SERVICE

SERIAL NUMBER

Record serial numbers and date of purchase in spaces provided.

Date of Manufacture:	
Date of Purchase:	
Plow Serial Number	
Engine Serial Number:	

100sx - SERVICE *1*
SERIAL NUMBER

SERVICE

SERIAL NUMBER

Record serial numbers and date of purchase in spaces provided.

Date of Manufacture:	
Date of Purchase:	
Plow 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 Center

At the Ditch Witch Training Center, dealers, customers, and operators review theory and operation and gain hands-on experience. Ditch Witch training personnel also present information on safety and new products. For information about the next seminar, contact your Ditch Witch dealer.

2
100sx - SERVICE
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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.

100sx - FOREWORD **3**

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Operator's Manual
100sx

Issue No.4.0/OP-6/99
Part Number 054-406

4 100sx - FOREWORD

Operator's Manual
100sx

Issue No.4.0/OP-6/99
Part Number 054-406

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by The Charles Machine Works, Inc.,
Perry, Oklahoma


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CONTENTS

100sx - CONTENTS 5

CONTENTS

SERVICE 1
Serial Number 1
Support Procedure 2
Resources 2

FOREWORD 3

CONTENTS 5

OVERVIEW 7

CONTROLS 9
Overview 9
Descriptions 10

SAFETY 13
Accessories 14
Underground Hazards 14
Emergency Procedures 15
Jobsite Classifications 18
Safety Alert Classifications 22
Safety Alerts 23

6 100sx - CONTENTS

OPERATION 29
Inspect Machine 29
Start-up 30
Shutdown 31
Drive 32
Attach and Remove Blade 33
Plow 34

TRANSPORTATION 35
Lift 35
Haul 36
Load 37
Unload 38

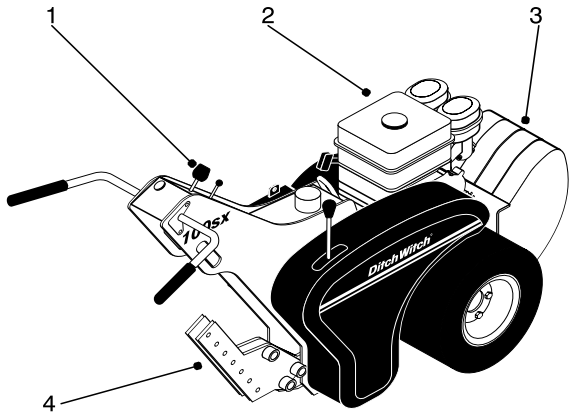
LUBRICATION 39
Overview 40
Hydraulic Oil 41
Chain 41
Engine Oil 42
Wheel Bearings 43

MAINTENANCE 45
Overview 46
Tires and Lugnuts 47
Air Filter Elements 47
Belt Tension 47

SPECIFICATIONS 49

OVERVIEW

The 100SX is a self-propelled, walk-along vibratory plow. The 100SX is powered by a 10 horsepower Honda engine and is designed to operate in a variety of soil conditions with either a pull or feed blade.



om0384h.eps

1. Control panel/operator position
2. Engine
3. Weight assembly
4. Blade mount bracket

100sx - OVERVIEW **7**

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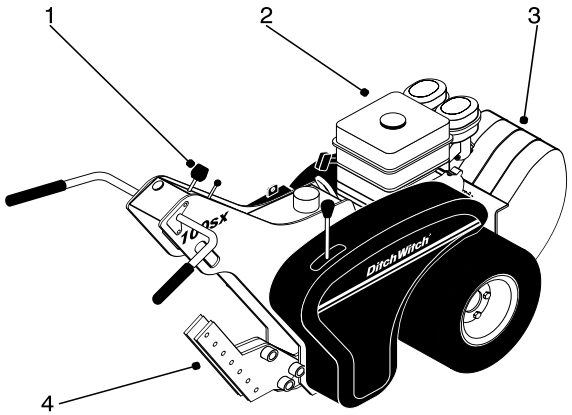

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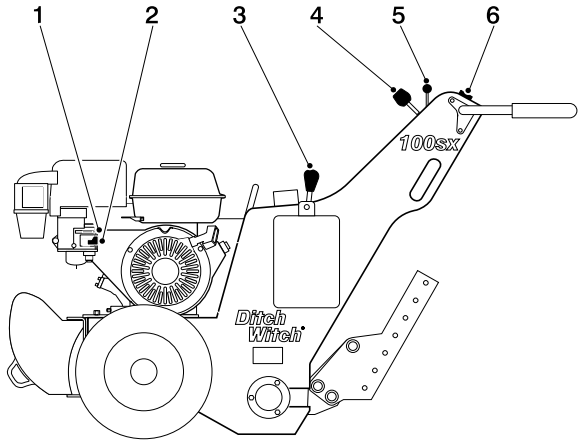
8 100sx - OVERVIEW

CONTROLS

OVERVIEW



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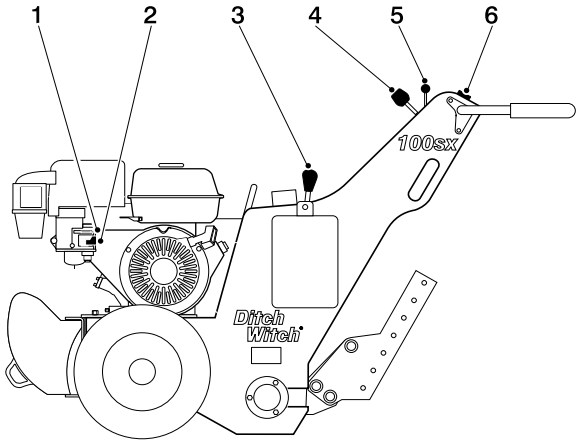
1. Choke
2. Fuel shutoff valve
3. Plow control
4. Speed/direction control
5. Throttle lever
6. Key switch

