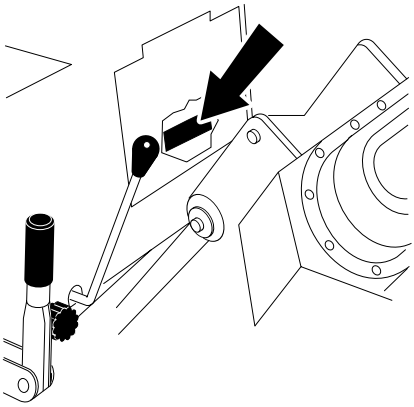
SERVICE

SERIAL NUMBER

Record the serial numbers and date of purchase for your equipment in the spaces below.



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Date of purchase:	
Serial number:	
Engine serial number:	

SUPPORT PROCEDURE

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

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

Return damaged parts to dealer for inspection and warranty consideration.

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

RESOURCES

Publications

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

Ditch Witch Training

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

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. 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.

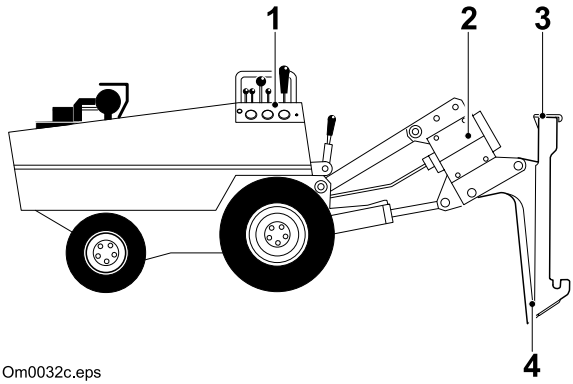
Operator's Manual
255sx

Issue No. 8.0/OP-2/03
Part Number 054-402

CONTENTS

OVERVIEW

The 255sx is a self-propelled, walk-along vibratory plow. Powered by a 24 hp (18 kW) two-cylinder Honda gas engine, the 255sx is designed to operate in a variety of soil conditions with either a pull, CATV, or feed blade.



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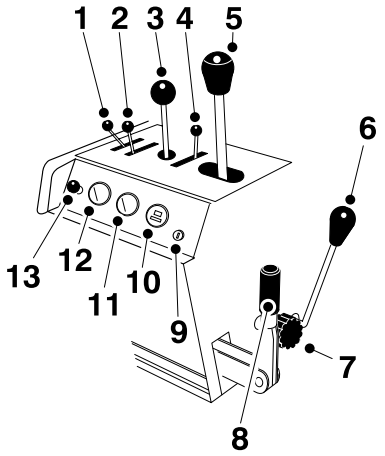
- Control console (1)
- Shaker box (2)
- Feed tube (3)
- Plow blade (4)

CONTROLS

OVERVIEW



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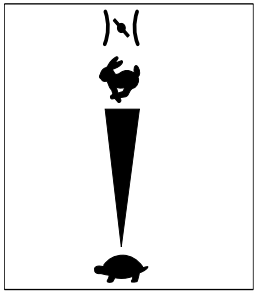
- Throttle (1)
- Roto Witch drilling control (optional) (2)
- Plow control (3)
- Crowd range control (4)
- Speed/direction control (5)
- Axle lock (6)
- Plow swing lock (7)
- Parking brake (8)
- Ignition switch (9)
- Hourmeter (10)
- Voltmeter (11)
- Fuel gauge (12)
- Choke (13)

DESCRIPTIONS

Throttle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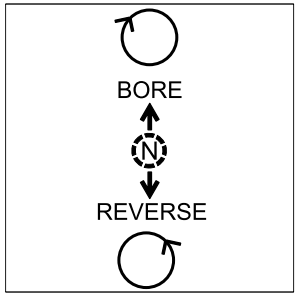
This lever controls engine speed.

- Push forward to increase speed.
- Pull backward to decrease speed.

Roto Witch Drilling Control (Optional)



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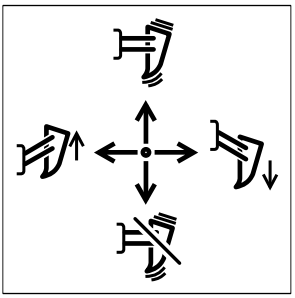
This lever controls drilling attachment. Refer to **DRILLING ATTACHMENT** chapter for additional information.

- Push forward to rotate clockwise.
- Pull backward to rotate counterclockwise.

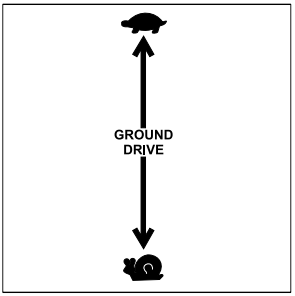
Plow Control


lc0045c.eps

This lever lowers and raises plow attachment, and it engages and disengages plow vibrator.

- Push down and move right to lower.
- Push down and move left to raise.
- Push down and move forward to engage.
- Push down and move backward to disengage.

Crowd Range Control



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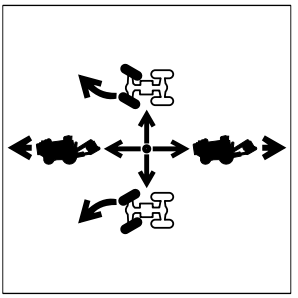
This control shifts from drive range to work range.

