

FX30/FXT30

Tier 4

Operator's Manual



Overview

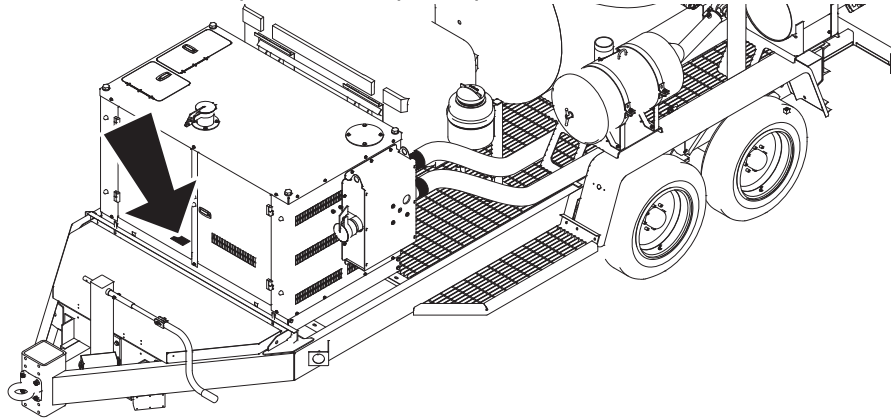


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Serial Number Location

Record serial numbers and date of purchase in spaces provided. FX30 serial number is located as shown.



j33om001h.eps

Date of manufacture	
Date of purchase	
FX30 serial number (shown)	
Engine serial number	
Blower serial number	
Water pump serial number	
Trailer serial number	

Intended Use

The FX30 is a self-contained vacuum excavation unit capable of vacuuming a wide variety of non-hazardous, non-flammable liquid and solid debris. The FXT30 is a truck-mounted version of the FX30 vacuum excavation unit. They are designed to perform efficient soft excavation, including exposing utilities for visual verification and potholing. The optional reverse flow system allows for spoils transfer to another tank. The optional air system on the FXT30 can operate auxiliary pneumatic tools on low (100 psi/689 kPa) setting.

The FX30 and FXT30 are 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 FX30 and FXT30 should be operated, serviced, and repaired only by persons familiar with its particular characteristics and acquainted with the relevant safety procedures.

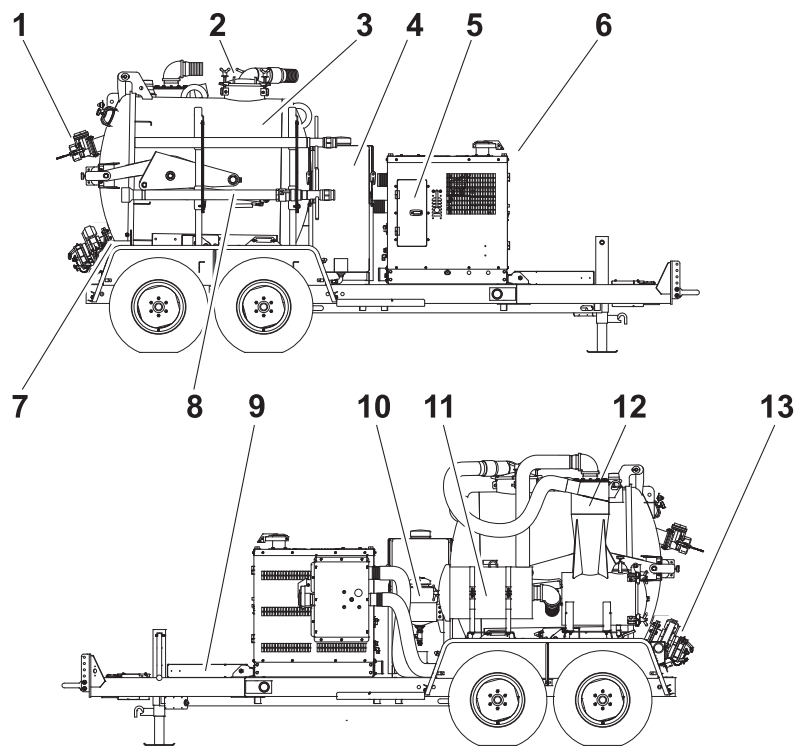
Equipment Modification



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

FX30 Unit Components

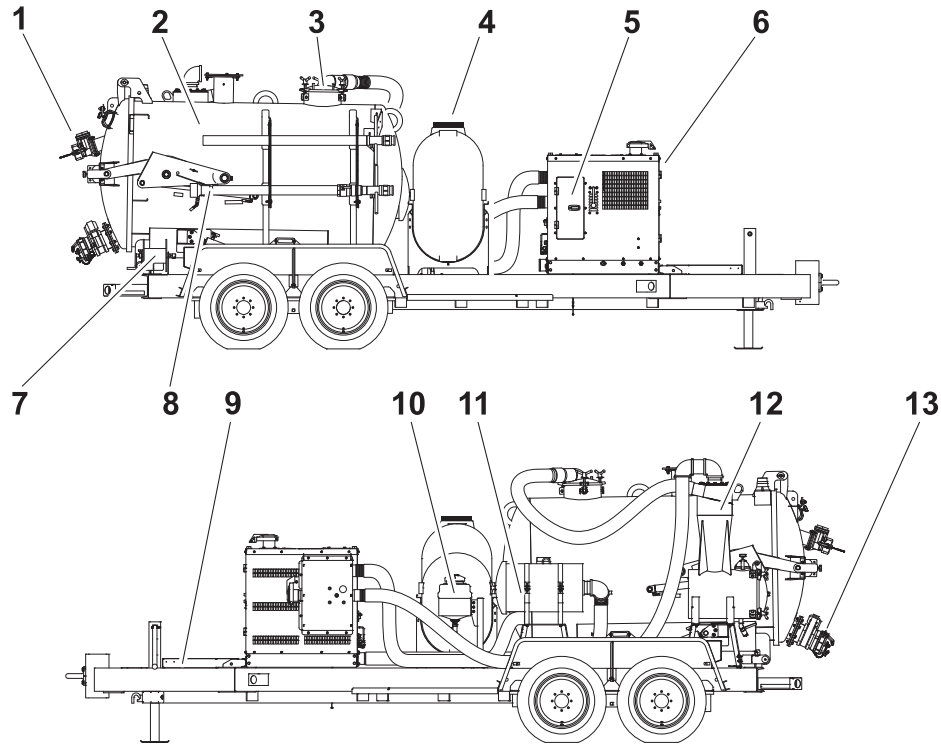
500-Gal (1893-L) Tank



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- | | |
|---------------------------|------------------------|
| 1. Inlet valve | 8. Potholing tools |
| 2. Primary shut-off valve | 9. Tool storage |
| 3. Vacuum tank | 10. Antifreeze tank |
| 4. Water tank | 11. Vacuum filter |
| 5. Operator's station | 12. Cyclone filter |
| 6. Power pack | 13. Drain/Outlet valve |
| 7. Hose reel | |

