
Overview

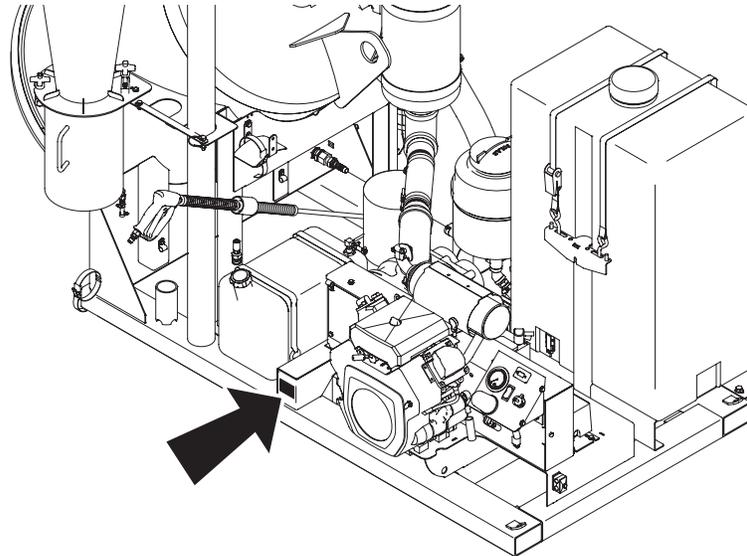


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Serial Number Location

Record serial numbers and date of purchase in spaces provided. FX20 serial number is located as shown.



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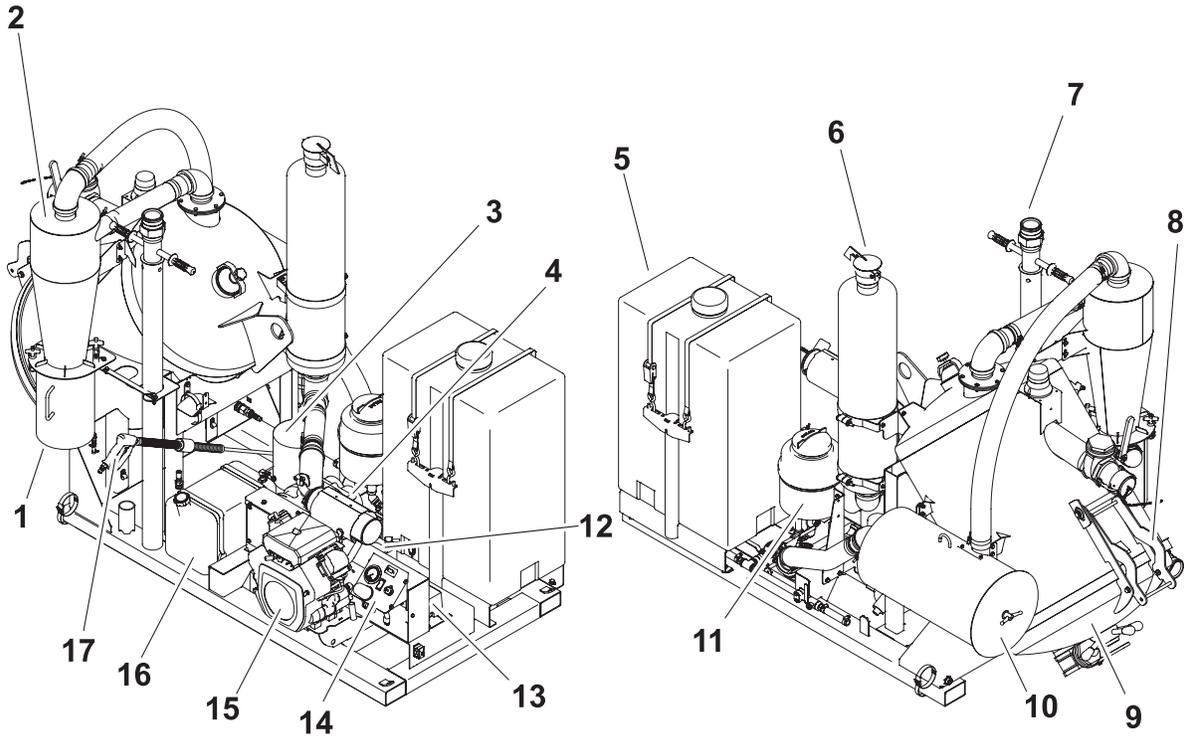
| | |
|----------------------------|--|
| Date of manufacture | |
| Date of purchase | |
| FX20 serial number (shown) | |
| Engine serial number | |
| Blower serial number | |
| Water pump serial number | |
| Trailer serial number | |

Intended Use

The FX20 is a self-contained vacuum excavation unit capable of vacuuming a wide variety of non-hazardous, non-flammable liquid and solid debris. It is designed to perform efficient soft excavation, including exposing utilities for visual verification and/or potholing, and is intended for operation in ambient temperatures from 0° to 115°F (-18° to 46°C). Use in any other way is considered contrary to the intended use.

The FX20 should be operated, serviced, and repaired only by persons familiar with its particular characteristics and acquainted with the relevant safety procedures.

Unit Components



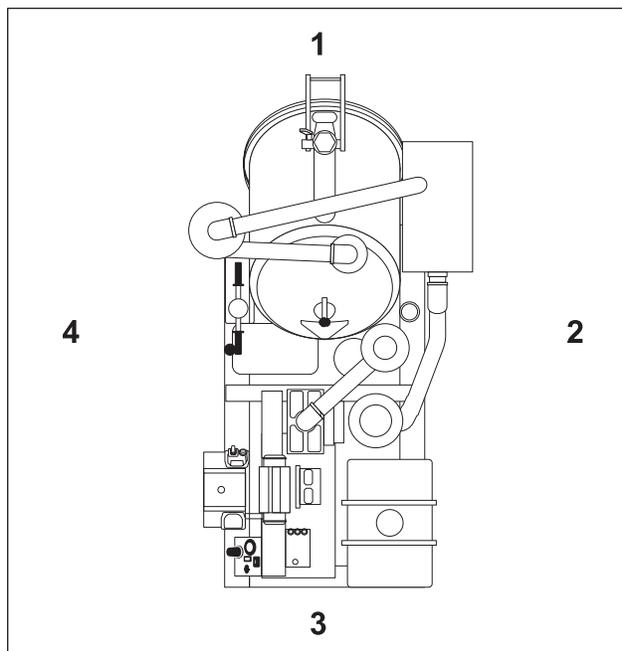
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- | | |
|------------------------------|------------------------|
| 1. Cyclonic filter reservoir | 10. Vacuum filter |
| 2. Cyclonic filter | 11. Antifreeze tank |
| 3. Air pre-filter | 12. Battery |
| 4. Blower | 13. Water pump |
| 5. Water tank | 14. Operator's station |
| 6. Blower silencer | 15. Engine |
| 7. Potholing tools | 16. Fuel tank |
| 8. Door prop | 17. Wash wand |
| 9. Vacuum tank | |

Operator Orientation

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

Right and left sides of machine are determined by facing towing vehicle.



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About This Manual

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

Bulleted Lists

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

Numbered Lists

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

Foreword



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

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

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

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

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

Thank you for buying and using Ditch Witch equipment.

Reporting Safety Defects (Trailer-Mounted Units)

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying the Product Safety Coordinator at The Charles Machine Works, Inc.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in any individual problems between you, your Ditch Witch dealer, or The Charles Machine Works, Inc.

To contact NHTSA you may either call the Auto Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153), go to <http://www.safercar.gov>, or write to:

Administrator
NHTSA
1200 New Jersey Avenue S.E.
Washington, DC 20590

You can also obtain other information about motor vehicle safety from <http://www.safercar.gov>.

**FX20
Operator's Manual**

Issue number 1.1/OM-6/08

Part number 053-1270

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U.S. patents pending.

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Service Record

a record of major service performed on the machine

Safety

Chapter Contents



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Guidelines

Follow these guidelines before operating any jobsite equipment:

- Complete proper training and read operator's manual before using equipment.
- Contact your local One-Call (811 in USA) or the One-Call referral number (888-258-0808 in USA and Canada) to have underground utilities located before digging. Also contact any utilities that do not participate in the One-Call service.
- Classify jobsite based on its hazards and use correct tools and machinery, safety equipment, and work methods for jobsite.
- Mark jobsite clearly and keep spectators away.
- Wear personal protective equipment.
- Review jobsite hazards, safety and emergency procedures, and individual responsibilities with all personnel before work begins. Safety videos are available from your Ditch Witch dealer.
- Replace missing or damaged safety shields and safety signs.
- Use equipment carefully. Stop operation and investigate anything that does not look or feel right.
- Do not operate unit where flammable gas may be present.
- Contact your Ditch Witch dealer if you have any question about operation, maintenance, or equipment use.

Safety Alert Classifications

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



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

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

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

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

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

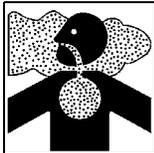
NOTICE can keep you from doing something that might damage the machine or someone's property. It can also alert you against unsafe practices.

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

Safety Alerts



⚠ DANGER 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.



⚠ DANGER Confined space will cause suffocation. Use proper procedures for entering or stay away.



⚠ DANGER Vacuum will suffocate. Maintain distance between face and vacuum inlets.



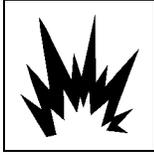
⚠ WARNING Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.



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



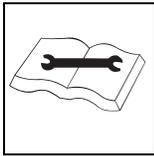
⚠ WARNING Moving parts could cut off hand or foot. Stay away.



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



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



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



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





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



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



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



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



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



⚠ CAUTION Battery acid may cause burns. Avoid contact.



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

Emergency Procedures



⚠ WARNING

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



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

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

Electric Strike Description



⚠ DANGER

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

When working near electric cables, remember the following:

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

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

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

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

If an Electric Line is Damaged

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

- Warn people nearby that an electric strike has occurred. Instruct them to leave the area and contact utility.
- Do not allow anyone into area until given permission by utility company.
- Do not allow anyone to touch equipment.

If you suspect an electric line has been damaged and you are **off truck or trailer**, DO NOT TOUCH EQUIPMENT. Take the following actions. The order and degree of action will depend on the situation.

- LEAVE AREA.
- Contact utility company to shut off power.
- Do not return to area or allow anyone into area until given permission by utility company.

If a Gas Line is Damaged



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



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



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

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

If a Fiber Optic Cable is Damaged

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

If Machine Catches on Fire

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

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

Controls

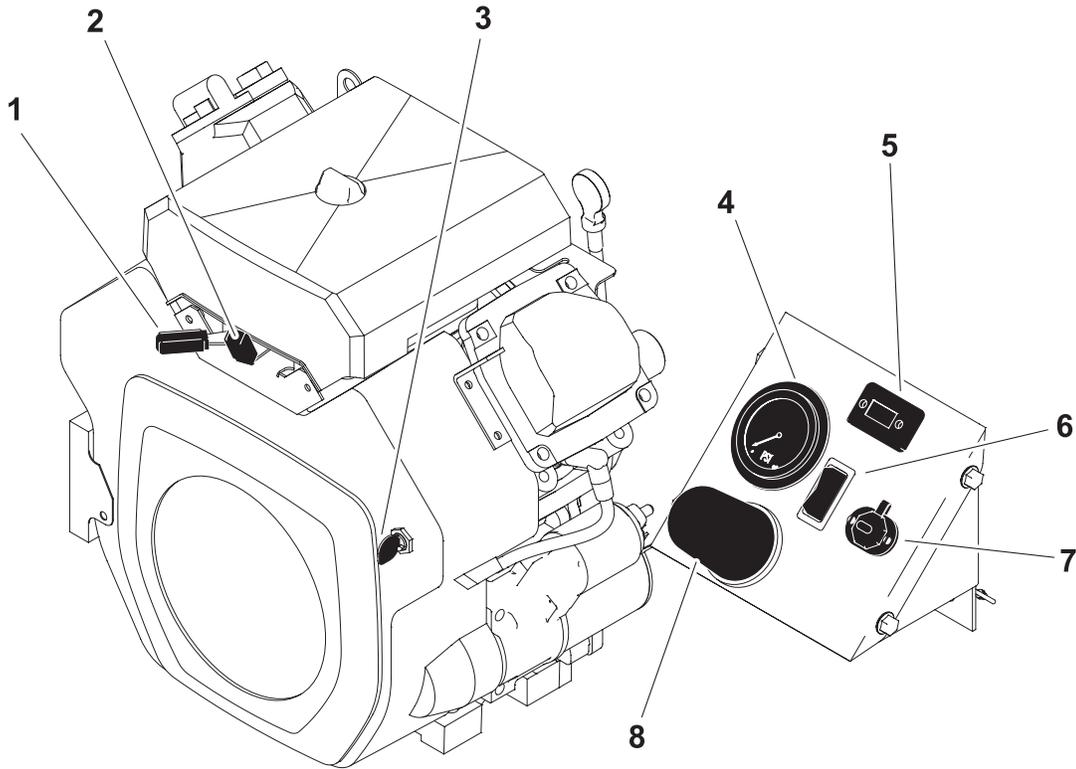
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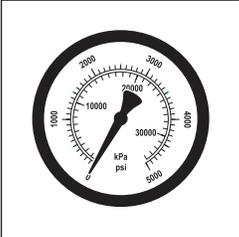
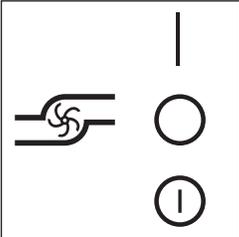
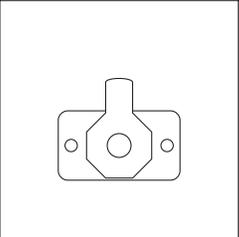
Engine/Operator's Station



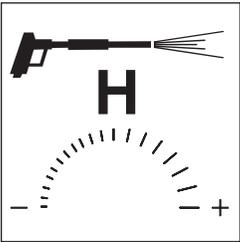
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|-------------------------|---------------------------|
| 1. Throttle | 5. Hourmeter |
| 2. Choke | 6. Water pump switch |
| 3. Ignition switch | 7. Auxiliary outlet |
| 4. Water pressure gauge | 8. Water pressure control |

