 6' (2 m) while turning steering wheel left to right to fully disengage axle lock.

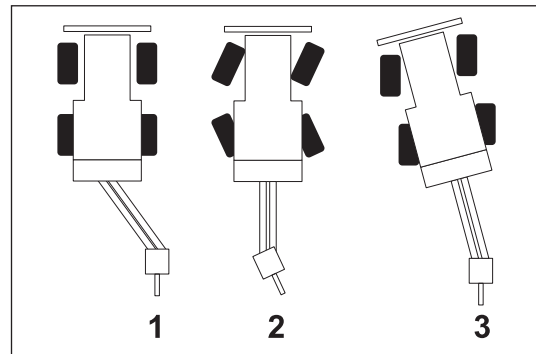
31. Drive a short distance away from work site.
32. Disengage axle lock by driving tractor in reverse 6' (2 m).
33. Shut down tractor. See page 68 for proper shutdown procedures.



Special Plowing

Your Ditch Witch equipment allows you to plow four ways: normal plowing, offset plowing (1), coordinated plowing (2), and crabbing (3).

NOTICE: Oversteering blade may damage blade or cable.



Offset Plow

Offset plowing can be used to plow next to a road while keeping tires on a more stable surface or in similar conditions.

1. Use plow swing to move plow to planned trench line.
2. Use blade steer to position blade parallel to direction of tractor frame.

Coordinated Plow

Coordinated plowing can be used 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. Plow as normal.

IMPORTANT: When coordinated plowing, keep plow blade straight or in the same angle position as rear tires.

Crab

Crab plowing can be used to plow along edge of jobsite or in similar conditions.

1. Move steer select control to crab position.
2. Slowly move tractor forward.
3. Plow as normal.

Reel Winder

Chapter Contents

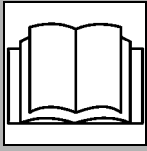
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- Adjust Reel Winder 96

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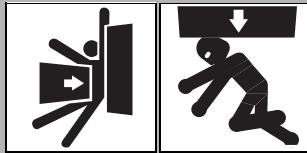
Setup



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

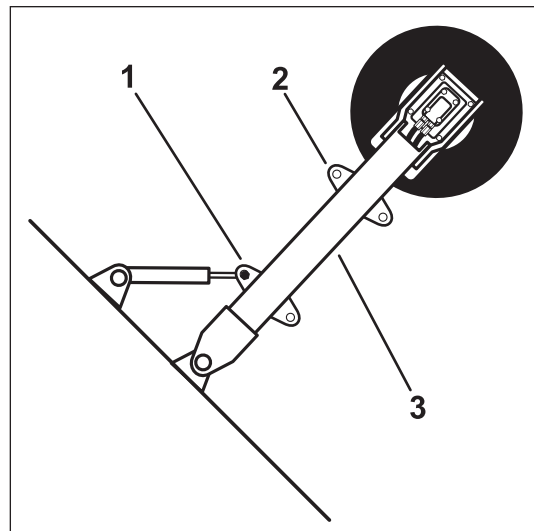
Adjust Reel Winder

1. Lower reel carrier.
2. Turn ignition switch to STOP.
3. Remove reel.



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

4. While supporting lever arm (3), remove bolt (1) that attaches hydraulic lift cylinder to lever arm.
5. Attach cylinder rod to the correct mounting hole for your diameter reel:
 - For 2-5' (61-152 cm) diameter reels, attach to bottom mounting hole (1).
 - For 5-7' (152-213 cm) diameter reels, attach to top mounting hole (2).



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Operation

1. Fasten and adjust seat belt.
1. Drive to beginning of planned plow path.
2. Engage parking brake.
3. Lower backfill blade.
4. Lower plow attachment.
5. Adjust throttle.
6. Attach service line to reel.



away.

Moving parts could cut off hand or foot. Stay

7. Move reel winder selector switch to activate reel winder control functions.
8. Lower reel winder arm until tire meets reel flange.
9. Wind service line.
10. When finished winding, raise reel winder arm.
11. Adjust throttle.
12. Move reel winder selector switch to activate backfill blade controls.
13. Raise backfill blade.
14. Release parking brake.
15. Follow directions in "Plow" on page 87 to begin plowing.

Saw

Chapter Contents

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- Before First Use and After Replacing Bits. 101
- Normal Use 101

Operation..... 103



Setup

EMERGENCY SHUTDOWN - Turn ignition switch to STOP.



WARNING

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

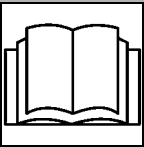
NOTICE: Use attachments or counterweights to make front and rear loads balance when all attachments are raised. Contact your Ditch Witch dealer about counterweighting for your equipment.



WARNING

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

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



WARNING

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

Before First Use and After Replacing Bits

NOTICE: Unless otherwise instructed, all service should be performed with tractor off.

Check Bit Clearance

1. Check that all bits are properly secured.
2. Check that all bit retaining rings are secure.
3. Spin wheel by hand and listen for bits hitting diverters.
4. If bits hit diverters, repeat steps 1-3 to make sure bits are in the proper location and secured at proper depth.
5. If bits do not hit diverters:
 - Set parking brake.
 - Fasten and adjust seat belt.
 - Start tractor and adjust throttle.
 - Raise saw slightly.
 - Use attachment speed/direction control to rotate saw slowly. As it rotates, listen for clicking sounds. If clicking is present, repeat steps 1-4.



Normal Use

IMPORTANT:

- Saw use is not recommended for soft, wet, or sticky soil conditions.
- Before operating saw, check bits for free rotation. Tap bits lightly with a hammer and turn by hand. If bits are stuck, remove and clean packed soil from bit block.
- For best results, use retaining clip loading and removing tool and a knock-out bar included with saw to remove and reinsert bits.
- Carbide bits are recommended for cutting abrasive material, such as sandstone or frozen sands or gravels.

1. Fasten and adjust seat belt.
2. Start tractor. See page 64 for start-up procedures.
3. Drive to starting point. Move in line with planned trench. See page 66 for correct operating procedures.
4. Engage parking brake and verify parking brake indicator is on.
5. Move gearbox control to 1 (low).
6. Tilt steering wheel column up.
7. Swivel seat to the desired position.
8. Engage axle lock.

9. Lower saw to just above ground.
10. Lower stabilizer until distance from bottom of skid shoe to bottom of saw bits equals desired trench depth.
11. Check that saw is in line with planned trench and that tires are pointing straight ahead. Work slowly and carefully.

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



⚠ CAUTION

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

1. Adjust throttle to low idle.
2. Move attachment speed/direction control to desired speed. SAW WILL TURN.

**⚠ DANGER**

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

NOTICE:

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

3. Slowly lower saw to trench depth.

**⚠ WARNING**

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

NOTICE: Ensure that stabilizers are in contact with the ground while sawing. Failure to use stabilizers correctly will damage equipment.

4. Release parking brake and verify parking brake indicator is off.
5. Increase engine speed to full throttle.
6. Push ground drive control forward to trenching speed.

IMPORTANT:

- Lower saw into softer material then move into harder or abrasive material. For example, lower saw into dirt at shoulder before cutting across road.
- For cruise control operation, see page 118.

7. If a curved trench must be cut, make a series of straight cuts.
8. When trench is complete, adjust throttle to low idle.
9. Raise saw and stabilizers.
10. As saw clears top of trench, move attachment speed/direction control to neutral.
11. Swivel seat to the drive position.
12. Tilt steering wheel column down.
13. Drive a short distance away from work site.

14. Disengage axle lock.

IMPORTANT: Drive tractor in reverse 6' (2 m) while turning steering wheel left to right to fully disengage axle lock.

15. Shut down tractor. See page 66 for correct shutdown procedures.

16. Wash bits and mounting blocks with high pressure water before parking unit overnight.



Backhoe

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Stowing 110



Setup

1. Move attachment speed/direction control to neutral position.
2. Press 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.

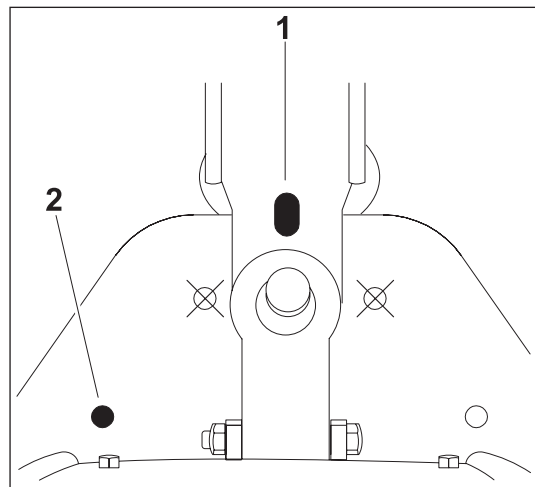
IMPORTANT: For more information about stabilizer controls, see page 40.

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 page 44.

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

NOTICE: Engine speed affects speed of backhoe operation.

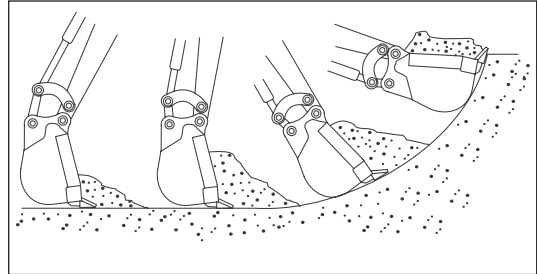


Operation

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

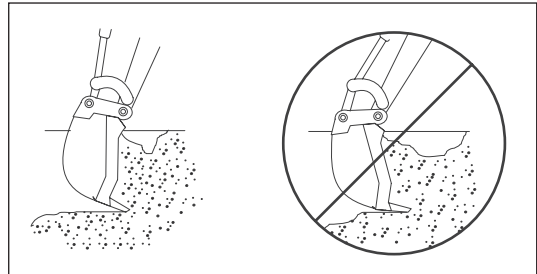
IMPORTANT: For more information about backhoe controls, see page 48.

- 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.



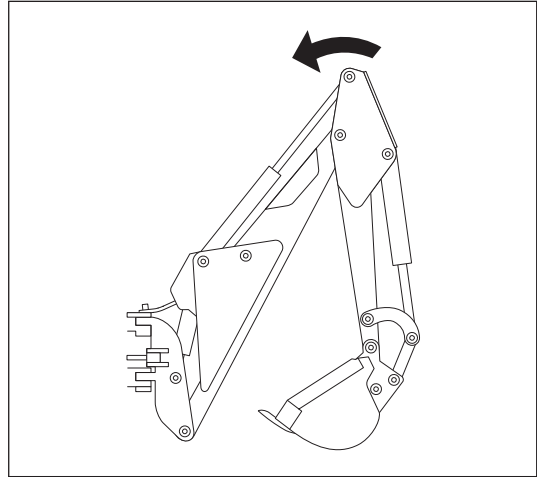
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Stowing

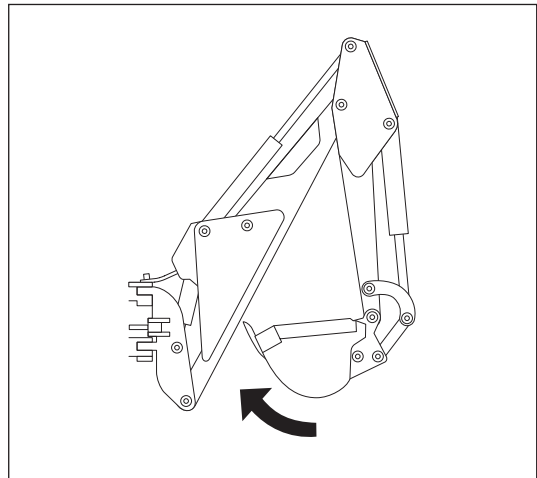
NOTICE: Before returning to tractor operator station, raise stabilizers, return remote throttle to low idle, and stow and lock boom.

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



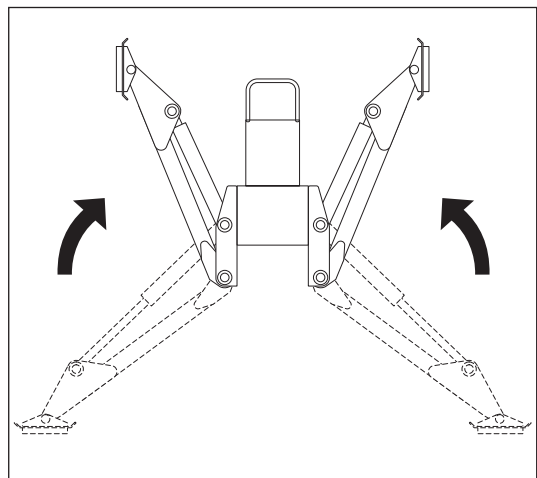
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2. Curl bucket closed and move dipper fully toward boom.
3. Lift boom to highest position and latch stow lock.
4. Lower boom slightly to engage lock.
5. Engage swing lock. See page 108.



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



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Drill

Chapter Contents

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- Approach Trench (1) 113
- Target Trench (2). 113
- Drill Pipe and Equipment. 113

Drill 114

- Using Drill String Guide. 114

Add Rod 115

Backream 115

Disassemble Joints. 116





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

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

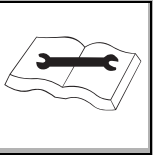


Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

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



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



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.

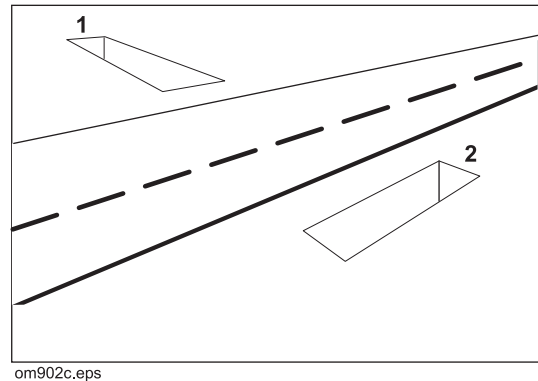
Prepare Jobsite and Equipment

Approach Trench (1)

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

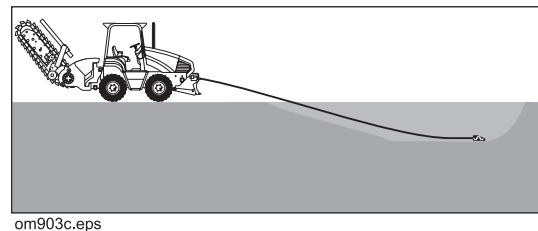
IMPORTANT: The actual length of the target trench depends on soil conditions and length of pipe sections. Make it deep enough for drill bit to enter slightly above the trench floor.



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 page 27.

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 bore 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



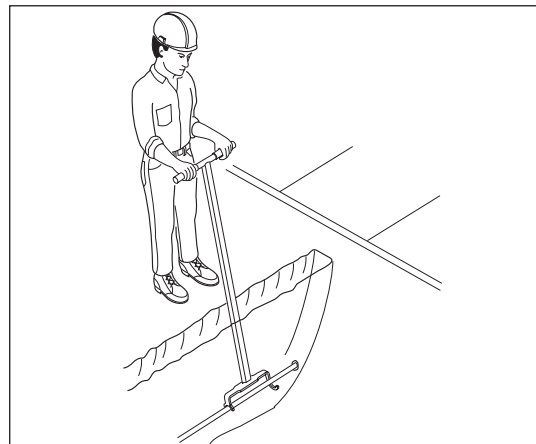
⚠ DANGER

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

NOTICE: Keep everybody at least 10' (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.



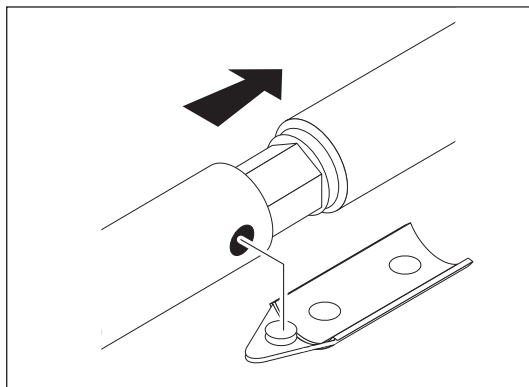
4. Slowly back up tractor while maintaining rotation.
5. When backreamer exits the bore hole, stop rotation immediately.

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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- Operate Cruise Control 118

Trench Depth Meter 119

Chain, Teeth, and Sprockets 119

- Chain and Tooth Maintenance 119
- Chain Types 119
- Chain Selection 120

Optional Equipment 121

- RT95 Tractor 121
- H910/H911 Trencher 121
- H932 Plow 121
- H940/H1140 Saw 121



Cruise Control

Cruise control is an optional feature that allows the unit to automatically adjust ground drive speed to digging conditions. In easier soil conditions, the ground drive speed will increase. When the unit encounters difficult soil conditions, the ground drive speed will decrease. The unit does this by adjusting ground drive pump output to maintain a preset engine RPM.

Operate Cruise Control

EMERGENCY SHUTDOWN - Turn ignition switch to STOP.

1. First set the following controls:
 - ground drive control to neutral
 - hydraulic motor switch to low
 - gearbox control to (low)
 - ensure cruise control is off
 - all other controls set as desired
2. Move cruise control RPM control to arrow at center.
3. Depress cruise control switch once and ensure that cruise control indicator turns on.
4. Following procedures on page 81, begin trenching to desired depth.
5. When desired depth is reached, ensure throttle is fully open.
6. Slowly move ground drive control fully forward.
7. Slowly adjust cruise control RPM control to match digging conditions.

IMPORTANT:

- In harder digging conditions, higher cruise control rpm setting may improve digging performance.
- In easier digging conditions, lower cruise control rpm setting may increase ground drive speed.

8. When finished digging, move ground drive control to neutral and depress cruise control switch again to turn off cruise control.
9. Allow chain to dig itself free before stopping attachment.

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's 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 140.
- 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.

RT95 Tractor

Equipment	Description
dual batteries	provide more cranking power for cold starting
backup alarm	for use with saws or other 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	climate control system for units with cabs
heater kit	heater-only systems for units with cabs
auxiliary step kit	additional step for moving from operator's station to backhoe station

H910/H911 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



H932 Plow

Equipment	Description
blades	several blade options are available
RC55 reel carrier	designed to fit your Ditch Witch equipment and speed cable installation
toes	stabilize the plow for more constant depth
bullets	allow a larger cavity for the material being installed

H940/H1140 Saw

Equipment	Description
bits and bit holders	replace as needed to increase efficiency and keep from damaging machine
block repair jigs	use to repair worn or damaged blocks or plates housing the bit holder; use block repair jig available from your Ditch Witch dealer and an E7018 or equivalent

Complete the Job



Chapter Contents

Restore Jobsite 124

- Backfilling 124

Rinse Equipment 124

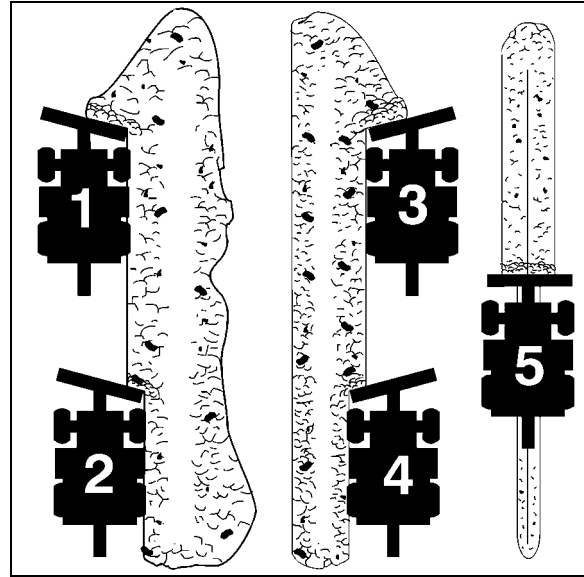
Stow Tools 124

Restore Jobsite

After product is installed, return spoils to the trench with optional 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 and properly secured on trailer.

Service

Chapter Contents



Lubrication Overview 126

Recommended Lubricants/Service Key 126

- Approved Coolant 128
- Engine Oil Temperature Chart. 128

10 Hour 129

50 Hour 146

250 Hour 154

500 Hour 159

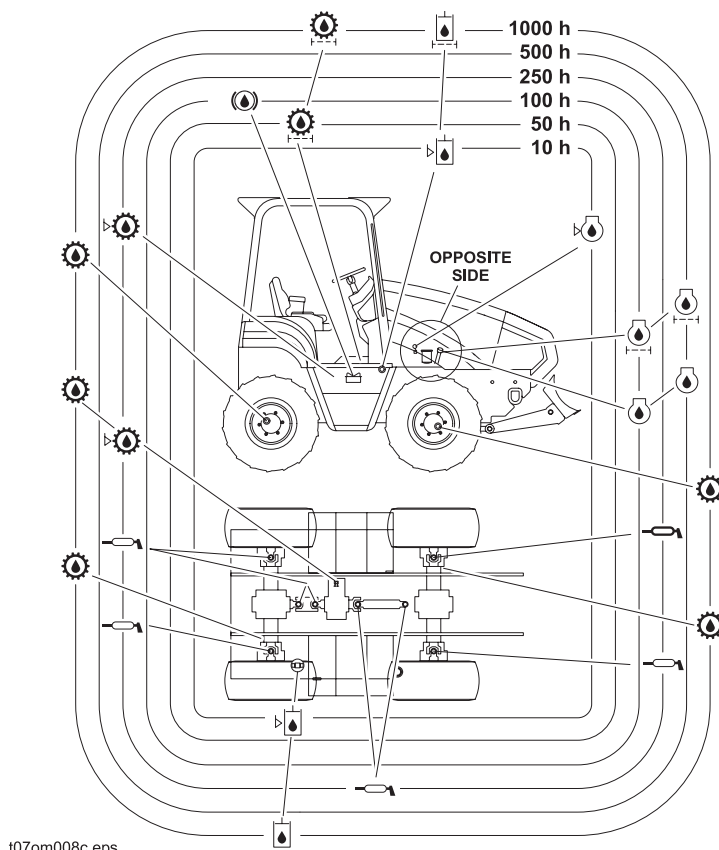
1000 Hour 165

2000 Hour. 168

5000 Hour. 169

As Needed 170

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
 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 182.