Drive range allows operator to maneuver around jobsite, while work range is for plowing.

- Push forward for drive range.
- Pull backward for work range.

Speed/Direction Control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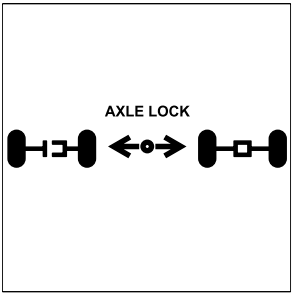
This lever controls unit speed and direction.

The speed/direction control is spring-centered and will return to neutral when released.

- Push down and move left to travel forward.
- Push down and move right to reverse.
- Return to center (neutral) position to stop.
- Push down and move in the direction of intended travel to turn.

Axle Lock



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This control connects left and right ground drive motor systems for positive four-wheel drive.

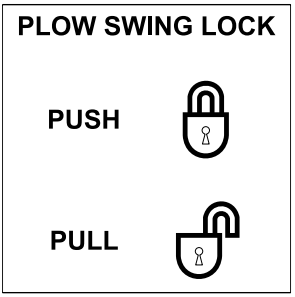
Axle lock provides superior traction for rough or slippery terrain; however, differential action between left and right drive motors is eliminated.

- Push to lock.
- Pull to release.

Plow Swing Lock

This control locks plow in any position.

- Push to lock.
- Pull to release.



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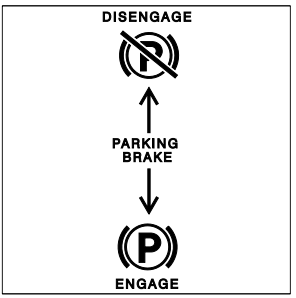
Parking Brake

This lever holds unit at rest.

- Push to set.
- Pull to release.



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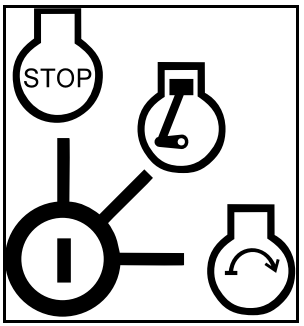
Ignition Switch

This switch starts and stops engine.

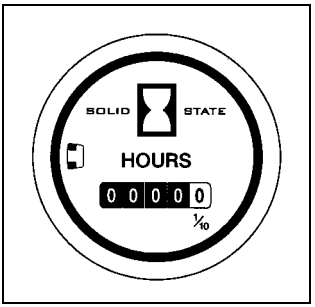
- Insert key and turn clockwise to start.
- When engine starts, release key. It will return to on position.
- If engine does not start or is killed, turn to STOP then restart.



Hourmeter

This gauge records engine operating time and is used to schedule lubrication and maintenance.

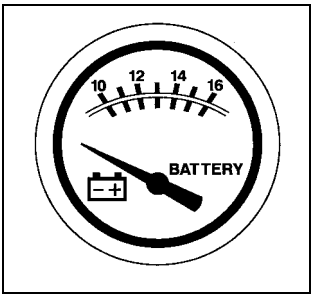
Hourmeter runs as long as ignition switch is in the on position.



Voltmeter

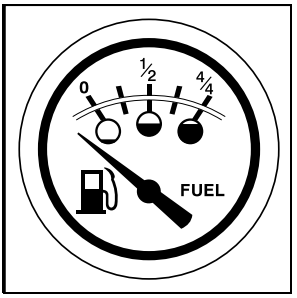
This gauge measures voltage in electrical system.

Readings should be between 13-15 volts with engine running. If not, stop engine and determine cause.



Fuel Gauge

This gauge shows level of fuel in tank.



Choke

This control assists in starting cold engine.

- Pull out before starting engine.
- Push in after engine is running.

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SAFETY

Follow these guidelines before operating any jobsite equipment:

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

UNDERGROUND HAZARDS

Striking underground hazards can cause explosion, electrocution, fire, and exposure to hazardous materials.

Hazards include:

- Electric cables
- Natural gas lines
- Fiber optic lines
- Water lines
- Sewer lines
- Pipes carrying other chemicals, liquids, or gases
- Storage tanks

EMERGENCY PROCEDURES

If an Electric Line is Damaged

- DO NOT MOVE. Stay where you are and do not touch any equipment.
- Warn others that an electric line has been hit and that they should stay away.
- Have someone contact electric company.
- Do not return to area until given permission by electric company.

If a Gas Line is Damaged

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

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

If a Fiber Optic Cable is Damaged

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

If Machine Catches on Fire

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

- Immediately move battery disconnect switch (if equipped) to disconnect postition.
- 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.

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.

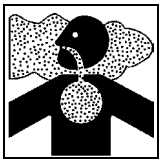
Watch for two other words: **NOTICE** and **IMPORTANT**.

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

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

SAFETY ALERTS

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

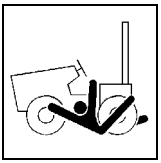


⚠ DANGER Deadly gases. Lack of oxygen or presence of gas will cause sickness or death. Provide ventilation.