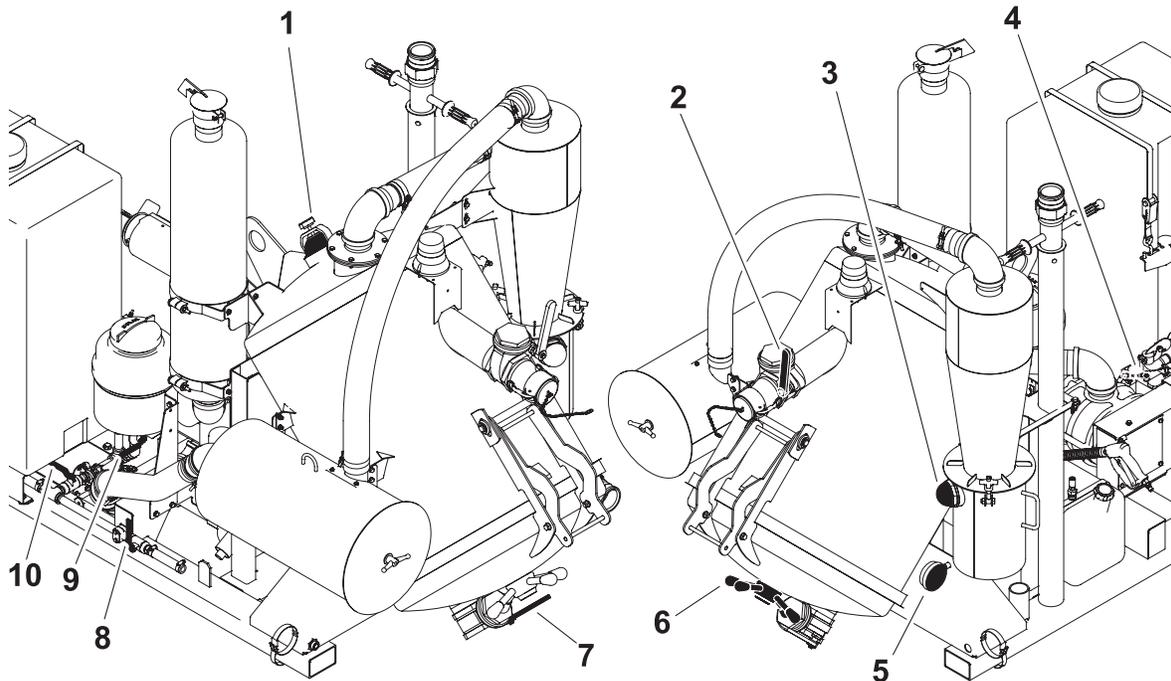
| Item | Description | Notes |
|-------------|---|---|
| 1. Throttle | To increase engine speed, move left. To decrease engine speed, move right. | NOTICE: Set engine speed to full throttle before turning off engine. |
| 2. Choke | To choke cold engine, move left. To operate normally, move right. | |

| Item | Description | Notes |
|--|---|---|
| <p>3. Ignition switch</p> | <p>To start engine, insert key and turn clockwise.</p> <p>To stop engine, turn key counterclockwise.</p> | <p>IMPORTANT: When engine is on, blower operates and vacuum is present at tank inlet.</p> <p>NOTICE: Set engine speed to full throttle before turning off engine.</p> |
| <p>4. Water pressure gauge</p>  <p>c00ic522h.eps</p> | <p>Displays water pressure when water pressure switch is on and water lance is in use.</p> | |
| <p>5. Hourmeter</p> | <p>Displays engine operating time.</p> | <p>Hourmeter runs when ignition switch is on.</p> <p>Use these times to schedule service.</p> |
| <p>6. Water pump switch</p>  <p>c00ic520h.eps</p> | <p>To turn on water pump, press top.</p> <p>To turn off water pump, move to center position.</p> <p>To bypass low water indication, press bottom.</p> | <p>Use bypass to feed antifreeze into system when freshwater tank is empty. See "Add Antifreeze" on page 52.</p> |
| <p>7. Auxiliary outlets</p>  <p>c00ic140h.eps</p> | <p>To operate work lights or other 12V devices, plug into outlet.</p> | <p>Outlet has power only when ignition switch is on.</p> |



| Item | Description | Notes |
|---|--|-------|
| <p>8. Water pressure control</p>  <p><small>c00ic521h.eps</small></p> | <p>To increase water pressure, turn clockwise.</p> <p>To decrease water pressure, turn counterclockwise.</p> | |

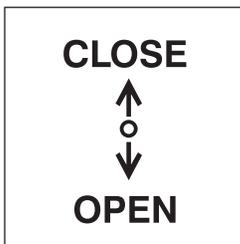
Machine Controls



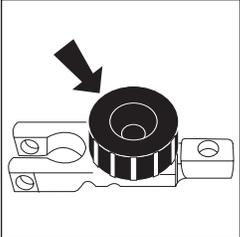
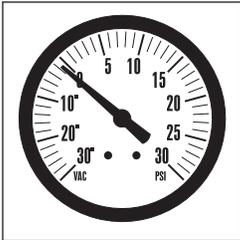
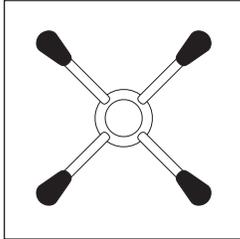
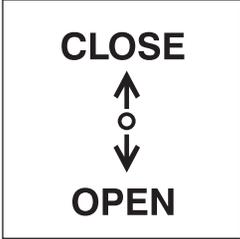
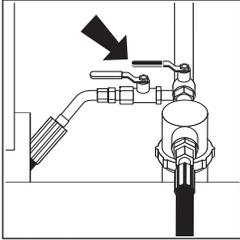
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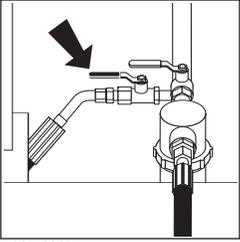
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| <ul style="list-style-type: none"> 1. Debris tank sight glass 2. Inlet valve 3. Cyclonic filter sight glass 4. Battery disconnect switch 5. Vacuum gauge | <ul style="list-style-type: none"> 6. Tank door handle 7. Drain valve 8. Water tank drain valve 9. Antifreeze tank supply valve 10. Water tank supply valve |
|---|--|

| Item | Description | Notes |
|--------------------------------|---|-------|
| 1. Debris tank sight glass | | |
| 2. Inlet valve | <p>To close valve (stop suction), rotate up.</p> <p>To open valve (start suction), rotate down.</p> | |
| 3. Cyclonic filter sight glass | | |



c00ic127h.eps

| Item | Description | Notes |
|---|---|--|
| <p>4. Battery disconnect switch</p>  <p>c00ic143h.eps</p> | <p>To connect, turn clockwise.</p> <p>To disconnect, turn counterclockwise.</p> | <p>IMPORTANT: Use battery disconnect switch when servicing, welding, and during long-term storage.</p> |
| <p>5. Vacuum gauge</p>  <p>c00ic131h.eps</p> | <p>Displays blower vacuum reading in inches of mercury. Vacuum relief valve opens when vacuum reaches 15" (381 mm).</p> | |
| <p>6. Tank door handle</p>  <p>c00ic176h.eps</p> | <p>To close tank door, turn clockwise several times.</p> <p>To open tank door, turn counterclockwise several times.</p> | <p>IMPORTANT: Do not push on door when closing with handle.</p> |
| <p>7. Drain valve</p>  <p>c00ic127h.eps</p> | <p>To drain tank, rotate down.</p> <p>To close drain, rotate up.</p> | |
| <p>8. Water tank supply valve</p>  <p>c00ic130h.eps</p> | <p>To open valve (send water from the water tank through the pump and water lance), rotate counterclockwise.</p> <p>To close valve (stop water flow), rotate clockwise.</p> | <p>IMPORTANT: Water tank supply valve or antifreeze supply valve must be open when pump is running or pump will be damaged.</p> |

| Item | Description | Notes |
|--|---|---|
| <p>9. Antifreeze tank supply valve</p>  <p>c00ic129h.eps</p> | <p>To open valve (send antifreeze through pump and water lance), rotate counterclockwise.</p> <p>To close valve (stop antifreeze flow), rotate clockwise.</p> | <p>IMPORTANT:</p> <ul style="list-style-type: none"> • Water tank supply valve or antifreeze supply valve must be open when pump is running or pump will be damaged. • Close supply valve when using antifreeze valve. |
| <p>10. Water tank drain valve</p> | <p>To drain tank, open valve.</p> <p>Close valve when tank is empty.</p> | |



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Planning

1. Gather information about jobsite (page 32).
2. Inspect jobsite (page 33).
3. Check supplies and prepare equipment (page 35).

Setting Up at Jobsite

1. Prepare jobsite (page 34).
2. Position vacuum excavation unit.
3. Leave unit hitched to towing vehicle or properly stabilized if trailer-mounted unit.
4. Block trailer wheels if trailer-mounted unit.

Vacuuming

1. Connect hoses (page 44).
2. Start unit (page 44).
3. Remove debris (page 45).
4. Disconnect hoses.
5. Drain tank (page 48).

Potholing

1. Connect hoses (page 44).
2. Start unit (page 44).
3. Pothole (page 46).
4. Disconnect hoses.
5. Drain tank (page 48).

Leaving Jobsite

1. Rinse unit and tools (page 53).
2. Stow tools (page 53).

Storing Equipment

1. For cold weather storage, antifreeze vacuum excavation unit (page 52).
2. For long-term storage, disconnect battery disconnect switch (page 23).



Prepare

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Gather Information

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

Arrange for Traffic Control

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

Prepare for Working Near Existing Utilities

If jobsite may contain electrical lines, wear protective boots and gloves meeting the following standards:

- Boots must have high tops and meet the electric hazard protection requirements of ANSI Z-41, 1991, when tested at 14,000 volts. Tuck legs of pants completely inside boots.
- Gloves must have 17,000 AC maximum use voltage, according to ASTM specification D120-87.

If working around higher voltage, use gloves and boots with appropriately higher ratings.

Plan for Emergency Services

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

Inspect Jobsite

- Follow U.S. Department of Labor regulations on excavating and trenching (Part 1926, Subpart P) and other similar regulations.
- Contact your local One-Call (811 in USA) or the One-Call referral number (888-258-0808 in USA and Canada) to have underground utilities located before working. Also contact any utilities that do not participate in the One-Call service.
- Inspect jobsite and perimeter for evidence of underground hazards, such as:
 - “Buried utility” notices
 - Utility facilities without overhead lines
 - Gas or water meters
 - Junction boxes
 - Drop boxes
 - Light poles
 - Manhole covers
 - Sunken ground
- Mark location of all buried utilities and obstructions.



Prepare Jobsite

**WARNING**

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

NOTICE:

- If jobsite classification is in question or if the possibility of unmarked electric utilities exists, classify jobsite as electric.
- Cutting high voltage cable can cause electrocution. Expose lines by hand before using unit.
- All vegetation near operator's station must be removed. Contact with trees, shrubs, or weeds during electrical strike could result in electrocution.

Prepare Excavation Point

- Clear the area to be excavated. Remove rocks or branches too large for vacuum hose.
- If excavating fluids while drill string is moving, clear area of trees, shrubs, and weeds.
- Select a solid area to stand on while excavating.

Check Supplies and Prepare Equipment

Assemble Accessories

Fire Extinguisher

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

Lighting Kit

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

Check Supplies

- water and additional hoses
- fuel
- keys
- spray lubricant
- personal protective equipment, such as hard hat and safety glasses



Prepare Equipment

Fluid Levels

- fuel
- battery
- engine oil
- blower oil

Condition and Function

- filters (air, oil)
- belts
- blower
- tires
- hoses and valves
- couplers and fittings
- water tanks
- trailer parking brake (trailer-mounted unit)

Transport

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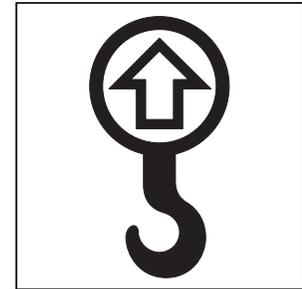
Lift



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

Points

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

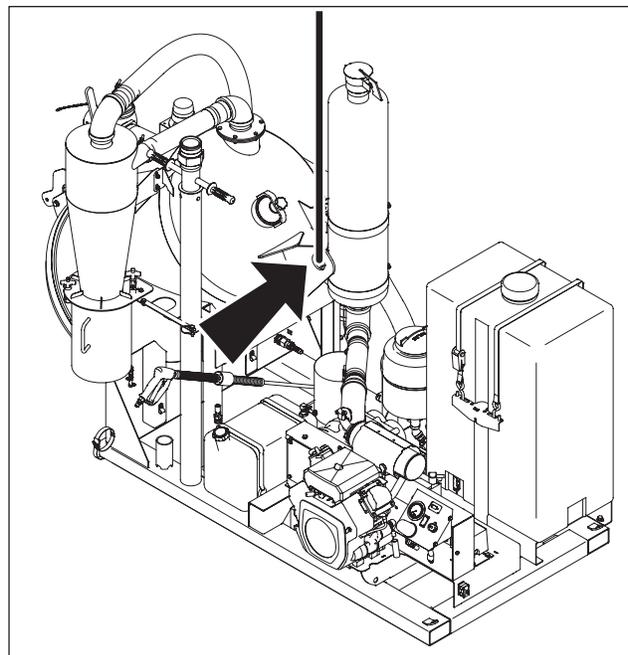


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Procedure

Use a crane capable of supporting the equipment's size and weight. See "Specifications" on page 81 or measure and weigh equipment before lifting. Use top lift point as shown.

IMPORTANT: Lift unit only when debris and water tanks are empty.

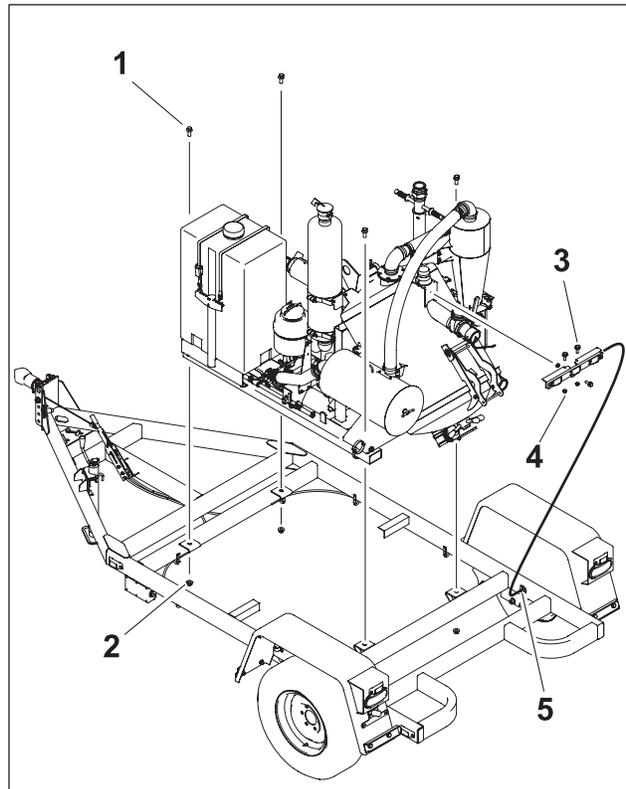


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Attach Skid to Trailer

Bolt skid to S4S trailer at 4 locations. Use bolt and nut (1,2) to secure. Tighten to 200-225 ft•lb (270-305 N•m). Install light strip to rear of tank using bolts and nuts (3,4). Connect wiring harness from light strip to connector (5).