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 159 to record all required service to your machine.

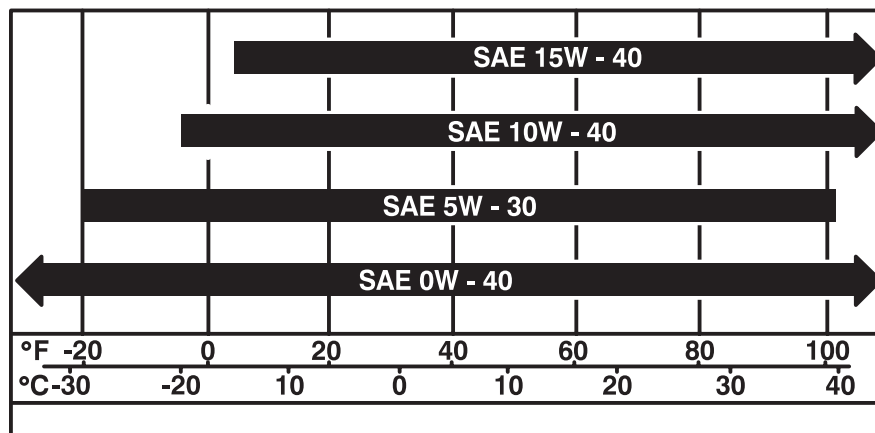
Approved Coolant

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.

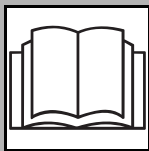
NOTICE: Do not mix heavy-duty diesel engine coolant and automotive-type coolant. This will lead coolant breakdown and engine damage.

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

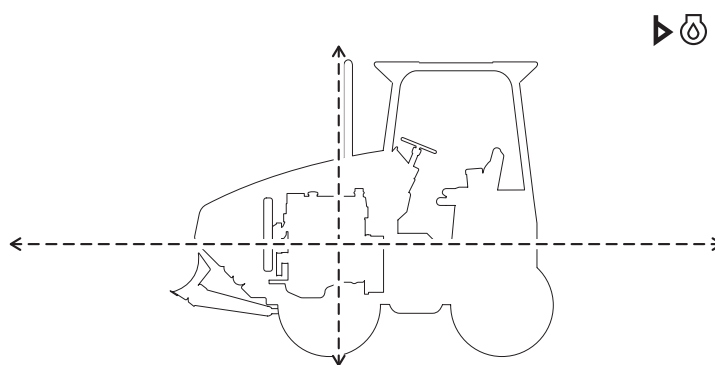
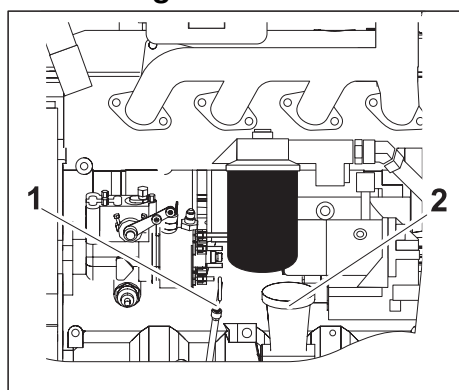
Location	Task	Notes
TRACTOR	Check engine oil	DEO
	Check air filter indicator and clean dust trap	
	Check water separators and fuel filter	
	Check hydraulic fluid	THF
	Check hydraulic reservoir fill and strainer	
	Check hydraulic hoses	
	Check coolant level	DEAC
	Check hoses	
	Check radiator fins	
	Check tire pressure	
	Check wheel lug nuts	295 ft•lb (400 N•m)
TRENCHER	Lube trencher tail roller	EPG
	Lube trencher pivot	EPG
	Lube trencher auger bearings	EPG
	Lube trencher auger shaft	EPG
	Check trencher auger bolts	
	Check digging chain	
	Check digging chain tension	
	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)
PLOW	Lube plow pivots	EPG
	Check plow vibrator oil	MPL
	Check plow arm pins and bushings	
	Check plow connector pivots	
	Check attachment mounting bolts	200 ft•lb (271 N•m)
COMBO	Complete all service items for trencher and plow	



Location	Task	Notes
SAW	Clean saw	
	Clean spoils chutes	
	Lube saw wheel shaft bearings	EPG
	Check saw bits	
	Check segments	
	Check segment bolts (initial)	700 ft•lb (950 N•m)
	Check attachment mounting bolts	200 ft•lb (271 N•m)

Tractor

Check Engine Oil Level

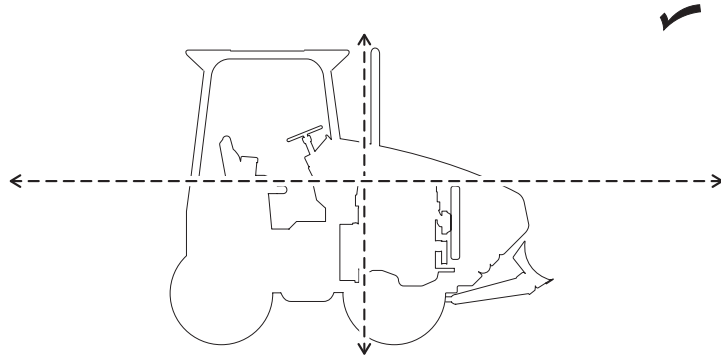
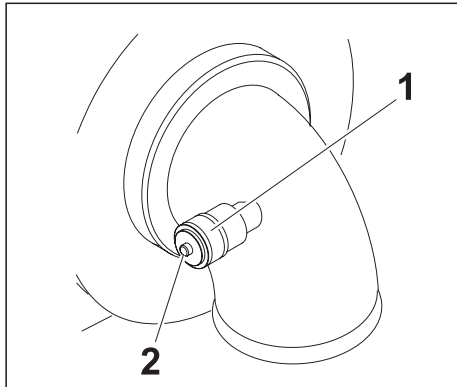


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Check engine oil at dipstick (1) before operation and every 10 hours thereafter. Add DEO at fill (2) as necessary to keep oil level at highest line on dipstick.

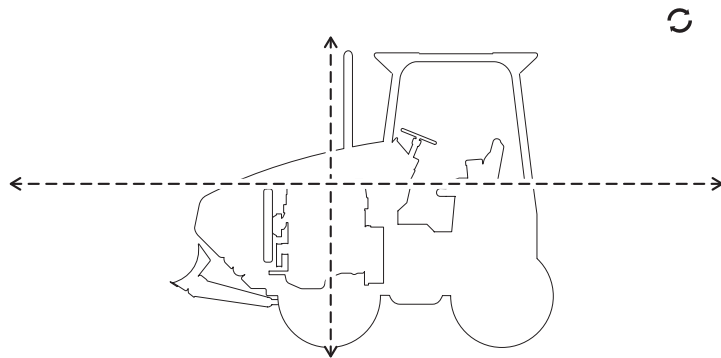
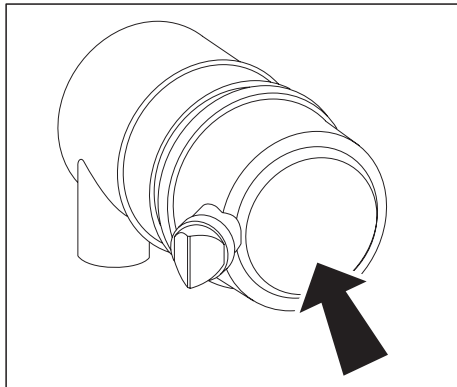
IMPORTANT: If adding oil before the initial oil change at 250 hours, add only SAE 10W30. After 250 hours, see page 126 for DEO specifications.

Check Air Filter Indicator and Clean Dust Trap



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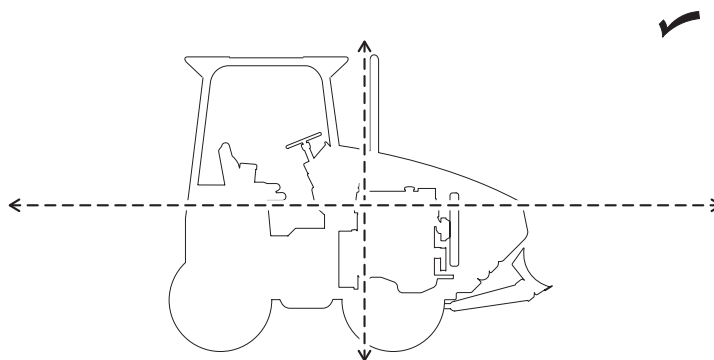
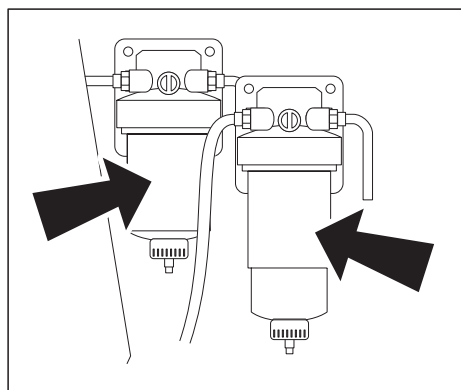
Check air filter indicator (1) and clean dust trap every 10 hours. Red band indicates filter must be changed. Push button (2) to re-set indicator.



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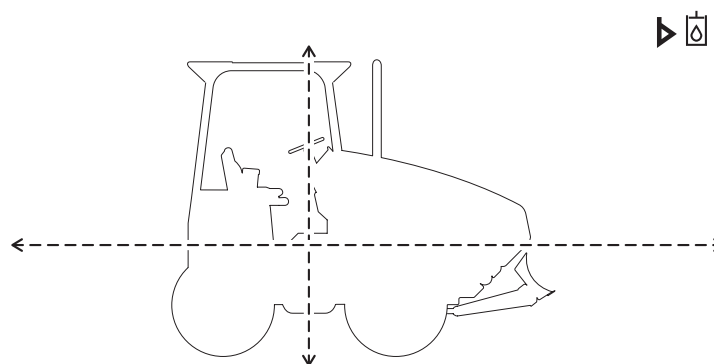
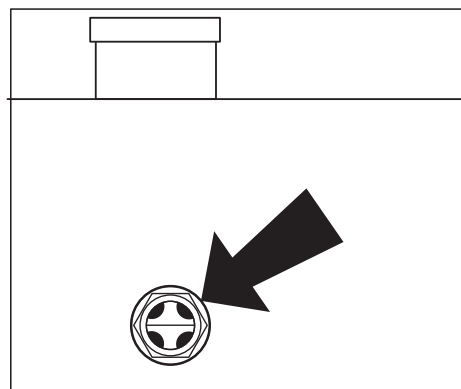
Clean dust from trap by blowing with low-pressure air every 10 hours.



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

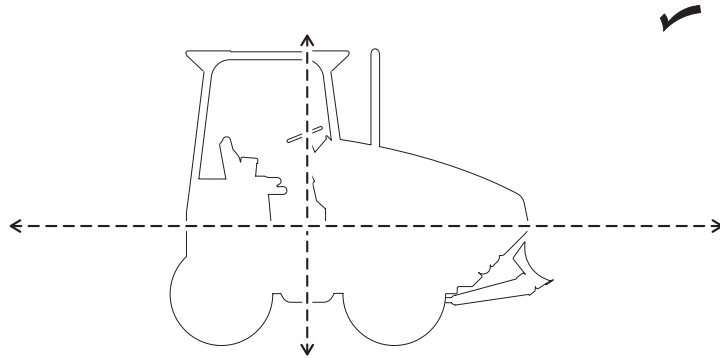
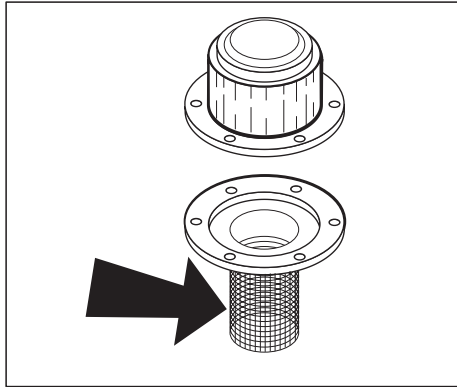
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With frame level, check fluid at sight glass every 10 hours. Add THF at fill as necessary. Fluid capacity up to sight glass is 24 gal (91 L).

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

IMPORTANT: Do not open unless adding hydraulic fluid.

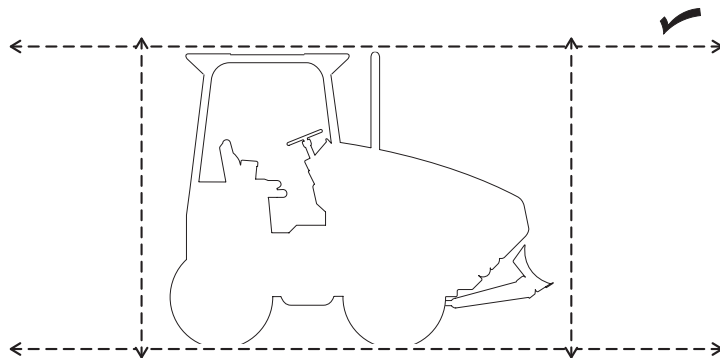
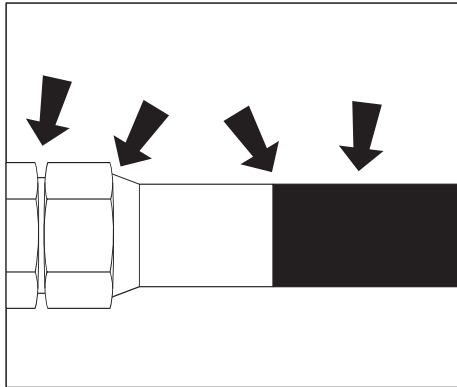
Check Hydraulic Reservoir Fill and Strainer



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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



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Check all hydraulic hoses every 10 hours.

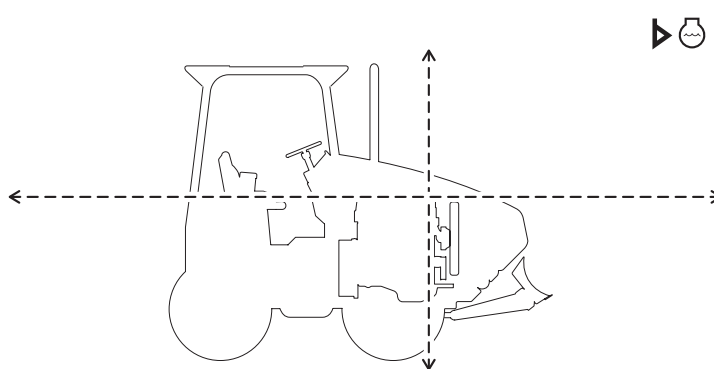
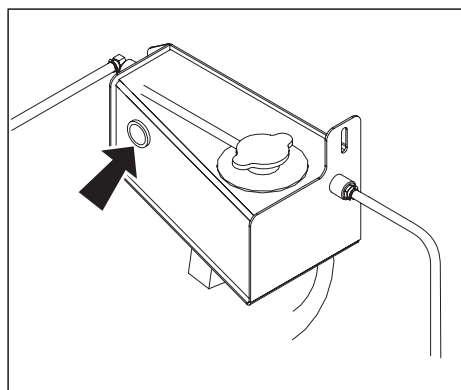


⚠ WARNING

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.

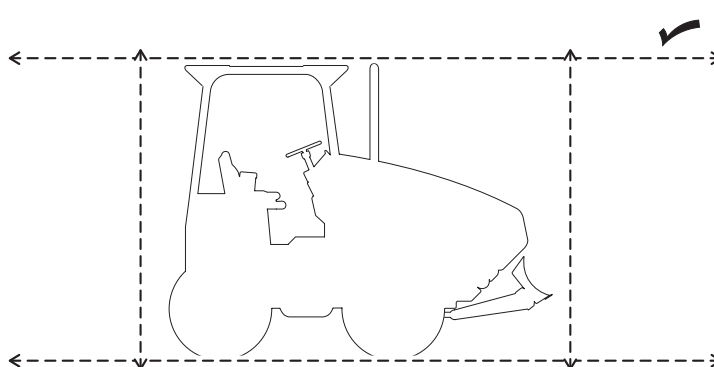
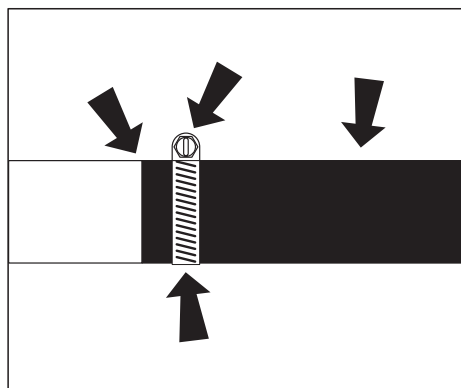
- Before disconnecting a hydraulic line, turn engine off and operate all controls to relieve pressure. Lower, block, or support any raised component with a hoist. Cover connection with heavy cloth and loosen connector nut slightly to relieve residual pressure. Catch all fluid in a container.
- Before 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.

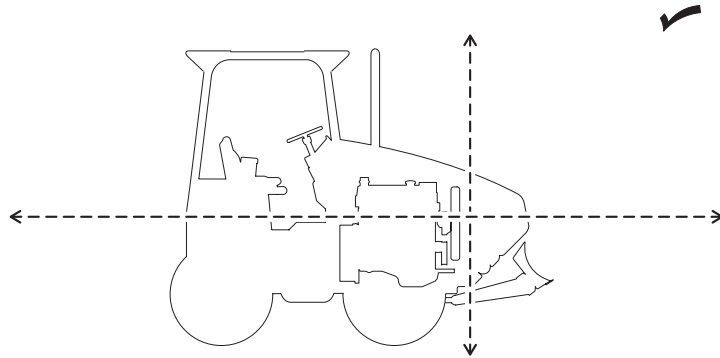
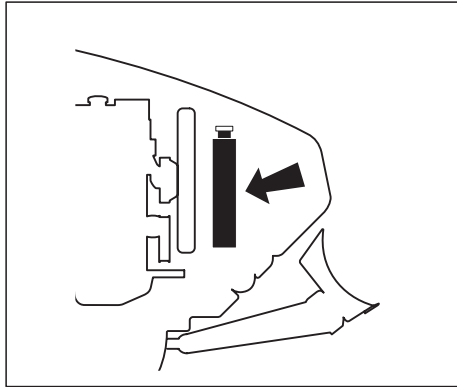
IMPORTANT: See page 128 for information on approved coolants.

Check Hoses

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Check all hoses every 10 hours.

Check Radiator Fins

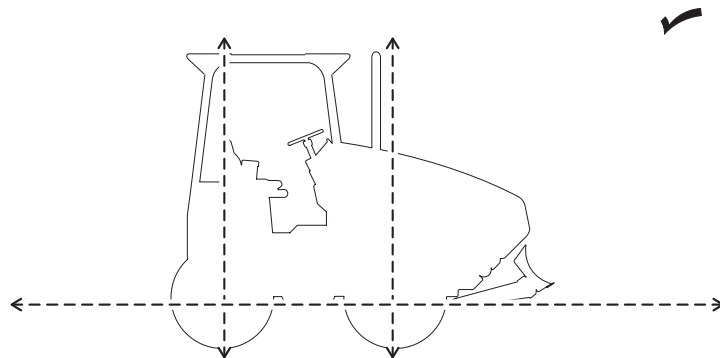
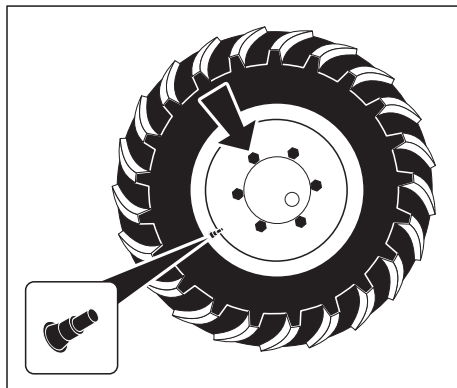


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Check radiator for dirt, grass, and other foreign matter every 10 hours. Clean out with compressed air or spray wash if required. Be careful not to damage fins with high pressure air or water. Check more often if operating in dusty or grassy conditions.

Check Tire Pressure



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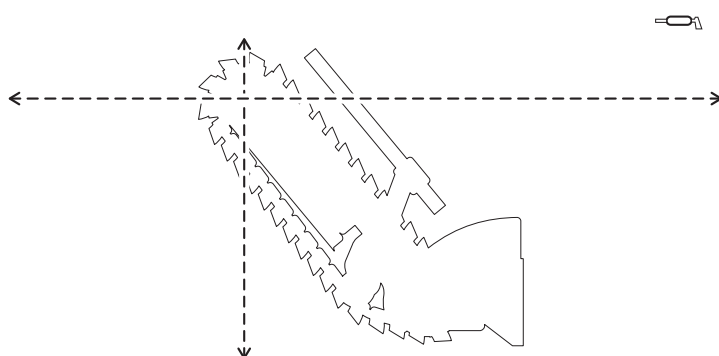
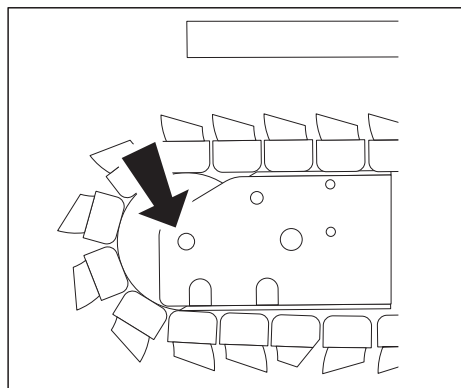
Check tire pressure every 10 hours.