800-Gal (3028-L) Tank

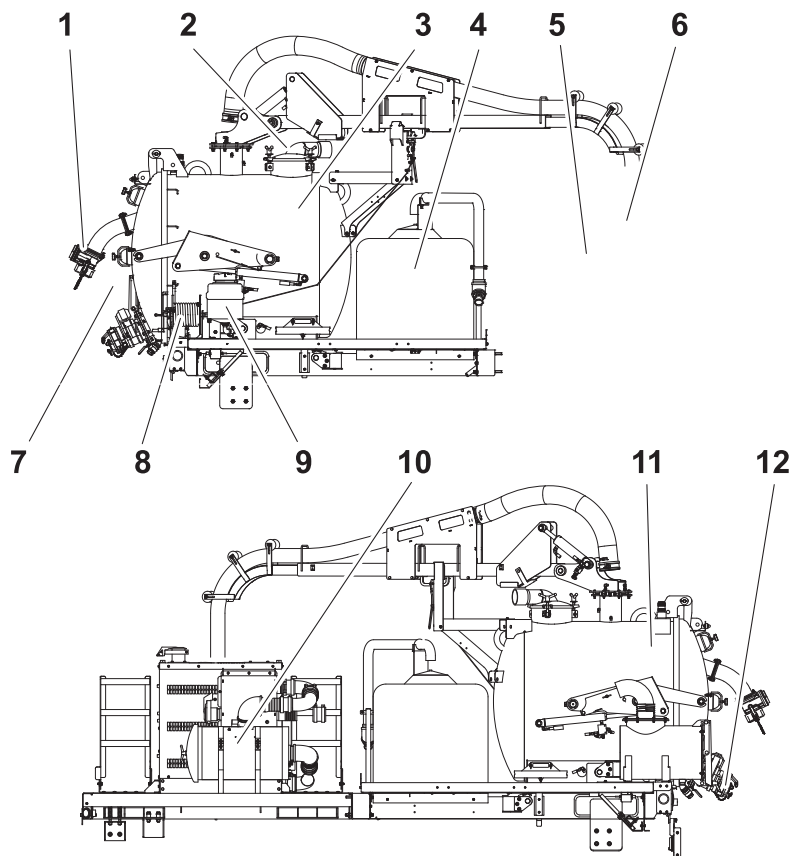


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- | | |
|--------------------------|------------------------|
| 1. Inlet valve | 8. Potholing tools |
| 2. Vacuum tank | 9. Tool storage |
| 3. Primary shutoff valve | 10. Antifreeze tank |
| 4. Water tank | 11. Vacuum filter |
| 5. Operator's station | 12. Cyclonic filter |
| 6. Power pack | 13. Drain/Outlet valve |
| 7. Hose reel | |

FXT30 Unit Components

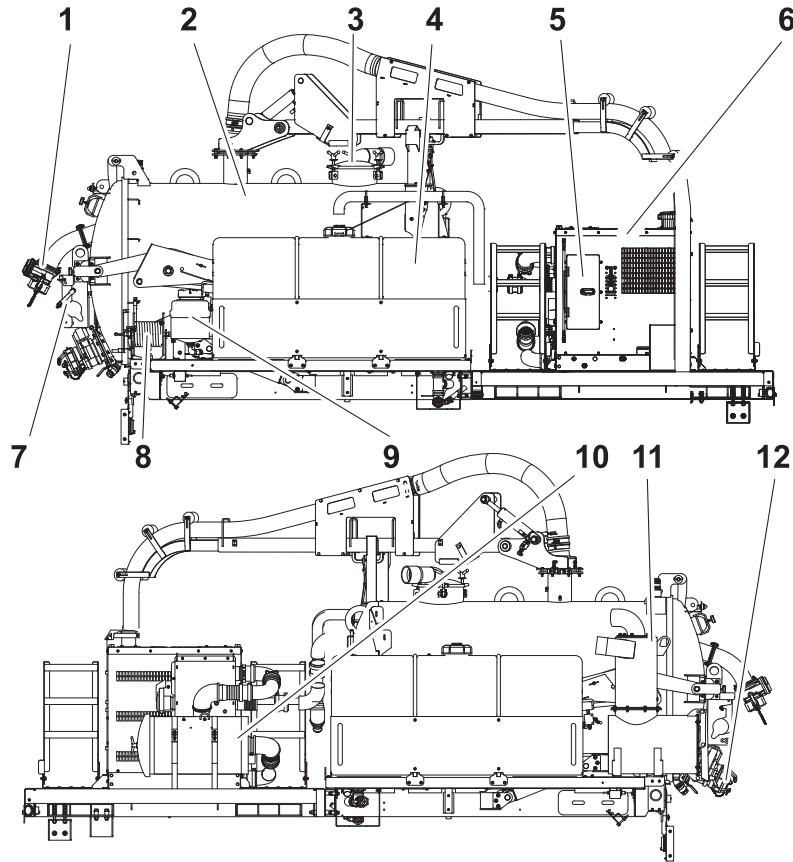
500-Gal (1893-L) Tank



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- | | |
|---------------------------|------------------------|
| 1. Inlet valve | 7. Potholing tools |
| 2. Primary shut-off valve | 8. Hose reel |
| 3. Vacuum tank | 9. Antifreeze tank |
| 4. Water tank | 10. Vacuum filter |
| 5. Operator's station | 11. Cyclone filter |
| 6. Power pack | 12. Drain/Outlet valve |

800-Gal (3028-L) Tank



j39om006h.eps

- | | |
|---------------------------|------------------------|
| 1. Inlet valve | 7. Potholing tools |
| 2. Vacuum tank | 8. Hose reel |
| 3. Primary shut-off valve | 9. Antifreeze tank |
| 4. Water tank | 10. Vacuum filter |
| 5. Operator's station | 11. Cyclone filter |
| 6. Power pack | 12. Drain/Outlet valve |

FCC Statement - Internal Transmitter



U.S.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by **The Charles Machine Works, Inc.** could void the user's authority to operate the equipment.

Contains **FCC ID**: LW9-ERGOF-2G4 & LW9-MFS-RX-2G4.

Canada

This device complies with Industry Canada *license-exempt* RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Contient **IC**: 2119B-ERGOF & 2119B-MFSRX

RF Exposure Statement

In order to comply with RF exposure requirements during normal operation, this device must be held in front of the body horizontally. The antenna must be vertical in line with the body with at least 4" (100 mm) separation distance from the body.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

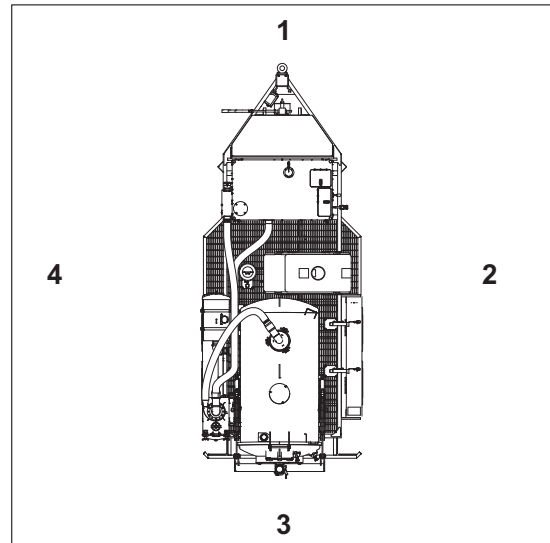
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Health Canada's Safety Code Section 6.

Operator Orientation

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

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



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

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>.



FX30/FXT30 with Tier 4 Engine Operator's Manual

This manual covers the following models: FX30 Tier 4, FXT30 Tier 4.

Issue number 4.1/OM-12/17

Part number 053-2632

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and Ditch Witch are registered trademarks of The Charles Machine Works, Inc.

This product and its use may be covered by one or more patents at <http://patents.charlesmachine.works>.

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Safety

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Guidelines



When you see this safety alert sign, carefully read and follow all instructions.

YOUR SAFETY IS AT STAKE. Read this entire section before using your equipment.