100sx - CONTROLS 9
OVERVIEW

CONTROLS

OVERVIEW



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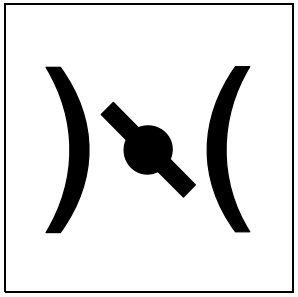
CONTROL DESCRIPTIONS

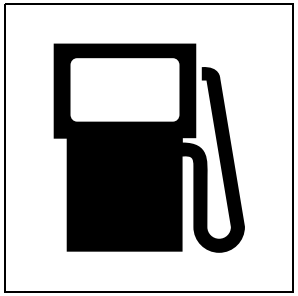
Choke



This control assists in starting cold engine.

- Push lever forward before starting.
- Pull lever back after engine is running.

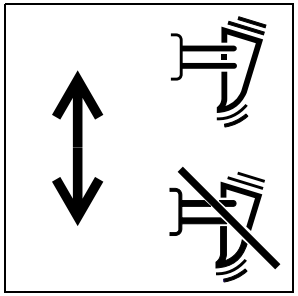
Fuel Shutoff Valve



Controls fuel flow to engine.

- Open to run machine.
- Close when machine is not running.

Plow Control



This lever engages and disengages plow vibrator drive.

- Push forward to engage plow vibrator.
- Pull backward to disengage plow vibrator.

10
100sx - CONTROLS
CONTROL DESCRIPTIONS

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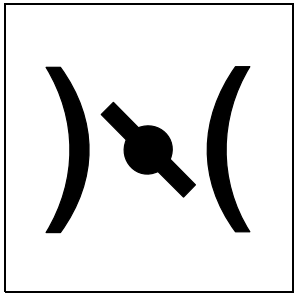
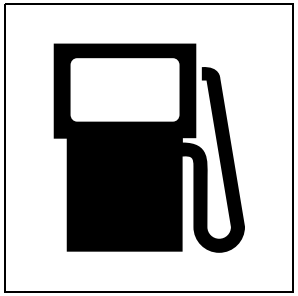
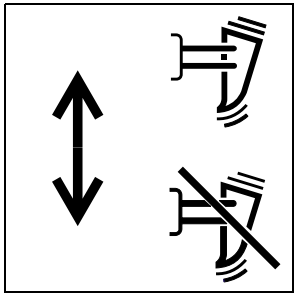
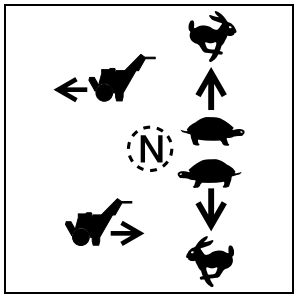






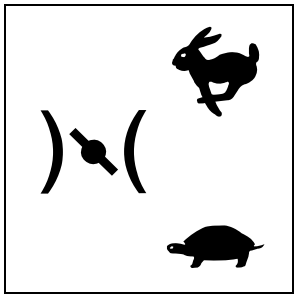
Speed/Direction Control



This lever controls the speed and direction of the ground drive.

- To travel forward, move lever to forward position.
- To travel in reverse, move lever to reverse position. Control automatically returns to neutral position if released in reverse position.
- To go faster in either direction, move control farther from neutral.
- Move control to neutral position to stop movement.

Throttle Lever

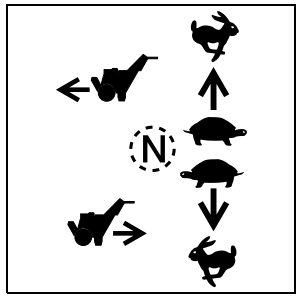


This lever controls engine and vibrator speed when plow is engaged.

- Move lever forward to increase speed.
- Move lever backward to decrease speed.

100sx - CONTROLS 11
CONTROL DESCRIPTIONS

Speed/Direction Control



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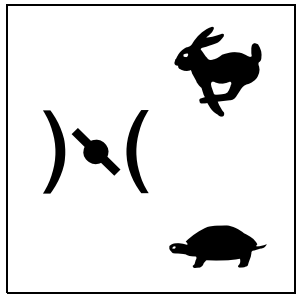

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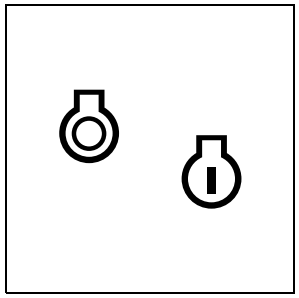
Key Switch



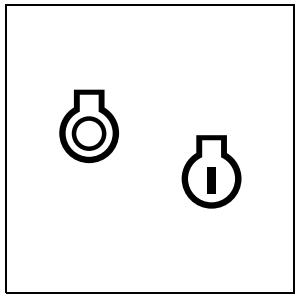
This switch enables engine start.

- Ensure plow control is disengaged.
- Move speed/direction control to neutral position.
- Insert key and turn to on position to enable rope start.
- Turn key to off position to stop engine.

12

100sx - CONTROLS
CONTROL DESCRIPTIONS

Key Switch



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

100sx - SAFETY 13

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ACCESSORIES

Fire Extinguisher

If required, a fire extinguisher should be mounted 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.

Lighting Kit

If you need additional light, plug lighting kit into provided outlet. Contact your Ditch Witch dealer for further information.

UNDERGROUND HAZARDS

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

Hazards include:

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

14 100sx - SAFETY
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EMERGENCY PROCEDURES

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

EMERGENCY SHUTDOWN - Turn ignition switch to stop position or push remote engine stop button.