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 lugnuts (shown) every 10 hours. Tighten lugnuts to 295 ft•lb (400 N•m).

Trencher

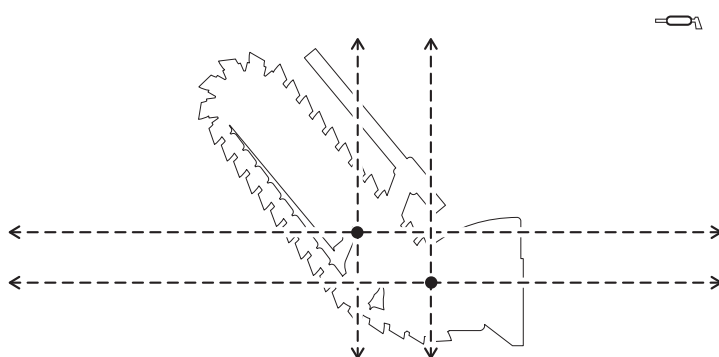
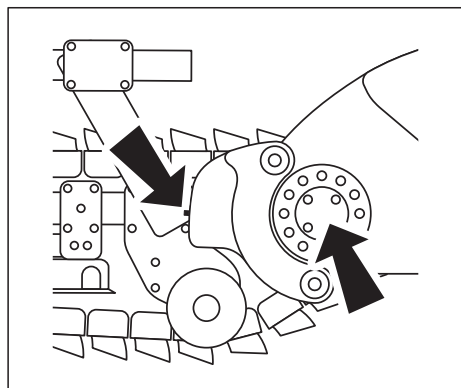
Lube Trencher Tail Roller



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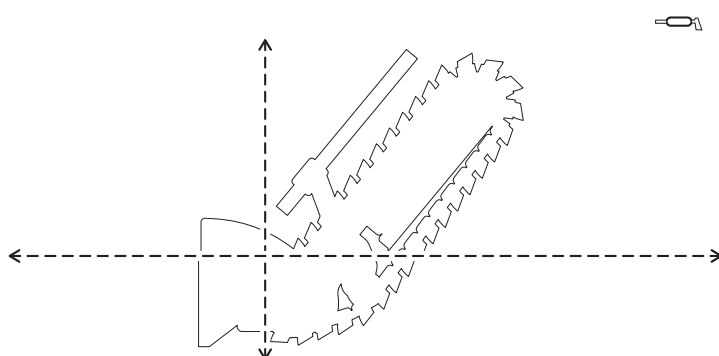
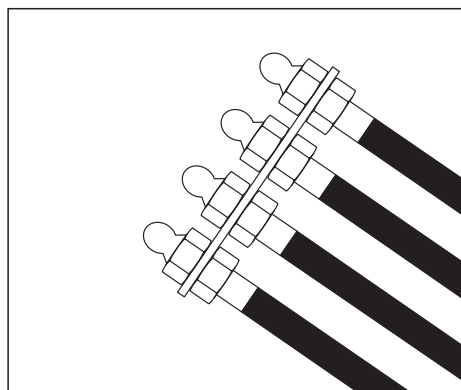
Wipe zerks clean and lube every 10 hours with EPG. Lube roller zerks on both sides of boom.

Lube Trencher Pivot



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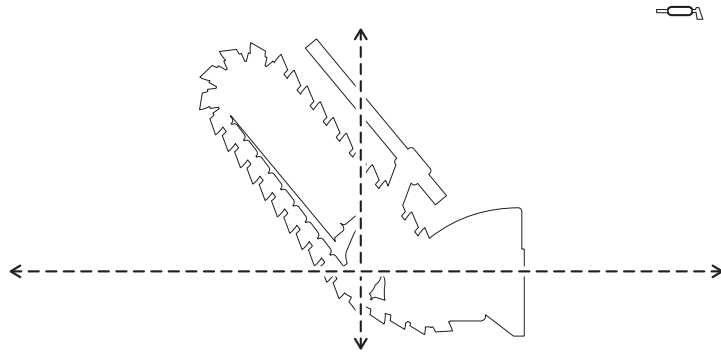
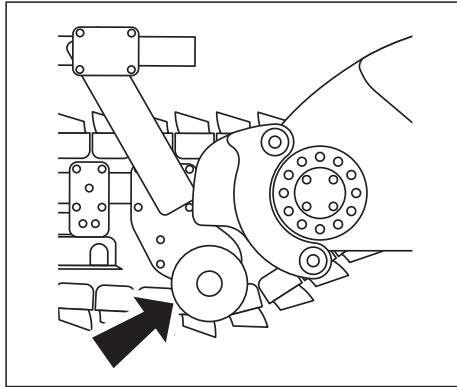
Wipe five zerks located on right of trencher pivot clean and lube every 10 hours with EPG.



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

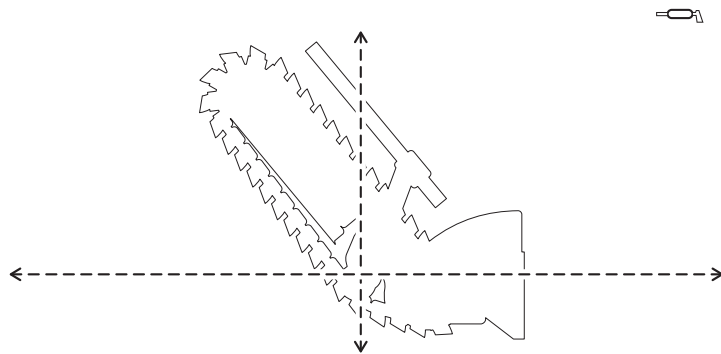
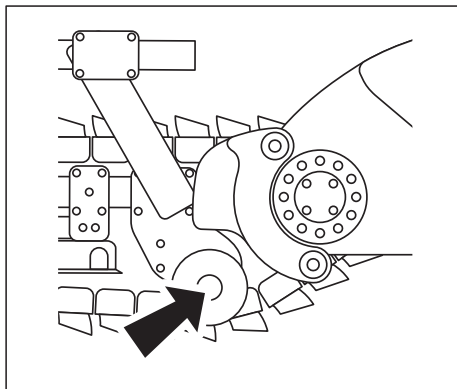
Lube Trencher Auger Bearings



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

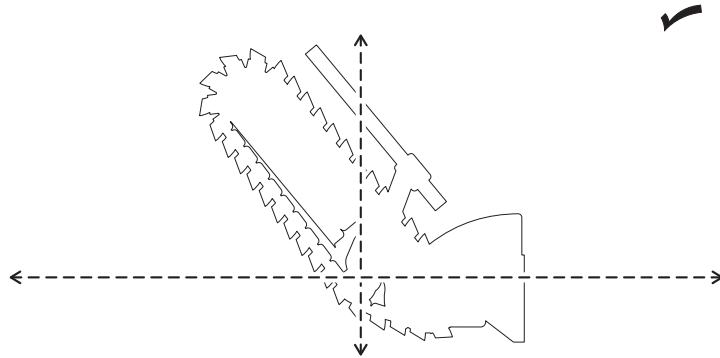
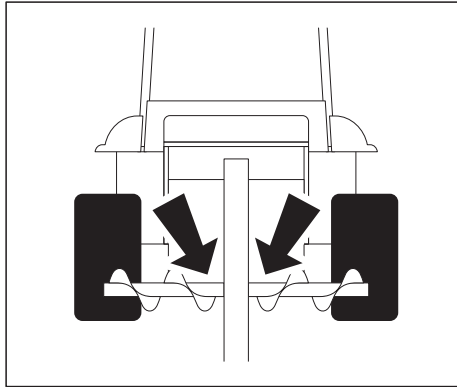
Lube Trencher Auger Shaft



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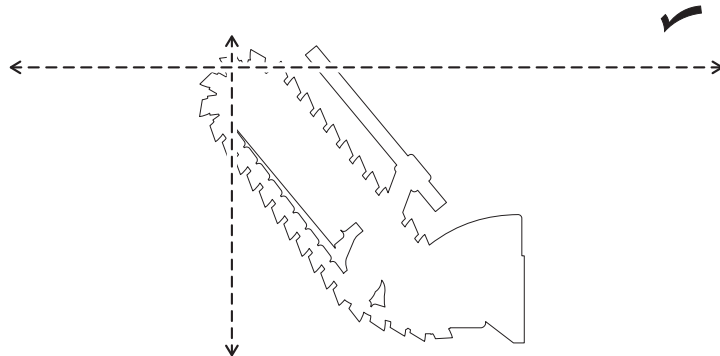
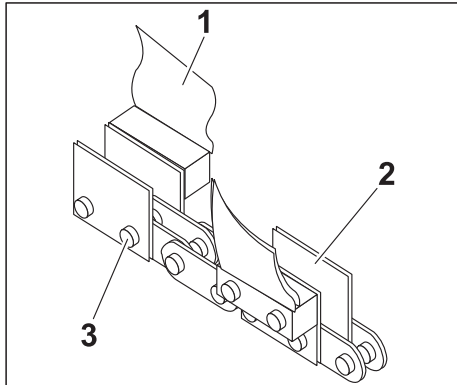
Lube four auger shaft zerks (two on each side) every 10 hours with EPG.



Check Trencher Auger Bolts

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

Check Digging Chain Teeth and Bits

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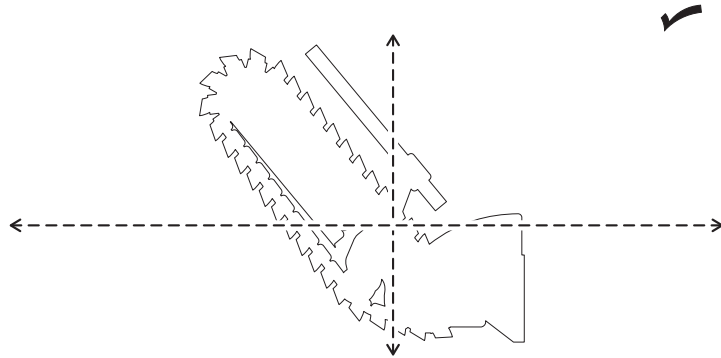
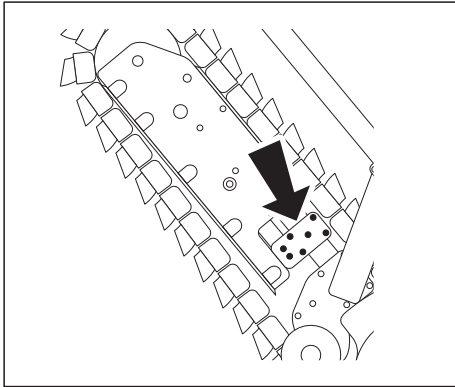
Check teeth (1) for wear every 10 hours. Replace worn teeth, using Ditch Witch replacement parts and maintaining original tooth pattern.

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.

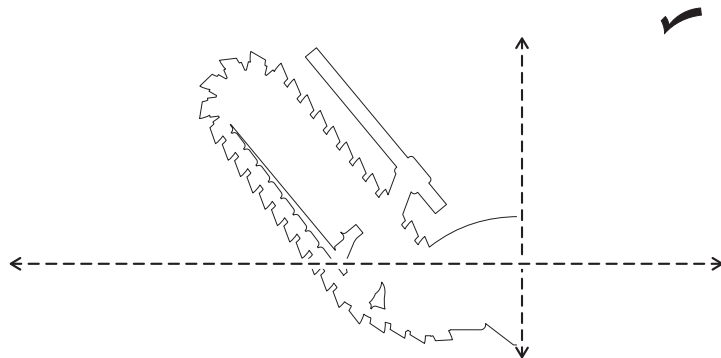
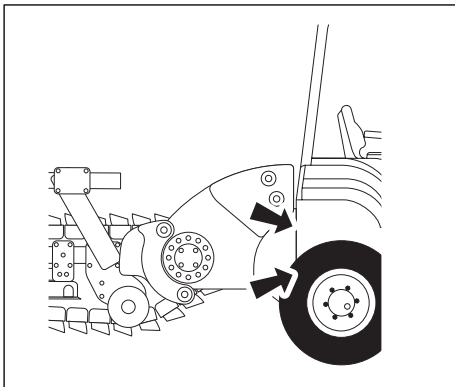
Check Boom Mounting Bolts



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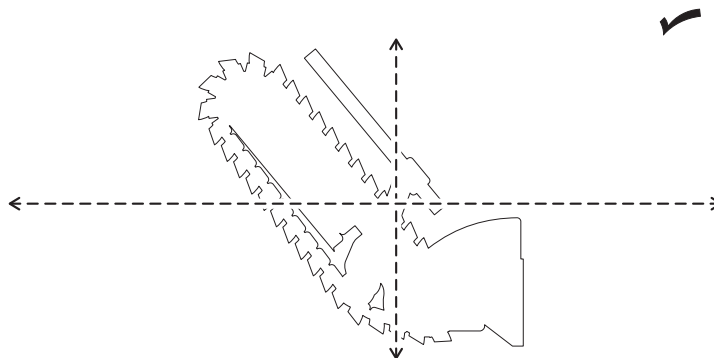
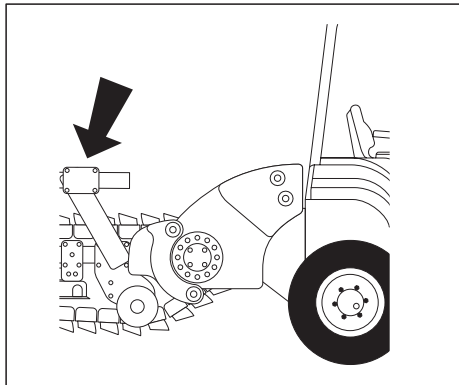
Check 14 bolts (7 on each side) every 10 hours and torque as necessary to keep bolts and other fasteners tight. Check for looseness or wear. Check that bolts are torqued to 250 ft•lb (28 N•m).

Check Attachment Mounting Bolts



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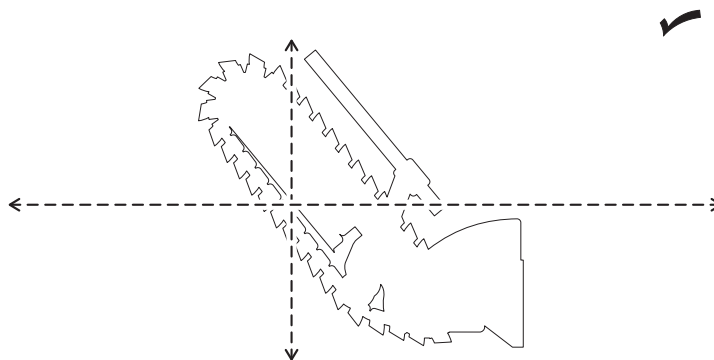
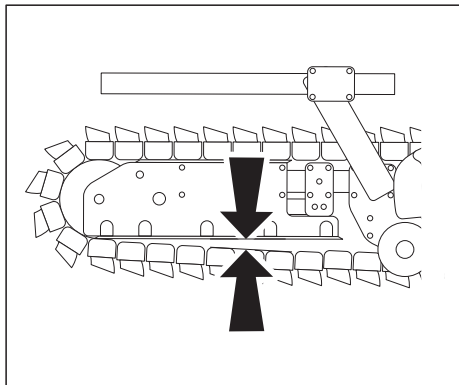
Check bolts every 10 hours and torque as necessary to keep bolts and other fasteners tight. Check for looseness or wear. Apply Loctite 271[®] adhesive. Check that bolts are torqued to 200 ft•lb (271 N•m).

Check Personnel Restraint Bar/Trench Cleaner

t13om032c.eps

Check all 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.

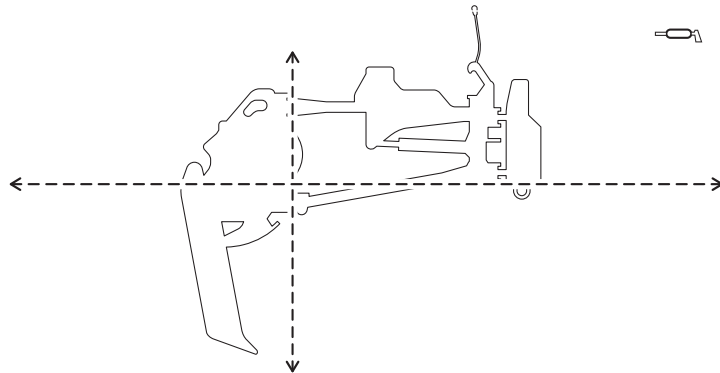
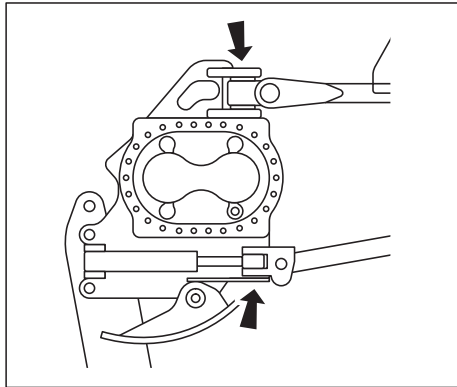
**WARNING**

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.

Plow

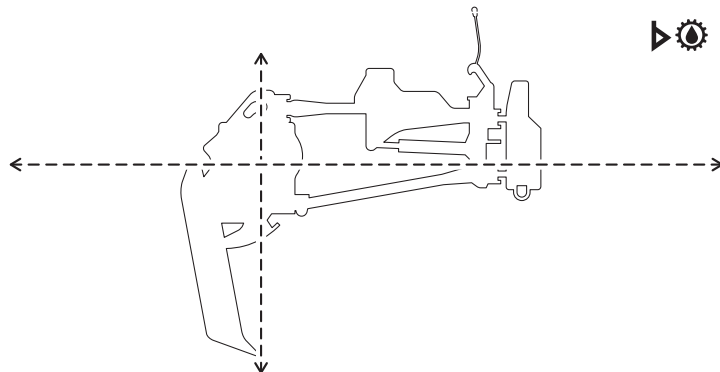
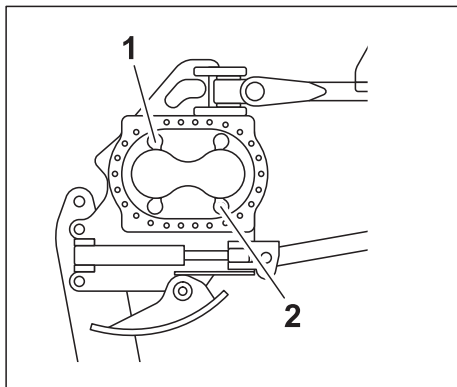
Lube Plow Pivots



t13om034c.eps

Lube pivots every 10 hours with EPG.

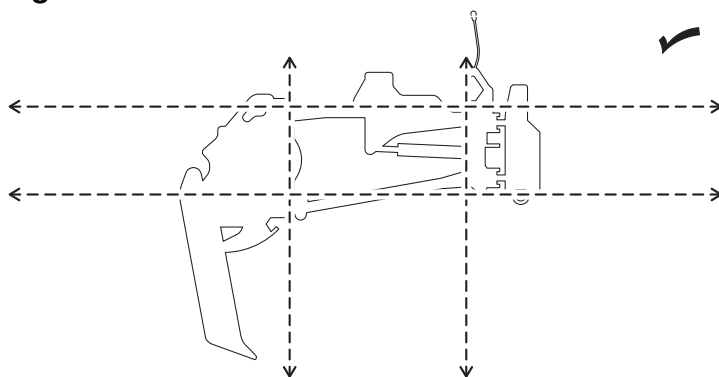
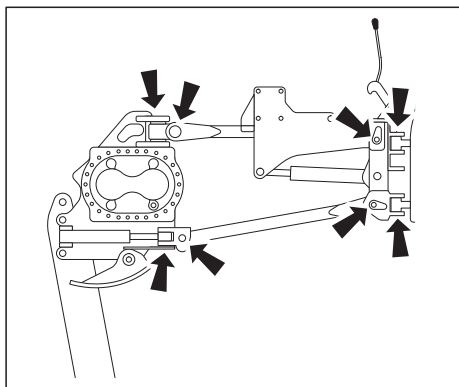
Check Plow Vibrator Oil



t13om035c.eps

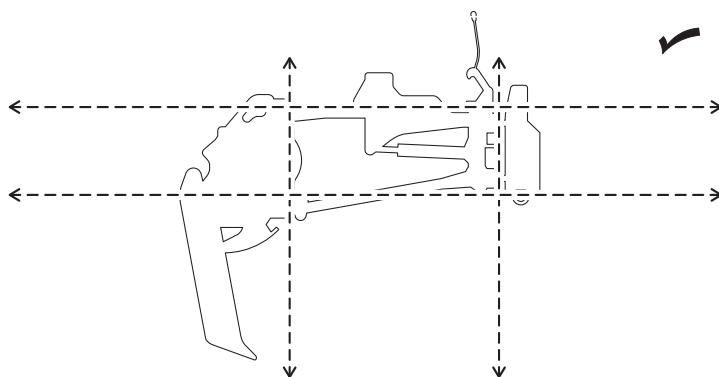
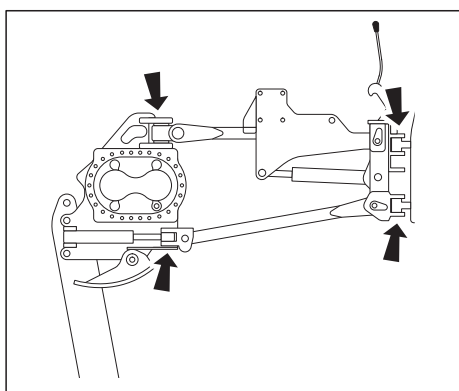
Check plow vibrator oil on each side of vibrator every 10 hours. With vibrator horizontal, oil should be halfway up sight glass (2). Add MPL as needed at fill (1).