Follow these guidelines before operating any jobsite equipment:

- Complete proper training and read operator's manual before using equipment.
- Mark proposed path with white paint and have underground utilities located before working. In the US or Canada, call 811 (US) or 888-258-0808 (US and Canada). Also contact any local utilities that do not participate in the One-Call service. In countries that do not have a One-Call service, contact all local utility companies to have underground utilities located.
- 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 or at www.ditchwitch.com/safe. Safety Data Sheets (SDS) are available at www.ditchwitch.com/support.
- Fully inspect equipment before operating. Repair or replace any worn or damaged parts. Replace missing or damaged safety shields and safety signs. Contact your Ditch Witch dealer for assistance.
- Use equipment carefully. Stop operation and investigate anything that does not look or feel right.
- Do not operate machine where flammable gas may be present.
- Only operate equipment in well-ventilated areas.
- Contact your Ditch Witch dealer if you have any question about operation, maintenance, or equipment use.
- Complete the equipment checklist located at www.ditchwitch.com/safe.

California Proposition 65 Warning

This product may contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

- battery posts, terminals and related accessories
- engine exhaust
- ethylene glycol

Emergency Procedures



WARNING

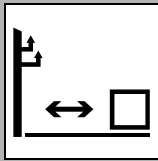
Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.



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 will cause death or serious injury. Stay away. 274-049

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. The ground surface may be electrified so take small shuffle steps with feet close together to reduce the hazard of being shocked from one foot to the other.
- 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. 275-419 (2P)



⚠ 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 orders 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. Contact utility company.

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 and accessible) 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.

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 a hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

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

 **CAUTION** indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

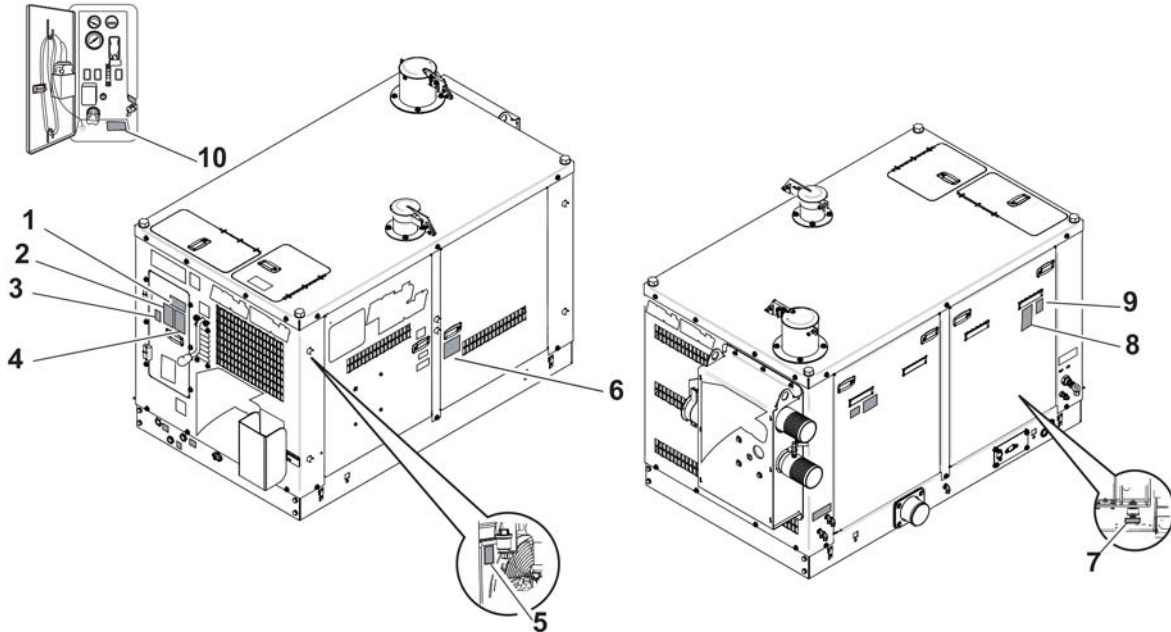
Watch for two other words: **NOTICE** and **IMPORTANT**.

NOTICE indicates information considered important, but not hazard-related (e.g., messages relating to property damage).

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

FX30T4 Machine Safety Alerts

Power Unit



Decal_FX30T4F_PowerPack.png

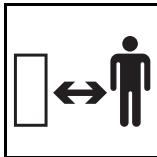
1



⚠ WARNING

Incorrect boom procedures could result in serious injury or death. Lock boom before transporting or tilting.

2



⚠ CAUTION

Equipment can be operated by remote control. Stay away.

3



⚠ CAUTION

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

4



⚠ CAUTION

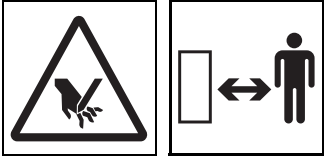
Flying objects thrown by machine may strike people. Wear safety glasses and hard hat.

FX30/FXT30 Operator's Manual

FX30T4 Machine Safety Alerts

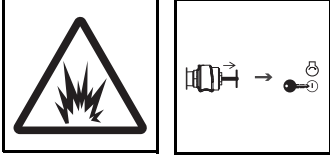
Safety - 21

5



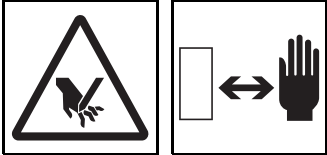
WARNING Moving parts could cut off hand or foot. Stay away.

6



WARNING System may be pressurized. If over pressurized, death or serious injury can occur. Exercise and clean relief valve before each use.

7



WARNING Moving parts could cut off hand. Stay away.

8



WARNING Fire or explosion possible. Do not use starter fluid.

9



CAUTION Hot parts may cause burns. Do not touch until cool or wear gloves.

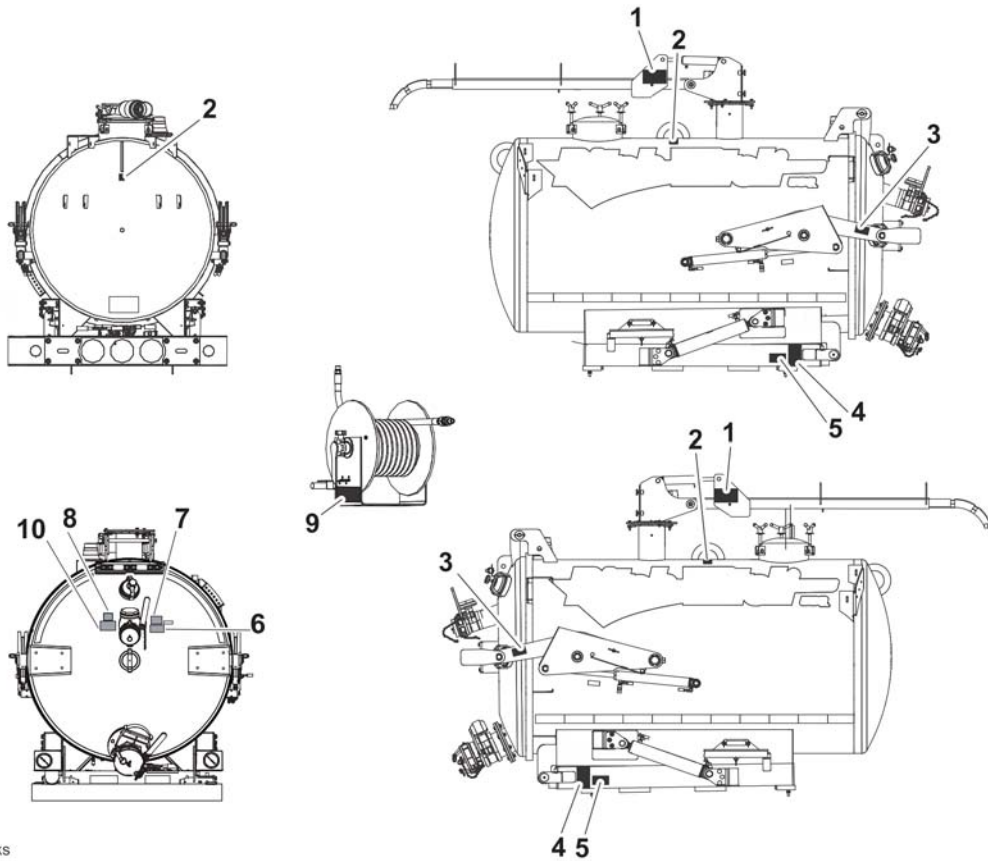
10



WARNING Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use.