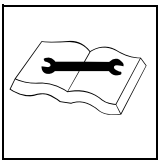
⚠ WARNING Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

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

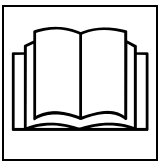
⚠ WARNING Moving parts could cut off hand or foot. Stay away.



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



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

NOTICES:

- Unless otherwise instructed, all service should be performed with engine shut off.
- Refer to engine manufacturer's manual for engine maintenance instructions.

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

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

OPERATION

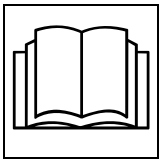
INSPECT MACHINE

Check the following before each day's work. Refer to **LUBRICATION** and **MAINTENANCE** chapters for additional information.

- General appearance.
- Condition of plow blade, drive belts, and air filter.
- Hydraulic oil level, system leaks, and filler/breather assembly.
- Plow vibrator oil level.
- Air filter, hoses, and clamps.
- Fuel lines and fittings for signs of leakage, wear, or other damage.
- Tire pressure. Use reliable tire pressure gauge.
- Engine oil level. Keep oil level at highest line on filler cap/dipstick.
- Fuel level. Fill tank at end of day to reduce condensation.
- Signs are in place and readable.
- Guards and shields are secure and in place.
- Controls in neutral or disengage positions.
- Nuts and bolts are tight. Tighten as specified in torque tables in Parts Manual.

START SYSTEM

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



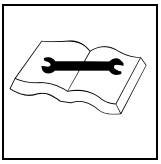
WARNING Incorrect procedures could result in death, injury, or property damage. Learn to use equipment correctly.

IMPORTANT: Read engine manufacturer's starting and operating instructions. Follow directions for new engine break-in.

1. Check that all controls are in neutral or disengaged position.
2. Engage parking brake.
3. Open fuel shutoff valve.
4. Move throttle to half open.
5. Insert key and start engine.

   IMPORTANT: If engine does not start within 30 seconds, release ignition key. Allow starter to cool before attempting to start again. If engine does not start after three attempts, determine cause.
6. Run engine at half throttle or less for five minutes before operating. After engine has warmed up, check function of all controls.

SHUTDOWN

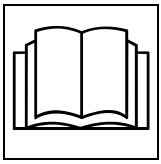


⚠WARNING Improper control function could cause death or serious injury. If control does not work as described in instructions, stop machine and have it serviced.

EMERGENCY SHUTDOWN: Turn key switch to STOP.

1. Return all controls to neutral or disengaged position.
2. Lower plow to ground and engage parking brake.
3. Briefly run at half throttle or less to cool engine.
4. Completely close throttle.
5. Place crowd range control into work range.
6. Turn ignition switch to STOP and remove key.
7. Close fuel shutoff valve.

DRIVE



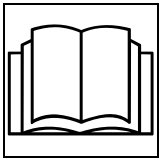
⚠WARNING Incorrect procedures could result in death, injury, or property damage. Learn to use equipment correctly.

NOTICE: Drive slowly and cautiously at all times.

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

1. Check that speed/direction control is in neutral.
2. Start engine and run at low idle.
3. Raise plow attachment.
4. Move crowd range control to drive range.
5. Ensure tires are steered straight or in direction of intended turn.
6. Move throttle lever to half open position.
7. Slowly engage speed/direction control.
8. Adjust engine speed with throttle for desired maximum ground speed.
9. Adjust drive speed with speed/direction control.
10. To stop, move speed/direction control to neutral.

PLOW



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

NOTICE: Keep hands on handlebars while operating plow.

1. Drive to starting point.
2. Place crowd range control in work range.
3. For plow-in plowing, insert cable into plow blade cable grip. For feed-in plowing, feed cable through plow blade feed tube. Leave excess cable to tie off at starting point.
4. Lower plow blade to ground.
5. Increase throttle setting to at least half open.
6. Engage plow vibrator.
7. Open throttle completely.
8. Slowly move speed/direction control forward to begin plowing.
9. To steer, move the speed direction control in desired direction.

10. Unlock plow swing before turning.
11. To raise plow at end of job:
    - Begin raising plow blade from ground.
    - Leave plow vibrator engaged until plow blade is almost at ground level, then disengage vibrator and continue raising.
    - In sticky soils or when installing delicate cable, it may be necessary to move the unit forward as plow blade is raised.
    - Place plow swing lock in locked position before blade clears ground.
12. Follow shutdown procedure.
13. Remove cable from cable chute and follow blade removal procedure.

ATTACH AND REMOVE BLADE

1. Raise plow attachment and shut down engine.
2. Position blade with cutting edge down so pin holes in blade align with those in vibrator trolley.
3. Install upper (rear) blade pin first, then install lower (front) pin.
4. Secure both pins with keeper pins.
5. Restart engine and lower plow attachment to ground.
6. To remove blade, remove keeper pins and pull out two plow blade pins.

TRANSPORTATION

LIFT

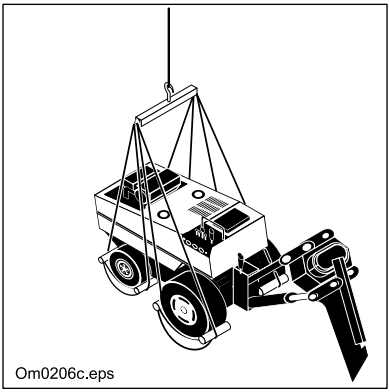
⚠WARNING Crushing weight could cause death or serious injury. Use proper procedures and equipment or stay away.