IMPORTANT: Do not add oil to plow vibrator when hot. Let plow vibrator cool before removing fill plug.

Check Plow Arm Pins and Bushings

t13om036c.eps

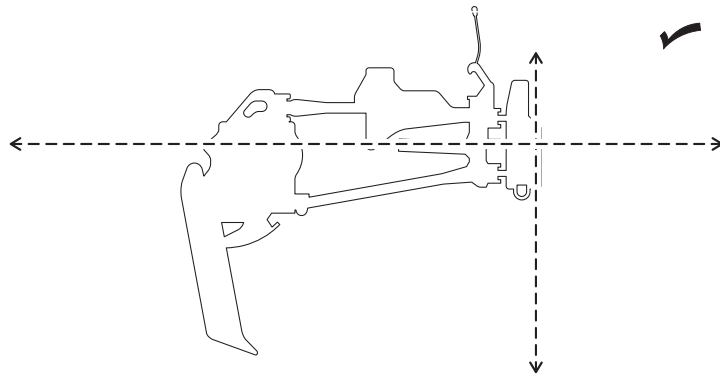
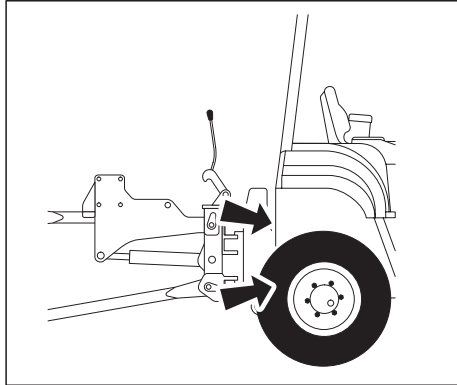
Check plow arm pins and bushings every 10 hours. Tighten as needed.

Check Plow Connector Pivots

t13om037c.eps

Visually check pivots every 10 hours for wear or damage.

Check Attachment Mounting Bolts



t13om038c.eps



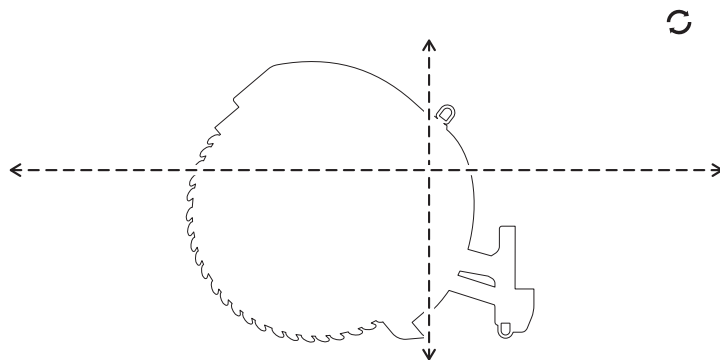
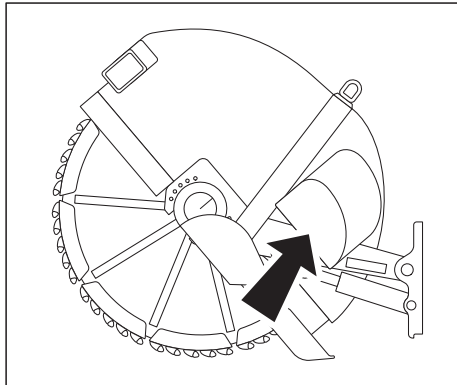
Check mounting bolts every 10 hours and torque as necessary to keep bolts and other fasteners tight. Check for looseness or wear. Apply Loctite 271[®] adhesive. Check that bolts are torqued to 200 ft•lb (271 N•m).

Saw

Clean Saw

Clean saw after each use. After using saw, clean tractor before performing routine lubrication and maintenance. Wash bits and mounting blocks with high pressure water.

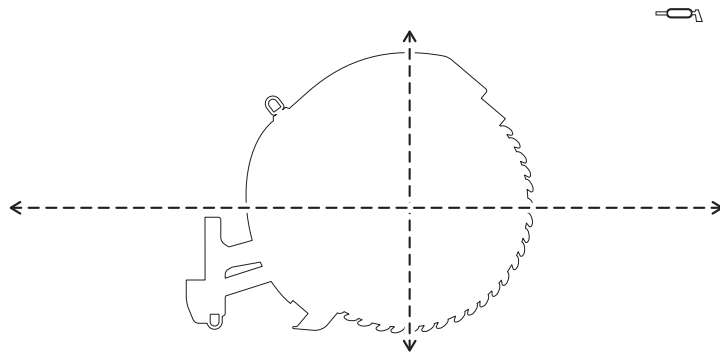
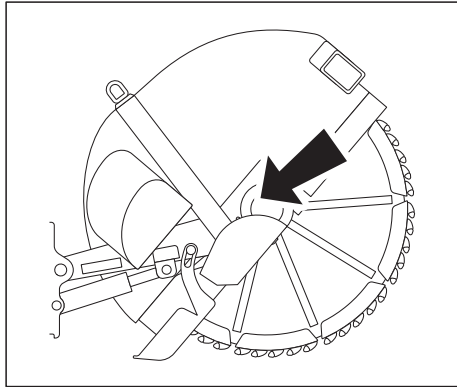
Clean Spoil Chutes



t13om039c.eps

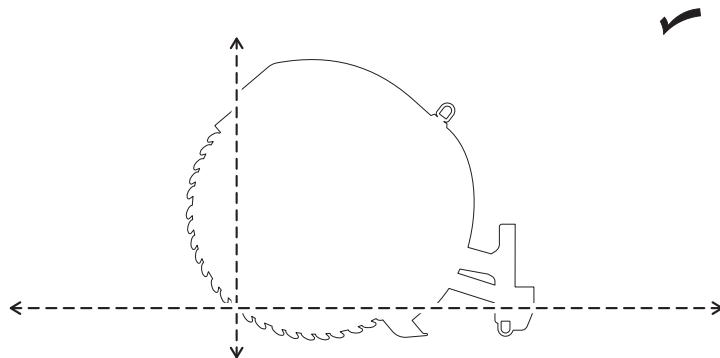
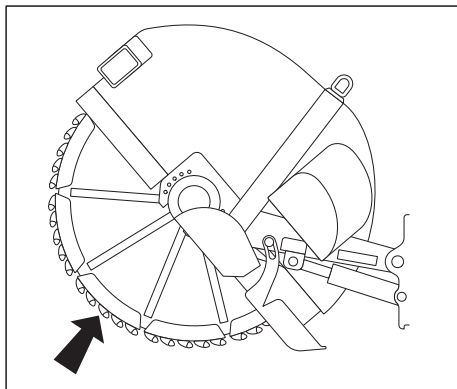
Clean spoil chutes after each use. To clean:

1. Lower wheel to ground.
2. Turn engine off.
3. Clean out chute.

Lube Saw Wheel Shaft Bearings

t13om040c.eps

Lube saw wheel shaft bearings every 10 hours with EPG.

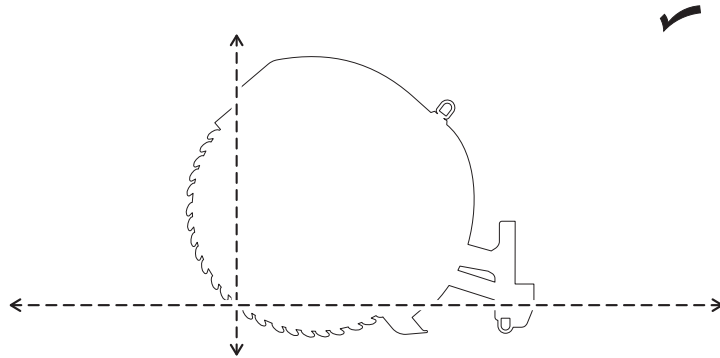
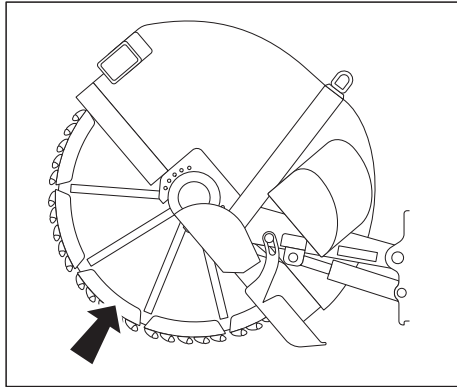
Check Saw Bits

t13om041c.eps

Check that saw bits rotate freely. Clean and check bits after each use. If bits are stuck, remove and clean packed soil from retaining ring.

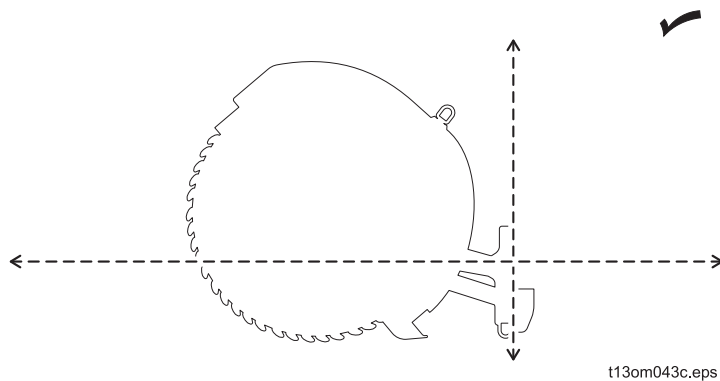
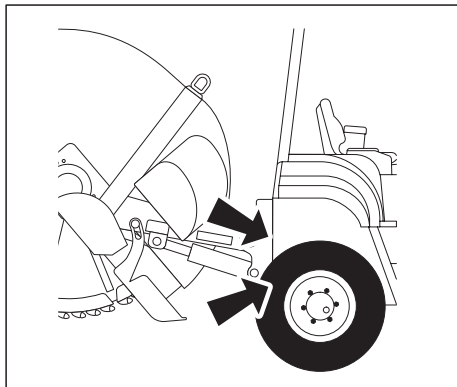
Replace bit when carbide cap or insert is worn or adapter can be damaged.

Check Segments



Check saw segments every 10 hours. Replace as needed. Check segment bolts after first 10 hours of operation and then as needed. Torque to 700 ft•lb (950 N•m).

Check Attachment Mounting Bolts



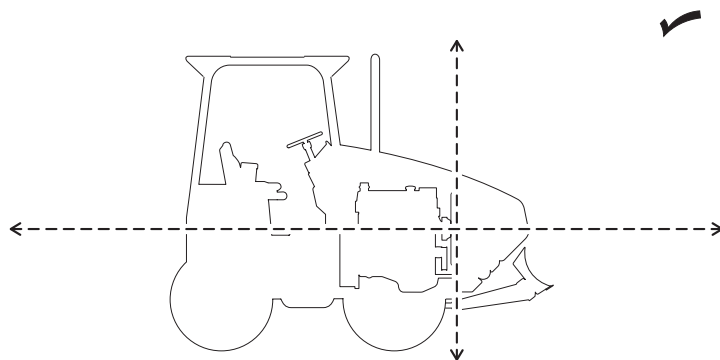
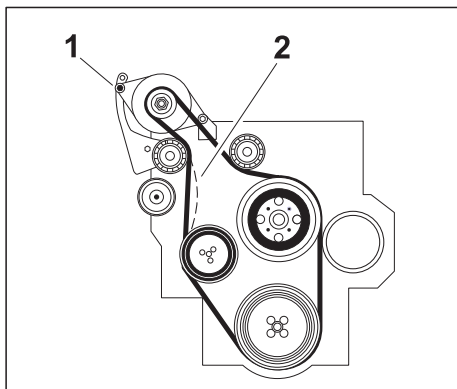
Check mounting bolts every 10 hours and tighten as necessary. Check for looseness or wear. Apply Loctite® 271 adhesive. Check that bolts are torqued to 200 ft•lb (271 N•m).

50 Hour

Location	Task	Notes
TRACTOR	Check drive belt	
	Check hydraulic reservoir breather	
	Check fuel tank breather	
	Check cab air filter	
TRENCHER	Check trencher gearbox oil	MPL
PLOW	Change plow vibrator oil (initial)	MPL
COMBO	Complete all service items for trencher and plow	
SAW	Lube saw lift arm pivot	EPG

Tractor

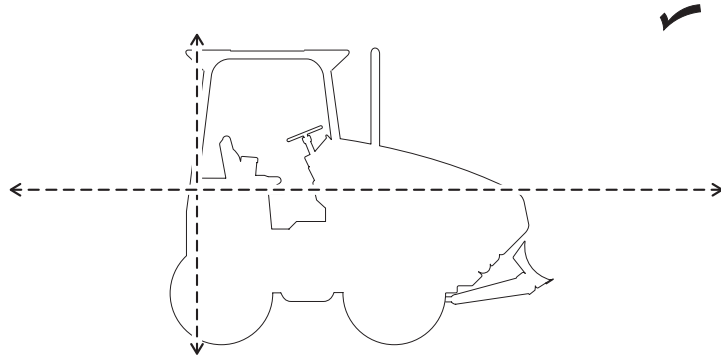
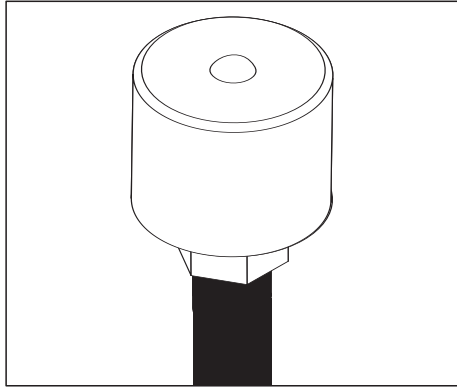
Check Drive Belt



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

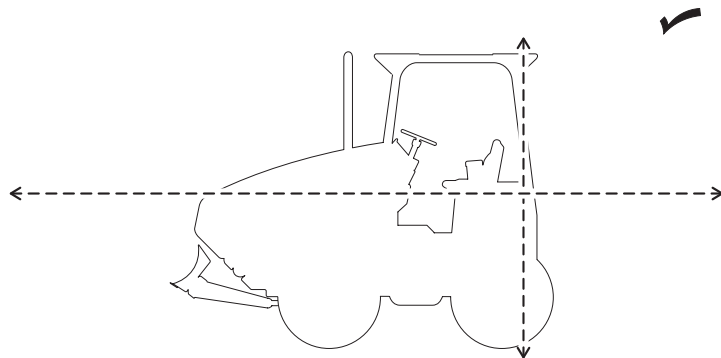
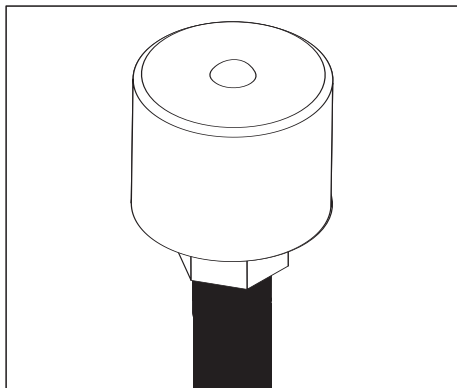


t13om045c.eps



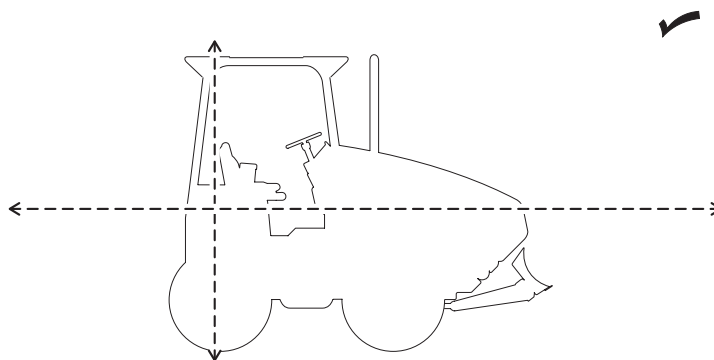
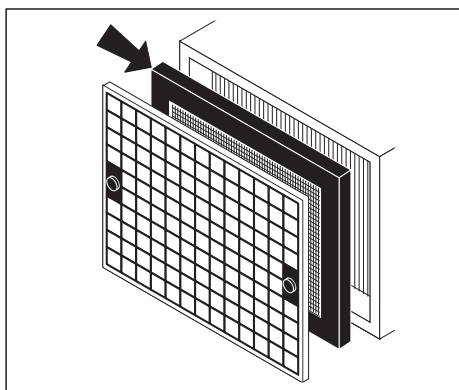
Check hydraulic reservoir breather every 50 hours. Ensure breather is not clogged. Remove dust around breather as needed by blowing with low-pressure air. When breather element becomes clogged, remove and clean or replace.

Check Fuel Tank Breather



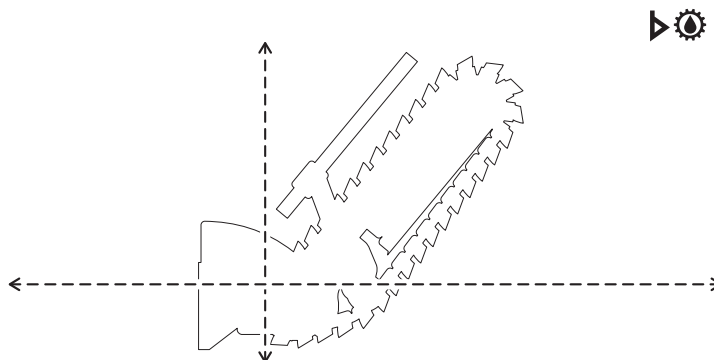
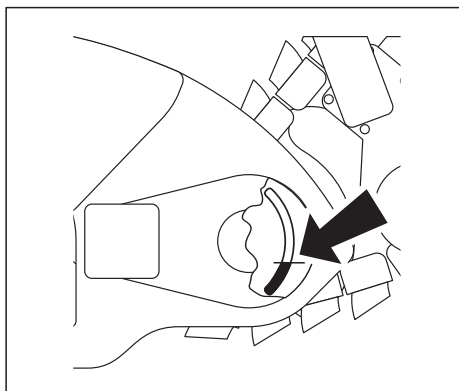
t13om046c.eps

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.

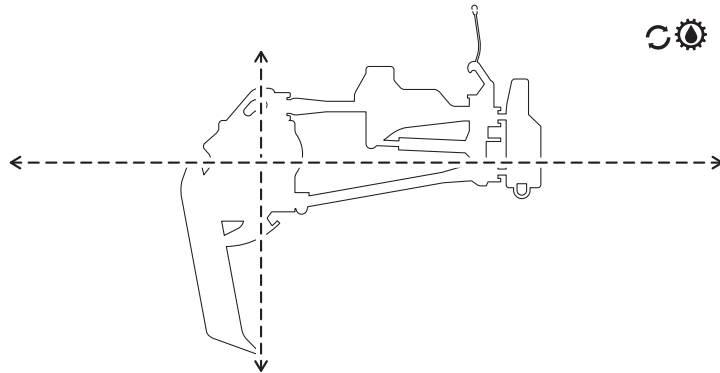
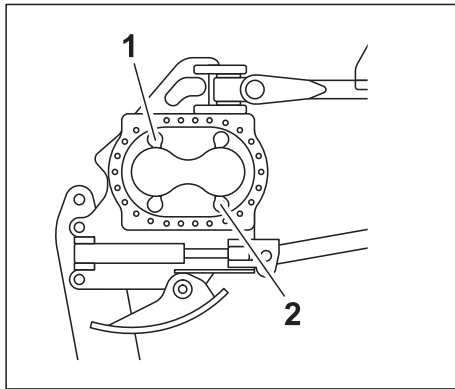
Trencher**Check Trencher Gearbox Oil**

t13om048c.eps

Check oil at sight tube every 50 hours. Keep oil level at horizontal line on housing. If necessary, add MPL at fill plug.

Plow

Change Plow Vibrator Oil



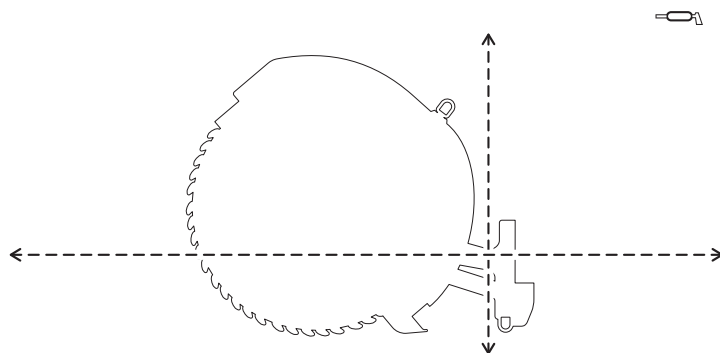
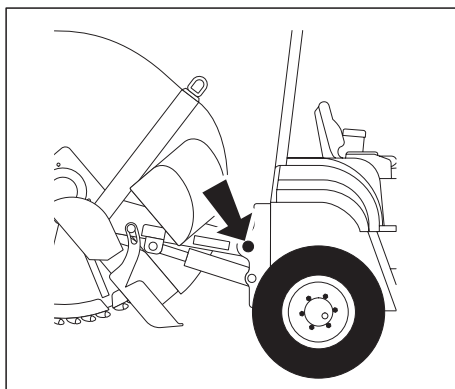
t13om049c.eps

Change plow vibrator oil after first 50 hours of operation. Drain oil at drain plug (2). Replace plug and move plow vibrator to horizontal position. Add MPL at fill (1) until oil is halfway up sight glass (2). Refill capacity is 4 qt (3.8 L).