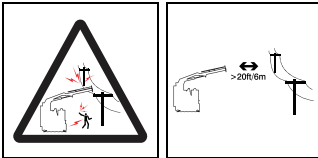


Tanks



Decal_FX_Tanks

1



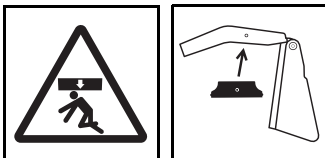
⚠ DANGER Do not get boom near power lines. Death or serious injury will occur. Keep required distance between boom and power lines. Use a spotter.

2



Lift point. See Transport chapter for more information.

3

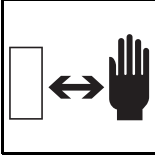
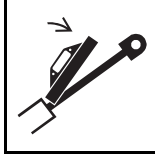
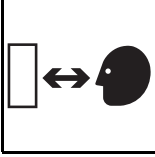
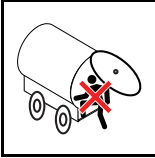
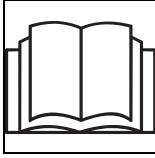


⚠ WARNING Pin door lock on linkage before servicing.

FX30/FXT30 Operator's Manual

FX30T4 Machine Safety Alerts

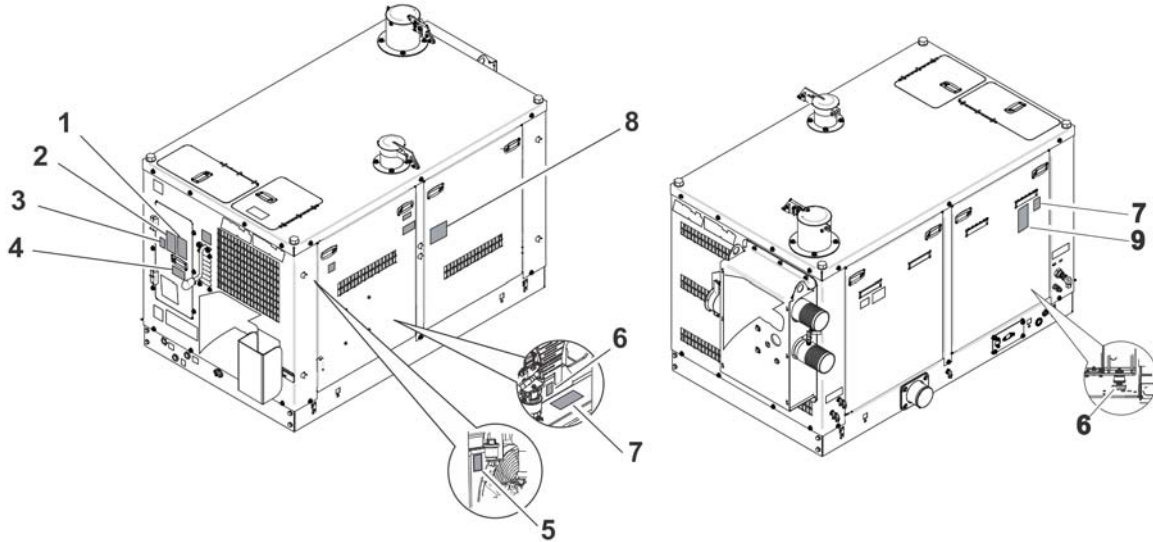
Safety - 23

4	 	⚠ WARNING Moving parts could cut off hand or foot. Stay away.
5	 	⚠ WARNING Crushing can cause death or serious injury. Secure raised part with locking device or stay away.
6	 	⚠ DANGER Vacuum can suffocate. Keep hose end away from face.
7	 	⚠ DANGER Confined space will cause suffocation. Use proper procedures for entering or stay away.
8	 	⚠ WARNING Static charge. Fire or Explosion will cause death or serious injury. Do not vacuum flammable or combustible substances.
9	 	⚠ WARNING Pressurized fluid or air could pierce skin and cause severe injury. Refer to operator's manual for proper use.
10	 	⚠ WARNING Contents under pressure. Relieve pressure before opening. Death or injury could occur.



FXT30T4 Machine Safety Alerts

Power Unit



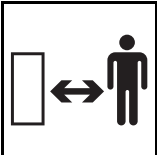
Decal_FXT30_PowerPack.png

1



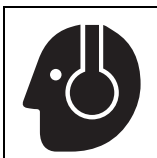
CAUTION Flying objects thrown by machine may strike people. Wear safety glasses and hard hat.

2



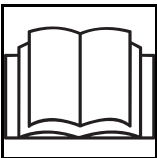
CAUTION Equipment can be operated by remote control. Stay away.

3



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

4



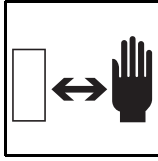
WARNING Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use.

FX30/FXT30 Operator's Manual

FXT30T4 Machine Safety Alerts

Safety - 25

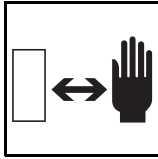
5



! WARNING

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

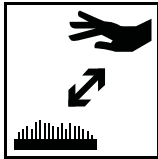
6



! WARNING

Moving parts could cut off hand. Stay away.

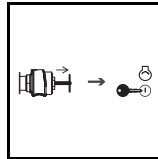
7



! CAUTION

Hot parts may cause burns. Do not touch until cool or wear gloves.

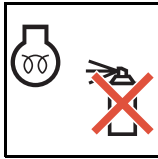
8



! WARNING

System may be pressurized. If over pressurized, death or serious injury can occur. Exercise and clean relief valve before each use.