IMPORTANT: See parts manual for correct bolt size and grade.

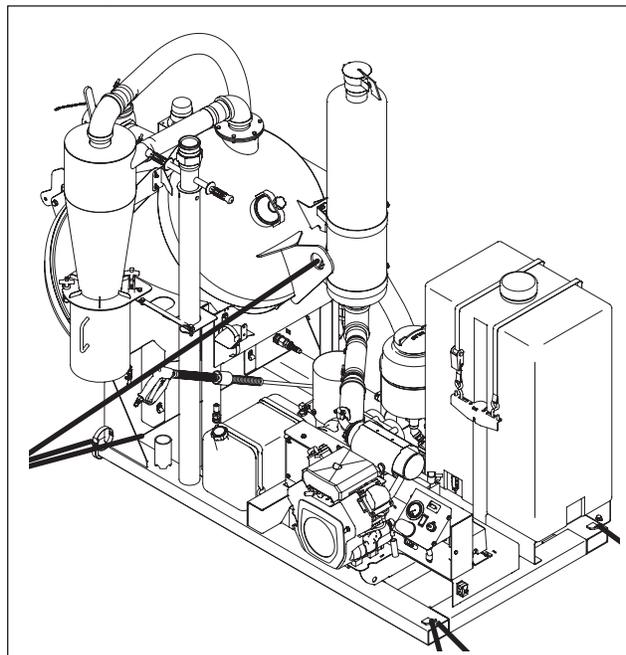


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Attach Skid to Truck Bed

Use indicated tiedowns to secure skid to truck bed. Be sure to tie down both front and rear of unit. The skid can also be bolted to a truck bed using the 4 holes indicated above.

NOTICE: Use a chain, not a strap, if using the lift/tiedown point on top of the tank.



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Haul (Trailer-Mounted Unit)


⚠ WARNING

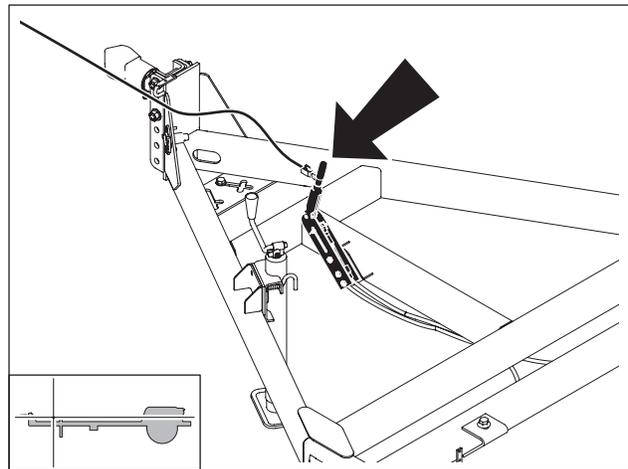
Crushing weight. If load falls or moves it could kill or crush you. Use proper procedures and equipment or stay away.

Inspect Trailer

- Check hitch for wear and cracks. Lubricate if needed.
- Inspect lights for cleanliness and correct operation. Inspect reflectors and replace if needed.
- Check tire pressure. Check lug nut torque with a torque wrench.

Hitch Trailer

1. Back tow vehicle to trailer.
2. Put manual transmission into first or reverse gear or automatic transmission into park. Turn off ignition. Set parking brake.
3. Connect trailer coupler to tow vehicle hitch and lock in place with lock pin. If needed, adjust coupler height to level load.
4. Connect safety chains to tow vehicle chain keepers (cross-shaped slots on bumper of tow vehicle). Attach left chain to right side of tow vehicle and vice versa to cradle hitch. Do not connect to pintle hook or hitch ball.
5. Connect emergency parking brake cable to tow vehicle and pull handle back as shown.
6. Plug trailer electrical connector into tow vehicle connector.
7. Use jack crank to raise jack base and stow.
8. Remove wheel blocks.



j27om032h.eps

Unhitch Trailer

1. Stop tow vehicle and trailer on level ground.
2. Put manual transmission into first or reverse gear or automatic transmission into park. Turn off ignition. Set parking brake.
3. Block trailer wheels or set trailer emergency parking brake.
4. To unhitch trailer from tow vehicle, reverse "Hitch Trailer" steps.



Vacuum and Pothole

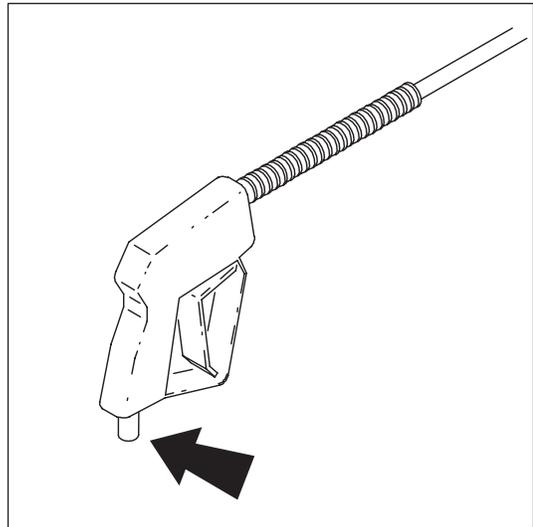
Chapter Contents

| | |
|----------------------------|-----------|
| Connect Hoses | 44 |
| Start Unit | 44 |
| Remove Debris | 45 |
| • Procedure | 45 |
| Pothole | 46 |
| Drain Tank | 48 |



Connect Hoses

1. Remove vacuum hoses from storage.
2. If potholing, remove potholing tool from storage.
3. Connect hoses. Secure all locking clamps.
4. Ensure inlet and drain valves are closed.
5. If potholing, connect water pressure hose (shown).



j08om007h.eps

Start Unit

EMERGENCY SHUTDOWN: Turn ignition switch to STOP.

1. Insert key.
2. Choke engine if necessary. See page 20 for more information.
3. Turn key clockwise. See page 21 for more information.
4. Run engine at low throttle for 5 minutes.

IMPORTANT: Engine will not run at low idle when inlet valve is closed.

Remove Debris

EMERGENCY SHUTDOWN: Turn ignition switch to STOP.

Procedure

1. Position vacuum hose in area to be excavated.
2. Start engine.



⚠ DANGER

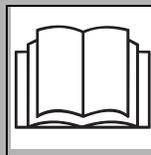
Vacuum will suffocate. Maintain distance between face and vacuum inlets.



⚠ WARNING

Fire or explosion possible. Do not vacuum flammable or combustible substances.

3. Open inlet valve if necessary to begin excavation.



⚠ WARNING

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

NOTICE: Do not excavate hazardous or toxic materials. Unit is designed to excavate only soil cuttings, drilling fluids, and other non-toxic waste.

4. Use sight glass to monitor liquid debris level in tank. Vacuum will shut off when tank is full. Engine will remain running.

Watch debris tank and cyclone sight glasses to determine when tank is full of dry debris. Shut off engine.

IMPORTANT: Do not overfill debris tank.



Pothole

EMERGENCY SHUTDOWN: Turn ignition switch to STOP.

1. Start engine.



⚠ DANGER

vacuum inlets.

Vacuum will suffocate. Maintain distance between face and



⚠ WARNING

combustible substances.

Fire or explosion possible. Do not vacuum flammable or

2. Open water tank valve.
3. Move water pump switch to on. It might be necessary to prime the pump if water level is low. See "Prime Water Pump" on page 47.
4. Open inlet valve if necessary.
5. Position tool over area to be excavated and begin pothole.



⚠ DANGER

serious injury. Know location of lines and stay away.

Electric shock. Contacting electric lines will cause death or

NOTICE: Do not direct water lance at overhead lines. Water conducts electricity.

- First use water lance to loosen soil.
- Work tool in a rocking or circular motion to excavate soil.
- Use water lance and tool alternately until hole is at the desired diameter and depth.

6. Adjust water pressure as needed to match soil conditions and/or material of utility being exposed.



WARNING

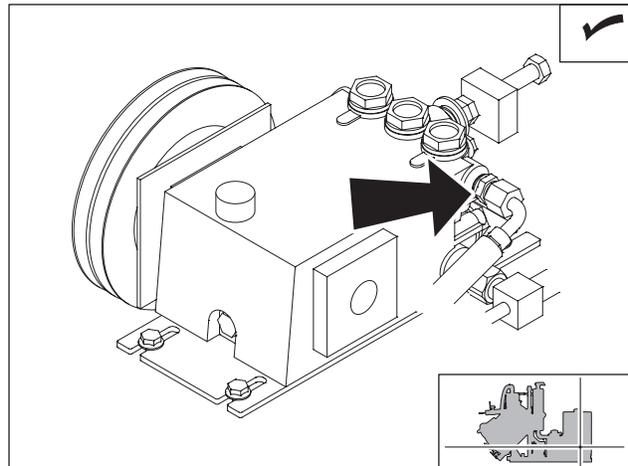
Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

NOTICE: High pressure water can cut utility lines. Test water pressure on a sample of the material to be located. Adjust pressure until no damage occurs to the material.

7. Ensure that water sprays from nozzle in a fan pattern. If it does not, nozzle may be clogged and pump will not function properly. Clean or replace nozzle as necessary.
8. Water pump will shut off when freshwater tank is empty.

Prime Water Pump

Loosen joint (shown) to start water flow. Tighten after water begins flowing.



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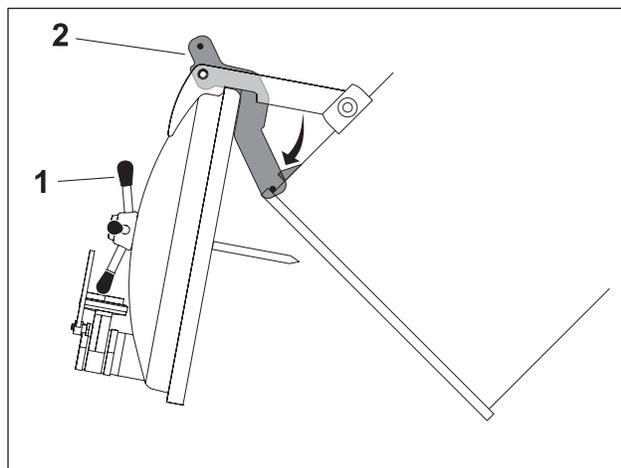


Drain Tank

EMERGENCY SHUTDOWN: Turn ignition switch to STOP.

1. Ensure that unit is hitched to vehicle for trailer-mounted units. See "Hitch Trailer" on page 40.
2. Haul unit to approved dumping area.
3. Open drain valve and inlet valve.
4. Open tank door.

- Turn tank door handle (1) counterclockwise to loosen door.
- Turn off engine. Tank door will open when vacuum is relieved.
- Pull door open and guide door prop (2) until it engages stop as shown.



j27om036h.eps

5. Allow tank to drain completely.
6. Connect water pressure hose to water lance.
7. Turn water pump switch on. Adjust water pressure.
8. Use water lance to thoroughly rinse inside of tank and around door seal.



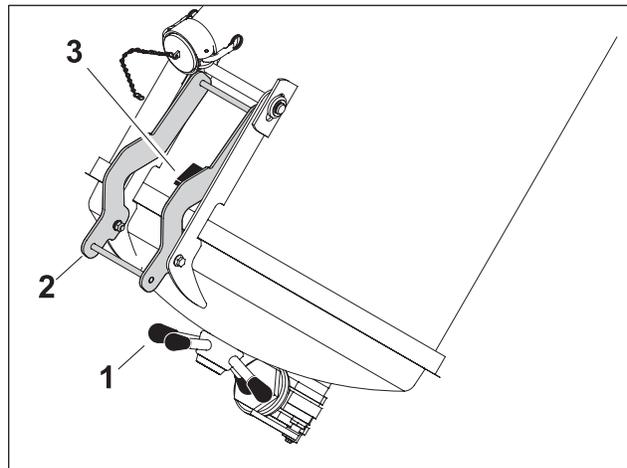
⚠ DANGER

Confined space will cause suffocation. Use proper procedures for entering or stay away.

NOTICE: Enter tank only if necessary. Follow U.S. Department of Labor guidelines for entering confined spaces.

9. Close tank door.
 - Lift door until door prop (3) clears stop (2). Slide prop to stowed position as shown.
 - Start engine. This will pull a vacuum and cause door to pull toward tank.
 - Turn door handle (1) clockwise 9-11 turns to tighten door against seal.

IMPORTANT: Do not lean on door, prop or other handles when tightening door to avoid misalignment.



j27om037h.eps



Complete the Job



Chapter Contents

| | |
|--|-----------|
| Antifreeze Vacuum Excavation Unit | 52 |
| • Add Antifreeze | .52 |
| • Reclaim Antifreeze | .52 |
| Rinse Equipment | 53 |
| Disconnect | 53 |
| Stow Tools | 53 |

Antifreeze Vacuum Excavation Unit

Add Antifreeze

Follow these steps for overnight or long-term storage of unit during cold weather.

1. Open water tank valve and drain valve to drain all water from water tank.
2. Fill antifreeze tank with a propylene-glycol based antifreeze.
3. Close water tank valve and drain valve.
4. Open antifreeze tank valve.
5. Connect water pressure hose to water lance.
6. Start engine.
7. Move water pump switch to on. If freshwater tank is empty, hold water pump switch in bypass position.
8. Squeeze water lance handle and run until antifreeze runs through the water lance.
9. Move water pump switch to off.
10. Close antifreeze tank supply valve.
11. Turn ignition switch to off.
12. Drain water tank completely.