IMPORTANT: Do not drain oil from plow vibrator when hot. Let plow vibrator cool before removing drain plug.

Saw

Lube Saw Lift Arm Pivot



t13om050c.eps

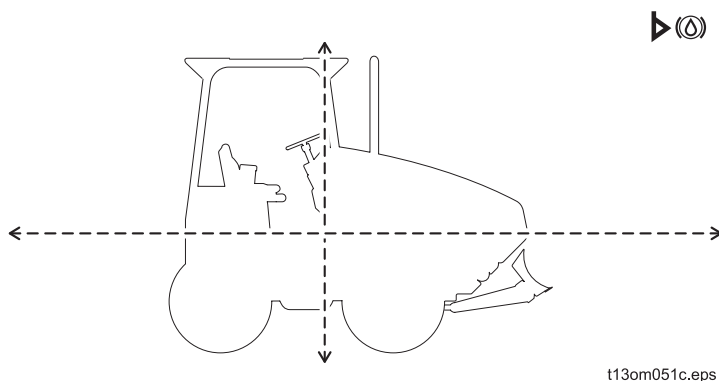
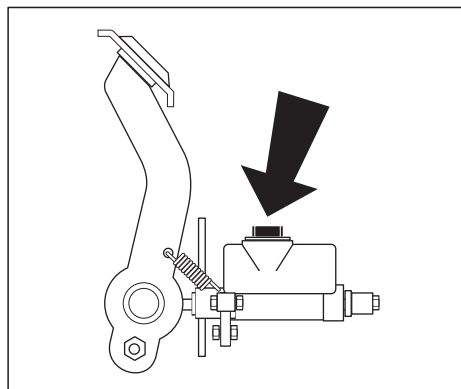
Wipe zerks clean and lube saw lift arm pivots every 50 hours with EPG.

100 HOUR SERVICE

Location	Task	Notes
TRACTOR	Check brake fluid	BRAKE
	Change engine oil and filter	DEO, initial
PLOW/ COMBO	Check plow shear mounts	
	Test plow connector pivots	

Tractor

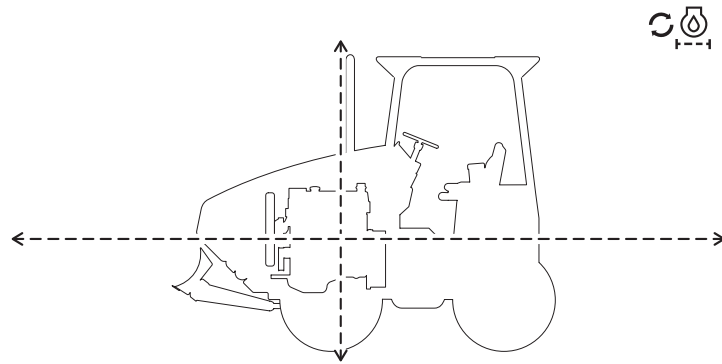
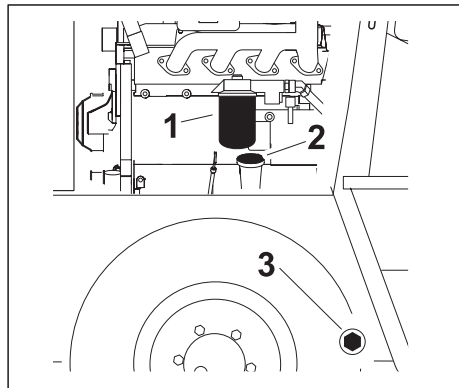
Check Brake Fluid



t13om051c.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:

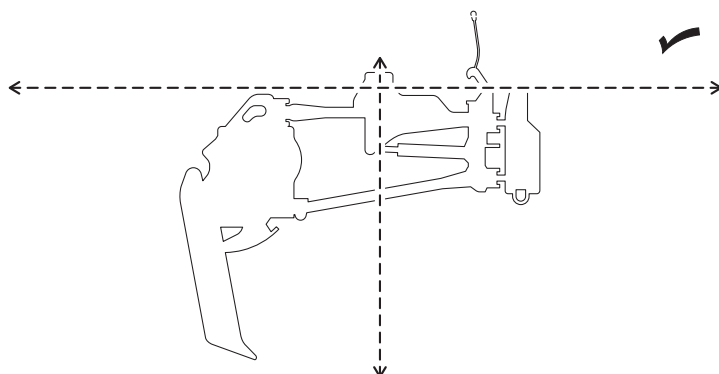
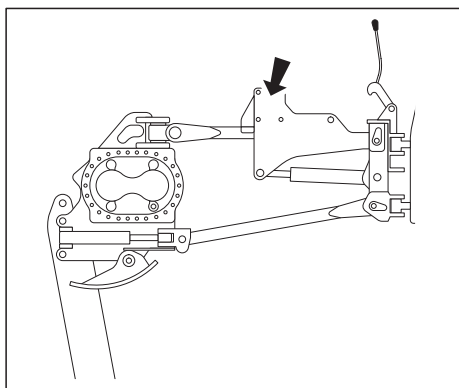
1. While oil is warm, remove drain plug (3). Drain oil and replace plug.
2. Remove filter (1) and replace with new filter each time oil is changed. Refill with DEO at fill neck (2).

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.

Plow

Check Shear Mounts

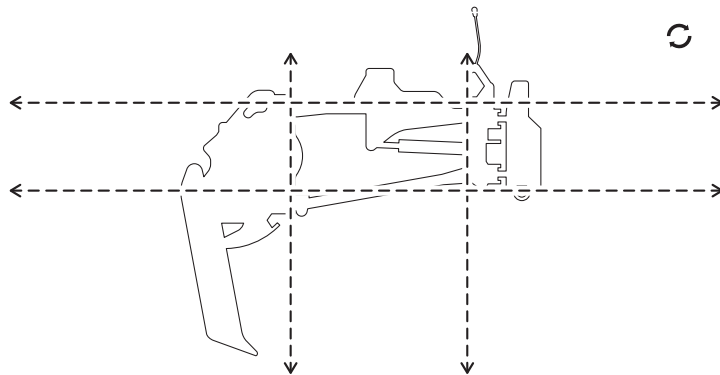
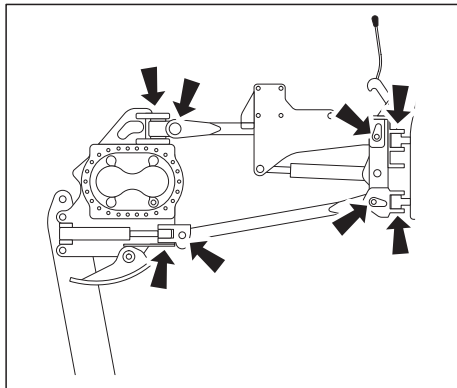


t13om053c.eps

Check shear mounts for wear every 100 hours. Replace as needed.

IMPORTANT: When replacing shear mounts, it is important to compress the shear mounts with the washers to prevent the shear mount from tearing.

Test Plow Connector Pivots



t13om054c.eps



Test upper and lower connector pivots every 100 hours.

To test upper pivot:

1. Lower plow to ground.
2. Use plow lift control to put hydraulic load on pivot joints. Do not raise plow.
3. As hydraulic load is applied and released, visually check joints for motion. If motion is observed, contact your Ditch Witch dealer.

To test lower pivot:

1. Lower plow to ground.
2. Use hydraulic jack to place load on lower arm.
3. As hydraulic load is applied and released, visually check joints for motion. If motion is observed, contact your Ditch Witch dealer.

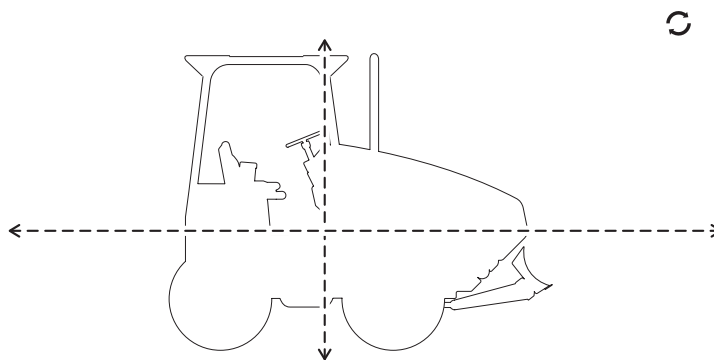
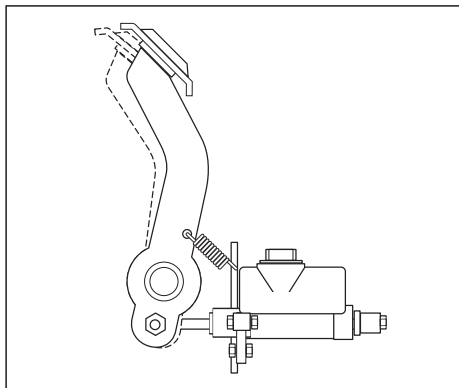
IMPORTANT: Lower plow blade to ground and visually inspect bushings and joints. Replace bushings if there is excessive motion.

250 Hour

Location	Task	Notes
TRACTOR	Adjust service brake	
	Lube driveshaft U-joints	EPG
	Lube axle spindle pins	EPG
	Check ground drive gearbox oil	MPL
	Check differential oil	MPL
	Lube planetary wheel ends	MPL
	Check ROPS shock mounts	
	Change cab air filter	

Tractor

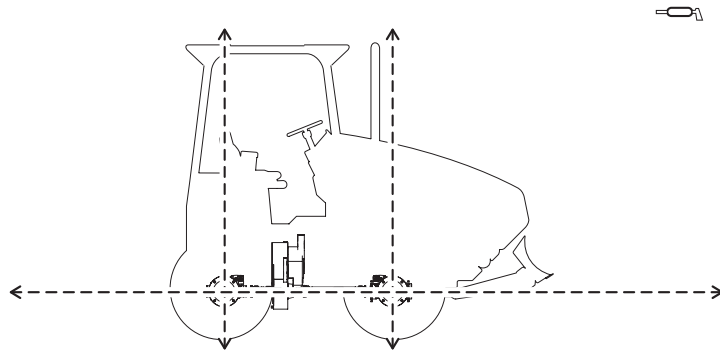
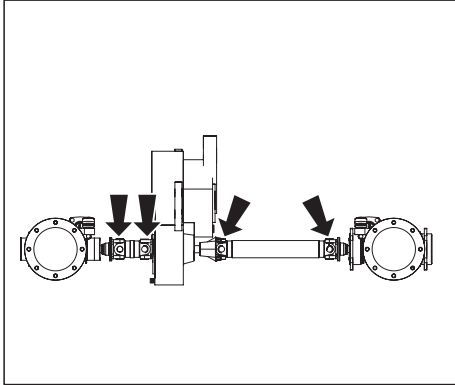
Adjust Service Brake



t13om055c.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.

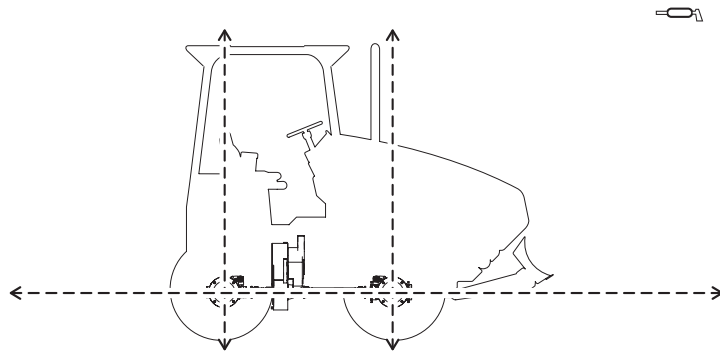
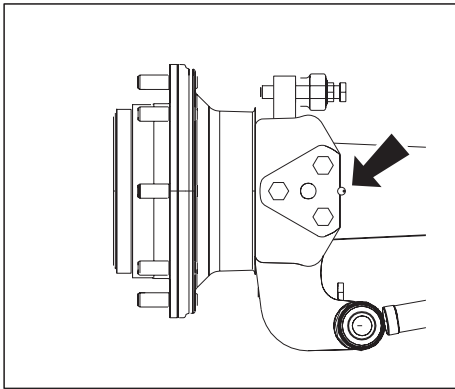
Lube Driveshaft U-joints



t13om056c.eps

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

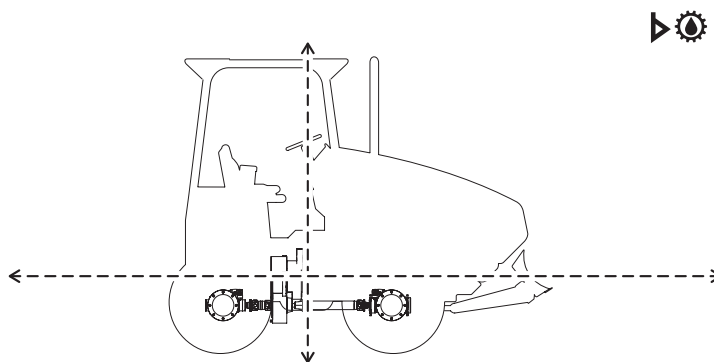
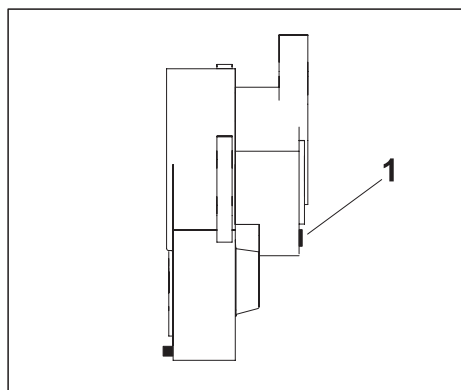
Lube Axle Spindle Pins



t13om057c.eps

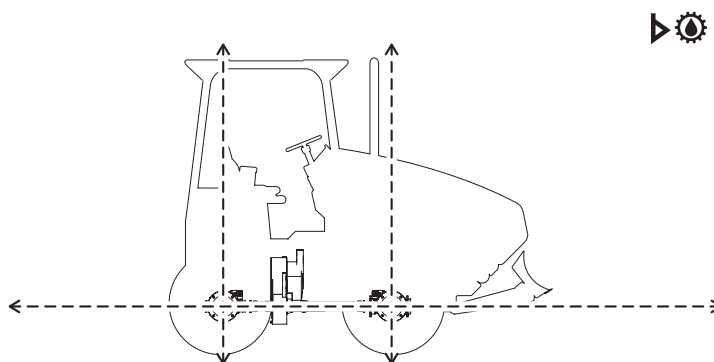
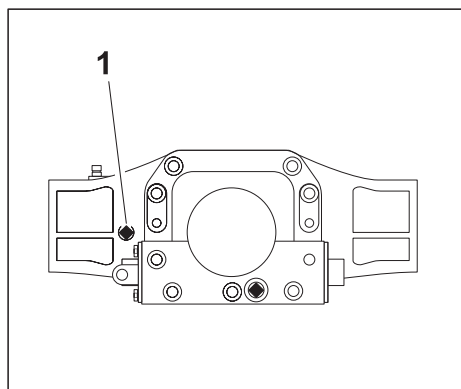
Lube axle spindle pins every 250 hours with 3-4 shots of EPG.



Check Ground Drive Gearbox Oil

t13om058c.eps

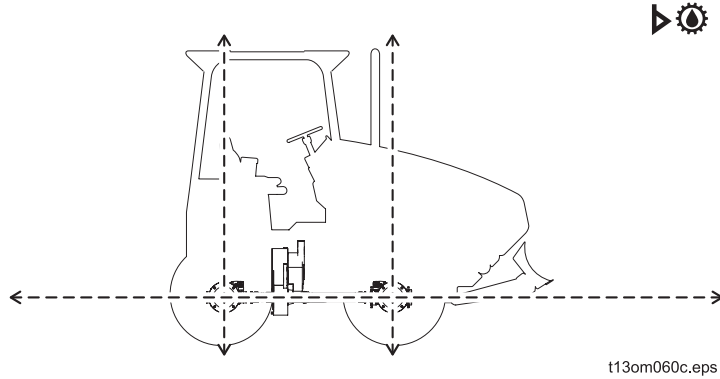
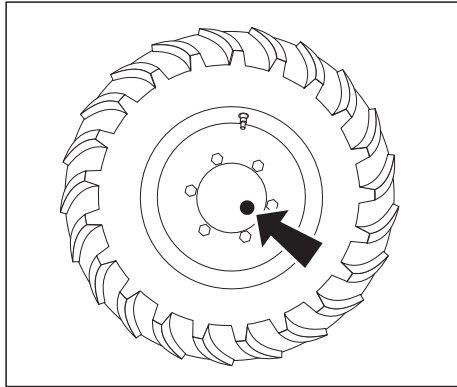
Check oil level at fill (1) every 250 hours. Keep level at raised horizontal line on gearbox. Add MPL as needed.

Check Differential Oil

t13om059c.eps

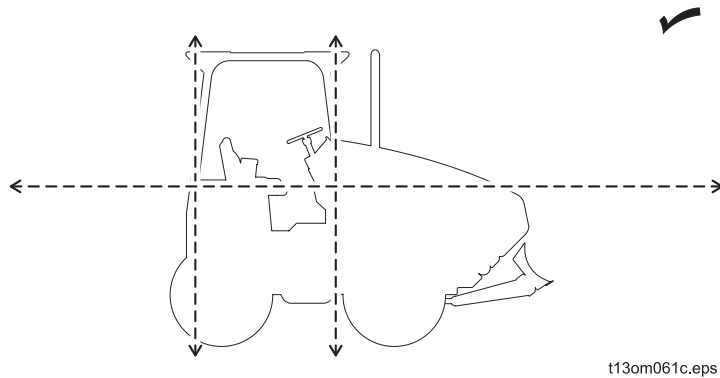
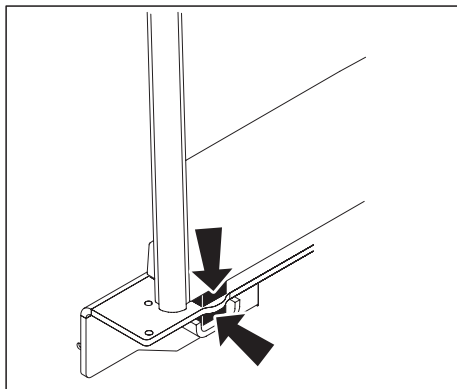
Check oil level at fill (1) every 250 hours. Add MPL as needed.

Lube Planetary Wheel Ends



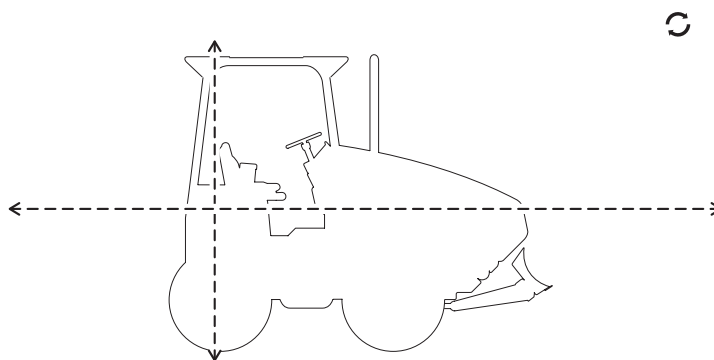
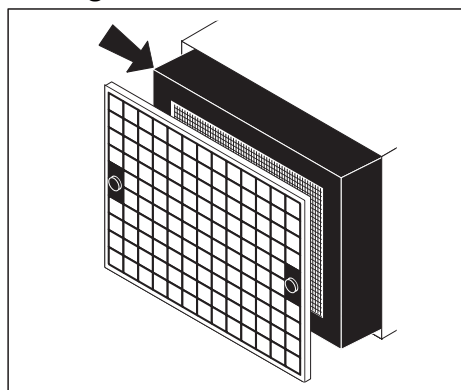
Check oil level in planetary wheel ends every 250 hours. Add MPL as needed.

Check ROPS Shock Mounts



Check ROPS shock mounts for wear or damage every 250 hours. Ensure that isolator irons do not make contact with frame. Replace if necessary.