9

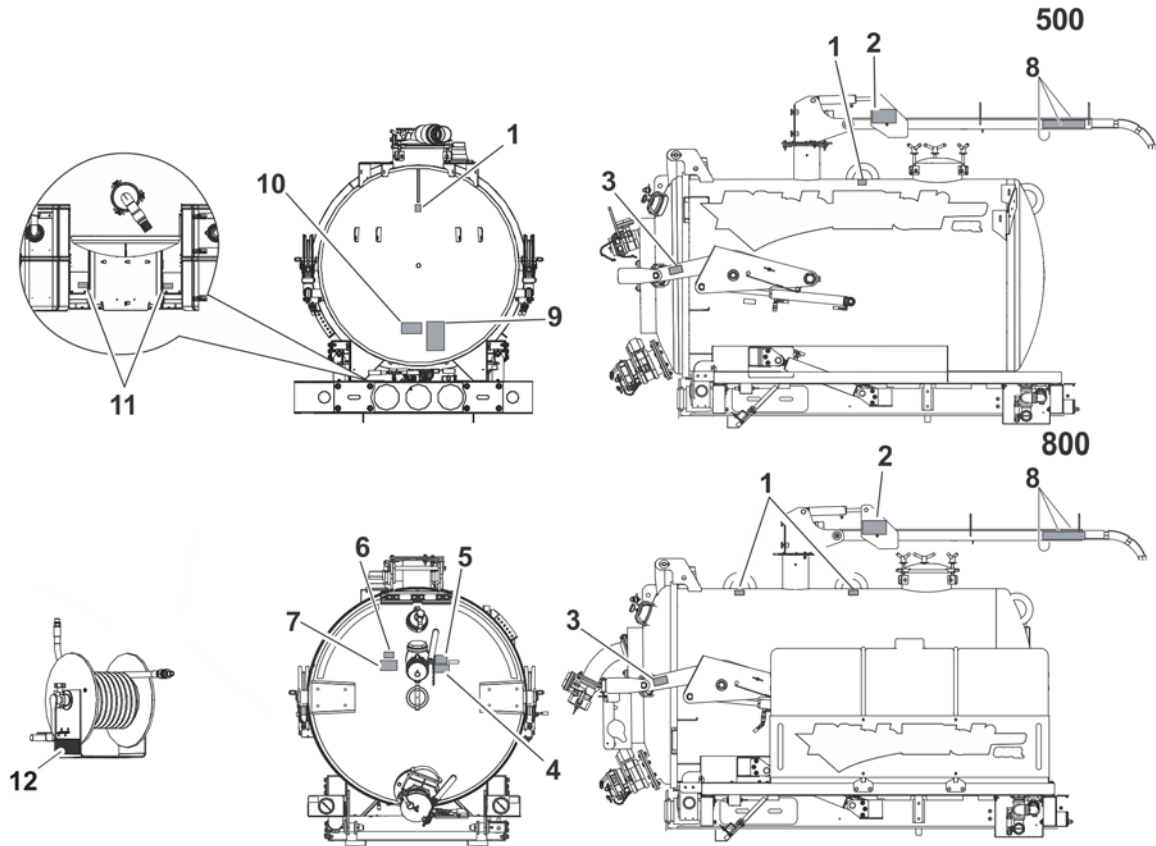


! WARNING

Fire or explosion possible. Do not use starter fluid.



Tanks



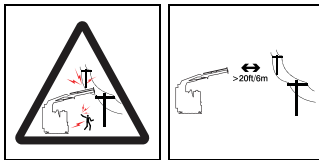
Decal_FXT_Tanks

1



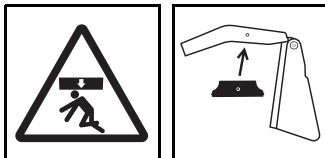
Lift point. See Transport chapter for more information.

2



⚠ DANGER Do not get boom near power lines. Death or serious injury will occur. Keep required distance between boom and power lines. Use a spotter.

3



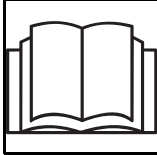
⚠ WARNING Crushing weight can cause death or serious injury. Pin door lock on linkage before servicing.

FX30/FXT30 Operator's Manual

FXT30T4 Machine Safety Alerts

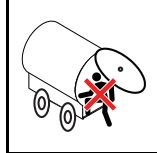
Safety - 27

4



⚠ WARNING Contents under pressure. Impact can cause death or serious injury. Relieve pressure before opening.

5



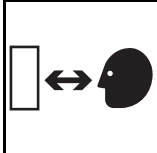
⚠ DANGER Confined space will cause suffocation. Use proper procedures for entering or stay away.

6



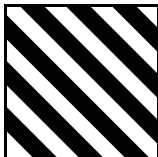
⚠ WARNING Static charge. Fire or Explosion will cause death or serious injury. Do not vacuum flammable or combustible substances.

7



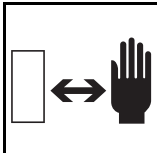
⚠ DANGER Vacuum can suffocate. Keep hose end away from face.

8



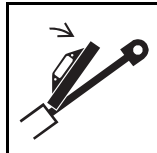
DANGER stripe decal. See Parts Manual for replacement part numbers.

9



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

10



⚠ WARNING Crushing can cause death or serious injury. Secure raised part with locking device or stay away.

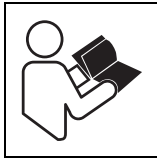
11



⚠ CAUTION Fall possible. Do not use this area as a step.

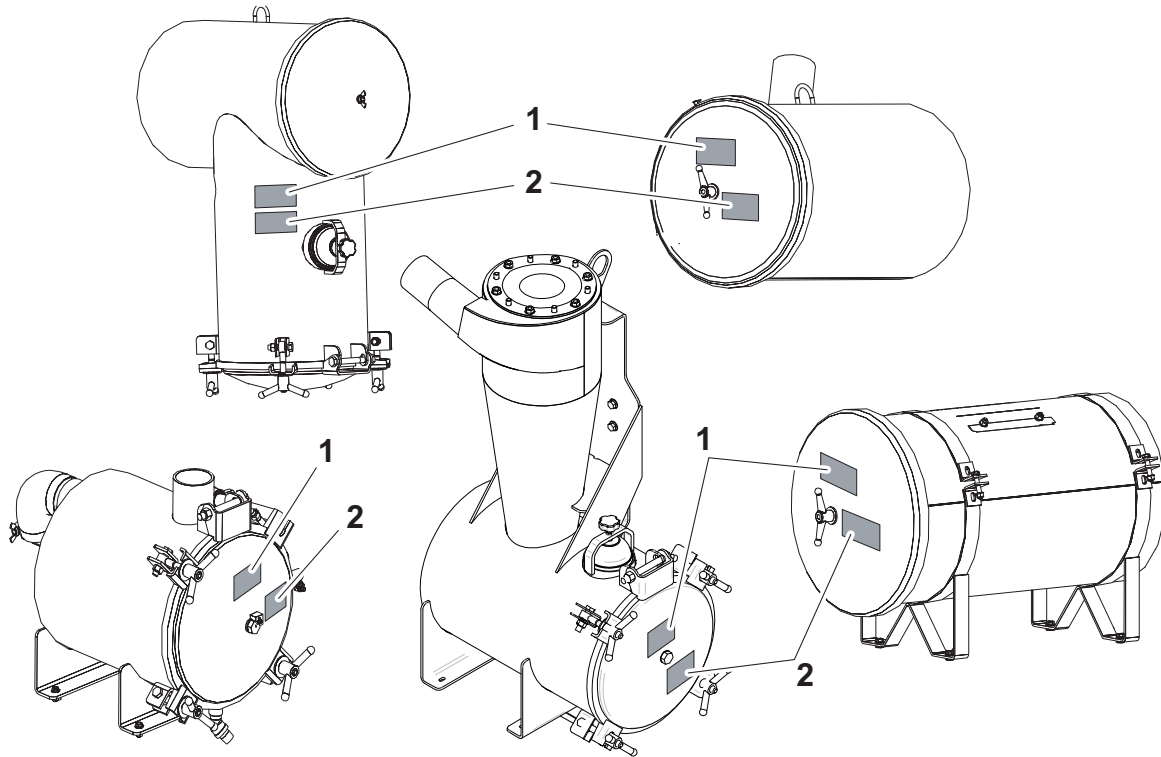


12



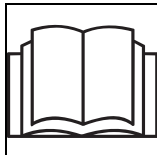
⚠ WARNING Pressurized fluid or air could pierce skin and cause severe injury. Refer to operator's manual for proper use.