Electric Strike Description

When working near electric cables, remember the following:

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

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

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

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

100sx - SAFETY **15**
EMERGENCY PROCEDURES

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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.
- Contact utility company to shut off power.
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16
100sx - SAFETY
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If a Gas Line is Damaged

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

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

If a Fiber Optic Cable is Damaged

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

If Machine Catches on Fire

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

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

100sx - SAFETY **17**
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JOBSITE CLASSIFICATION

Inspecting Jobsite

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

18
100sx - SAFETY
JOBSITE CLASSIFICATION

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Selecting a Classification

Jobsites are classified according to underground hazards present.

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

100sx - SAFETY **19**
JOBSITE CLASSIFICATION

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Applying 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.

20 100sx - SAFETY
JOBSITE CLASSIFICATION

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Crystalline Silica (Quartz) Dust Precautions

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

Other Jobsite Precautions

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

100sx - SAFETY *21*
JOBSITE CLASSIFICATION

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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.

22
100sx - SAFETY
SAFETY ALERT CLASSIFICATIONS

SAFETY ALERT CLASSIFICATIONS

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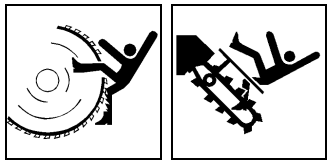
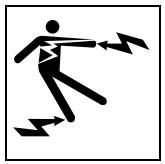
SAFETY ALERTS

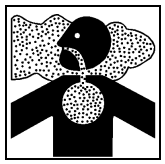


DANGER Moving digging teeth will kill you or cut off arm or leg. Stay away.

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



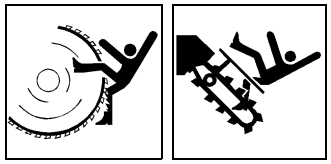
DANGER Electric shock. Contacting electric lines will cause death or serious injury. Know location of lines and stay away.



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

100sx - SAFETY **23**
SAFETY ALERTS

SAFETY ALERTS



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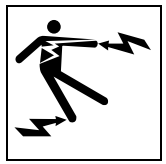

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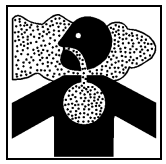

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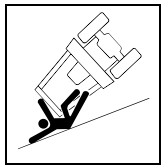
WARNING Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.


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

24
100sx - SAFETY
SAFETY ALERTS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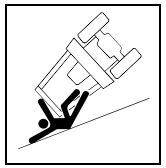
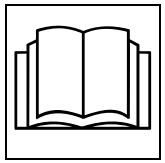
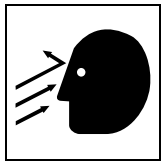


WARNING Rollover possible. If machine rolls over, you could be thrown from seat and killed or crushed. Wear seat belt.

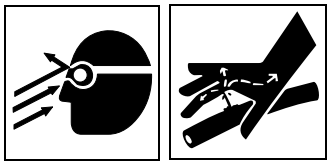
⚠WARNING Explosion possible. Serious injury or equipment damage could occur. Follow directions carefully.



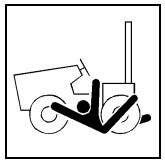
⚠WARNING Incorrect procedures could result in death, injury, or property damage. Learn to use equipment correctly.



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



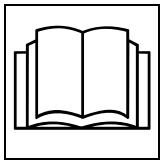
⚠WARNING Fluid or air pressure could pierce skin and cause injury or death. Stay away.



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

100sx - SAFETY **25**
SAFETY ALERTS

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



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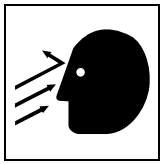

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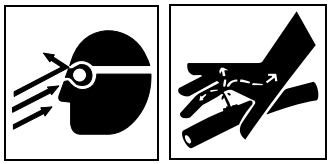

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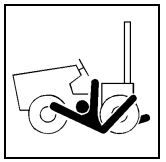
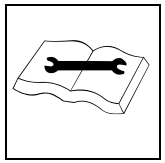


⚠WARNING Runaway possible. Machine could run over you or others. Learn how to use all controls. Start and operate only from operator's position.

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.



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.

26
100sx - SAFETY
SAFETY ALERTS

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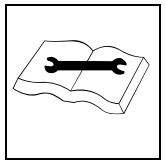

WARNING Improper control function could cause death or serious injury. If control does not work as described in instructions, stop machine and have it serviced.

⚠ 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).

100sx - SAFETY **27**
SAFETY ALERTS

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28 100sx - SAFETY
SAFETY ALERTS

OPERATION

INSPECT MACHINE

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

- General appearance.
- Condition of plow blade, drive belts, and air filter.
- 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 in place.
- Nuts and bolts are tight. Tighten as specified in torque tables in *Parts Manual*.

100sx - OPERATION *29*
INSPECT MACHINE

OPERATION

INSPECT MACHINE

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

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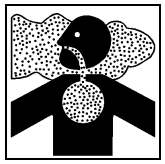
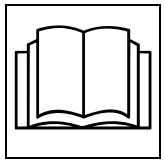
START-UP



⚠ 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. Disengage plow control by moving lever back.
2. Open fuel shutoff valve.
3. Check that speed/direction control (orange) is in neutral position.
4. Move throttle to half open.
5. Close choke to start cold engine.
6. Insert key into switch and turn to on position.

30 100sx - OPERATION
START-UP

START-UP

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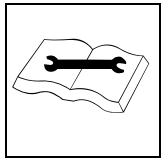
4. Move throttle to half open.
5. Close choke to start cold engine.
6. Insert key into switch and turn to on position.