Change Cab Air Filter



t13om062c.eps

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

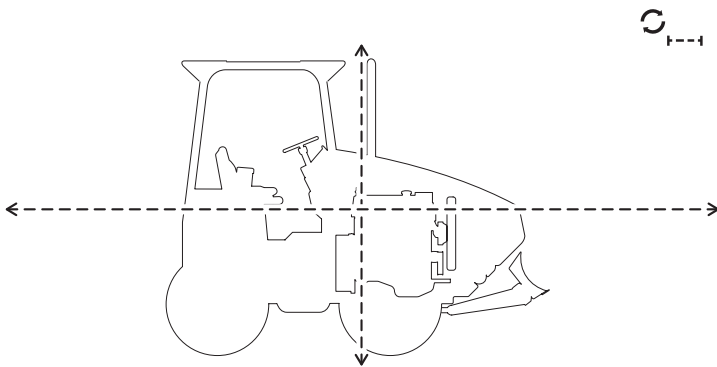
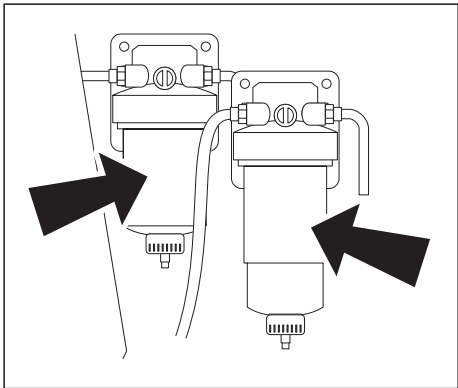
500 Hour

Location	Task	Notes
TRACTOR	Change fuel filters	
	Change engine oil and filter	DEO
	Change hydraulic fluid and filter	THF
	Check radiator SCA level	
PLOW	Change plow vibrator oil	MPL
COMBO	Adjust headshaft bearings	



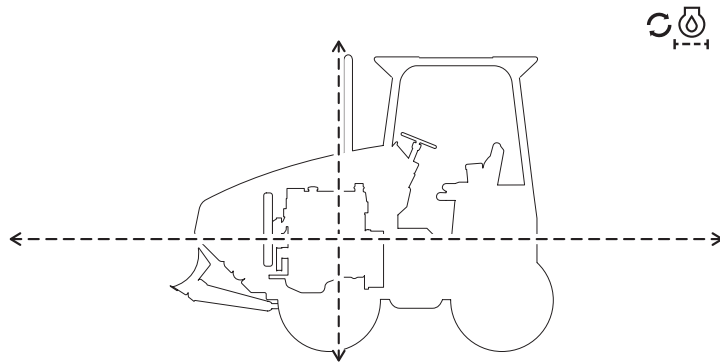
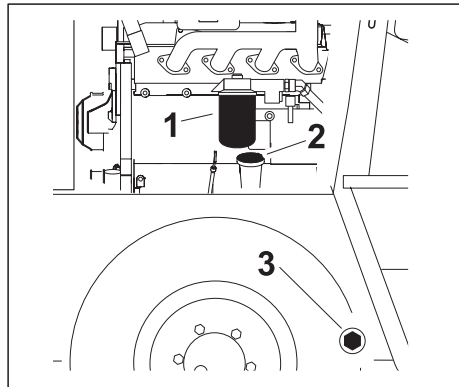
Tractor

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.

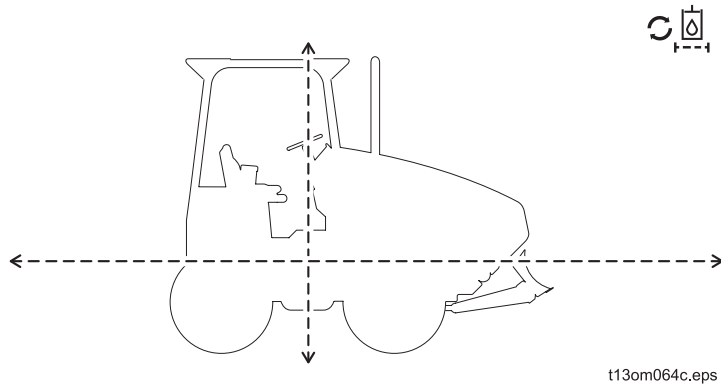
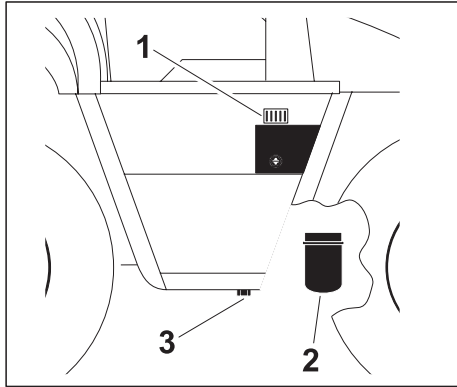
To change:

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

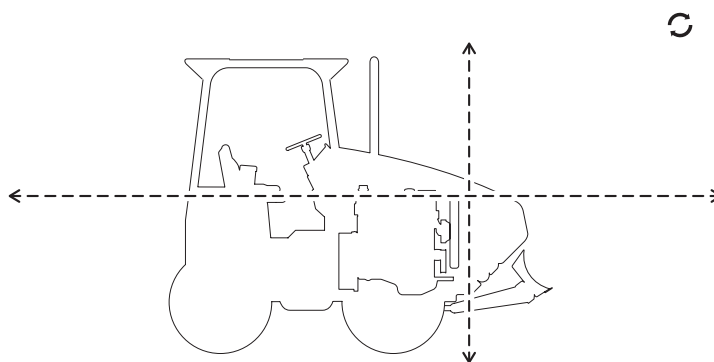
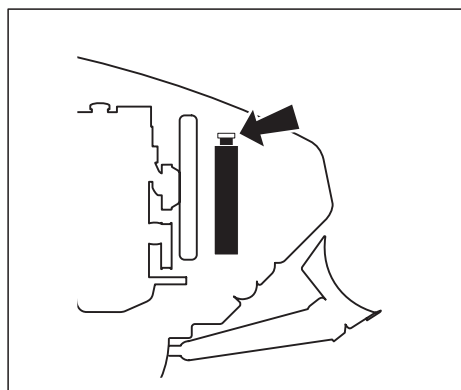


t13om064c.eps

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

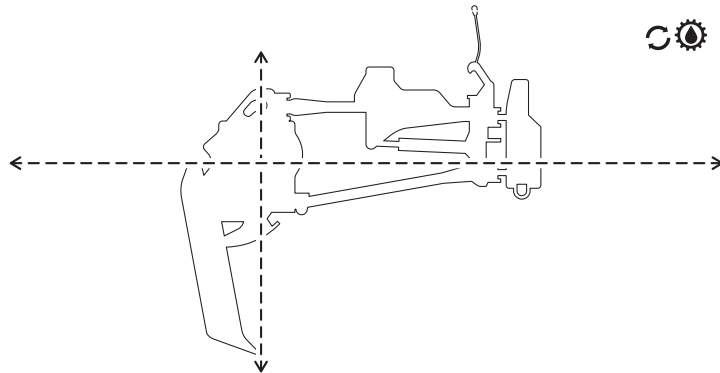
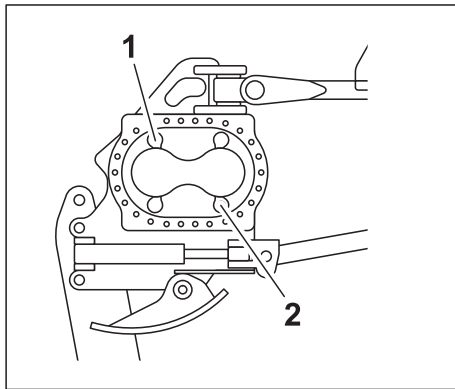
Test SCA level every 500 hours using 3-Way Heavy Duty Coolant Test Kit (p/n 256-032). If SCA levels do not fall within appropriate range, replenish with a heavy-duty coolant conditioner such as John Deere coolant conditioner (p/n 256-033).

IMPORTANT:

- Always check expiration date on 3-Way Heavy Duty Coolant Test Kit. An expired kit will not give accurate readings.
- See page 128 for more information on approved coolants.

Plow

Change Plow Vibrator Oil



t13om049c.eps



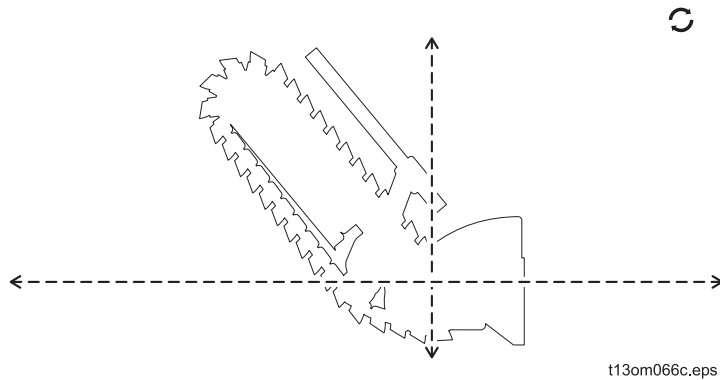
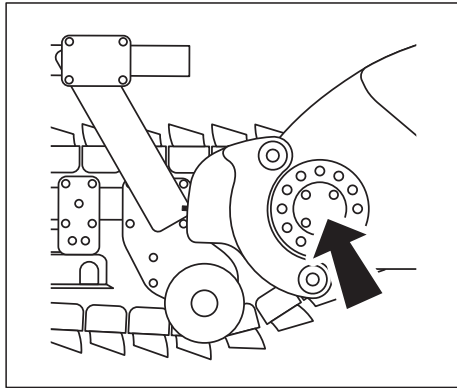
Change plow vibrator oil every 500 hours. If normal operating temperature exceeds 100° F (38° C), change plow vibrator oil every 250 hours.

Drain oil at drain plug (2). Replace plug and move plow vibrator to horizontal position. Add MPL at fill until oil is halfway up sight glass (1). Refill capacity is 4 qts (3.8 L).

IMPORTANT: Do not drain oil from plow vibrator when hot. Let plow vibrator cool before removing drain plug.

Combo

Adjust Headshaft Bearing



Adjust headshaft bearing every 500 hours.

To adjust:

1. Remove cover. Remove bolts attaching trenching attachment motor to gearbox.
2. Remove bolt and washers in left end of headshaft.
3. Support gearbox with hoist and slide it off headshaft.
4. Install spacer (p/n 184-044) in place of gearbox while checking bearings.
5. Replace bolt on end of headshaft.
6. Remove chain from headshaft sprocket.
7. Turn chain sprocket until headshaft sprocket turns. When properly adjusted, it will take two hands and some effort. If it turns easily, remove a shim.

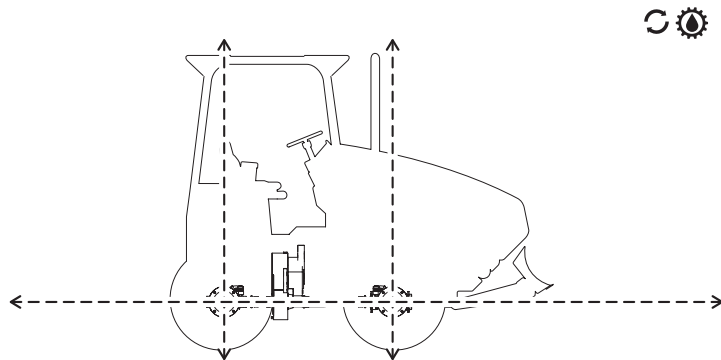
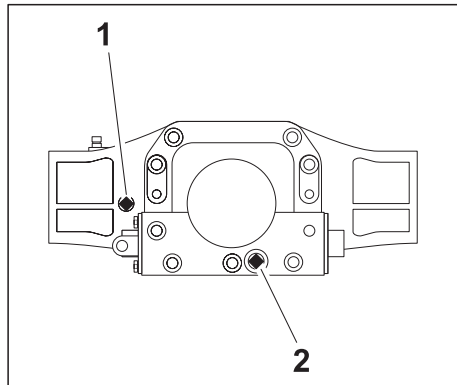
1000 Hour

Location	Task	Notes
TRACTOR	Change differential oil	MPL
	Change ground drive gearbox oil	MPL
	Change planetary wheel end oil	MPL
TRENCHER/ COMBO	Change trencher gearbox oil	MPL



Tractor

Change Differential Oil

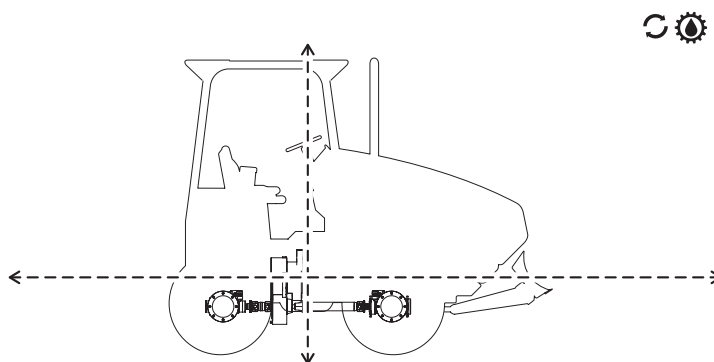
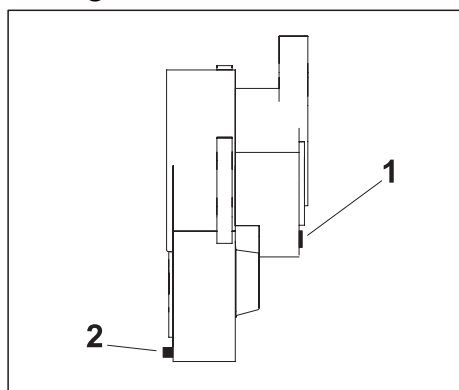


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Change differential oil every 1000 hours.

To change:

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

Change Ground Drive Gearbox Oil

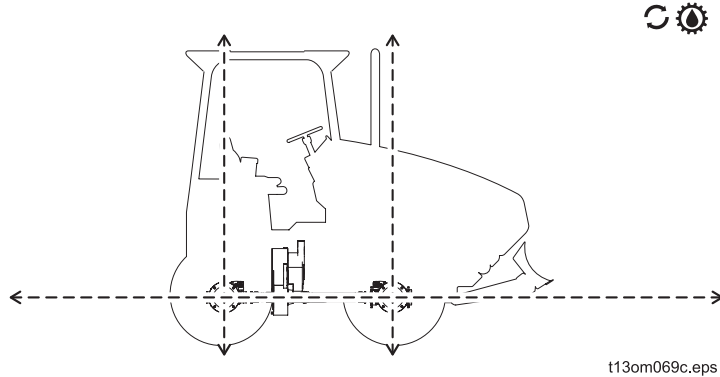
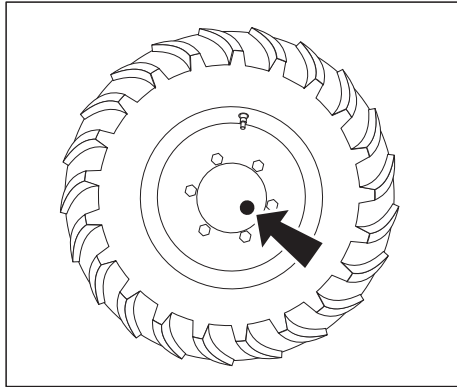
t13om068c.eps

Change ground drive gearbox oil every 1000 hours.

To change:

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

Change Planetary Wheel End Oil



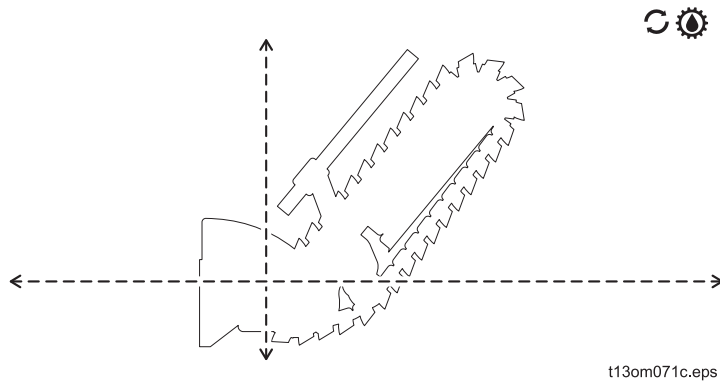
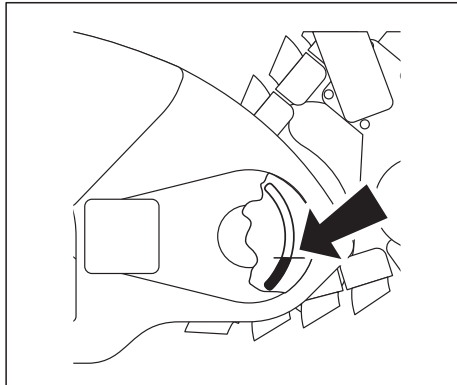
Change wheel end oil every 1000 hours.

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.

Trencher

Change Trencher Gearbox Oil



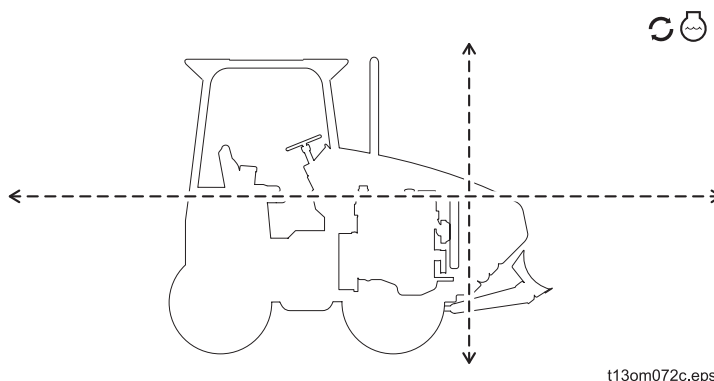
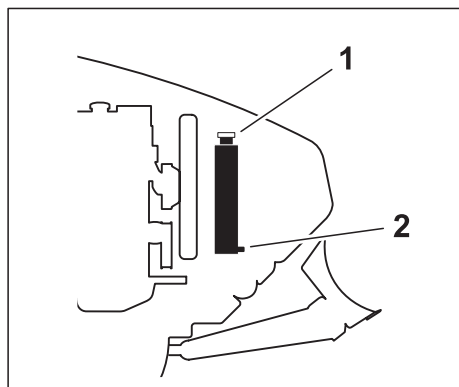
Change trencher gearbox oil every 1000 hours. Drain at plug. Replace drain plug and fill with MPL to lowest line on sight tube.

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 169 if proper SCA levels are maintained when using Cool-Gard

Tractor

Change Engine Coolant



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 128 for list of approved coolants.

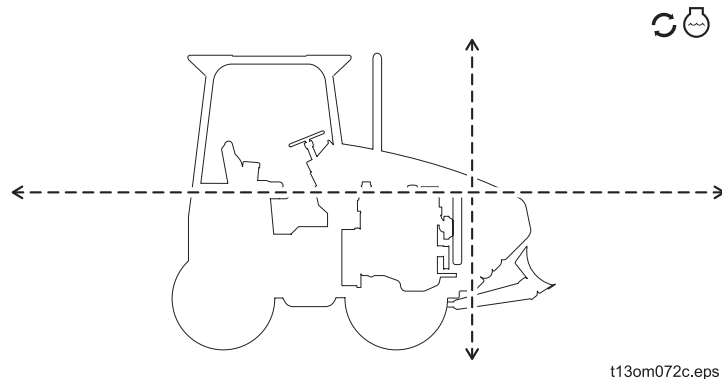
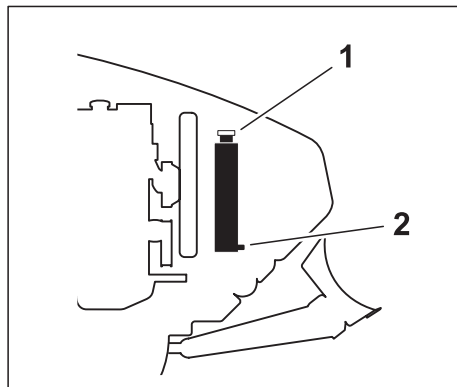
5000 Hour

Location	Task	Notes
TRACTOR	Change engine coolant	if proper SCA levels are maintained when using Cool-Gard; see "2000 Hour" on page 168 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. Add Cool-Gard coolant (p/n 255-006) at fill (1).

NOTICE:

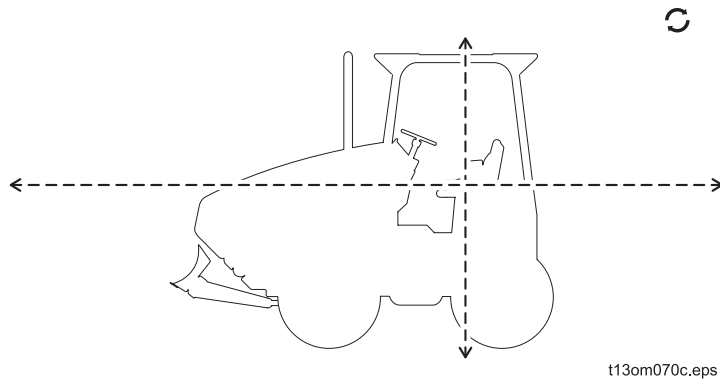
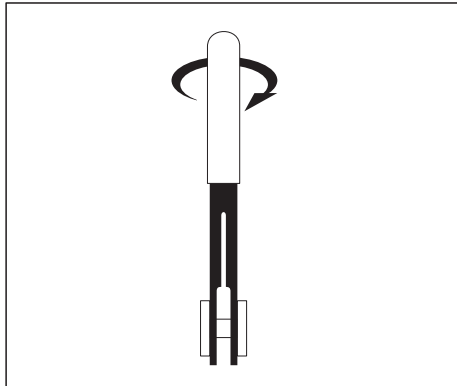
- Coolant change interval depends on coolant used and whether SCA levels are properly maintained. Read note above carefully to ensure coolant is changed at the correct interval.
- The use of non-approved coolant may lead to engine damage or premature engine failure and will void engine warranty.
- See page 128 for list of approved coolants.

As Needed

Location	Task	Notes
TRACTOR	Clean radiator fins	
	Adjust parking brake	
TRENCHER	Replace digging chain	
PLOW	Clean feed tube	
	Replace sod cutter and blade	
	Check plow blade bolts	210 ft•lb (285 N•m)
COMBO	Complete all service for trencher and plow	
SAW	Replace saw bits	
	Replace saw segments	
	Check saw segment bolts	700 ft•lb (950 N•m)
	Hard surface saw segments and wear bars	
BACKHOE	Replace pins and bushings	

Tractor

Adjust Parking Brake



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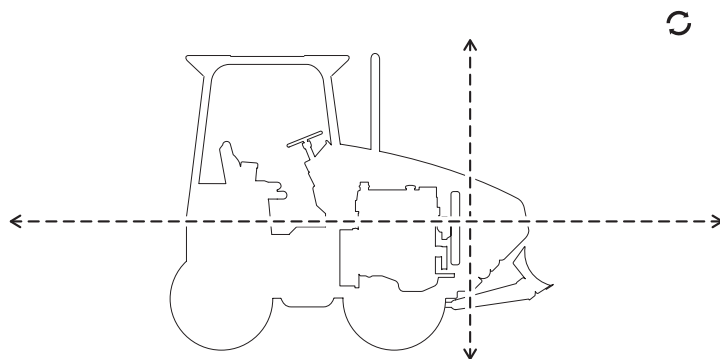
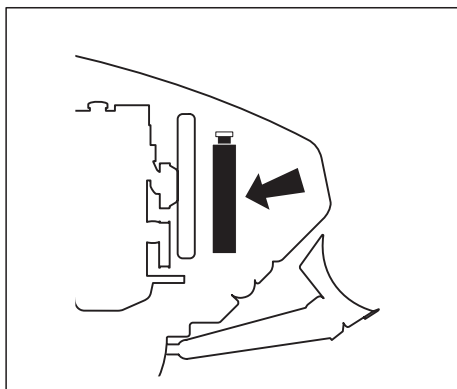


Adjust parking brake every 1000 hours.