FX Filters and Cyclones Safety Alerts



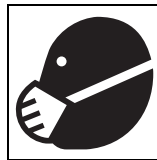
FX_Filters_&_Cyclones.eps

1



WARNING Contents under pressure. Impact can cause death or serious injury. Relieve pressure before opening.

2



CAUTION Breathing crystalline silica dust may cause lung disease. Cutting, drilling, or working materials such as concrete, sand, or rock containing quartz may result in exposure to silica dust. Use dust control methods or appropriate breathing protection when exposed to silica dust.

To help avoid injury:

- Use water spray or other means to control dust.
- Refer to U.S. Department of Labor Occupational Safety and Health Administration guidelines to learn more about appropriate breathing protection and permissible exposure limits.

Controls

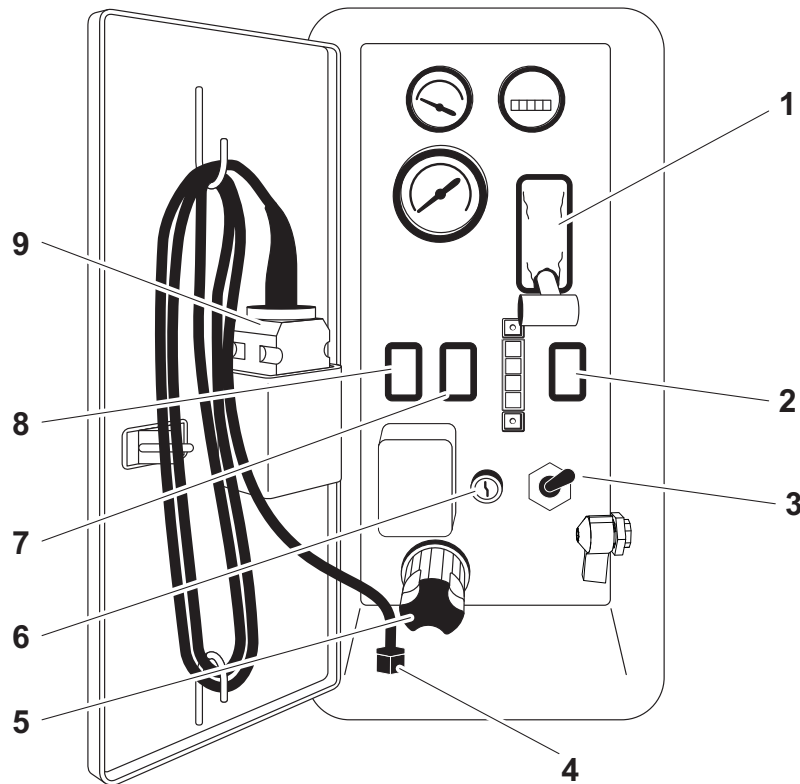
Chapter Contents

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Power Pack

Controls and Connectors



j33om002w.eps

- | | |
|-----------------------------------|------------------------------|
| 1. Throttle | 6. Ignition switch |
| 2. Water pressure switch | 7. Auxiliary outlet switch |
| 3. Air pressure switch (optional) | 8. Hydraulic function switch |
| 4. Tethered tank control outlet * | 9. Tethered tank control |
| 5. Water pressure control | |

* FX30 units only; outlet for FXT30 units is at the back of the unit.

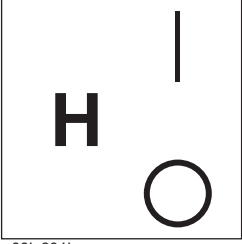
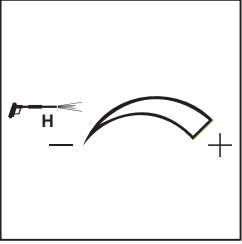
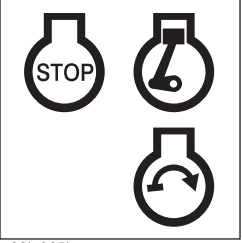
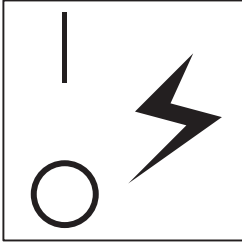
Item	Description	Notes
1. Throttle 	To increase engine speed, push up. To decrease engine speed, pull down.	IMPORTANT: Run engine at full throttle during operation.

c00ic116h.eps

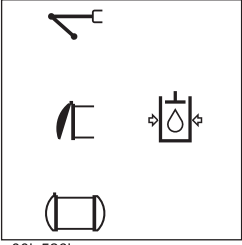
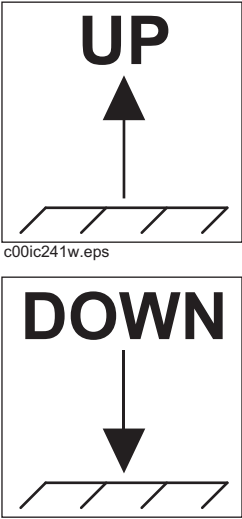
FX30/FXT30 Operator's Manual

Power Pack

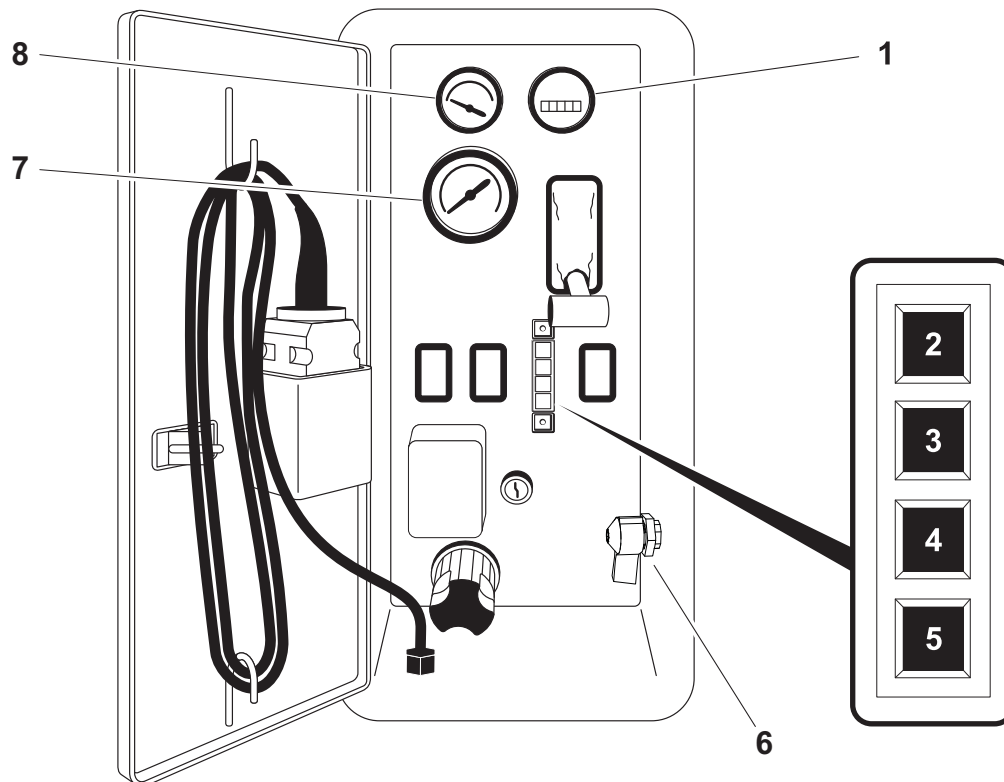
Controls - 33

Item	Description	Notes
2. Water pressure switch  c00ic601h.eps	To turn on water pump, press top. To turn off water pump, move to center position. To bypass low water indication, press bottom. Water pump will operate for 60 seconds.	Use bypass to feed antifreeze into system when freshwater tank is empty. See "Add Antifreeze" on page 84.
3. Air pressure switch	To select low-pressure air, move to left. To select high-pressure air, move to right.	IMPORTANT: Operate auxiliary pneumatic tools at low air setting.
4. Tethered tank control outlet (FX30 only)	Connection for tethered tank lift/lower control.	IMPORTANT: The outlet for FXT30 units is at the back of the unit.
5. Water pressure control  c00ic060t.eps	To increase water pressure, turn clockwise. To decrease water pressure, turn counterclockwise.	
6. Ignition switch  c00ic065h.eps	To start engine, insert key and turn clockwise. To stop engine, turn key counterclockwise.	NOTICE: Do not start unit unless flow direction control is in vacuum mode. IMPORTANT: - When engine is on, blower operates and vacuum is present at tank inlet. - All indicators should light briefly at startup.
7. Auxiliary outlet switch  c00ic061t.eps	To turn on, press top. To turn off, press bottom.	