Reclaim Antifreeze

1. Turn water pressure down.
2. Move water pump switch to on. If water tank is not full, use bypass position.
3. Put end of water lance in antifreeze tank.
4. Squeeze water lance handle and run until water comes out of lance.
5. Move water pump switch to off.

Rinse Equipment



Spray water onto equipment to remove dirt and mud. Use water lance. Thoroughly rinse inside of tank and around door seal.



⚠ DANGER Confined space will cause suffocation. Use proper procedures for entering or stay away.

NOTICE: Enter tank only if necessary. Follow U.S. Department of Labor guidelines for entering confined spaces.

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

Disconnect

Disconnect and store vacuum hose and water pressure hose.

Stow Tools

Make sure potholing tools, water lance, and other tools are properly stowed.

Service

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Recommended Lubricants/Service Key 56

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25 Hour 65

50 Hour 66

100 Hour 69

200 Hour 71

500 Hour 72

1000 Hour 72

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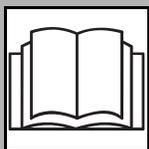
3000 Mile 75

12,000 Mile 76

As Needed 77



Precautions


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.

Recommended Lubricants/Service Key

| Item | Description |
|---|---|
|  GEO | Gasoline engine oil meeting or exceeding SG, SH, or SJ per the API service classifications and SAE viscosity recommended by engine manufacturer (SAE 10W30) |
|  HTG | NGLI #2 premium grade, petroleum-based grease with high temperature resistance and good mechanical stability |
|  NDO | SAE30 non-detergent oil |
|  SGL | Synthetic gear oil, ISO 100, p/n 256-044. See blower manual for more information. |
|  MPL | Multipurpose gear oil meeting API service classification GL-5 (SAE 80W90) |
|  MPG | Multipurpose grease meeting ASTM D217 and NLGI 5 |
|  | Check level of fluid or lubricant |
|  | Check condition |
|  | Filter |
|  | Change, replace, adjust, service or test |

Proper lubrication and maintenance protects Ditch Witch equipment from damage and failure. Service intervals listed are for minimum requirements. In extreme conditions, service machine more frequently. Use only recommended lubricants. Fill to capacities listed in "Specifications" on page 121.

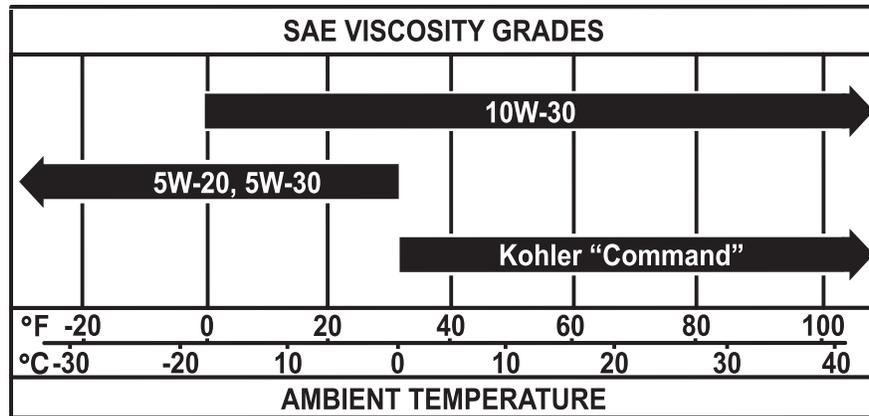
For more information on engine lubrication and maintenance, see your engine manual.

NOTICE:

- Use only genuine Ditch Witch parts, filters, approved lubricants, TJC, and approved coolants to maintain warranty.
- Use the "Service Record" on page 91 to record all required service to your machine.



Engine Oil Temperature Chart



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Temperature range anticipated before next oil change

See engine manual for more information about oil viscosity and operation in arctic conditions.

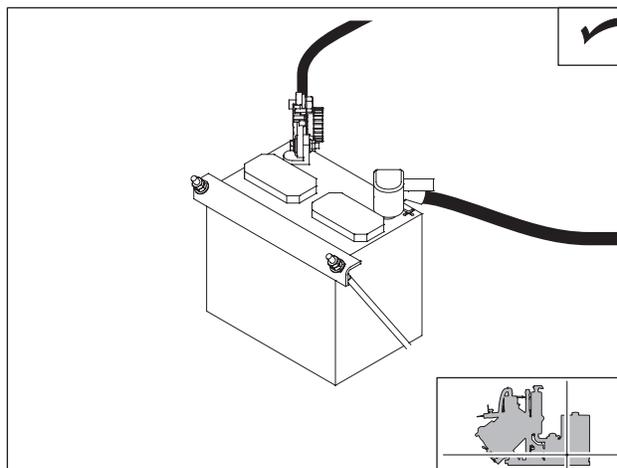
Each Use

| Location | Task | Notes |
|---------------|--|--|
| Vacuum System | Check battery | |
| Trailer | Check torque of hitch bolts | 271 ft•lb (367 N•m) |
| | Check tire pressure and lug nut torque | 65 psi (4.5 bar) 95 ft•lb (129 N•m) |
| | Check lights and reflectors | |
| | Check strobe light | |

Vacuum System

Check Battery

Check battery connections for wear or corrosion. Keep connections clean and tight. Batteries supplied by factory are maintenance-free. Service replacement batteries according to manufacturer's instructions.



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Trailer

Check Torque of Hitch Bolts

Check torque of hitch bolts. Tighten bolts to 271 ft•lb (367 N•m).

Check Tire Pressure and Lug Nut Torque

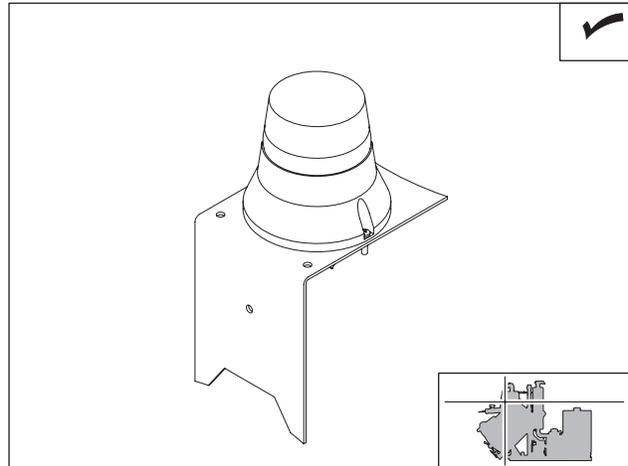
Check tire pressure and lug nut torque. Inflate tires to 65 psi (4.5 bar) and tighten lug nuts to 95 ft•lb (129 N•m).

Check Lights and Reflectors

Check lights and reflectors for correct operation and cleanliness.

Check Strobe Light

Check strobe light for proper function every 10 hours. When ignition is on, strobe light should be flashing. Repair if necessary.



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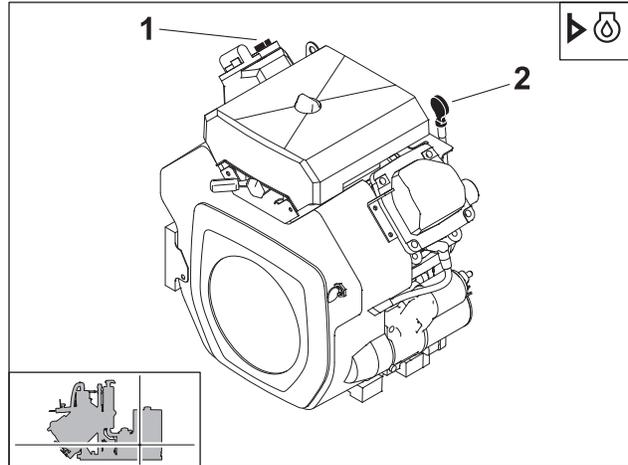
10 Hour

| Location | Task | Notes |
|----------------------|---------------------------------------|-------|
| Vacuum System | Check engine oil level | GEO |
| | Check engine air filter | |
| | Check blower oil level | SGL |
| | Check blower | |
| | Check water pump oil level | |
| | Check water pump | NDO |
| | Check water pump regulator | |
| | Clean water pump filter | |
| | Clean vacuum air filter | |
| | Check cyclonic filter canister | |
| | Check spray nozzle | |
| Debris Tank | Check vacuum tank hoses | |
| | Check vacuum tank door seals/fittings | |

Vacuum System

Check Engine Oil Level

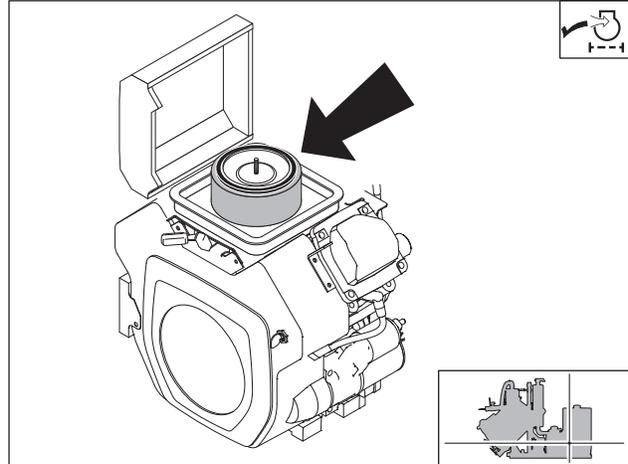
Check engine oil at dipstick (2) before operation and every 10 hours thereafter. Check with unit on level surface and at least 15 minutes after stopping engine. Add GEO at fill (1) as necessary to keep oil level at highest line on dipstick.



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Check Engine Air Filter

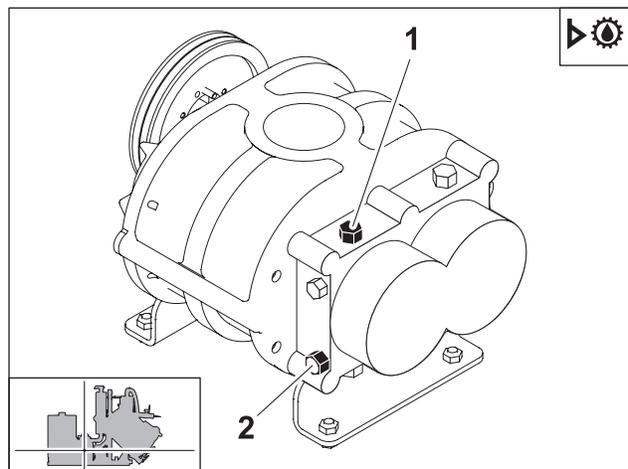
Check air filter every 10 hours. Change filter element as needed.



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Check Blower Oil Level

With frame level, check blower oil level at sight glass (2) every 10 hours. Add SGL at breather (1) as necessary to maintain oil level at halfway point on sight glass (2). Do not overfill.

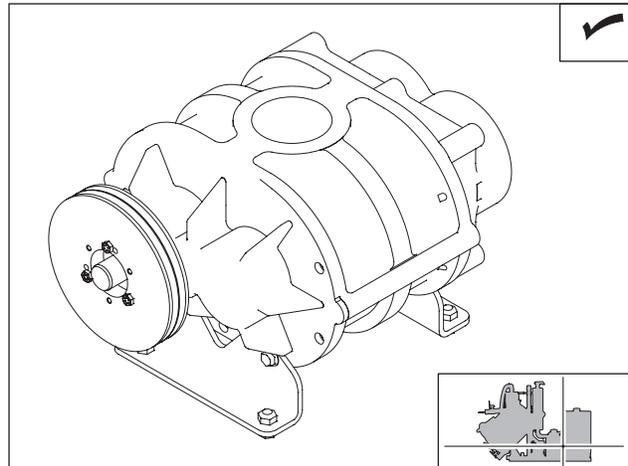


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Check Blower

Check blower every 10 hours for unusual noise or vibration. If malfunction is detected:

1. Stop engine.
2. Consult blower repair manual.

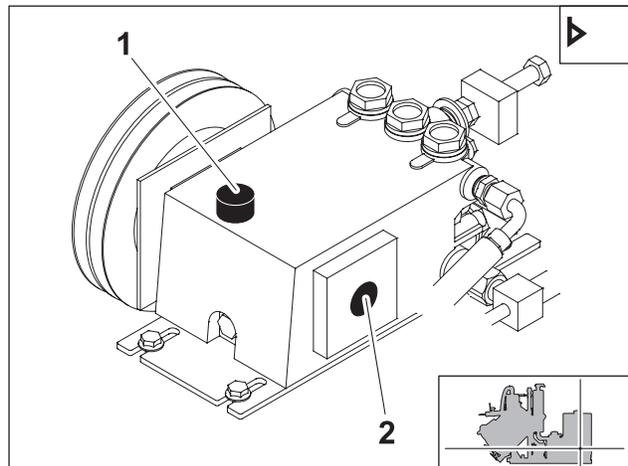


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Check Water Pump Oil Level

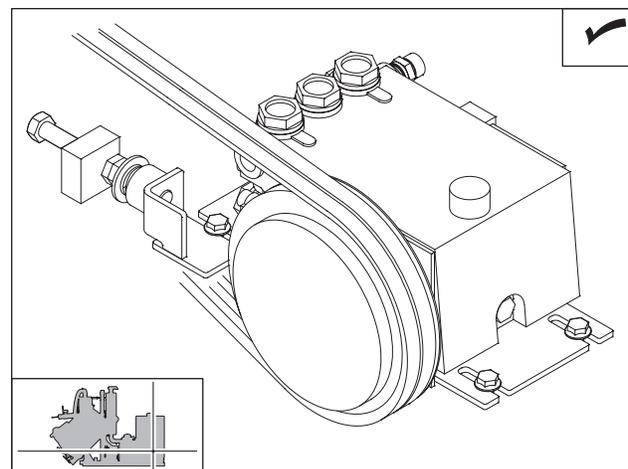
With frame level, check water pump oil at dipsitch every 10 hours. Oil should be at full mark on dipstick. Add NDO at fill as necessary to keep oil at full mark on dipstick.



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Check Water Pump

Check water pump unit every 10 hours for leaks, loose fittings, unusual noise or vibration. Repair if necessary.