Procedure

Before lifting, check **SPECIFICATIONS** chapter. Use a crane capable of supporting the equipment's size and weight.

Engage barking brake and plow swing lock before lifting.

Lift unit by attaching slings to wheels and to a common member.



HAUL

Machine can be hauled by trailer, van, or pickup truck. Before hauling check the following:

- Check that loading ramps will support weight. See **SPECIFICATIONS**.
- Check that adequate tiedowns are available.

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

NOTICES:

- Park, unload, and load trailer on level part of jobsite.
- To prevent tipping, connect trailer to tow vehicle before loading or unloading.

LOAD

1. Align machine with ramps or trailer.
2. Start machine following instructions in **OPERATION**.
3. Move throttle to half open.

EMERGENCY SHUTDOWN: Turn ignition switch to STOP position.

4. Move crowd range control to work position.
5. Slowly guide the machine onto trailer.
6. When tiedown position is reached, move speed/direction control to neutral position.
7. Lower plow blade to trailer bed.
8. Leaving crowd range control in work mode, completely close throttle, turn ignition switch key to STOP, and remove key.
9. Close fuel shutoff valve.
10. Securely chain unit to trailer using tiedown binders.

UNLOAD

1. Remove tiedowns from machine.
2. Start machine following instructions in **OPERATION**.
3. Use speed/direction control to slowly back machine off trailer or down ramps.

DRILLING ATTACHMENT

Use Roto Witch attachment to drill under obstructions such as sidewalks and driveways. Roto Witch attachments come in two types: wet bore and dry bore. Wet bore pipe is used for wet or dry drilling; dry bore rod is used for dry drilling only.

sf1019

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

sf1016

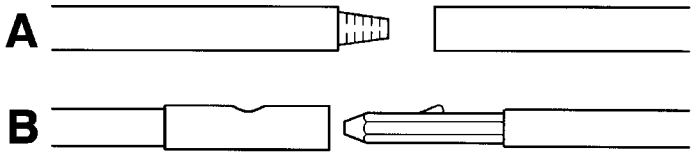
DANGER Turning shaft will kill you or crush arm or leg. Stay away.

NOTICES:

- Keep everyone at least 10 feet (3 m) away from turning drill string. Do not straddle trench or drill string while drilling.
- If swivel malfunctions, material being installed can rotate.
- Keep all persons away from material being installed.

EMERGENCY SHUTDOWN: Turn ignition switch to STOP.

BORE TYPES



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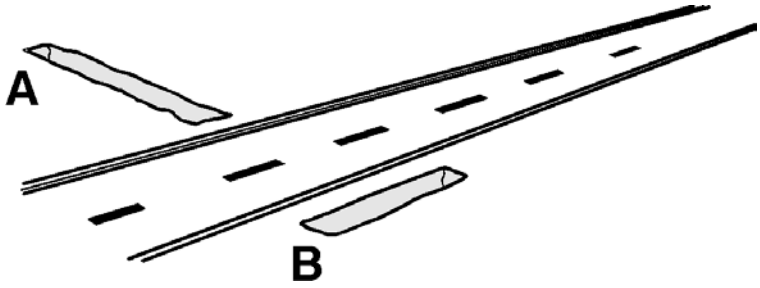
Wet bore Roto Witch attachments (A) use hollow drill pipe screwed together using pipe wrenches.

Dry bore Roto Witch attachments (B) use solid stem rods attached with slip-latch couplers.

NOTICE: Do not use bolts or pins to replace broken spring-loaded tabs. Replace with new tabs or drill rod.

SETUP

1. Dig a starting trench (A) about two drill stem lengths from the obstruction and ending as close to the obstruction as possible. This trench should be as deep as the desired drilling depth.



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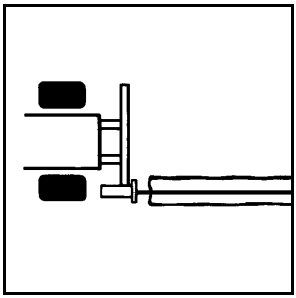
2. Dig a second trench (B) on the other side of obstruction across the path of the bore. This trench should be deeper than the desired drilling depth.

   The longer the bore, the longer and deeper this trench should be.

IMPORTANT: If mechanical guide is necessary to control drill rod in starting trench, guide rods or stem guides are recommended.

3. Connect one or two lengths of drill string and install drill bit.
4. Position drilling attachment in line with intended bore and slowly move up to drill string.
5. Shut down engine and attach end of string to drilling attachment quick-disconnect yoke.



DRILLING

NOTICE: Push rod or pipe slowly. Forcing can bend string. Bent rod or pipe should not be used.

1. When setup is complete, check that gearbox control is in low.
2. Start engine and use throttle to control drilling attachment rotation speed.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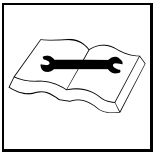
DANGER Turning shaft will kill you or crush arm or leg. Stay away.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WARNING Improper control function could cause death or serious injury. If control does not work as described in instructions, stop machine and have it serviced.