Item	Description	Notes
8. Hydraulic function switch  c00ic526h.eps	To operate the vacuum boom option, press top. To operate hydraulic door lift, move to center position. To operate hydraulic tank tilt, press bottom.	
9. Tethered tank control  c00ic241w.eps c00ic242w.eps	To lift and lower tank, set hydraulic function switch to the tank position, then - To lift tank, press UP. - To lower tank, press DOWN. To open and close tank door, set hydraulic function switch to the door position, then - To open door, press UP. - To close door, press DOWN.	IMPORTANT: These functions are also included on the wireless control module.

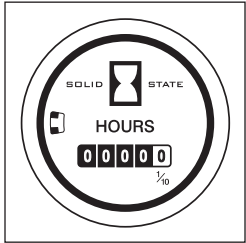
Gauges and Indicators



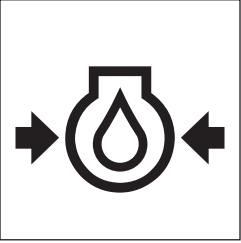
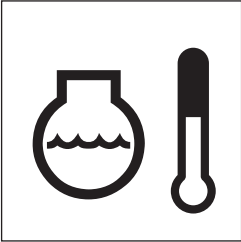
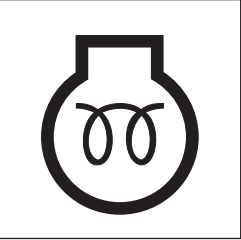
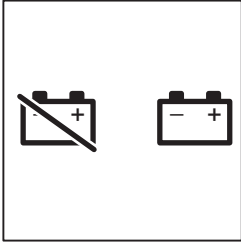
j33om001w.eps

- | | |
|---|--------------------------------|
| 1. Hourmeter | 5. Not used |
| 2. Engine oil pressure indicator | 6. Battery disconnect switch * |
| 3. Engine coolant temperature indicator | 7. Water pressure gauge |
| 4. Cold start wait indicator | 8. Fuel gauge |

* FXT30 units and FX30 units from CMWFX30XLE0002054

Item	Description	Notes
1. Hourmeter 	Displays engine operating time.	Hourmeter runs when engine is running. Use these times to schedule service.

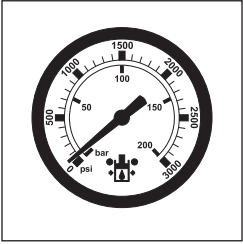
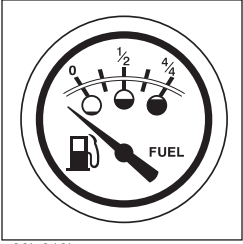
c00ic019h.eps

Item	Description	Notes
2. Engine oil pressure indicator  c00ic119h.eps	Indicates engine oil pressure is low. Also lights briefly when engine is started.	Engine will stop. 1. Check oil level. 2. Check for leaks before starting engine.
3. Engine coolant temperature indicator  c00ic120h.eps	Indicates cooling system fluid is overheated.	Engine will stop. 1. Let engine cool. 2. Check cooling system fluid level.
4. Cold start wait indicator  c00ic180h.eps	Indicates engine preheater (glow plug) is on.	Wait for engine preheater to go off before starting engine.
5. Not used		
6. Battery disconnect switch  c00ic063t.eps	To connect, turn clockwise. To disconnect, turn counterclockwise.	IMPORTANT: Location for all FXT30 units and FX30 units from CMWFX30XLE0002054. IMPORTANT: Use battery disconnect switch when servicing, welding, and during long-term storage.

FX30/FXT30 Operator's Manual

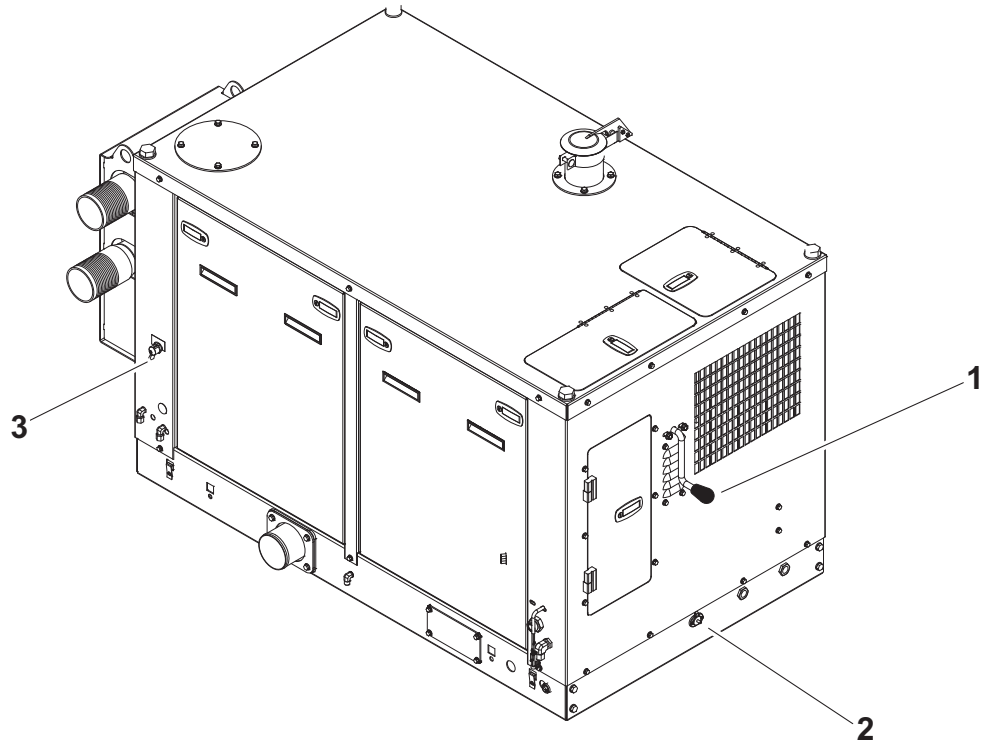
Power Pack

Controls - 37

Item	Description	Notes
7. Water pressure gauge  c00ic118h.eps	Displays water pressure when water pressure switch is on.	
8. Fuel gauge  c00ic018h.eps	Displays fuel level in tank.	Use only #2 diesel fuel. In temperatures below 40° F (4° C), use #1 diesel fuel. Tank holds 15 gal (57 L).