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.

Clean Radiator Fins

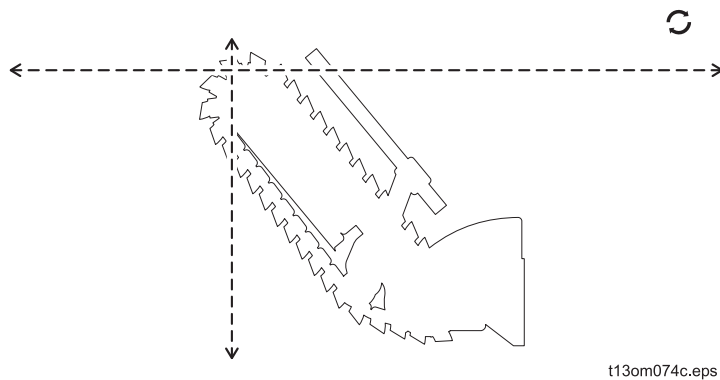
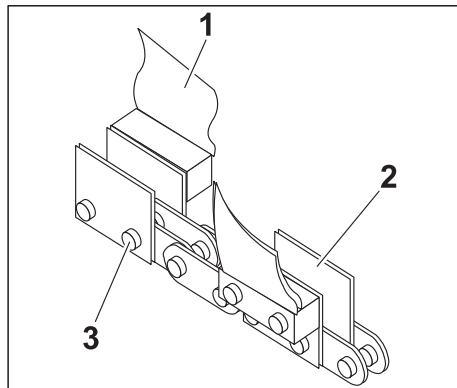


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Clean out radiator fins with compressed air or spray wash if required. Be careful not to damage fins with high-pressure air or water. Check more often if operating in dusty or grassy conditions.

Trencher

Replace Digging Chain



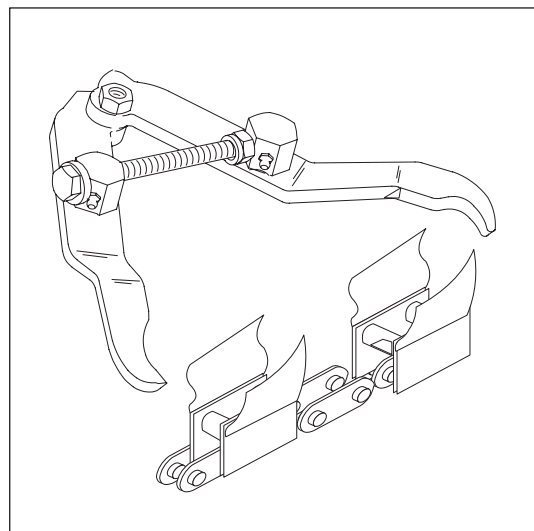
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Visually check digging chains for wear on teeth (1), rollers, and sidebars (2). Check pins (3) and bushing wear by measuring distance between chain pins and comparing it with a new chain.

IMPORTANT: Replace sprockets when a new chain is installed.

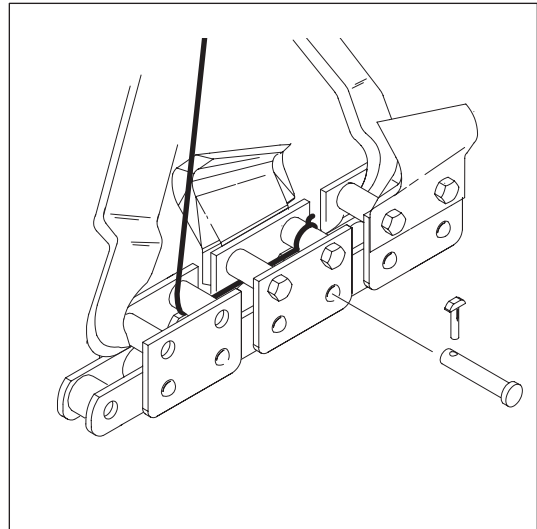
To remove chain:

1. Fasten and adjust seat belt.
2. Start tractor. See page 66 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.



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8. Loop cable through links nearest connector pin.



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:

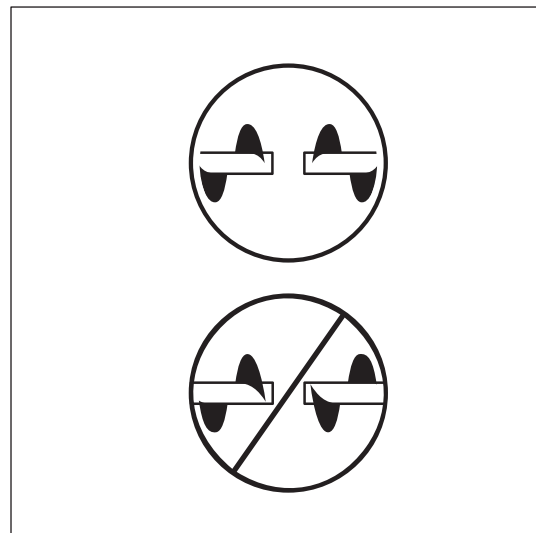
1. Lay chain on ground with teeth down and pointed toward unit.
2. Fasten and adjust seatbelt.
3. Start tractor. See page 64 for start-up procedures.
4. Disengage parking brake and verify parking brake indicator is off.
5. Move ground drive control to reverse.
6. Back unit up until chain extends past 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:

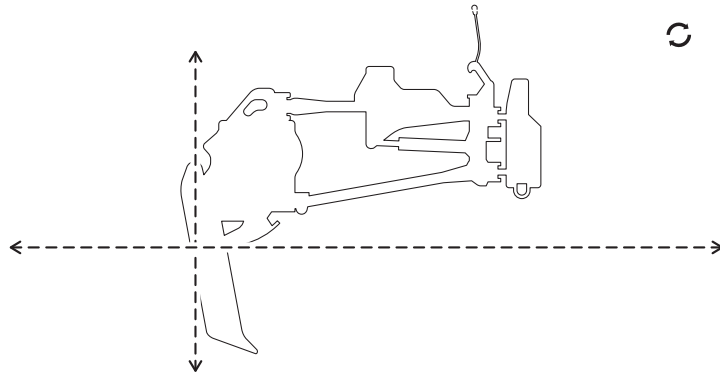
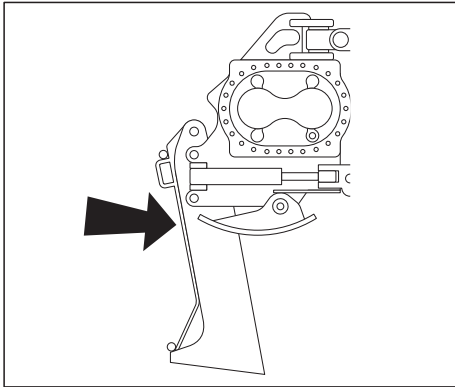
1. Remove bolts holding augers to auger shaft and rotate either auger as needed until augers are balanced.
2. Reinstall bolts and tighten securely.



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Plow

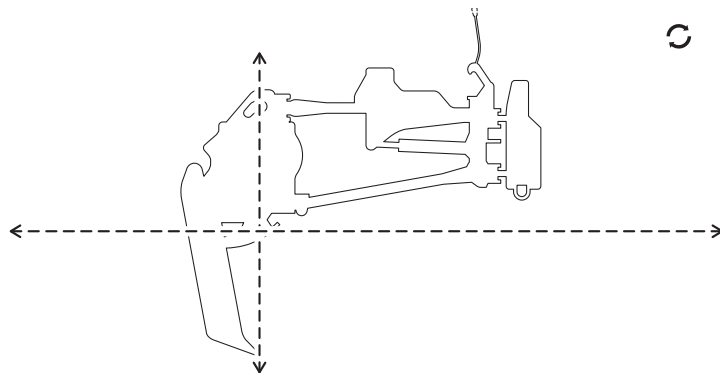
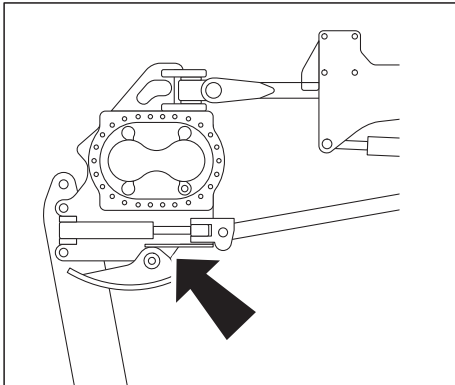
Clean Feed Tube



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Clean feed tube as needed.

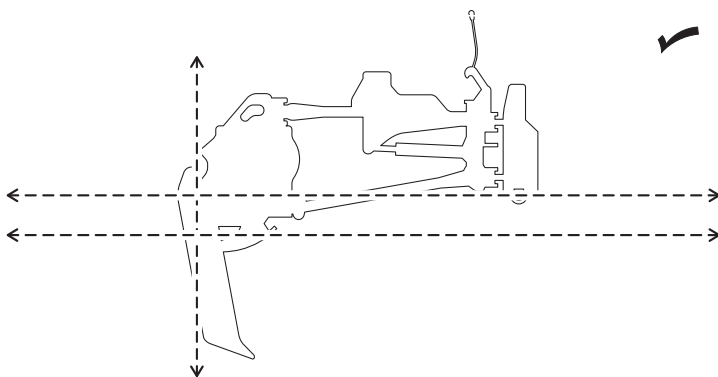
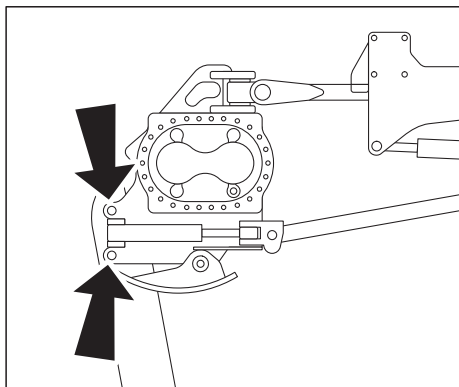
Replace Sod Cutter and Blade



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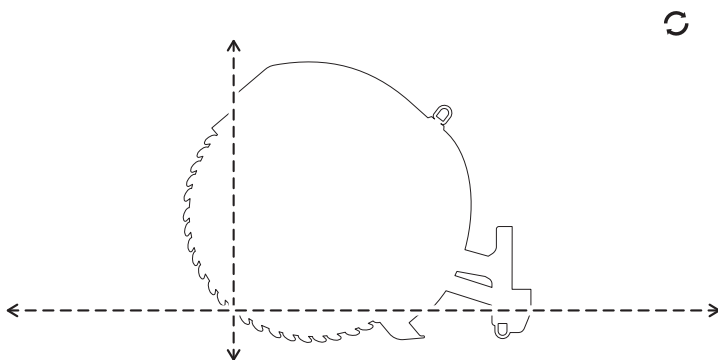
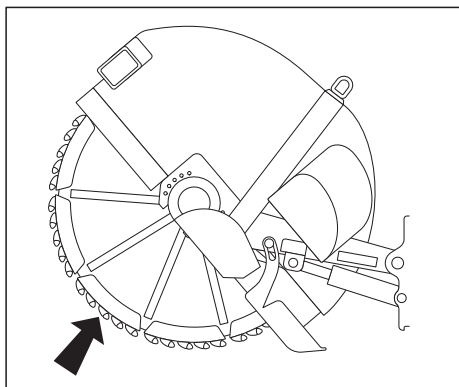
Replace worn sod cutter and plow blade as needed.



Check Plow Blade Bolts

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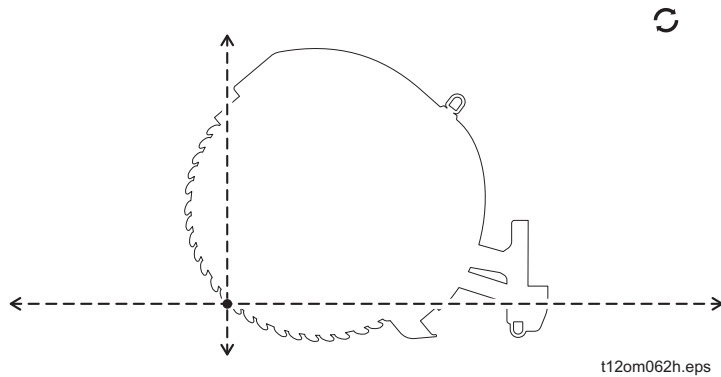
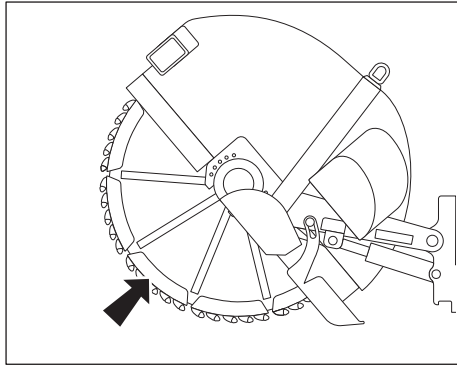
Check plow blade bolts as needed. If loose, use Loctite® 242 (blue) and torque bolts to 210 ft•lb (285 N•m).

Saw**Replace Saw Bits**

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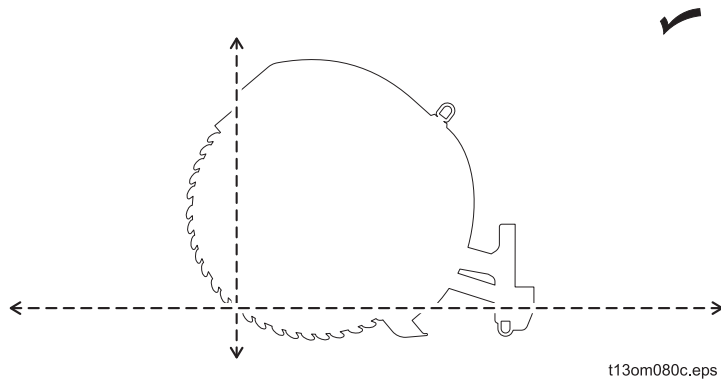
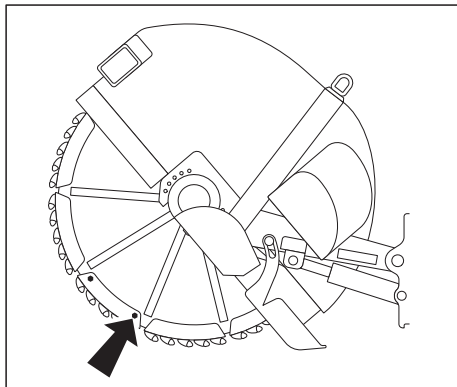
Replace bit when carbide cap or insert is worn or adapter can be damaged.

Replace Saw Segments



Replace worn segments as needed. To repair, clamp jig to block and weld block to the segment with E7018 or equivalent.

Check Saw Segment Bolts



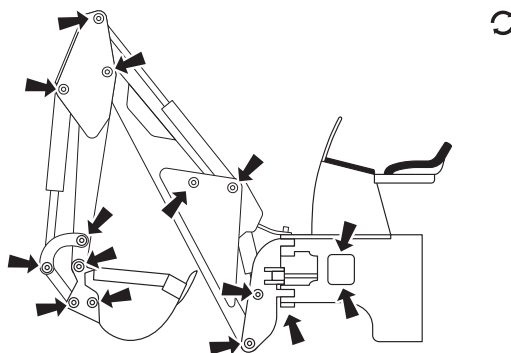
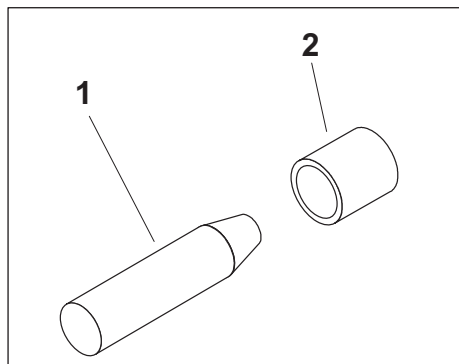
Check segment bolts after first 10 hours of operation and then as needed. Torque to 700 ft•lb (950 N•m).

Hard Surface Saw Segments and Wear Bars

Hard surface saw segments and wear bars before hard surfacing wears away to protect the life of the part.

Backhoe

Replace Pins and Bushings

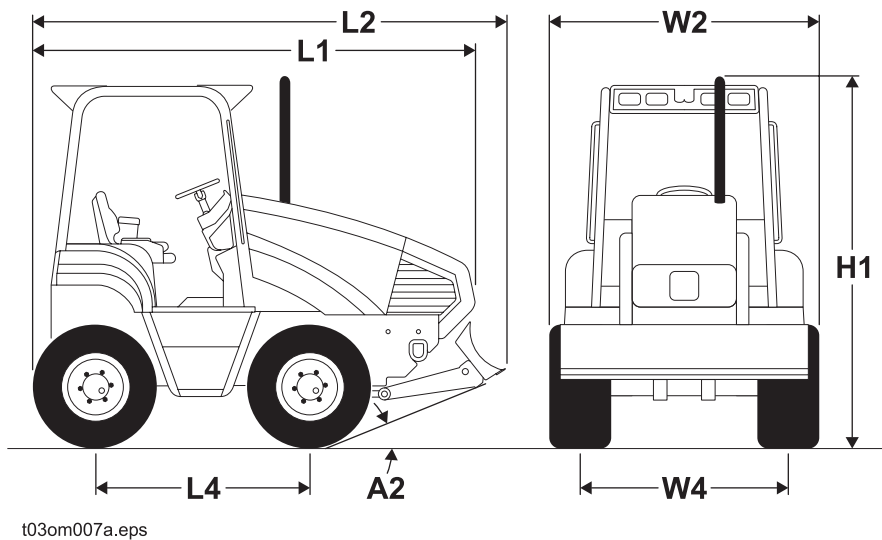


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Replace pins (1) and bushings (2) when worn or damaged.

Specifications

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, hydrostatic ground drive through rubber tires, 4-wheel steering, hydrostatic attachment drive, riding unit

Operation		U.S.	Metric
Forward speeds			
	Low/Low	0.6 mph	0.9 km/h
	Low/High	1.3 mph	2.0 km/h
	High/Low	4.4 mph	7.0 km/h
	High/High	9.4 mph	15.1 km/h
Reverse speeds			
	Low/Low	0.3 mph	0.5 km/h
	Low/High	0.7 mph	1.2 km/h
	High/Low	2.9 mph	4.7 km/h
	High/High	6.2 mph	9.9 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 Plant		U.S.	Metric
Engine: John Deere 4045HF280B, 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		99 hp	74 kW
Estimated net power per SAE J1349		88 hp	66 kW
Rated speed		2400 rpm	2400 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: hydrostatic
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 14-ply bar lug flotation; inflate to 72 psi (5 bar) max.
Attachment drive transmission: hydrostatic, lever-operated speed infinitely variable from zero to maximum

Hydraulic System	U.S.	Metric
Ground drive pump capacity at 2500 rpm	30.4 gpm	115 L/min
Ground drive pump relief pressure at 2500 rpm	5000 psi	345 bar
Attachment pump capacity at 2500 rpm	50 gpm	189 L/min
Attachment pump relief pressure at 2500 rpm	6090 psi	420 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

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.

During normal operation, vibration level does not exceed 4.9 and 1.5 meters squared respectively.

Operator seat per ISO 7096.

Noise Levels

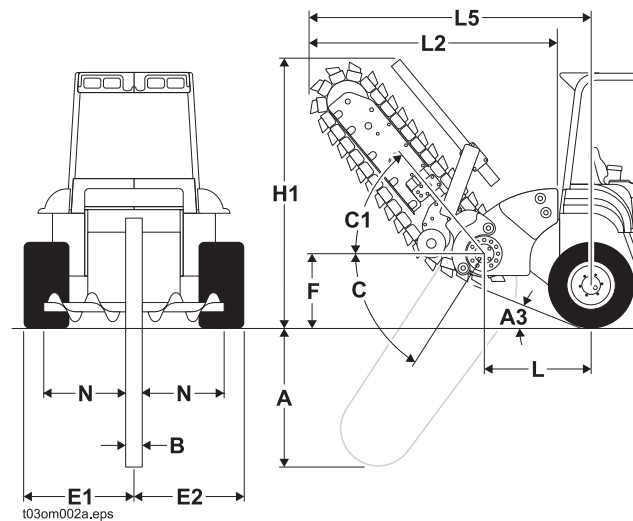
Operator 93 dBA sound pressure per ISO 6394

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.