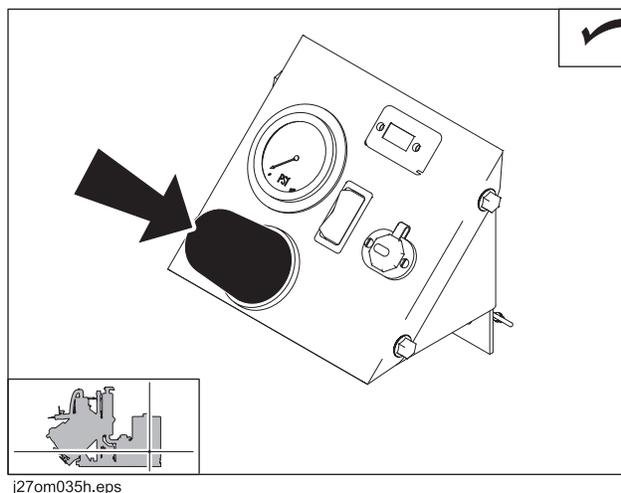
j27om034h.eps

Check Water Pump Regulator

Check for proper operation of regulator every 10 hours.

To check:

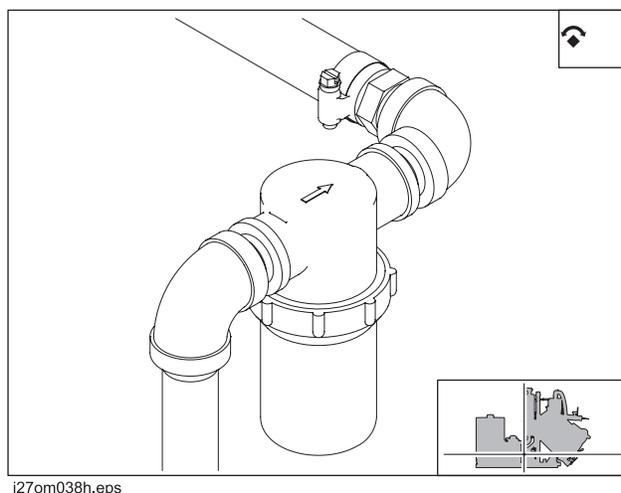
1. Ensure there is water in tank.
2. Start engine.
3. Connect water pressure hose to water lance.
4. Move water pressure switch to on.
5. Squeeze water lance handle. Water pump should engage.
6. Release water lance handle. Water pump should disengage.



If pump does not engage and disengage with movement of water lance handle, water pump control system is not functioning properly. See water pump manual for more information.

Clean Water Pump Filter

1. Open filter housing.
2. Remove element and rinse housing thoroughly with water.
3. Replace element and close filter housing.



Clean Vacuum Air Filter

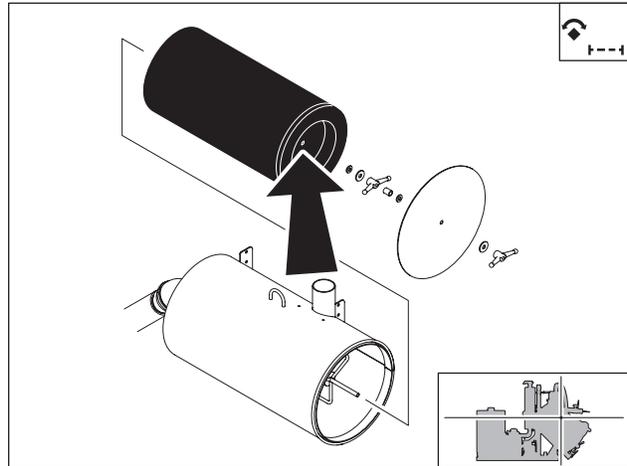
Clean filter every 10 hours or as needed.

To clean filter:

1. Remove filter from canister.
2. Run low pressure water into inside of filter.

NOTICE: Do not use high pressure water to clean filter. Filter will be damaged.

3. Allow filter to dry completely before returning to canister.



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Drain Cyclonic Filter Canister

Drain filter canister at drain every 10 hours or as needed. Drain when water is visible in sight glass (1).

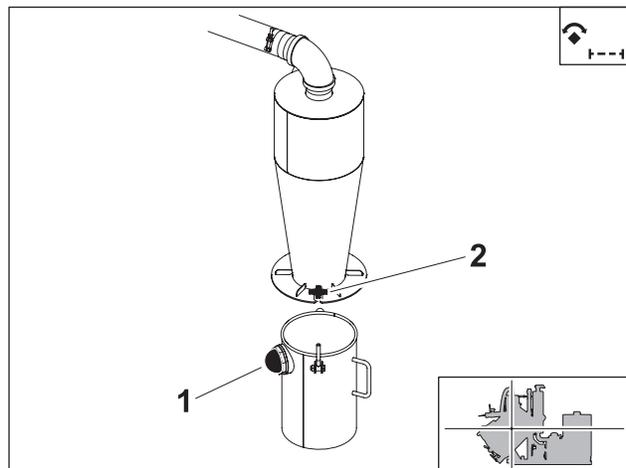
NOTICE: Follow procedure below to avoid seal damage.

To remove

1. Loosen back knob.
2. Loosen front knob (2).
3. Remove canister.

To install

1. Slide canister into place.
2. Tighten front knob.
3. Tighten rear knob.

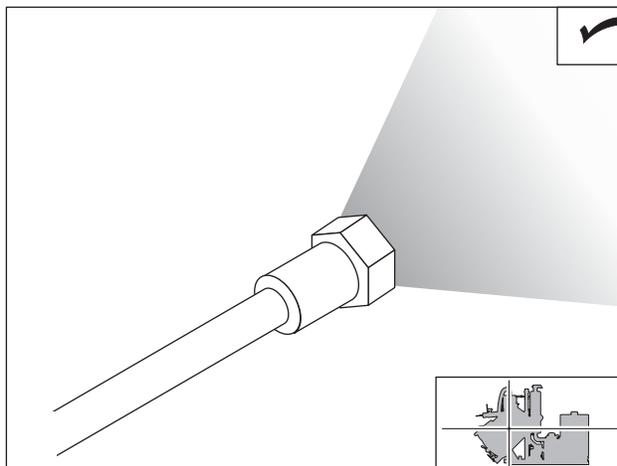


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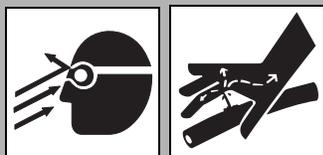


Check Spray Nozzle

Check spray nozzle every 10 hours. Ensure that water sprays from nozzle in a fan pattern. Clean or replace nozzle as necessary.



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WARNING

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

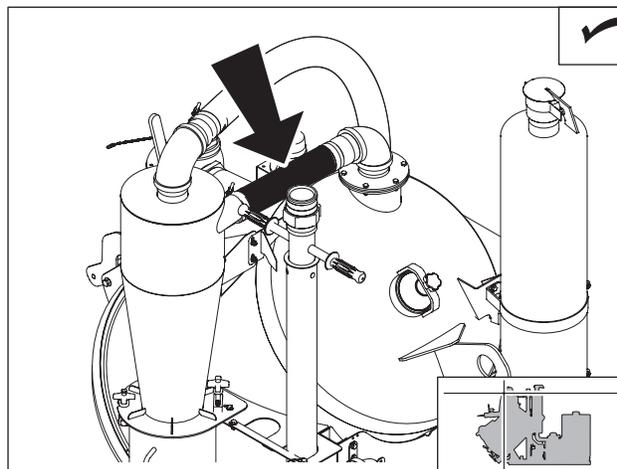
NOTICE: Escaping pressurized fluid can cause injury or pierce skin and poison.

- Before using system, check that all connections are tight and all lines are undamaged.
- Fluid leaks can be hard to detect. Use a piece of cardboard or wood, rather than hands, to search for leaks.
- Wear protective clothing, including gloves and eye protection.

Debris Tank

Check Vacuum Tank Hoses

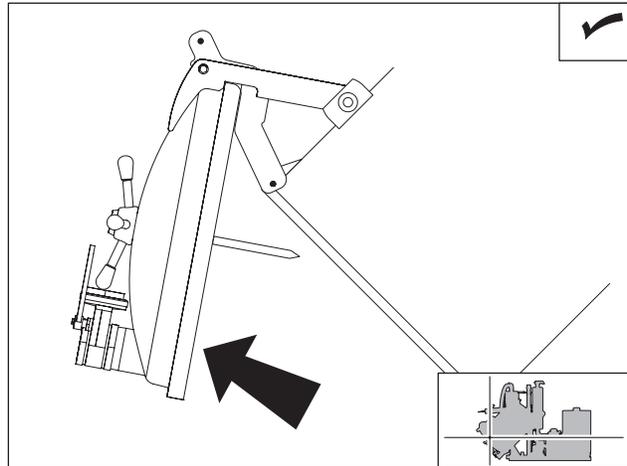
Check hoses every 10 hours for wear or damage. Replace as needed.



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Check Vacuum Tank Door Seals and Fittings

Check door seal every 10 hours for wear or damage. Repair if necessary. Check for leaks and loose fittings every 10 hours. Repair or replace if necessary.



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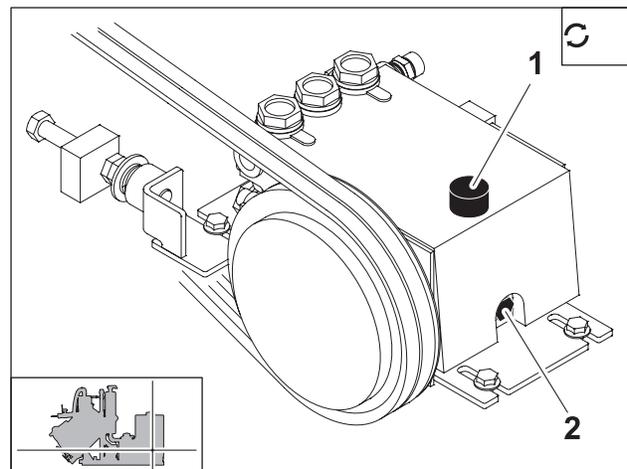
25 Hour

Vacuum System

Change Water Pump Oil

Change oil after the first 25 hours of operation and every 100 hours thereafter. Change oil more frequently if working in dusty conditions.

- Drain at drain plug (2) while oil is warm.
- Refill with NDO at fill (1) until oil is at full mark on dipstick or at halfway point on sight glass.



j27om009h.eps

50 Hour

| Location | Task | Notes |
|---------------|-----------------------------------|-------|
| Vacuum System | Check water pump belt tension | |
| | Check blower belt tension | |
| | Check blower relief valve | |
| | Lube blower bearings | MPG |
| | Check water pressure hoses | |
| | Check vacuum air filter and hoses | |
| Debris Tank | Lube door handle screw | |

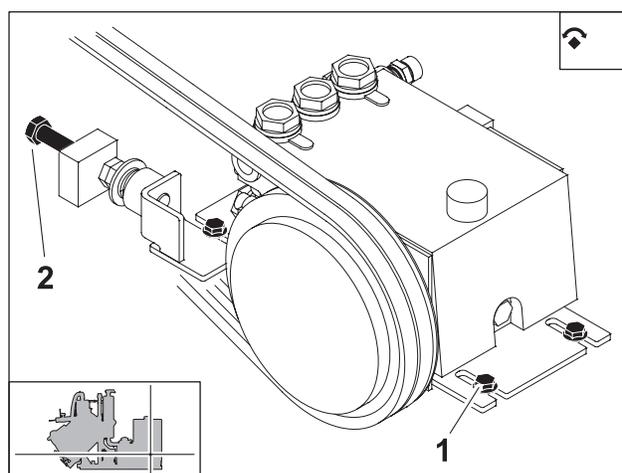
Vacuum System

Check Water Pump Belt Tension

Check belt every 50 hours for correct tension, damage or wear. Replace worn belt. Tighten as needed. See "Adjust Water Pump Belt Tension" on page 78.

To check

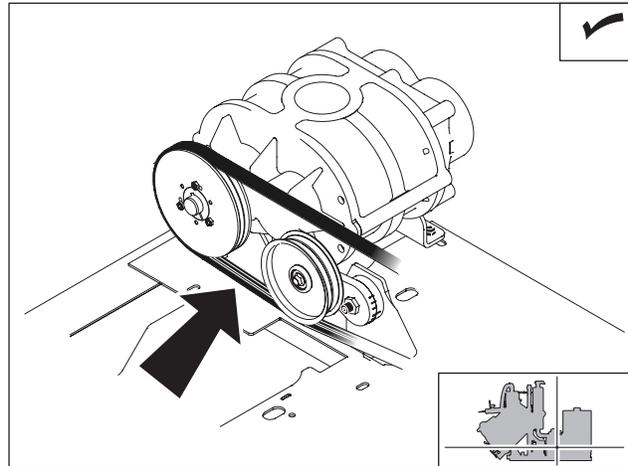
1. Turn ignition to STOP and remove key.
2. Apply moderate thumb pressure to belt between pulleys.
3. Belt is properly tensioned when deflection is about 1/4" (5-8 mm).



j27om008h.eps

Check Blower Belt Tension

Check belt every 50 hours for correct tension, damage or wear. Replace worn belt. Both ends of tube must touch spring caps for belt to be correctly tensioned. Tighten as needed. See "Adjust Blower Belt Tension" on page 77.



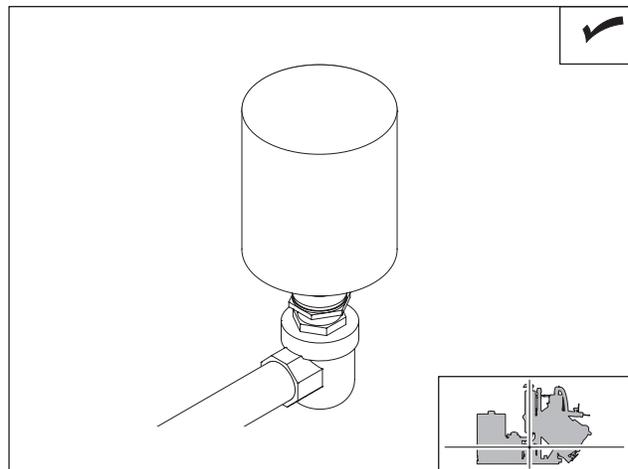
j27om044h.eps

Check Blower Relief Valve

Check relief valve for proper operation every 50 hours.

To check:

1. Ensure that vacuum inlet valve and drain valve are both closed.
2. Start engine. Vacuum will start to build.
3. When vacuum goes over relief, check for suction at the bottom of the relief air filter.
4. If suction is not present, stop engine and check relief valve.