7. Pull briskly on starter-rope handle at left side of machine.

   If engine does not start after three pulls on rope start, turn key switch to off position and check for fuel blockage or ignition system problems.
8. Check controls for correct operation.
9. After engine has warmed up, return choke to open 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.

EMERGENCY SHUTDOWN: Turn key switch to off position.

SHUTDOWN

1. Move speed/direction control to neutral position.
2. Disengage plow drive by moving plow control lever back.
3. Turn key switch to off position and remove key.
4. Close fuel shutoff valve.

100sx - OPERATION **31**
SHUTDOWN

7. Pull briskly on starter-rope handle at left side of machine.

   If engine does not start after three pulls on rope start, turn key switch to off position and check for fuel blockage or ignition system problems.
8. Check controls for correct operation.
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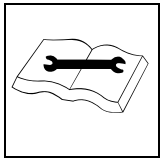

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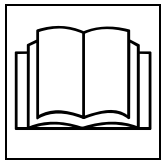
4. Close fuel shutoff valve.

DRIVE



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

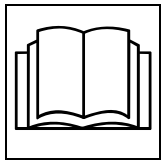
NOTICE: Drive slowly and cautiously at all times.


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

1. Start with speed/direction control in neutral position.
2. Run engine with throttle at low idle.
3. Slowly engage speed/direction control.
4. Adjust drive speed with speed/direction control.
5. To stop, move speed/direction control to neutral position.

32 100sx - OPERATION
DRIVE

DRIVE



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2. Run engine with throttle at low idle.
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5. To stop, move speed/direction control to neutral position.

ATTACH AND REMOVE BLADE

1. Shut off engine, close fuel shutoff valve, and tip machine forward onto weight assembly.
2. Use two blade pins to position blade mounts onto vibrator arm.
3. When attaching blade mount to vibrator arm, pin top hole first. Pivot blade mount to align lower vibrator arm hole with one of lower blade mount holes. Outer hole gives more vertical angle for normal plowing. Hole nearer plow gives steeper blade angle for difficult soil conditions.
4. The plow blade can be adjusted up or down in blade mount. Always install blade pin in lowest hole possible.
5. To remove blade, remove pins holding blade mount to vibrator arm.

100sx - OPERATION 33
ATTACH AND REMOVE BLADE

ATTACH AND REMOVE BLADE

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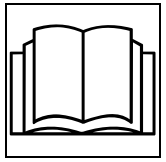
PLOW



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. Follow blade attachment procedure.
3. Feed cable in cable chute or insert material in pulling grip.
4. Open fuel shutoff valve.
5. Tilt machine back onto blade.
6. Start engine and run at high idle.
7. Engage plow control.
8. Lower plow blade to desired depth by pushing down on handlebars until skid-plate touches ground.
9. Slowly move speed/direction control forward to begin plowing.
10. To turn, push down on handlebars to break traction and pivot machine. Concentrate weight on handlebar to outside of turn.
11. When finished plowing, return speed/direction control to neutral position, lift handlebars to clear blade from ground, disengage plow control, and and move throttle to low idle.
12. Follow shutdown procedure.
13. Remove cable from cable chute and follow blade removal procedure.

34 100sx - OPERATION
PLOW

PLOW

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NOTICE: Keep hands on handlebars while operating plow.

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11. When finished plowing, return speed/direction control to neutral position, lift handlebars to clear blade from ground, disengage plow control, and and move throttle to low idle.
12. Follow shutdown procedure.
13. Remove cable from cable chute and follow blade removal procedure.

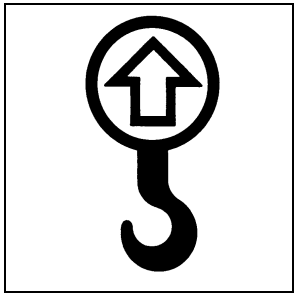
TRANSPORTATION


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

LIFT

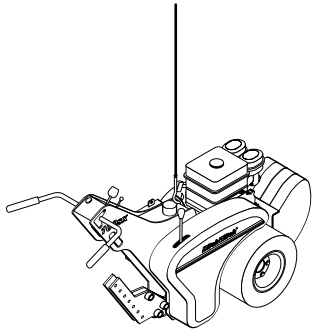
Points

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



Procedure

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



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100sx - TRANSPORTATION 35
LIFT

TRANSPORTATION


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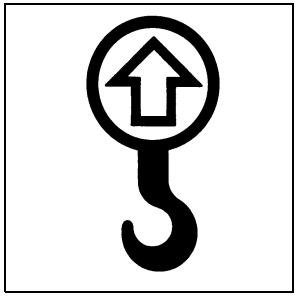

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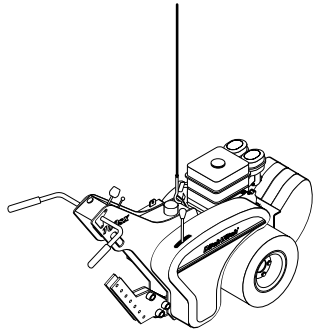

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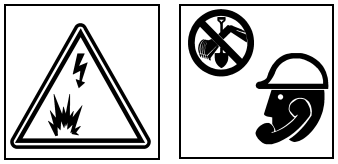
HAUL

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:

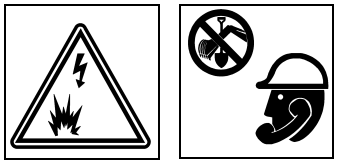
- Park, unload, and load trailer on level part of jobsite.
- To prevent tipping, connect trailer to tow vehicle before loading or unloading.

36 100sx - TRANSPORTATION
HAUL

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. Follow blade removal procedure.
2. Start machine following instructions in **OPERATION**.
3. Move throttle to half open.