NOTICE: Do not alter controls. Improper control function can cause serious injury. If releasing control does not stop turning shaft, turn off power supply, stop drilling, and have unit repaired.

3. Start drilling in clockwise direction by pushing top of Roto Witch control button.

   IMPORTANT: If using wet bore pipe, do not rotate counterclockwise, or pipe will unscrew and come apart in ground.

4. Start bore by moving attachment speed/direction control forward. Start bore very slowly to maintain grade. Increase speed after bore is underway.
5. To add to existing drill string:
    - Stop tractor and shut off engine.
    - Disconnect drill string from drilling attachment.
    - Move machine away from bore.
    - Attach new pipe or rod to drill string.
    - Repeat to complete bore.

BACKREAM

Backreaming enlarges the bore.

Do not try to increase bore size too much at one time. Several passes using successively larger reamers will save wear on machine.

1. Shut down tractor and attach backreamer.
2. Start tractor.
3. Turn drilling attachment clockwise and pull speed/direction control to move backreamer through bore.

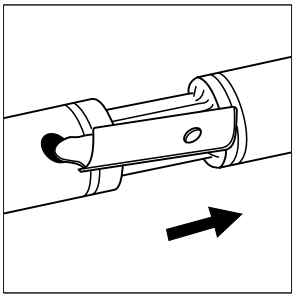
JOINT DISASSEMBLY

To separate screw-on drill pipe sections and end attachment:

1. Loosen joints with pipe wrenches.
2. Clean and oil threaded joints after disassembly.
3. Cover exposed threads to prevent damage.

To separate slip-latch couplers:

1. Using special tool, press tab through hole in joint while pulling stems apart.
2. Clean and oil exposed joints to prevent damage.



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OPTIONAL EQUIPMENT

Drill Pipe and Rod

Bent or damaged pipe and rod might break when being pushed. Replacement drill pipe, rod, and connectors are available through your Ditch Witch dealer.

Bits and Backreamers

Bits and backreamers are available in a variety of sizes and types to match jobsite needs. Contact your Ditch Witch dealer for more information.

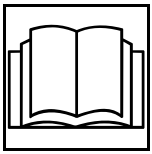
LUBRICATION

Proper lubrication and maintenance protects Ditch Witch equipment from damage and failure. In extreme conditions, lubricate more frequently.

Use only recommended lubricants. Fill to capacities listed in **SPECIFICATIONS** chapter.

Recommended Lubricants

GEO	Gasoline engine oil (see oil temperature chart for appropriate SAE weight) meeting API engine service classification SD
MPG	Multipurpose grease lubricant
EO	Engine oil of the appropriate SAE weight listed under GEO (API class SD). EO is not for engine applications
THF	Tractor hydraulic fluid, similar to Phillips 66 HG, Mobilfluid 423, Chevron Tractor Hydraulic Fluid, Texaco TDH Oil, or equivalent
10W40	Engine oil, SAE 10W40, meeting API service classification S/CC

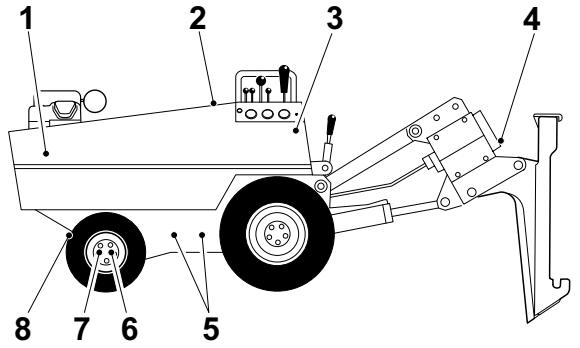


⚠ WARNING Incorrect procedures could result in death, injury, or property damage. Learn to use equipment correctly.

NOTICES:

- Unless otherwise instructed, all service should be performed with engine off.
- Refer to engine manufacturer’s manual for engine maintenance instructions.

OVERVIEW



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Interval	Task	Ref.	Lubricant
10 hours	Check hydraulic oil	2	THF
	Check engine oil	1	GEO
	Check vibrator oil	4	10W40
50 hours	Change engine oil	1	GEO
	Lube steering knuckle	7	MPG
	Lube spindle bearing	6	MPG
150 hours	Change hydraulic oil filter	3	
300 hours	Change hydraulic oil	2	THF
	Change vibrator oil	4	10W40
As needed	Lube drive chains	5	EO
	Lube drilling attachment cross & bearing	8	MPG

ENGINE OIL SYSTEM

Engine Oil

Check

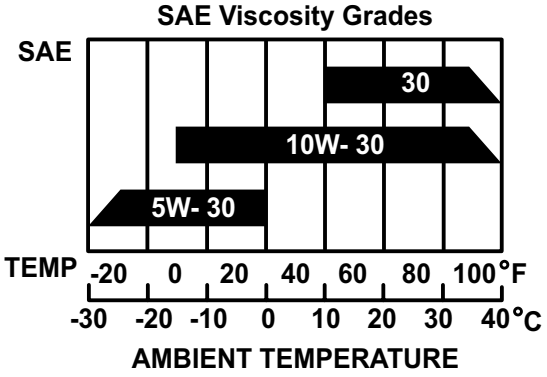
Check engine oil at dipstick every 10 hours. Maintain oil at FULL mark on dipstick.