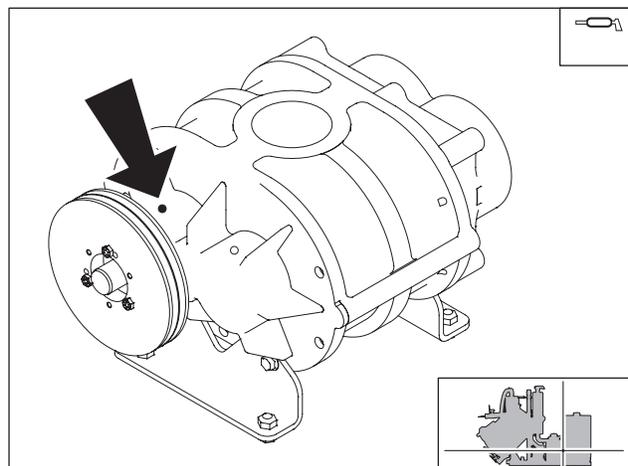


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Lube Blower Bearings

Wipe two zerks clean and lube every 50 hours with MPG. Inject grease into zerk until clean grease comes out of relief fittings.

NOTICE: Do not inject grease too quickly. Drive shaft seal damage could occur.

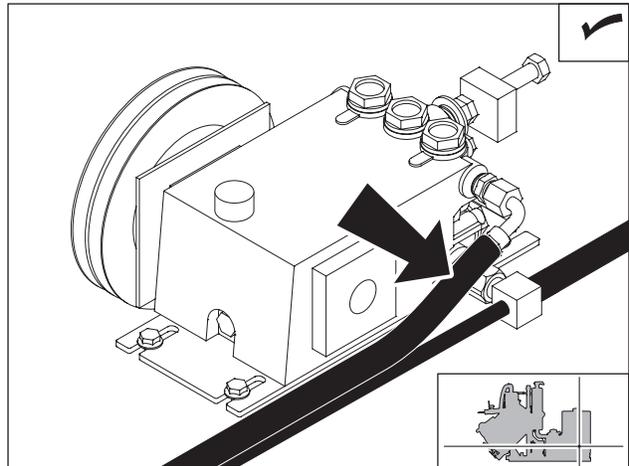


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Check Water Pressure Hoses

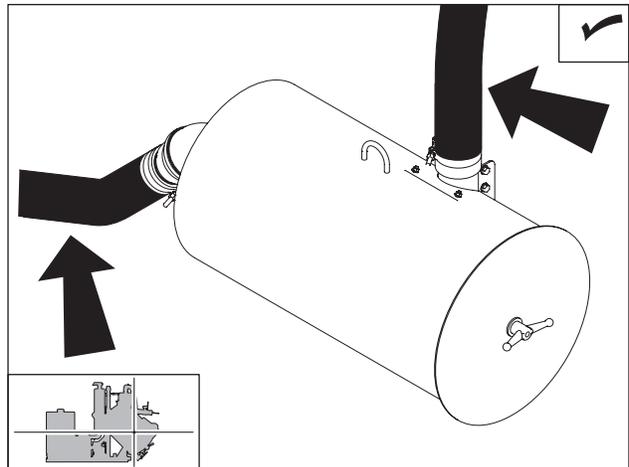
Check hoses every 50 hours for wear or damage. Replace as needed.



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Check Vacuum Air Filter and Hoses

Check filter and suction hose (shown) every 50 hours for wear or holes. Check more often if working in dusty conditions. Clean or replace filter if necessary.

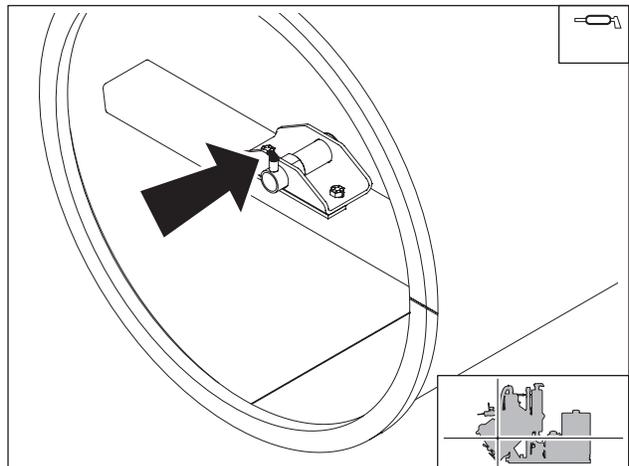


j27om046h.eps

Debris Tank

Lube Door Handle Screw

Lube every 50 hours with MPG.



j27om022h.eps

100 Hour

| Location | Task | Notes |
|---------------|-------------------------------|-------|
| Vacuum System | Change water pump oil | NDO |
| | Check blower drive components | |
| | Change engine oil | GEO |
| Debris Tank | Check tank deflector | |

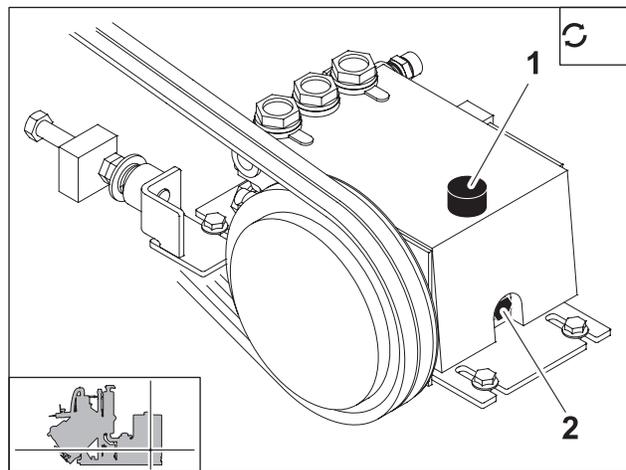


Vacuum System

Change Water Pump Oil

Change oil after the first 25 hours of operation and every 100 hours thereafter. Change oil more frequently if working in dusty conditions.

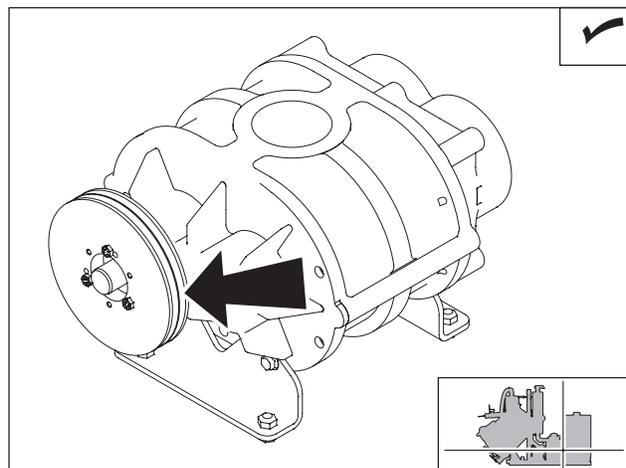
- Drain at drain plug (2) while oil is warm.
- Refill with NDO at fill (1) until oil is at halfway mark on dipstick.



j27om009h.eps

Check Blower Drive Components

Check drive components every 100 hours. Adjust and tighten if necessary.

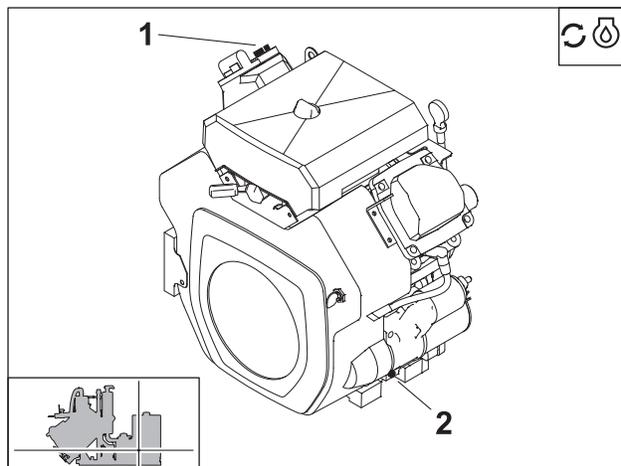


j27om011h.eps

Change Engine Oil

Change engine oil every 100 hours. Remove drain cap, push and turn 1/4 to open. Drain oil (2) and add 1.7-1.9 qt (1.6-1.8 L) of GEO at fill (1).

IMPORTANT: Use oil specified in "Engine Oil Temperature Chart" on page 57.

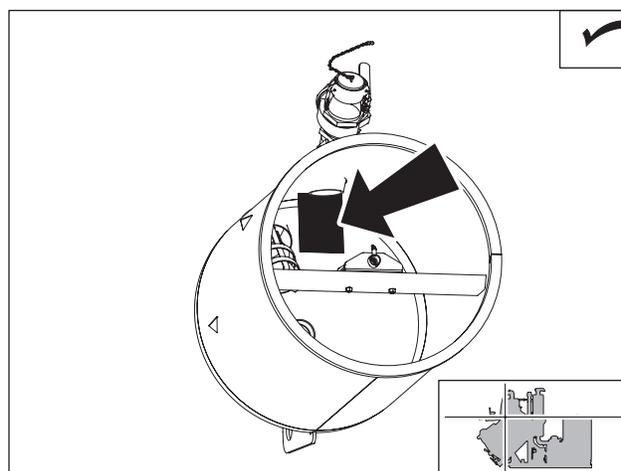


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Debris Tank

Check Tank Deflector

Check tank deflector every 100 hours for wear or damage. Replace as needed.



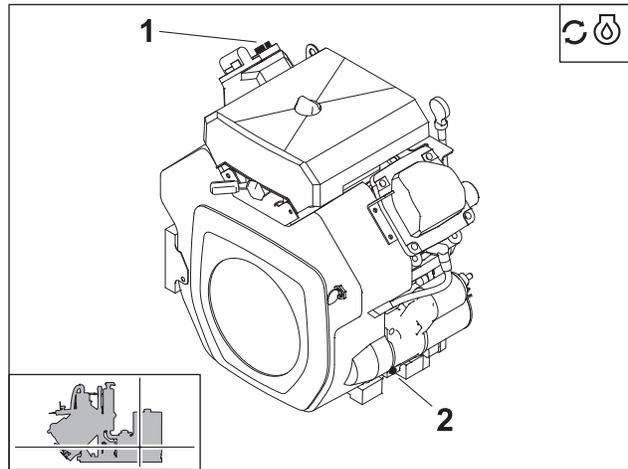
j27om047h.eps

200 Hour

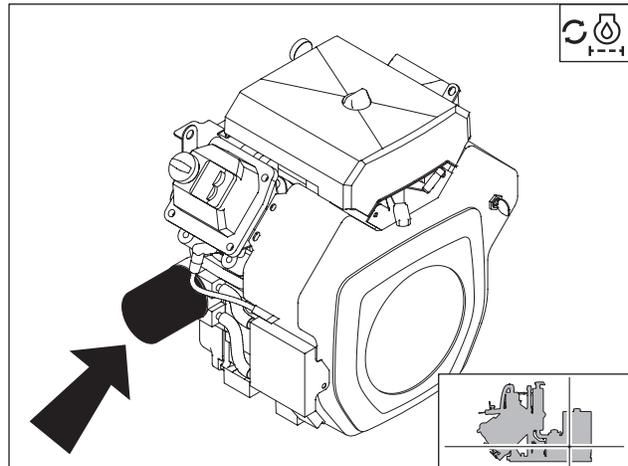
Change Engine Oil and Filter

Change engine oil every 200 hours. Drain oil (2) and replace filter (shown below). Add 1.7-1.9 qt (1.6-1.8 L) of GEO at fill (1).

IMPORTANT: Use oil specified in "Engine Oil Temperature Chart" on page 57.



j27om005h.eps



j27om007h.eps

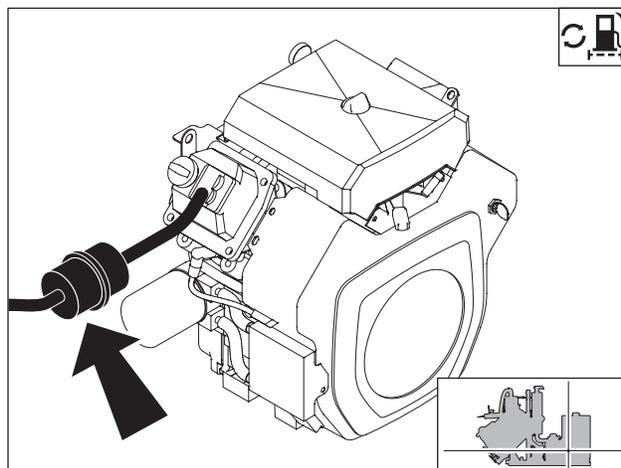


500 Hour

Vacuum System

Change Fuel Filter

Replace fuel filter every 500 hours for normal service. If you refuel from cans, replace filter more often. See parts manual or contact your Ditch Witch dealer for correct replacement filter.



j27om019h.eps

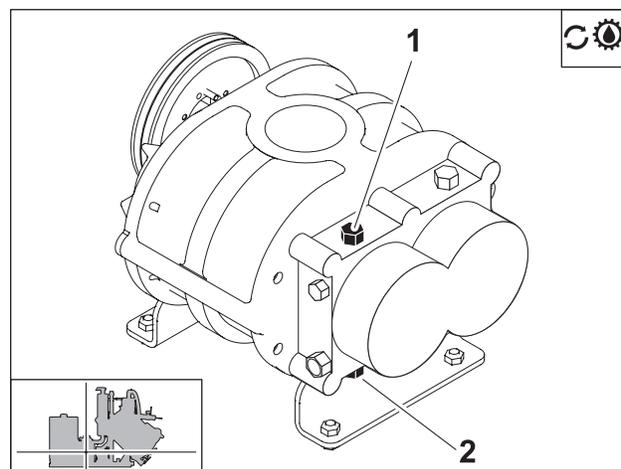
1000 Hour

Vacuum System

Change Blower Oil

Change oil every 1000 hours. Change oil more frequently if working in dusty conditions.

- Drain at drain plug (2) while oil is warm.
- Add SGL at breather (1) until oil is at halfway point on sight glass.



j27om017h.eps

2000 Hour

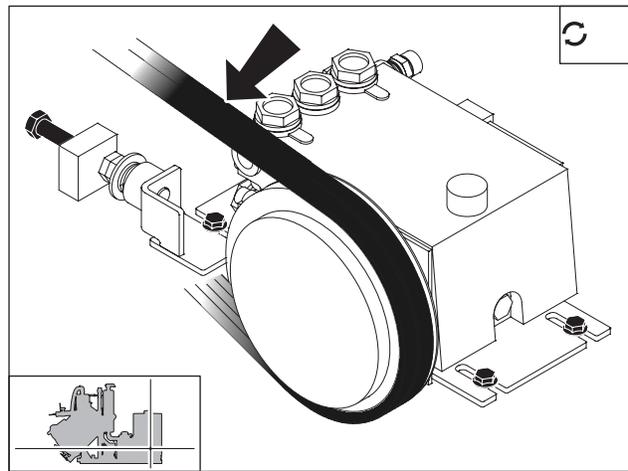
| Location | Task | Notes |
|---------------|-------------------------|-------|
| Vacuum System | Replace water pump belt | |
| | Replace blower belt | |



Vacuum System

Replace Water Pump Belt

Replace belt every 2000 hours.