EMERGENCY SHUTDOWN: Turn ignition switch to off position.

4. Align machine with ramps or trailer, boom first.
5. Guide machine onto trailer.
6. When tie-down position is reached, move speed/direction control to neutral position.
7. Chain through loop on weight assembly and tightly attach chain tie-down points on bed of trailer or vehicle.

   For machines with serial numbers below 4R0376, chain across weight assembly.
8. Move speed/direction control to reverse position.
9. Reverse machine to tighten front chain.
10. Follow shutdown procedure in **OPERATION**.
11. Place chain through slots below control console, attach chain to tie-down points on bed of trailer or vehicle and tighten chain with binder.

100sx - TRANSPORTATION 37
LOAD

LOAD

1. Follow blade removal procedure.
2. Start machine following instructions in **OPERATION**.
3. Move throttle to half open.

EMERGENCY SHUTDOWN: Turn ignition switch to off position.

4. Align machine with ramps or trailer, boom first.
5. Guide machine onto trailer.
6. When tie-down position is reached, move speed/direction control to neutral position.
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9. Reverse machine to tighten front chain.
10. Follow shutdown procedure in **OPERATION**.
11. Place chain through slots below control console, attach chain to tie-down points on bed of trailer or vehicle and tighten chain with binder.

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.

38 100sx - TRANSPORTATION
UNLOAD

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.

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** section.

Recommended Lubricants	
GEO	Gasoline engine oil (see oil temperature chart for appropriate SAE weight) meeting API engine service classification SD
MPG	Multipurpose grease
THF	Tractor hydraulic fluid, similar to Phillips 66 HG, Mobilfluid 423, Chevron Tractor Hydraulic Fluid, Texaco TDH Oil, or equivalent
CL	Chain lubricant

sf1027

⚠ 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.

100sx - LUBRICATION **39**
UNLOAD

LUBRICATION

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

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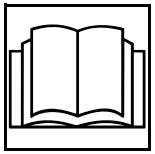
CL	Chain lubricant



sf1027

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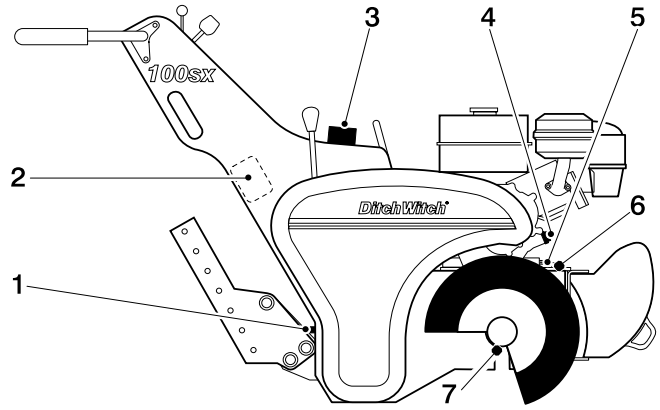
OVERVIEW



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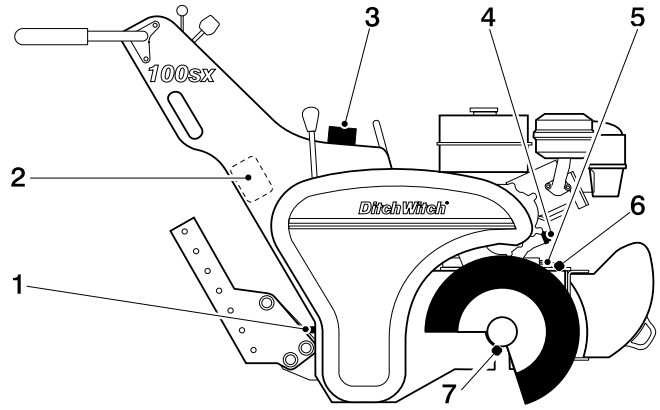
Interval	Task	Ref.	Lubricant
10 hours	Check hydraulic oil	3	THF
	Check engine oil	4	GEO
25 hours	Lube chain	6	CL
50 hours	Change engine oil	4,5	GEO
150 hours	Change hydraulic oil and filter	1,2,3	THF
	Lube wheel bearings	7	MPG

40 100sx - LUBRICATION
OVERVIEW

OVERVIEW



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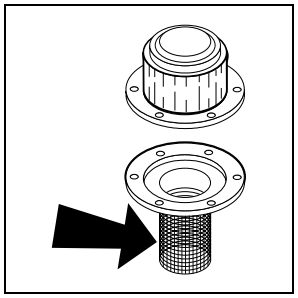
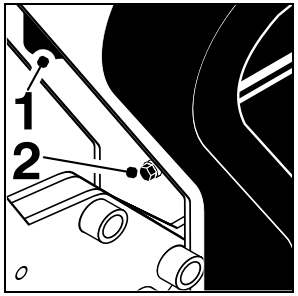
HYDRAULIC OIL



Check
Check hydraulic oil at filler/breather cap every 10 hours. Oil level should be at bottom of strainer screen when cool. Add THF if needed.



Change
Change hydraulic oil and filter every 150 hours. Drain oil at plug (2) located behind the plow mount. Replace drain plug.

Change hydraulic oil filter (1) located above drain plug.

Fill to bottom of strainer screen with THF.

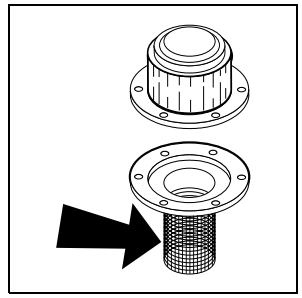
CHAIN

Lube chain every 25 hours with CL.

Access chain through hole in front of engine.