Change

Change engine oil after first 25 hours and every 50 hours thereafter. Drain plug is located under front-right corner of machine. Fill crankcase through oil fill; refill capacity with filter change is 1.5 qt (1.4 L).

If operating in extremely dusty conditions, change oil more frequently. Use oil specified in temperature chart.

Engine Oil Temperature Chart



Temperature range anticipated before next oil change

Engine Oil Filter

Change engine oil filter after first 25 hours and every 100 hours thereafter. Filter is located on right side of engine and may be reached by removing lower grille panel.

If operating in extremely dusty conditions, change filter more frequently. See Parts Manual for replacement filter.

HYDRAULIC SYSTEM

Hydraulic Oil

Check

Check hydraulic oil level daily. Maintain THF at bottom of filler screen.

Change

Change hydraulic oil every 300 hours. Drain plug is located below tank on right side of machine. Refill to bottom of filter screen with THF; tank capacity is 10.5 gal (39.7 L).

Hydraulic Oil Filter

Change hydraulic oil filter after first 25 hours and every 150 hours thereafter. Filter is located behind access door at machine's right-rear corner. See Parts Manual for replacement filter.

GENERAL

Steering Knuckle

Lubricate front wheel steering knuckles with MPG every 50 hours.

Spindle Bearing

Lubricate front wheel spindle bearings with MPG every 50 hours.

Drive Chain

Lubricate drive chains with EO as needed.

PLOW

Vibrator Oil

Check

Check vibrator oil level in sight gauge on gear cover every 10 hours. Maintain 10W40 in sight gauge when vibrator is level. Do not overfill.

Change

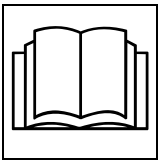
Change oil in vibrator gear cover every 300 hours. Use 10W40 and fill to sight gauge. Tank holds 8 oz (227 g). Add 1 oz (28 g) 10W40 to each of the two shaker box cylinders.

DRILLING ATTACHMENT

Lubricate drilling attachment cross & bearing with MPG as needed.

MAINTENANCE

Proper lubrication and maintenance protects Ditch Witch equipment from damage and failure. In extreme conditions, lubricate more frequently.

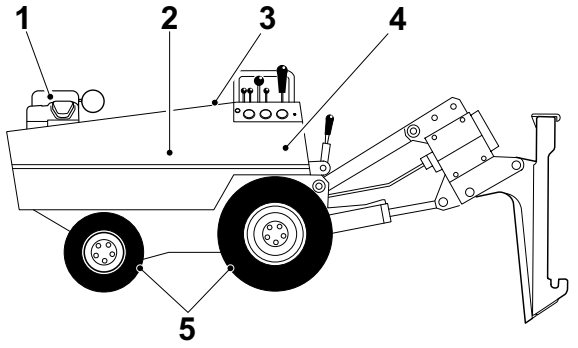


WARNING Incorrect procedures could result in death, injury, or property damage. Learn to use equipment correctly.

NOTICES:

- Unless otherwise instructed, all service should be performed with engine shut off.
- Refer to engine manufacturer’s manual for engine maintenance instructions.

OVERVIEW



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Interval	Task	Ref.
10 hours	Check tires	5
	Check air filter	1
100 hours	Check battery	4
Annually	Replace fuel filter	2
As needed	Clean hydraulic reservoir filler-breather	3
	Clean air filter	1

Engine Components

Air Filter

Check

Check air filter every 10 hours. Clean or replace filter elements as needed. Replace more often if operating in extremely dusty conditions. See Parts Manual for replacement filter.

Procedure

1. Remove air cleaner cover.
2. Remove and inspect foam and paper filter elements.
3. Clean or replace elements if they are dirty or damaged.
    - Clean paper element by tapping several times on hard surface or blowing compressed air through element from the bottom.
    - Clean foam element in warm, soapy water and allow to dry thoroughly.
4. Wipe dirt from insides of air cleaner cover and body with a moist rag.
5. Install both elements into air cleaner case.

    IMPORTANT: Ensure that seal lip is not folded over.
6. Install cover and latch tabs securely.

Air Cleaner System

Visually inspect outside of air cleaner system for loose or damaged parts every 8 hours.

Fuel Filter

Replace fuel filter annually. If unit normally is refueled from cans, replace more often. See Parts Manual for correct replacement.

Hydraulics

Hydraulic Filler/Breather

Check

Check cap periodically and replace if necessary.

Clean

Clean excess dust from hydraulic filler/breather cap by washing in solvent. If filler screen becomes clogged, remove and flush with solvent.

Electrical

Battery

Check

Check electrolyte level in battery every 100 hours. Battery is located behind access panel at rear of machine. Add distilled water to keep level above plates. Do not overfill.

Clean

Keep battery clean and free of corrosion. Apply coat of grease to cable clamps after cleaning.

Charge

In cold weather, battery starting ability drops. Closely watch voltmeter for signs of discharge.

If adding water in freezing weather, immediately charge battery to mix water and electrolyte. If battery will not hold charge, see Parts Manual for replacement.