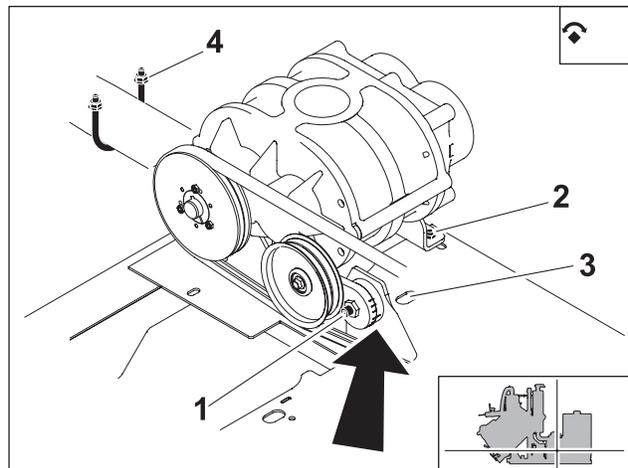


j27om049h.eps

Replace Blower Belt

Replace belt every 2000 hours.

1. Turn off engine.
2. Remove covers.
3. Loosen 4 bolts from underneath skid.
4. Loosen u-bolt (4) to allow blower to slide.
5. Slide pump and remove belt.
6. Install new belt.
7. Insert prybar in hole (3) and move blower until belt is tight.
8. Tighten 4 bolts and u-bolt.
9. Loosen bolt on tensioner (1) and apply wrench to large nut.
10. Tighten tensioner until the fixed bar is 3.5 lines from the bottom of the scale on the tensioner arm.
11. Install covers.



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300 Mile

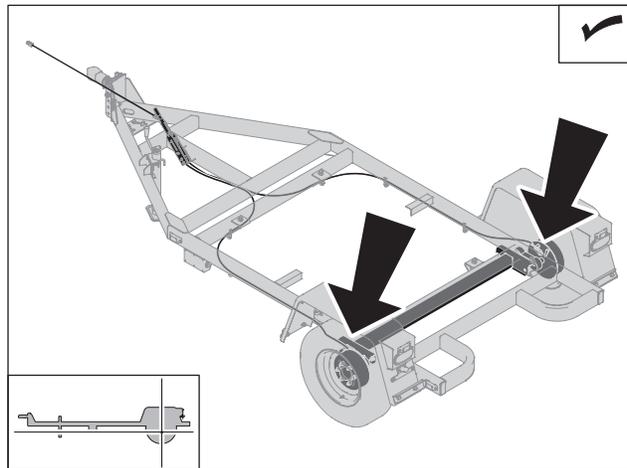
| Location | Task | Notes |
|----------|----------------------|---------|
| Trailer | Adjust brakes | Initial |
| | Adjust parking brake | |

Trailer

Adjust Brakes (Initial)

Adjust brakes after 300 miles (500 km).

1. Place adequate jack stands under frame rails.
2. Remove cover from adjusting slot on bottom of backing plate.
3. Rotate adjuster starwheel with screwdriver or brake spoon to expand brake shoes. Adjust until drum is very difficult to turn by hand.
4. Rotate starwheel the other direction until drum turns with slight drag.
5. Replace adjusting slot cover and replace wheel.
6. Repeat procedure for all remaining brakes.
7. Remove jack stands and lower wheels to ground.



j27om053h.eps

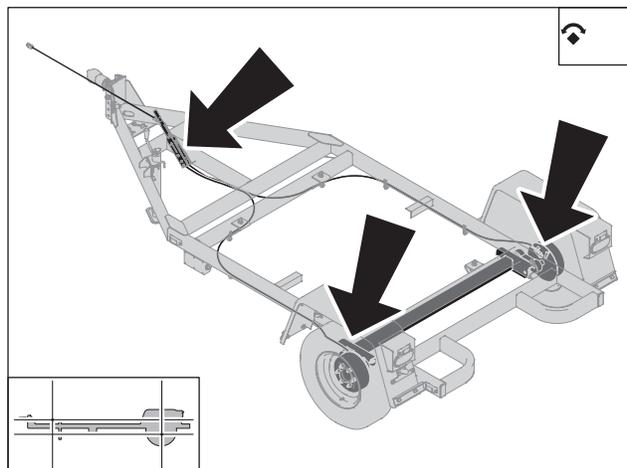
Adjust Parking Brake

Adjust brakes after 300 miles (500 km).

NOTICE: Do not overtighten brake.

With brake released, turn adjusting knob on end of hand lever clockwise until at least 90 lb (0.4 kN) but not more than 170 lb (0.76 kN) of force is needed to apply parking brake.

NOTICE: Do not exceed 170 lb (0.7 kN) of force when tightening the knob on the hand lever.



j27om052h.eps

When properly adjusted, brake pulls over center with a distinct click.

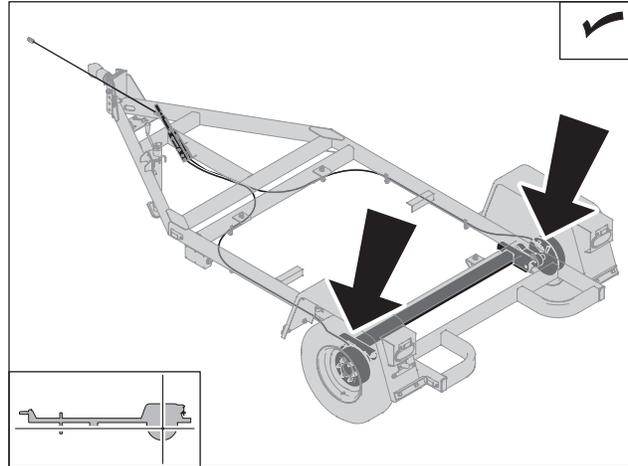
3000 Mile

Trailer

Adjust Brakes

Adjust brakes every 3000 miles (5000 km).

1. Place adequate jack stands under frame rails.
2. Remove cover from adjusting slot on bottom of backing plate.
3. Rotate adjuster starwheel with screwdriver or brake spoon to expand brake shoes. Adjust until drum is very difficult to turn by hand.
4. Rotate starwheel the other direction until drum turns with slight drag.
5. Replace adjusting slot cover and replace wheel.
6. Repeat procedure for all remaining brakes.
7. Remove jack stands and lower wheels to ground.



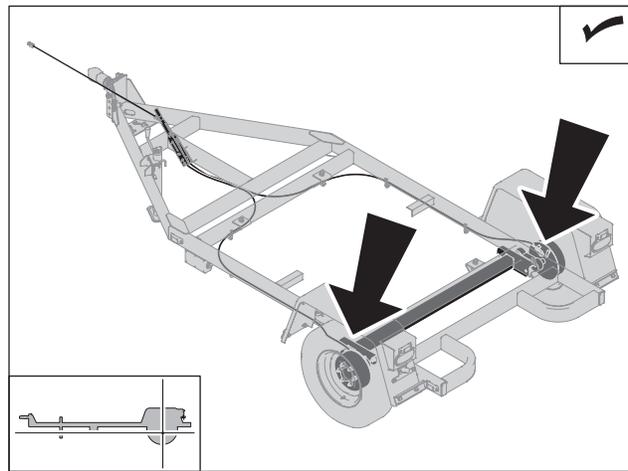
12,000 Mile

| Location | Task | Notes |
|----------|---------------------------------|-------|
| Trailer | Inspect brake shoes and linings | |
| | Adjust and lubricate bearings | |

Trailer

Inspect brake shoes and linings

Inspect shoes and linings every 12 months or 12,000 miles (20 000 km) for wear. When lining is worn to 1/16" (2 mm) or less, replace linings. Replace shoe and lining if contaminated by oil.

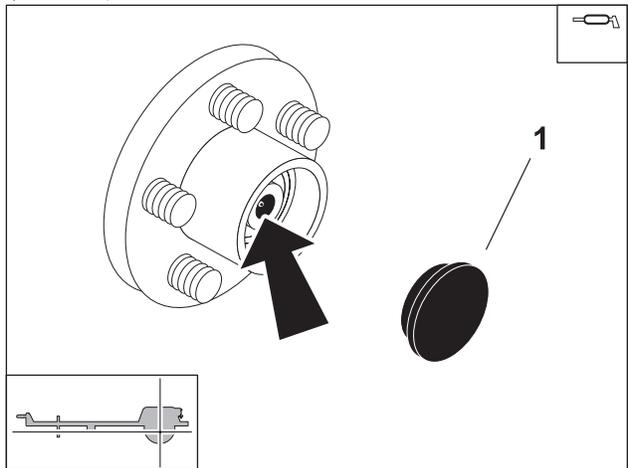


j27om053h.eps

Adjust and Lubricate Bearings

1. Place adequate jack stands under frame rails and remove wheels.
2. Remove rubber plug from end of grease cap (1).
3. Place grease gun onto grease fitting (shown).
4. Pump grease into fitting. Old grease will come out of fitting. Stop adding grease when new grease comes out of fitting.

IMPORTANT: Rotate hub while adding grease.



j27om055h.eps

5. Remove grease gun, wipe off excess grease and install rubber cap.

As Needed

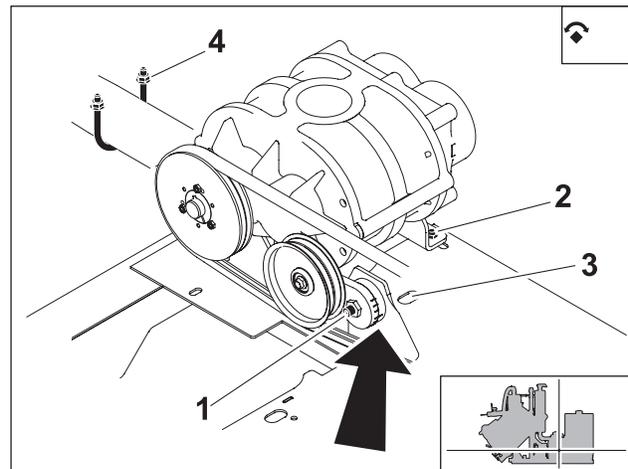
| Location | Task | Notes |
|----------------------|----------------------------------|-------|
| Vacuum System | Adjust water pump belt tension | |
| | Change water pump filter | |
| | Adjust blower belt tension | |
| | Lube blower for longterm storage | |
| | Change blower relief air filter | |
| Debris Tank | Clean primary shutoff valve | |



Vacuum System

Adjust Blower Belt Tension

1. Turn off engine.
2. Loosen 4 bolts (2) from underneath skid.
3. Loosen u-bolt (4) to allow blower to slide.
4. Insert prybar in hole (3) and move blower until belt is tight.
5. Apply moderate thumb pressure to belt between pulleys. Belt is properly tensioned when deflection is about 1/4" (5-8 mm).
6. Tighten 4 bolts and u-bolt.
7. Verify tensioner (1) is set with the fixed bar 3.5 lines from the bottom of the scale on the tensioner arm.



j27om030h.eps

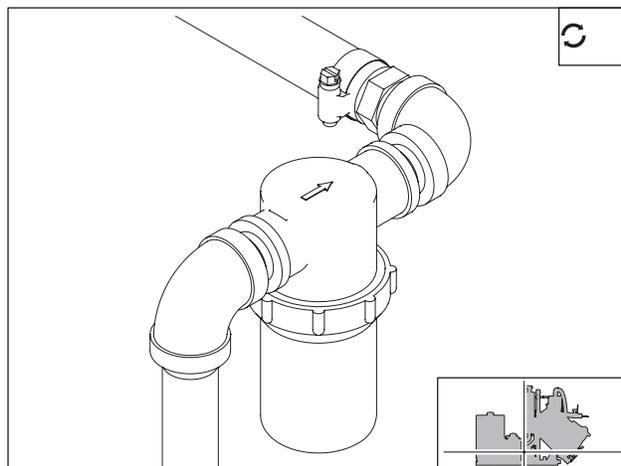
NOTICE: Over-tightening blower drive belts may result in premature blower shaft or engine bearing failure. Follow recommended procedure to ensure maximum component life.

Change Water Pump Filter

1. Open filter housing.
2. Remove element and rinse housing thoroughly with water.
3. Replace element.

NOTICE: Be sure filter element is properly seated.

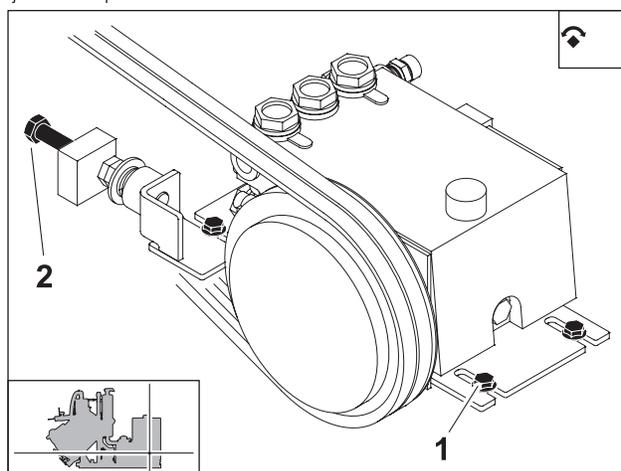
4. Close filter housing.



j27om050h.eps

Adjust Water Pump Belt Tension

1. Turn off engine and remove key.
2. Apply moderate thumb pressure to belt between pulleys. Belt is properly tensioned when deflection is about 1/4" (5-8 mm).
3. If needed, loosen four bolts (1).
4. Turn adjustment screw (2) clockwise or counterclockwise until tube touches bracket.
5. Tighten four bolts.