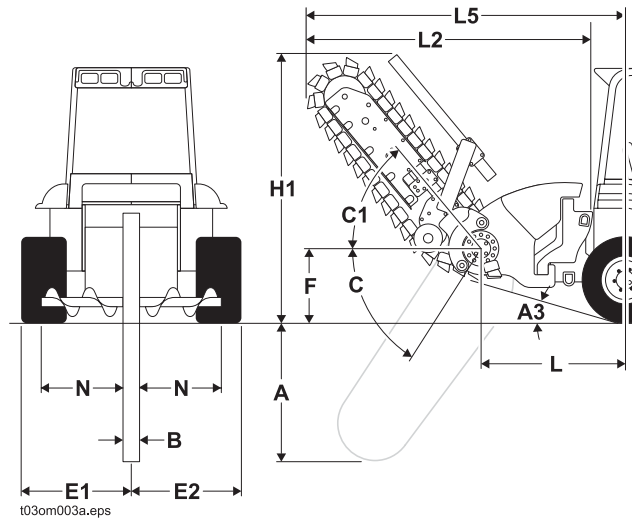
H910 Trencher



Dimensions		U.S.	Metric
A ³	Angle of departure		
	RT95 with 38 x 18.00-20 tires	28°	28°
A	Trench depth, maximum		
	RT95 with 38 x 18.00-20 tires	97 in	2.46 m
B	Trench width, maximum	24 in	610 mm
C	Boom travel down	65°	65°
C ¹	Boom travel up	50°	50°
E ¹	Centerline of trench to outside edge, left	41 in	1.0 m
E ²	Centerline of trench to outside edge, right	32 in	810 mm
F	Headshaft height, digging chain		
	RT95 with 38 x 18.00-20 tires	32 in	810 mm
H ¹	Transport height		
	RT95 with 38 x 18.00-20 tires	124 in	3.2 m
L ²	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 with RT95 at 2500 engine rpm			
	Ratio low	239 rpm	239 rpm
	Ratio standard	293 rpm	293 rpm
	Ratio high (not recommended)	394 rpm	394 rpm
Digging chain speeds with RT95			
	Ratio low	683 ft/min	208 m/min
	Ratio standard	834 ft/min	254 m/min
	Ratio high (not recommended)	1122 ft/min	342 m/min

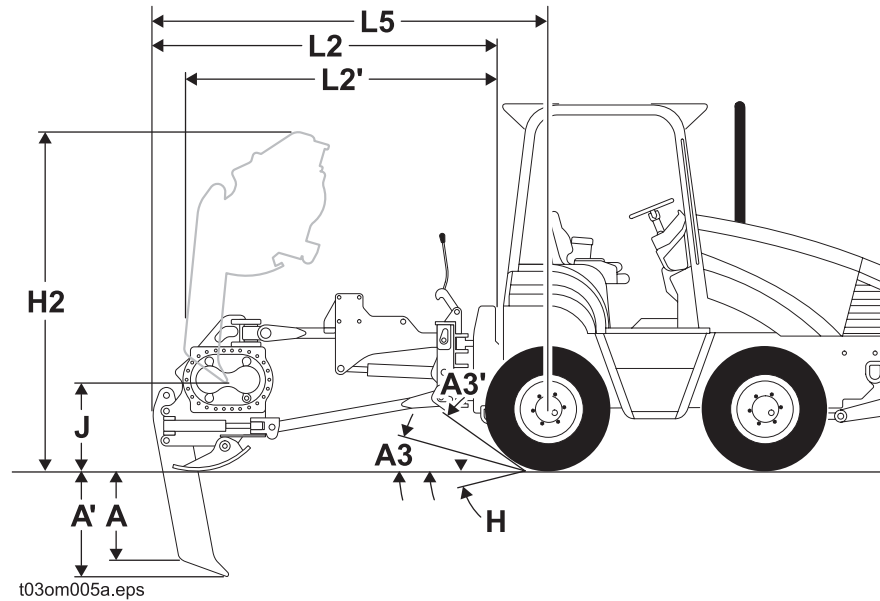
H911 Trencher



Dimensions		U.S.	Metric
A3	Angle of departure		
	RT95 with 38 x 18.00-20 tires	25°	25°
A	Trench depth, maximum		
	RT95 with 38 x 18.00-20 tires	94 in	2.4 m
B	Trench width, maximum	24 in	610 mm
C	Boom travel down	65°	65°
C1	Boom travel up	50°	50°
E1	Centerline of trench to outside edge, left	25 in	635 mm
E2	Centerline of trench to outside edge, right	13.5 in	340 mm
F	Headshaft height, digging chain		
	RT95 with 38 x 18.00-20 tires	35 in	890 mm
H1	Transport height		
	RT95 with 38 x 18.00-20 tires	126 in	3.2 m
L2	Transport length	126 in	3.2 m
L	Headshaft overhang	54 in	1.4 m
N	Soil discharge reach	33 in	840 mm
	Attachment weight	2350 lb	1066 kg

Operation		U.S.	Metric
Headshaft speeds with RT95 at 2500 engine rpm			
	Ratio low	239 rpm	239 rpm
	Ratio standard	293 rpm	293 rpm
	Ratio high (not recommended)	394 rpm	394 rpm
Digging chain speeds with RT95			
	Ratio low	683 ft/min	208 m/min
	Ratio standard	834 ft/min	254 m/min
	Ratio high (not recommended)	1122 ft/min	342 m/min

H932 Plow



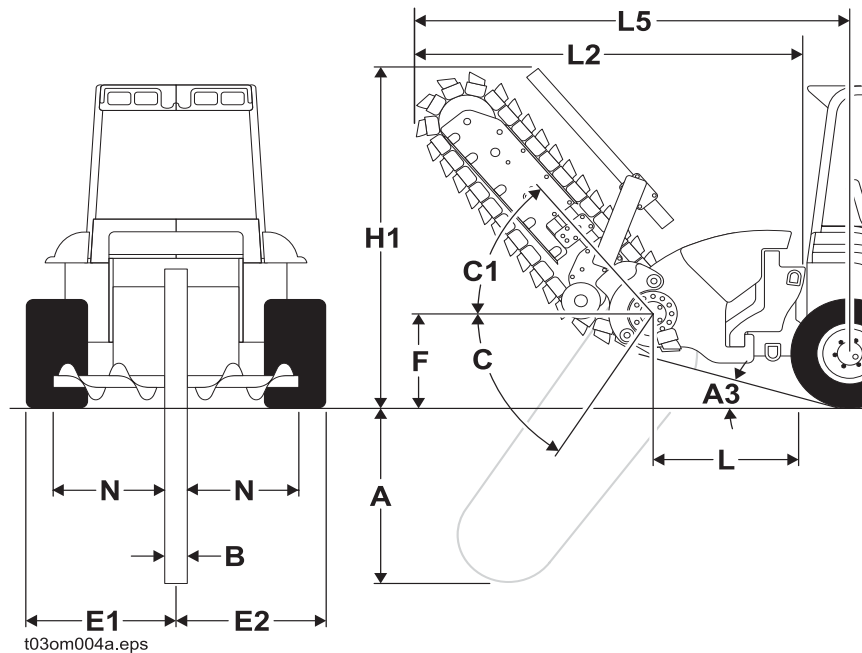
Dimensions		U.S.	Metric
A3'	Angle of departure, transport, no blade	30°	30°
A3	Angle of departure, transport, 24" (610-mm) blade	27°	27°
	Angle of departure, transport, 30" (760-mm) blade	23°	23°
H	Angle of depression, plow max.	10°	10°
H2	Height transport	96 in	2.4 m
L2	Attachment length, fully lowered, no blade	102 in	2.6 m
L2'	Attachment length, fully raised, no blade	69 in	1.7 m
J	Blade ground clearance, 30" (760-mm) blade	29 in	740 mm
A	Cover depth*	36 in	915 mm
A'	Penetration*	40 in	1.0 m
	Plow swing angle	43°	43°
	Inclusive blade steer angle	89°	89°
	Center of plow to outside edge of machine, left	40 in	1.0 m
	Center of plow to outside edge of machine, right	42 in	1.1 m

*Suggested maximum. Plow blade used will be determined by job requirements and soil conditions

Operation		U.S.	Metric
Plow vibrator force @ 1800 rpm		35,215 lb	157 kN
Maximum material diameter			
	Pulled	3 in	80 mm
	Fed	2 in	50 mm
General		U.S.	Metric
Operating weight, without plow blade		2400 lb	1100 kg
Counterweight required. Contact your local Ditch Witch dealer for counterweight requirements.			

H952 Combo

Trencher

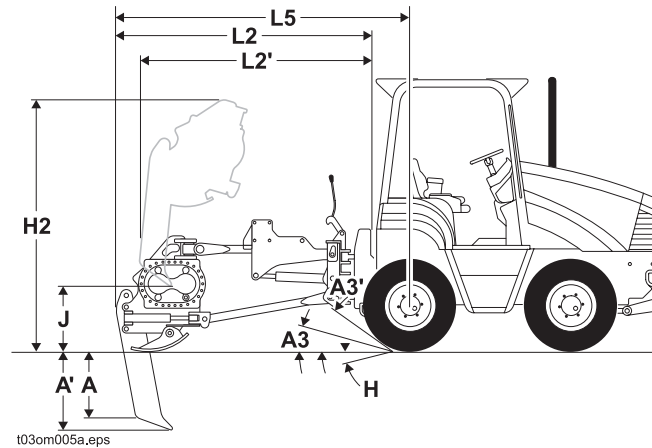


Dimensions		U.S.	Metric
A	Trench depth, maximum	70 in	1.8 m
	Trench width	6-12 in	150-305 mm
C1	Boom travel up	44°	44°
C	Boom travel down	60°	60°
F	Headshaft height, digging chain	31 in	790 mm
L ²	Transport length	126 in	3.2 m
D	Transport height	126 in	3.2 m
A3	Angle of departure	22°	22°
	Center of trench to outside edge, left*	8 in	190 mm
	Center of trench to outside edge, right	67 in	1.7 m
	Spoil discharge reach minimum	19 in	480 mm
	Headshaft overhang	40 in	1.0 m

*Left edge of machine is defined as outside of digging chain guard

Operation		U.S.	Metric
Maximum headshaft speed			
	Ratio low	239 rpm	239 rpm
	Ratio standard	293 rpm	293 rpm
	Ratio high (not recommended)	394 rpm	394 rpm
Maximum digging chain speed			
	Ratio low	623 ft/min	190 m/min
	Ratio standard	761 ft/min	232 m/min
	Ratio high	1024 ft/min	312 m/min

Plow



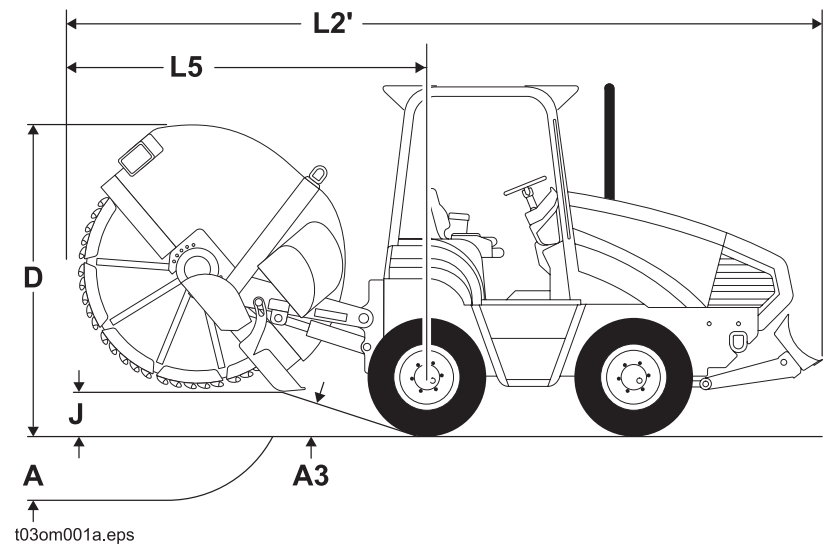
Dimensions		U.S.	Metric
A3'	Angle of departure, transport, no blade	30°	30°
A3	Angle of departure, transport, 24" (610-mm) blade	27°	27°
	Angle of departure, transport, 30" (760-mm) blade	22°	22°
H	Angle of depression, plow max.	10°	10°
H2	Height, transport	96 in	2.4 m
L2	Attachment length, fully lowered, no blade	103 in	2.6 m
L2'	Attachment length, fully raised, no blade	70 in	1.8 m
J	Blade ground clearance, 30" (760-mm) blade	29 in	740 mm
A	Cover depth*	36 in	915 mm
A'	Penetration*	40 in	1.0 m
	Plow swing angle, left	0°	0°
	Plow swing angle, right	38°	38°
	Inclusive blade steer angle	89°	89°
	Center of plow to outside edge of machine, left	45 in	1.1 m
	Center of plow to outside edge of machine, right	37 in	940 mm

* Suggested maximum. Plow blade used will be determined by job requirements and soil conditions.

Operational		U.S.	Metric
Plow vibrator force @ 1800 rpm		35,215 lb	156 644 kN
Maximum material diameter			
	Pulled	3 in	80 mm
	Fed	2 in	50 mm

General		U.S.	Metric
Operating weight without boom, chain, or plow blade		3065 lb	1390 kg
Counterweight required. Contact your local Ditch Witch dealer for counterweight requirements.			

H940 Saw



Dimensions		U.S.	Metric
A	Trench depth	30 in	760 mm
	Trench width	4.5, 6 in	115, 150 mm
D	Transport height, attachment	114 in	2.9 m
	Height, wheel on ground	85 in	2.2 m
L2'	Overall length, wheel on ground	227 in	5.8 m
J	Ground clearance at wheel	29 in	735 mm
A3	Angle of departure	23°	23°
	Attachment weight	4500 lb	2041 kg

Operation	U.S.	Metric
Maximum breakover angle at full depth	17°	17°
Cutting teeth on wheel (4.5", 6", 8")	70, 80, 80	70, 80, 80

Counterweight required. Contact your local Ditch Witch dealer for counterweight requirements.

Power Train

Cutting bit types: Rotating, self-sharpening conical bit with spring retainer. Carbide cap or carbide insert available.

Cutter wheel type: Steel wheel with 10 bolt-on segments.

Wheel motor: 85 in³ (1395 cc) radial piston with pair of tapered roller bearings.

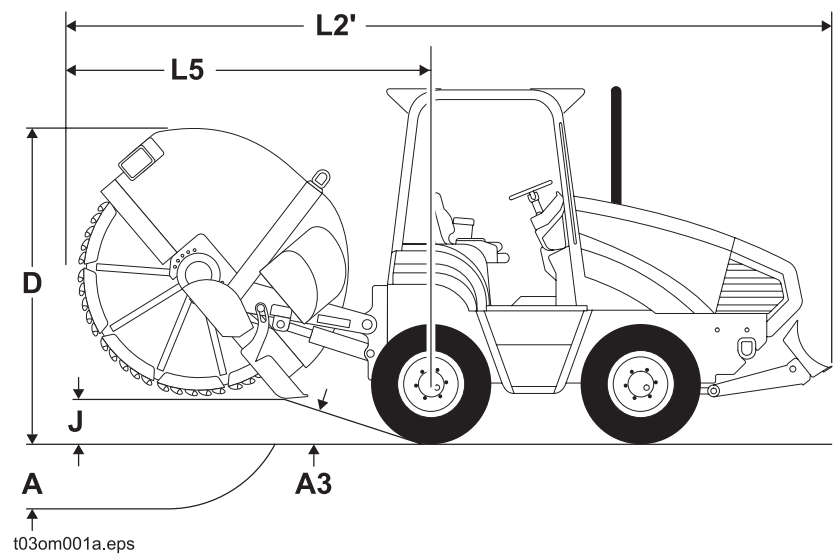
Wheel shaft bearing: 3" (76 mm) flanged cartridge double row, spherical roller bearing.

Lift provision: Two 3.5" (88.9 mm) hydraulic cylinders.

Gauge shoes: Minimize shock, bearing load, and vibration when cutting and move spoils away from trench.

Spoil placement: Both sides approximately 12-18" (305-457 mm) from trench.

H1140 Saw



Dimensions		U.S.	Metric
A	Trench depth	40 in	1 m
	Trench width	4.5, 6 in	115, 150 mm
D	Transport height - attachment	130 in	3.3 m
	Height - wheel on ground	102 in	2.6 m
L2'	Overall length - wheel on ground	252 in	6.4 m
J	Ground clearance at wheel	27 in	700 mm
A3	Angle of departure	21°	21°
	Attachment weight	5900 lb	2675 kg

Operation	U.S.	Metric
Maximum breakover angle at full depth	17°	17°
Cutting teeth on wheel (4.5", 6", 8")	70, 80, 80	70, 80, 80
Counterweight required. Contact your local Ditch Witch dealer for counterweight requirements.		

Power Train

Cutting bit types: Rotating, self-sharpening conical bit with spring retainer. Carbide cap or carbide insert available.

Cutter wheel type: Steel wheel with 10 bolt-on segments.

Wheel motor: 107 in³ (1747 cc) radial piston with pair of tapered roller bearings.

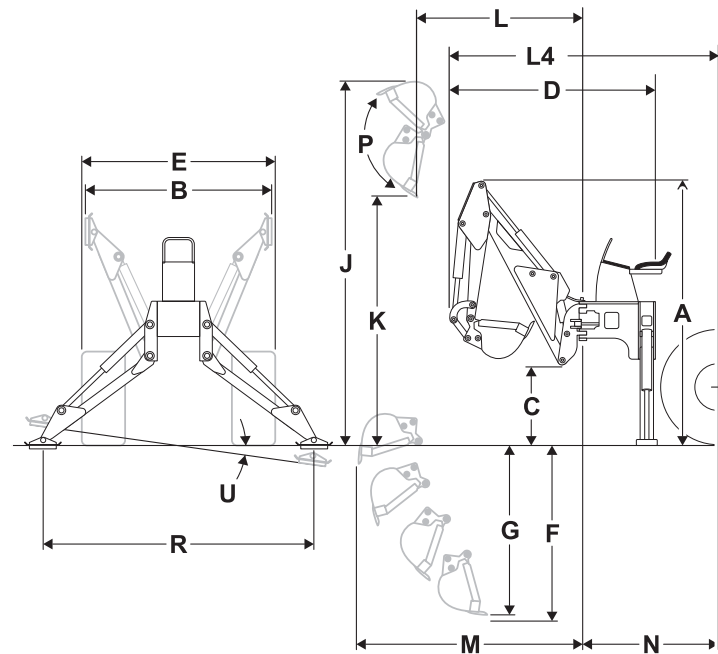
Wheel shaft bearing: 3" (76 mm) flanged cartridge double row, spherical roller bearing.

Lift provision: Two 4" (107 mm) hydraulic cylinders.

Gauge shoes: Minimize shock, bearing load, and vibration when cutting and move spoils away from trench.

Spoil placement: Both sides approximately 12-18" (305-457 mm) from trench.

A920 Backhoe

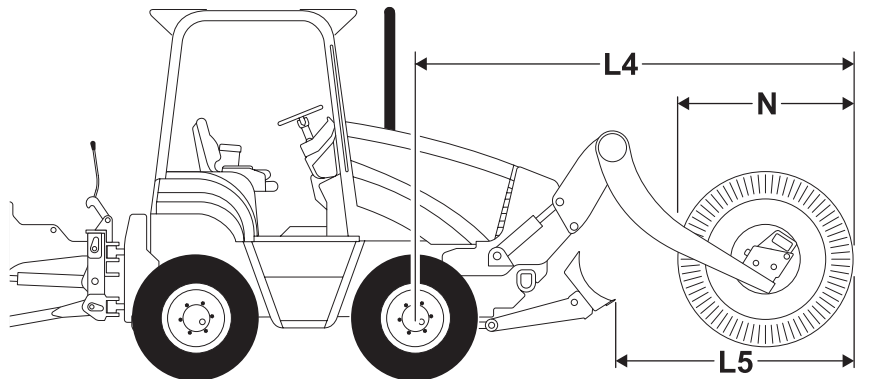


Dimensions		U.S.	Metric
A	Transport height	118 in	3.0 m
C	Ground clearance	29 in	740 mm
D	Backhoe length, stowed	117 in	2.9 m
F	Digging depth, max.	112 in	2.8 m
G	Digging depth, 2" (0.6 m) flat bottom	109 in	2.7 m
J	Operating height, fully raised	156 in	3.9 m
K	Loading height	104 in	2.6 m
L	Loading reach	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-.1 m ³
Backhoe weight with 18" (686 mm) bucket		3300 lb	1497 kg
Lift capacity, boom over end and swing arc, SAE*			
	@ 48" (1.2 m)	1170 lb	530 kg
	@ ground level	1250 lb	567 kg
	@ 72" (1.8 m)	1184 lb	537 kg
Lift capacity, dipperstick over end and swing arc, SAE*			
	@ 52" (1.3 m)	3184 lb	1444 kg
	@ 96" (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.

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 90-lb (41-kg) counterweights	1600 lb	726 kg

RC115 Counterweight Requirements				
	Reel weight	Back axle*	Front RC weight	Rear weight
RT95 with H932 plow	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)
RT95 with H952 combo	0-1500 lb (0-680 kg)	800 lb (363 kg)	600 lb (272 kg)	0 lb (0 kg)
	1500-2500 lb (680-1134 kg)	800 lb (363 kg)	0 lb (0 kg)	0 lb (0 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 SK5 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.

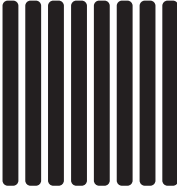
This will enable you to receive updates on this equipment as well as information on new products of interest.

Thanks for using Ditch Witch equipment.

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



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P.O. Box 66
Perry, Oklahoma 73077-9989**



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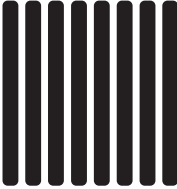
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**The Charles Machine Works, Inc.
P.O. Box 66
Perry, Oklahoma 73077-9989**



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Street Address or P.O. Box		
City	County	
State	Zip	Nation
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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		

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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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