Power Train

Tires

Check tires every 10 hours for proper condition and inflation. Use an accurate gauge to ensure correct pressure is maintained.

- Correct pressure for 16 x 6.50-8 front tires is 20 psi (1 bar).
- Correct pressure for 23 x 10.50-12 rear tires is 28 psi (2 bar).

Drive Chain

Adjust drive chains as needed.

To adjust:

1. Use lifting device to raise either side of machine, then block with adequate jackstands.
2. Remove rear tire and wheel assembly to gain access to rear drive chain idler.

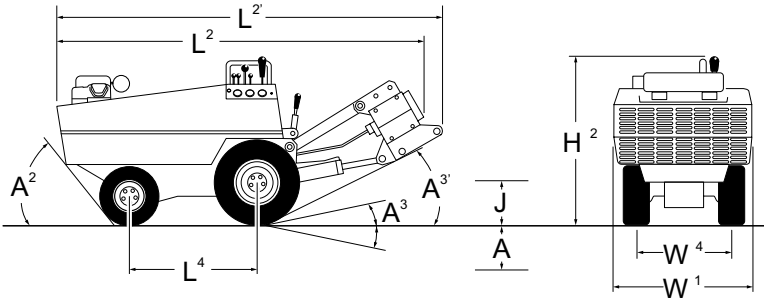
   IMPORTANT: It is not necessary to remove the front tire and wheel assembly to gain access to the front drive chain idler.
3. Loosen the drive chain idler bolts. Insert a 1/2 inch (13 mm) drive breaker bar into the square hole of the idler and press down firmly on bar to tighten the idler on the drive chain.
4. Securely tighten idler bolts while maintaining downward pressure on the breaker bar.
5. Repeat procedure on opposite side of machine.

Plow Attachment

Feed Tube

Clean feed tube on plow blades after each use.

SPECIFICATIONS



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Dimensions		U.S.	Metric
A	Maximum cover depth	13.5 in	343 mm
	Maximum penetration depth*	16.2 in	413 mm
A^3	Angle of approach:		
	with reel carrier	41°	41°
	without reel carrier	53°	53°
	with 25 in (612 mm) reel	28°	28°
$A^{3'}$	Angle of departure:		
	with 12 in (305 mm) blade	19°	19°
	without blade	40°	40°
H^2	Operating/transport height	46 in	1.2 m
J	Blade ground clearance	15.4 in	394 mm

L^2	Length plowing, without reel carrier	100.5 in	2.6 m
$L^{2,}$	Length transport, without reel carrier	108.5 in	2.8 m
L^4	Wheelbase	34 in	864 mm
W^1	Width transport:		
	maximum	35.8 in	909 mm
	minimum	31.5 in	800 mm
W^4	Thread front	25 in	635 mm
	Rear, STD	25.8 in	655 mm
	Rear, OPT	21.5 in	546 mm
	Width plow unit	17.5 in	444 mm
	Centerline plow in outside edge machine, blade centered:		
	STD	18 in	457 mm
	OPT	15.75 in	400 mm

Note: Dimensions are based on unit equipped with 12 in (305 mm) plow blade. For empty reel carrier, add 12 in (305 mm) to overall lengths

*Suggested maximum blade length. Actual plow blade length will be determined by job requirements and soil conditions

Operational	U.S.	Metric
Vehicle speeds at 3400 rpm		
Maximum transit forward	215 fpm	65.5 mpm
Maximum crowd forward	83 fpm	25.5 mpm
Maximum transit reverse	215 fpm	65.5 mpm
Maximum crowd reverse	83 fpm	25.5 mpm
Nominal plow-in depth	6-12 in	152-305 mm
Maximum bullet diameter, pull blade	3 in	76 mm
Inside diameter feed tube, feed blade	1 in	25 mm
Vehicle clearance, circle, wall-to-wall (SAE), axle locked, drive	26 ft	7.9 m

Axle unlocked, drive	16.5	5 m
Operating weight	1650 lb	748 kg
Operator orientation: Facing front of vehicle in full view of all operations		
Power Options	**U.S.**	**Metric**
Honda V-twin gasoline engine		
Cooling medium: air		
Number of cylinders: two		
Displacement	40.9 in^3	670 cm^3
Bore	3 in	77 mm
Stroke	2.8 in	72 mm
Engine manufacturer's gross power rating at 3600 rpm	24 hp	18 kW
Maximum governed speed as installed (no load)*	3600 rpm	3600 rpm
Power Train	**U.S.**	**Metric**
Transmission: Hydrostatic drive, infinitely variable from zero to maximum, lever operated speed and direction controls		
Brake: Direction control brakes machine hydraulically when moved to neutral position		
Parking brake: Disc type, hand operated		
Tires, load rating at recommended pressure at 10 mph (16 kph)		
16 x 6.50-8, front	620 lb	281 kg
	@28 psi	@ 2 bar
23 x 10.50-12	1340 lb	608 kg
	@20 psi	@ 1 bar
Hydraulic System	**U.S.**	**Metric**
Pump capacity at 3200 rpm relief valve setting		
2000 psi (138 bar) drive range, bore motor		
Plow vibrator (SEC #1)	12.5 gpm	47.3 Lmin