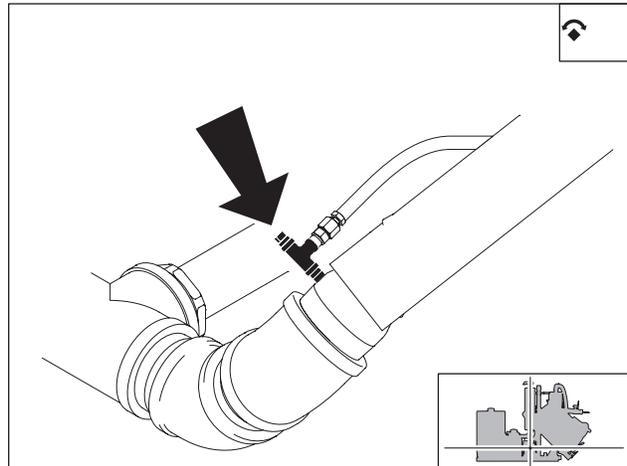


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Lube Blower for Long-term Storage

Lubricate blower before long-term storage to help prevent rust and lockup.

1. Remove plug from fitting at filter.
2. Start engine.
3. Spray light oil into port and run unit for 1-2 minutes.
4. Turn off engine.



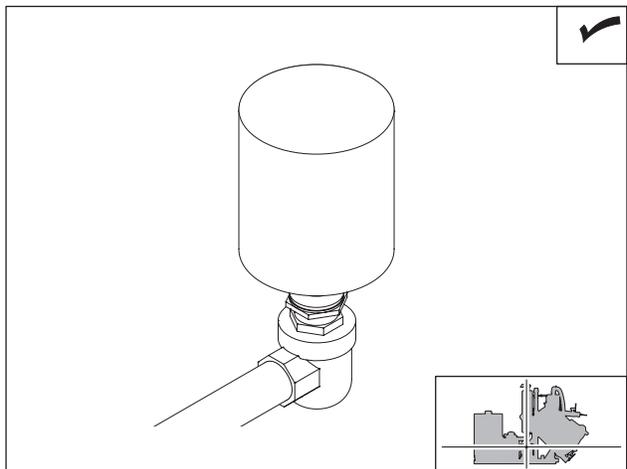
j27om027h.eps

Change Blower Relief Air Filter

Check air filter whenever vacuum gauge goes over 15" (381 mm) of mercury. Change as needed.

NOTICE: Operating system above 15" (381 mm) of mercury may result in blower damage.

1. Remove clamp.
2. Remove filter and discard.
3. Install new filter.
4. Replace clamp.



j27om025h.eps



Debris Tank

Clean Primary Shutoff Valve

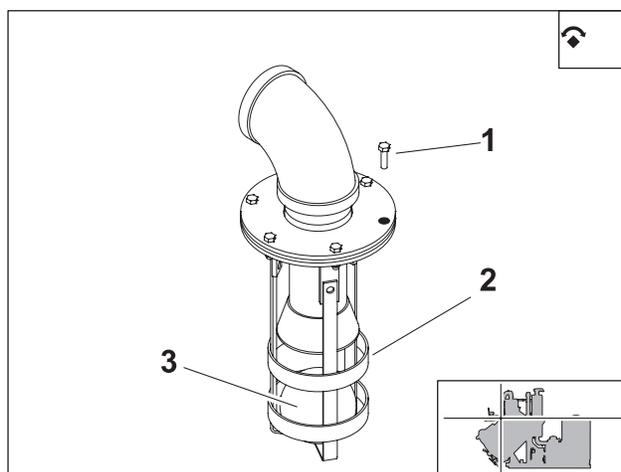
Clean primary shutoff valve as needed. Replace primary shutoff valve as needed.

To clean:

1. Open tank door. See "Drain Tank" on page 48.
2. Spray valve housing inside vacuum tank with high-pressure water.
3. Store water pressure hose.
4. Close tank door. See "Drain Tank" on page 48.

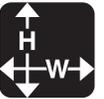
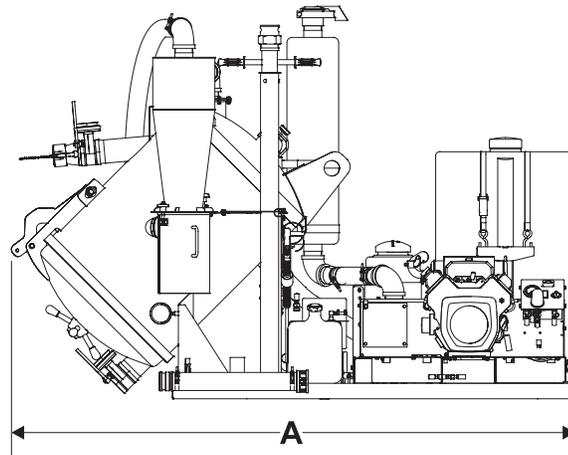
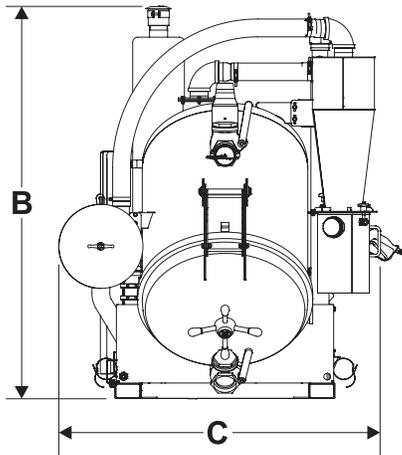
To remove:

1. Disconnect hose from elbow.
2. Remove bolts (1) and pull out valve housing (2).
3. Remove ball (3).
4. Clean ball and housing with high-pressure water.
5. Replace ball and housing.
6. Tighten nuts.



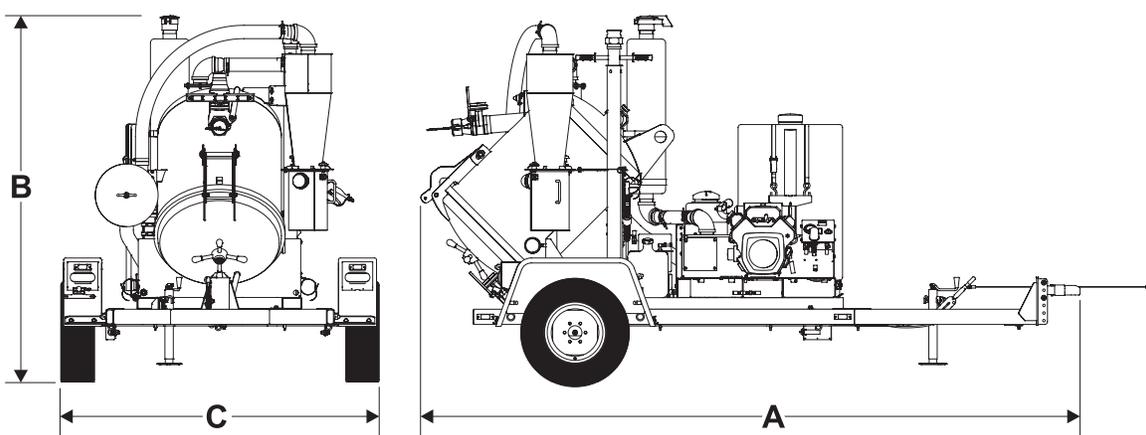
j27om051h.eps

Specifications



j27om003h.eps

| Dimensions (Skid Package) | | U.S. | Metric |
|--|--------|---------|---------|
| A | Length | 109 in | 2.8 m |
| B | Height | 74 in | 1.9 m |
| C | Width | 63 in | 1.6 m |
| Dry weight | | 1594 lb | 723 kg |
| Weight with empty water tank and spoils tank filled with water | | 2724 lb | 1236 kg |
| Weight with full water tank and empty spoils tank | | 2244 lb | 1018 kg |
| Weight with full water tank and spoils tank filled with water | | 3374 lb | 1530 kg |



j27om031h.eps

| Dimensions (S4S Trailer Package) | | U.S. | Metric |
|---|---|---------|---------|
| A | Length | 174 in | 4.4 m |
| B | Height | 93 in | 2.4 m |
| C | Width | 86 in | 2.2 m |
| Dry weight | | 2576 lb | 1168 kg |
| Weight with empty water tank and full spoils tank | | 3583 lb | 1625 kg |
| Weight with full water tank and empty spoils tank | | 3160 lb | 1433 kg |
| Weight with full water tank and spoils tank | | 4233 lb | 1920 kg |
| Tongue weight | | | |
| | Empty | 406 lb | 184 kg |
| | Weight with empty water tank and full spoils tank | 303 lb | 137 kg |
| | Weight with full water tank and empty spoils tank | 660 lb | 299 kg |
| | Weight with full water tank and spoils tank | 563 lb | 255 kg |

| Power | U.S. | Metric |
|------------------------|------|--------|
| Kohler CH740S Gasoline | | |

| Power | | U.S. | Metric |
|--|---------------------|--------------------|---------------|
| | Cooling medium | air | |
| | Fuel delivery | carburetor | |
| | Aspiration | natural | |
| | Number of cylinders | 2 | |
| | Displacement | 44 in ³ | 725 cc |
| | Bore | 3.27 in | 83 mm |
| | Stroke | 2.64 in | 67 mm |
| Engine manufacturer's gross power rating (per SAE J1940) | | 27 hp | 20.1 kW |
| Rated engine speed | | 3600 rpm | 3600 rpm |

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



| Battery |
|--|
| SAE res. cap. 41 min; SAE cold crank @ 0°F (-18°C) 340A, 12V |

| Noise levels |
|--|
| Operator 84 dBA sound pressure per ISO 6394, at operator ear 10' (3 m) behind vacuum tank. Exterior 110 dBA sound power per ISO 6393. |

| Vacuum system | U.S. | Metric |
|--|--------------------|--------------------------|
| Drive type | belt | |
| Displacement, 2-lobe blower (calculated) | 540 cfm | 15.3 m ³ /min |
| Maximum vacuum | 15 in Hg | 381 mm Hg |
| Vacuum tank capacity | 150 gal | 568 L |
| Tank dump angle, fixed | 45° | |
| Full opening rear door diameter | 32 in | 813 mm |
| Outlet valve size | 4 in | 102 mm |
| Inlet valve size | 4 in | 102 mm |
| Primary shutoff (ball type) | 4 in | 102 mm |
| Filter type | washable polyester | |

| Vacuum system | U.S. | Metric |
|-------------------------------|--------------------|--------------------|
| Filter area | 74 ft ² | 6.9 m ² |
| Cyclonic filter trap capacity | 4.5 gal | 17 L |
| Suction hose size (standard) | 3 in | 76 mm |
| Suction hose length (total) | 25 ft | 7.6 m |

| Water system | U.S. | Metric |
|-------------------------------|-------------|---------------|
| Water pump pressure (maximum) | 3000 psi | 207 bar |
| Water pump flow | 2.6 gpm | 9.8 L/min |
| Hose | 50 ft | 15.2 m |

Antifreeze: 50/50 water/antifreeze mix

Clutch type: electric with auto de-clutch and low-water shutdown

| Fluid capacities | U.S. | Metric |
|-------------------------|-------------|---------------|
| Engine oil with filter | 1.7-1.9 qt | 1.6-1.8 L |
| Fuel tank | 10 gal | 38 L |
| Vacuum pump | 22.8 oz | 674 mL |
| Water pump | 14 oz | 414 mL |
| Water tank | 80 gal | 303 L |

| Trailer - S4S | | U.S. | Metric |
|----------------------|------------------------------------|-------------------------|---------------|
| Dimensions | | | |
| | Adj. coupler height | 16 in | 406 mm |
| | Width between fenders | 64 in | 2.2 m |
| | Width outside fenders | 86 in | 2.2 m |
| General | | | |
| | Number of axles | 2 | |
| | Coupler (bolt-on adjustable) | 2", 2 5/16", 3" lunette | |
| | Type of brakes | electric | |
| | Lug nut torque | 95 ft•lb | 129 N•m |
| | Hitch bolt torque | 160 ft•lb | 217 N•m |
| | Electrical system | 12V DC | |
| Tire | | | |
| | ST225/75R15 load range D | 65 psi | 4.5 bar |
| Load rating | | | |
| | Tongue weight (empty) | 406 lb | 184 kg |
| | Tongue weight (full water) | 563 lb | 255 kg |
| | Max tongue load | 1500 lb | 680 kg |
| | GVWR (gross vehicle weight rating) | 4500 lb | 2041 kg |
| | GAWR (gross axle weight rating) | 4500 lb | 2041 kg |



Load ratings for speeds up to 65 mph (104 km/h).

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 weighed and measured. Due to selected options, delivered equipment may not match that shown.

Support

Procedure

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

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

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

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

Resources

Publications

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

Ditch Witch Training

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



Warranty

Ditch Witch Equipment and Replacement Parts Limited Warranty Policy

Subject to the limitation and exclusions herein, free replacement parts will be provided at any authorized Ditch Witch dealership for any Ditch Witch equipment or parts manufactured by The Charles Machine Works, Inc. (CMW) that fail due to a defect in material or workmanship within one (1) year of first commercial use (Exception: 2 years for all SK5 attachments). Free labor will be provided at any authorized Ditch Witch dealership for installation of parts under this warranty during the first year following "initial commercial" use of the serial-numbered Ditch Witch equipment on which it is installed. The customer is responsible for transporting their equipment to an authorized Ditch Witch dealership for all warranty work.

Exclusions from Product Warranty

- All incidental or consequential damages.
- All defects, damages, or injuries caused by misuse, abuse, improper installation, alteration, neglect, or uses other than those for which products were intended.
- All defects, damages, or injuries caused by improper training, operation, or servicing of products in a manner inconsistent with manufacturer's recommendations.
- All engines and engine accessories (these are covered by original manufacturer's warranty).
- Tires, belts, and other parts which may be subject to another manufacturer's warranty (such warranty will be available to purchaser).
- ALL IMPLIED WARRANTIES NOT EXPRESSLY STATED HEREIN, INCLUDING ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY.

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

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

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

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

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

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

First version: 1/91; Latest version: 7/05

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

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

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

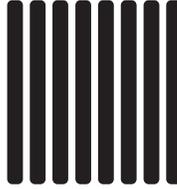
This will enable you to receive updates on this equipment as well as information on new products of interest.

Thanks for using Ditch Witch equipment.

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



**NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES**



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 23 PERRY OKLAHOMA

POSTAGE WILL BE PAID BY

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



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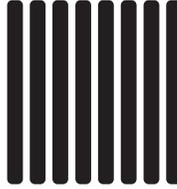
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**NO POSTAGE
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BUSINESS REPLY MAIL

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**



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

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()

Phone Number With Area Code

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