100sx - LUBRICATION 41
HYDRAULIC OIL

HYDRAULIC OIL



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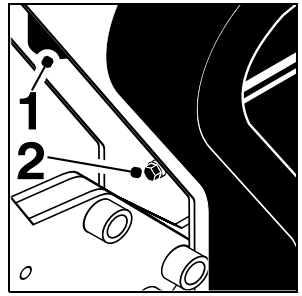


Change
Change hydraulic oil and filter every 150 hours. Drain oil at plug (2) located behind the plow mount. Replace drain plug.

Change hydraulic oil filter (1) located above drain plug.

Fill to bottom of strainer screen with THF.

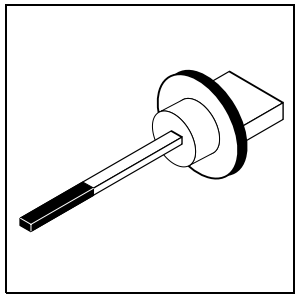
CHAIN

Lube chain every 25 hours with CL.

Access chain through hole in front of engine.

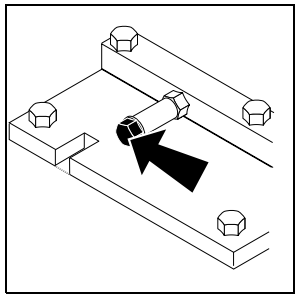
ENGINE OIL

Check
Check engine oil at filler cap/ dipstick. Oil should be at level indicated on dipstick. Add GEO if needed. Consult "Engine Oil Temperature Chart" for oil specifications.

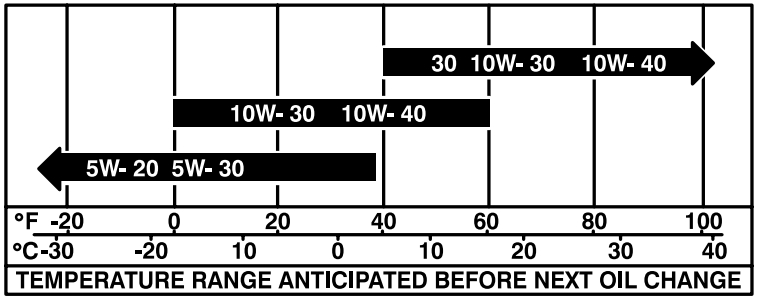


Change
Change engine oil every 50 hours. To drain oil remove drain plug at front of engine.

Replace drain plug, fill with GEO, and replace filler cap/dipstick.



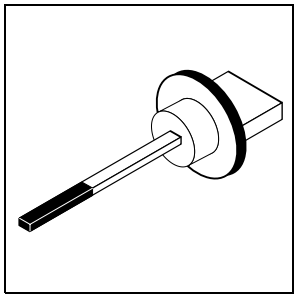
Engine Oil Temperature Chart



42 100sx - LUBRICATION
ENGINE OIL

ENGINE OIL

Check
Check engine oil at filler cap/ dipstick. Oil should be at level indicated on dipstick. Add GEO if needed. Consult "Engine Oil Temperature Chart" for oil specifications.



Change
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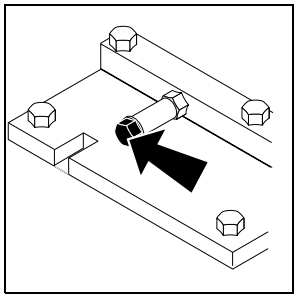
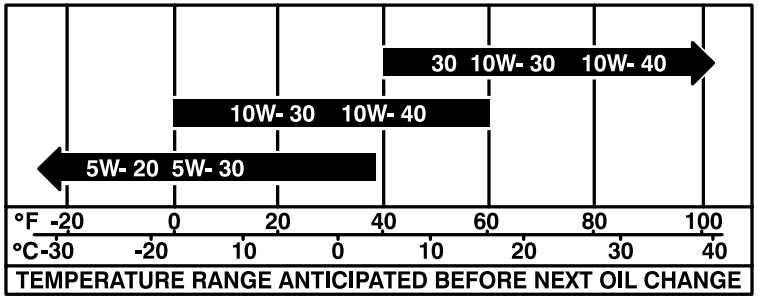
Replace drain plug, fill with GEO, and replace filler cap/dipstick.

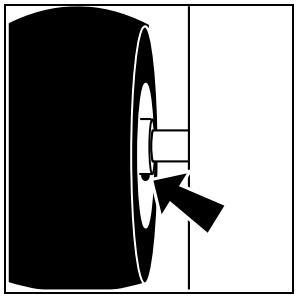


Engine Oil Temperature Chart



WHEEL BEARINGS

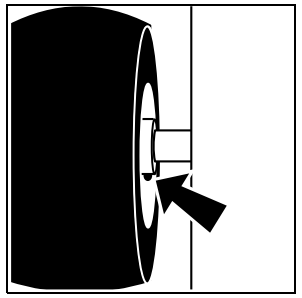
Lube zerk every 150 hours with MPG.



100sx - LUBRICATION 43
WHEEL BEARINGS

WHEEL BEARINGS

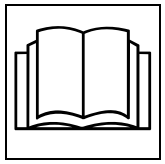
Lube zerk every 150 hours with MPG.



44 100sx -

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 manufacturerÕs manual for engine maintenance instructions.