Crowd range (SEC #2)	6.7 gpm	25.4 Lmin
Plow lift and steer (SEC #3)	3.6 gpm	13.6 Lmin
Hydraulic motor, ground drive (each)		
Torque at 2250 psi (155 bar) and 3.3 gpm (12.5 Lmin)		
	7353 in•lb	831 N•m
Speed at 2250 psi (155 bar) and 3.3 gpm (12.5 Lmin)		
	41 rpm	41 rpm
Displacement/rev	24 in^3	393.3 cm^3
Bidirectional		
Hydraulic motor, vibrator		
Torque at 2,000 psi (138 bar) and 12.5 gpm (47.3 Lmin)		
	399 in•lb	45 N•m
Speed at 2,000 psi (138 bar) and 12.5 gpm (47.3 Lmin)		
	1,560 rpm	1,560 rpm
Displacement/rev	1.48 in^3	24.25 cm^3
Hydraulic motor, boring		
Torque at 2000 psi (138 bar) and 12.5 gpm (47.3 Lmin)		
	5140 in•lb	581 N•m
Speed at 2000 psi (138) and 12.5 gpm (47.3 Lmin)		
	139 rpm	139 rpm
Displacement/rev	18.7 in^3	306.4 cm^3
Filtration:		
	Suction: Strainer with bypass 100 mesh	
	Return: Filter with bypass 10 micron nominal	
Hydraulic cylinders:		
	Function: Steering, plow lift	
	Type: Double acting	

Steering	U.S.	Metric
Power, front wheels, lever controlled		

Fluid Capacities	U.S.	Metric
Fuel tank	9 gal	34 L
Engine lubrication oil, incl. filter	1.5 qt	1.4 L
Vibrator oil	24 oz	710 mL
Hydraulic oil, system	13 gal	49.2 L
Tank	10.5 gal	39.7 L

Battery	U.S.	Metric
BCI Group U1-SAE res. capacity 35 minutes SAE cold crank at 0°F (-18°C) 255 amps (P/N 215-252)		

Optional Equipment	U.S.	Metric
Reel carrier: Maximum reel weight 100 lb (45.4 kg), maximum reel diameter 25 in (635 mm)		
Drilling attachment		

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

WARRANTY

Ditch Witch Equipment and Replacement Parts North American* Limited Warranty Policy

Major Component Limited Warranty

Major components are warranted for a period of 1000 hours of use or one year, whichever occurs first, beginning on date of delivery of any such new product. The Major Component Limited Warranty covers only Major Components listed under Major Component Limited Warranty that are manufactured and distributed by The Charles Machine Works, Inc. (“CMW”). Replacement parts and other serial numbered products (“Products”) that are not listed under Major Component Limited Warranty, and non-major components are covered under Product Limited Warranty.

Major Components are defined as:

- Frames.
- Differentials and parts contained within.
- Mechanical transmissions.
- Drive gearboxes and parts contained within.
- Hydraulic, hydrostatic, and fluid pumps, motors and components that control or protect pumps and motors.
- Auxiliary hydraulic control valves and electrical components used for controlling hydraulic components.
- Hydraulic cylinders and components excluding repair kits.
- Batteries, alternators, instruments, gauges, and protection components for electrical systems.
- Pierce Airrow bodies, strikers, and tailpieces.

Free replacement parts and labor will be provided at any authorized dealership for any part of Major Component which has a defect in material or workmanship within warranty period. Defects will be determined by an inspection of major component or part by CMW or its authorized dealer. The product containing a major component or part must be presented to CMW or its authorized dealer for inspection within 30 days of the date major component or part fails. 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 as it deems appropriate.

* Equipment owners in countries other than U.S., Canada, Mexico, and Puerto Rico should refer to Ditch Witch International Warranty Policy.

Product Limited Warranty

Products are warranted for 90 days from date of delivery of any new product. Free replacement parts and labor will be provided at any authorized dealership for any product which has a defect in material or workmanship within warranty period. Replacement parts are warranted for 90 days from date of delivery of any such replacement part. Any part of a product subject to ground contact is warranted only for defects in material or workmanship and only for the period of operational life of such part, which period shall not in any event exceed 90 days. Defects will be determined by an inspection of the product or part by CMW or its authorized dealer. The product or part must be presented to CMW or its authorized dealer for inspection within 30 days of the date of failure. 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 as it deems appropriate.

Exclusions

from Major Component and Product Limited Warranty

Specifically excluded from Major Component and Product Limited Warranty are:

- Transportation charges related to repair, replacement, or inspection of products, major components, or parts.
- Parts subject to ground contact (including but not limited to drill pipe, downhole tools, digging chain, teeth and sprockets).
- 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).
- 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.

This limited warranty applies to the owner of the product. 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 owner specific legal rights and the 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 revision: 4/99

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

Ditch Witch® Registration Card

Please Type or Print All Information

Purchaser's Company Name

Attention

Street Address or P.O. Box

City County

State Zip Nation

( )

Phone Number With Area Code

Model Serial Number

Attachments/Accessories Serial Numbers

Attachments/Accessories Serial Numbers

Attachments/Accessories Serial Numbers

Name of Ditch Witch Dealership

Your Signature