100sx - MAINTENANCE 45

MAINTENANCE

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NOTICES:

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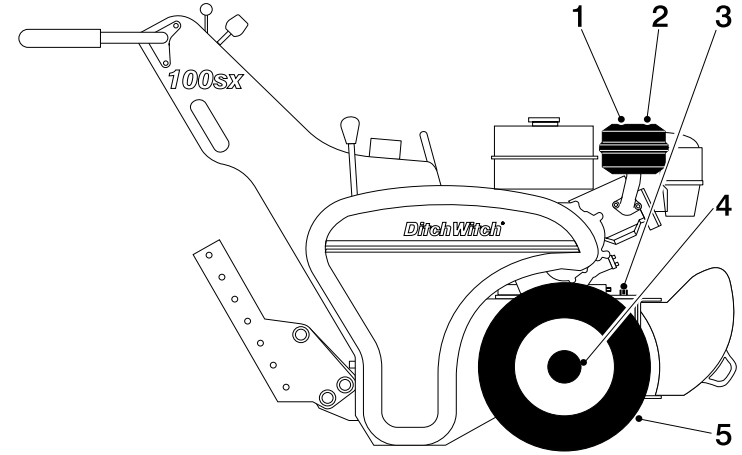
OVERVIEW



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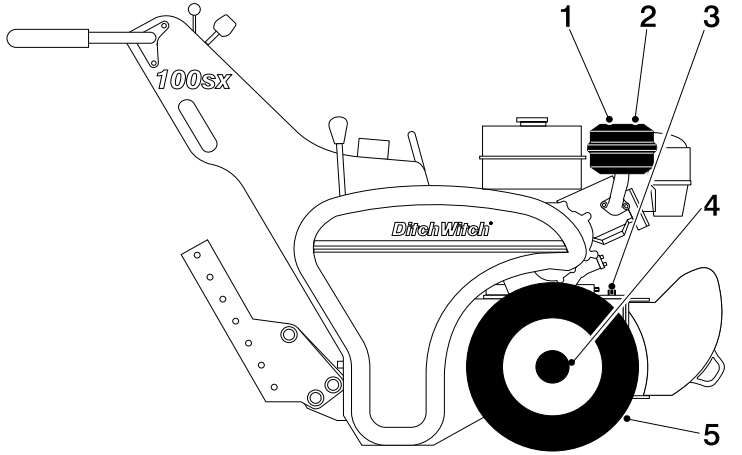
Interval	Task	Ref.
10 hours	Check tires and lugnuts	5,4
25 hours	Clean foam air filter element	2
100 hours	Change paper air filter element	1
As needed	Clean feed chute on plow blade	
	Adjust belt tension	3

46 100sx - MAINTENANCE
OVERVIEW

OVERVIEW



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TIRES AND LUGNUTS

Check tires every 10 hours for proper inflation. Use an accurate pressure gauge. Maintain air pressure at 15 psi (10.3 kPa). Tighten lugnuts to 32 ft¥lb (43.2 N¥m).

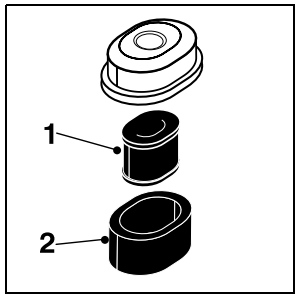
For machines with serial numbers below 4R0376, tighten castle nut firmly, then align castle nut slot with pin hole and insert cotter pin. If wheel will not turn without binding, loosen nut to next slot that aligns with hole. Reinstall cotter pin.

AIR FILTER ELEMENTS

Wash foam element (2) every 25 hours in high flashpoint solvent.

NOTICE: Do not use gasoline or low flashpoint solvent for cleaning. They are flammable and are explosive under certain conditions.

Change paper element (1) every 100 hours.



BELT TENSION

As needed, adjust belt tension by loosening four engine mounting bolts. Move engine forward to increase belt tension or backward to reduce tension.

100sx - MAINTENANCE 47
TIRES AND LUGNUTS

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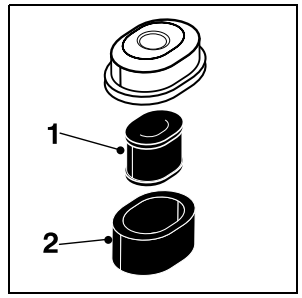

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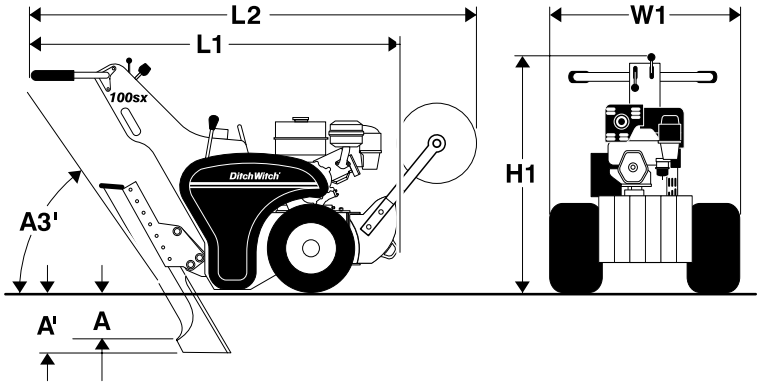
48 100sx - MAINTENANCE

SPECIFICATIONS



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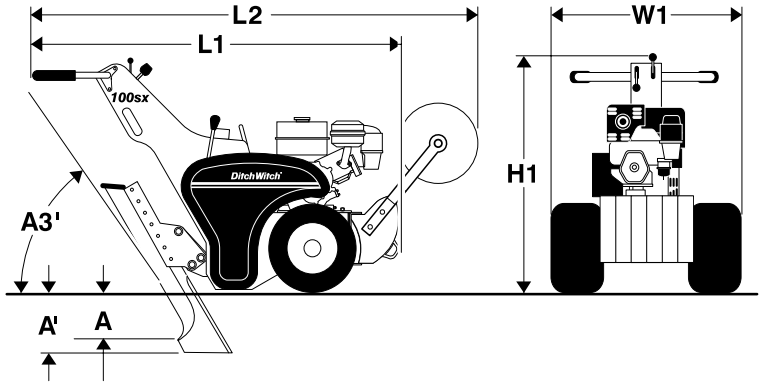
DIMENSIONS		U.S.	METRIC
H1	Operating height	41 in	104 cm
A3Õ	Angle of departure without blade	50û	50û
L1	Maximum length without reel carrier	70 in	178 cm
L2	Maximum length with reel carrier	86.5 in	220 cm
W1	Plow vehicle width	35 in	89 cm
AÕ	Maximum depth	13 in	33 cm
A	Maximum cover depth	12 in	30 cm
GENERAL			
Ditch Witch Model 100SX, self-propelled, non-riding, hydrostatic, two-wheel drive, vibratory plow. Pull and feed blades available. Ground drive is through rubber tires.			

OPERATION	U.S.	METRIC
Maximimum crowd speed forward	92 fpm	28 m/min
Maximum crowd speed reverse	92 fpm	28 m/min

SPECIFICATIONS



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OPERATION	U.S.	METRIC
Maximimum crowd speed forward	92 fpm	28 m/min
Maximum crowd speed reverse	92 fpm	28 m/min

OPERATION	U.S.	METRIC
Vehicle clearance circle	70 in	178 cm
Plow blade sizes		
Pull blades (cover depth x mole diameter)	6-12 x .75 in	152-305 x 19 mm
Feed blades (tube diameter x cover depth (bend radius)	.375 x 6-12 (1) in	9 x 152-305 (25) mm
Operating weight	720 lb	327 kg
Operator orientation: facing front of vehicle		
Vibration	47.9 ft/s^2	14.6 m/s^2
ENGINE		
Honda GX340 gasoline engine		
Cooling medium: air		
Number of cylinders: one		
Displacement	20.6 in^3	337 cm^3
Bore	3.22 in	82 mm
Stroke	2.52 in	64 mm
Engine manufacturerÕs gross horsepower rating @ 3600 rpm	11 hp	8.2 kW
*Maximum governed speed as installed (no load)	3400 rpm	3400 rpm
Flywheel power @ 3400 rpm (full load)	10.2 hp	7.5 kW
Fuel consumption @ 3600 rpm	0.89 gph	3.4 L/h
**Maximum tilt angle	20û	20û
*All warranty is void if engine is run above maximum governed speed as installed (no load) **Exceeding these operating angles will cause engine damage. This DOES NOT imply machine is stable to maximum angle of safe engine operation.		

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Pull blades (cover depth x mole diameter)	6-12 x .75 in	152-305 x 19 mm
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**Maximum tilt angle	20û	20û
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POWER TRAIN	U.S.	METRIC
Transmission: Hydrostatic, infinitely variable forward and reverse, 3:1 chain drive from motor to axle		
Tires: 18 x 11-8, 3-ply		
Drive line system: belts and sheaves		
Vibratory mechanism: eccentric shaft		
HYDRAULIC SYSTEM		
Ground drive pump capacity @ 3600 rpm, relief valve setting @ 2,000 psi	2.2 gpm	8.3 L/min
Ground drive pump displacement/revolution	.223 in^3	.556 cm^3
Ground drive motor displacement/revolution	9.6 in^3	157 cm^3
Directional control valve type: open center		
Delivery capacity	10 gpm	37.8 L/min
System relief valve setting	2500 psi	17 237 kPa
FLUID CAPACITIES		
Fuel tank	1.7 gal	6.5 L
Engine oil	2.3 pt	1.1 L
Hydraulic system	3.5 gal	13.2 L

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 shown.

100sx - SPECIFICATIONS **51**

POWER TRAIN	U.S.	METRIC
Transmission: Hydrostatic, infinitely variable forward and reverse, 3:1 chain drive from motor to axle		
Tires: 18 x 11-8, 3-ply		
Drive line system: belts and sheaves		
Vibratory mechanism: eccentric shaft		
HYDRAULIC SYSTEM		
Ground drive pump capacity @ 3600 rpm, relief valve setting @ 2,000 psi	2.2 gpm	8.3 L/min
Ground drive pump displacement/revolution	.223 in^3	.556 cm^3
Ground drive motor displacement/revolution	9.6 in^3	157 cm^3
Directional control valve type: open center		
Delivery capacity	10 gpm	37.8 L/min
System relief valve setting	2500 psi	17 237 kPa
FLUID CAPACITIES		
Fuel tank	1.7 gal	6.5 L
Engine oil	2.3 pt	1.1 L
Hydraulic system	3.5 gal	13.2 L

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 shown.

52 100sx - SPECIFICATIONS

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.

100sx - WARRANTY 53

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.

54 100sx - WARRANTY

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.

100sx - WARRANTY 55

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.

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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

56 100sx - WARRANTY

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)

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO 23 PERRY OKLAHOMA

POSTAGE WILL BE PAID BY

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

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

Ditch Witch® Registration Card

Please Type or Print All Information

Purchaser's Company Name

Attention

Street Address or P.O. Box

City County

State Zip Nation

( )

Phone Number With Area Code

Model Serial Number

Attachments/Accessories Serial Numbers

Attachments/Accessories Serial Numbers

Attachments/Accessories Serial Numbers

Name of Ditch Witch Dealership

Your Signature

Ditch Witch® Registration Card

Please Type or Print All Information

Purchaser's Company Name

Attention

Street Address or P.O. Box

City County

State Zip Nation

( )

Phone Number With Area Code

Model Serial Number

Attachments/Accessories Serial Numbers

Attachments/Accessories Serial Numbers

Attachments/Accessories Serial Numbers

Name of Ditch Witch Dealership

Your Signature

100sx - 59