Miscellaneous

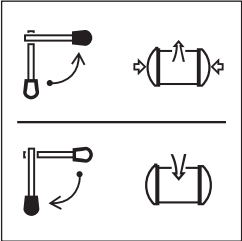


j33om006h.eps

1. Flow direction control (optional)
2. Auxiliary outlet

3. Battery disconnect switch *

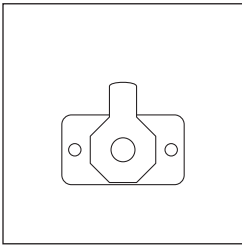
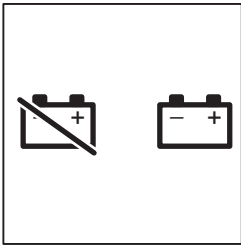
* FX30 units prior to CMWFX30XLE0002054

Item	Description	Notes
1. Flow direction control  c00ic605h.eps	To operate in reverse flow mode, turn counterclockwise. To operate in vacuum mode, turn clockwise.	Use optional reverse flow to unload tank contents to another tank. Operate in reverse flow mode only when drain/outlet valve is open.

FX30/FXT30 Operator's Manual

Power Pack

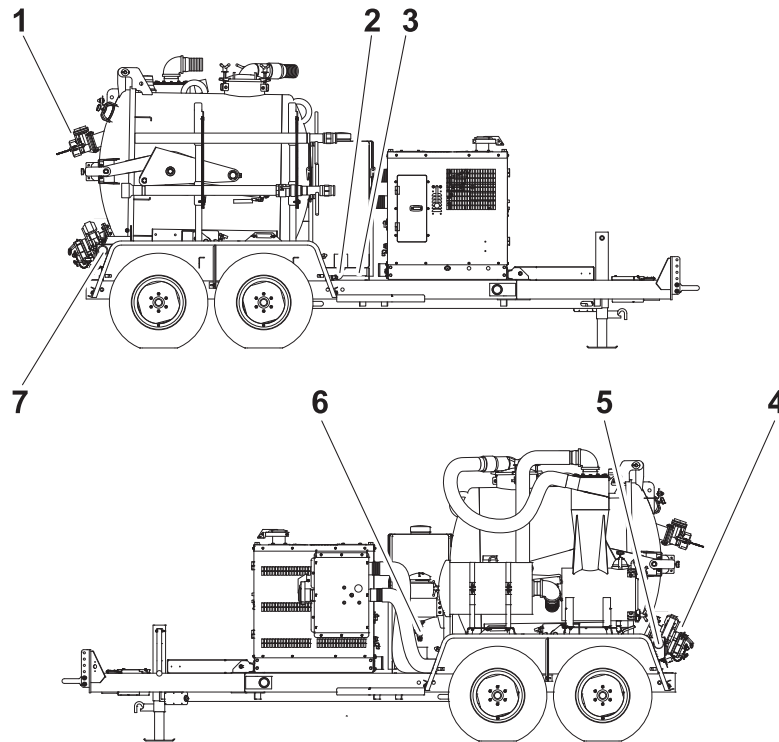
Controls - 39

Item	Description	Notes
2. Auxiliary outlet  c00ic140h.eps	To operate work lights or other 12V devices, plug into outlet.	Outlet has power only when ignition switch is on.
3. Battery disconnect switch  c00ic063t.eps	To connect, turn clockwise. To disconnect, turn counterclockwise.	IMPORTANT: Location for FX30 units prior to CMWFX30XLE0002054. IMPORTANT: Use battery disconnect switch when servicing, welding, and during long-term storage.



Machine Controls

500 Gallon Tank



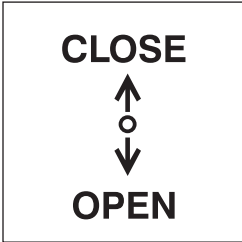
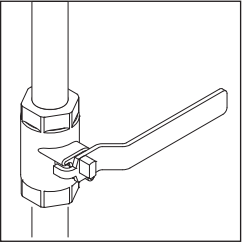
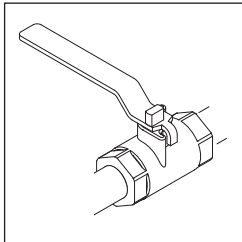
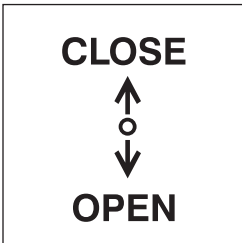
j33om007h.eps

- | | |
|----------------------------|---------------------------------|
| 1. Inlet valve | 5. Reverse flow gauge |
| 2. Water tank supply valve | 6. Antifreeze tank supply valve |
| 3. Water tank drain | 7. Vacuum gauge |
| 4. Drain/Outlet valve | |

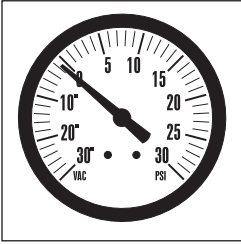
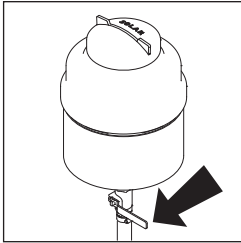
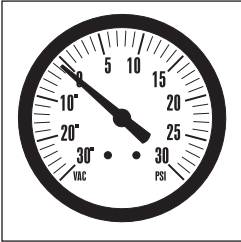
FX30/FXT30 Operator's Manual

Machine Controls

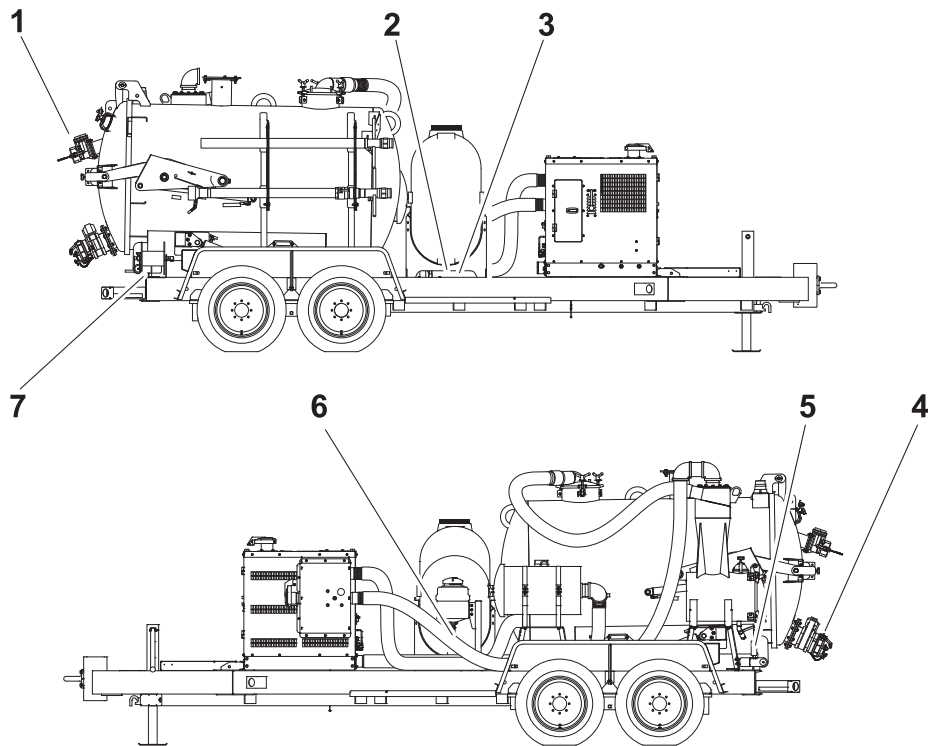
Controls - 41

Item	Description	Notes
1. Inlet valve  c00ic127h.eps	To close valve (stop suction), rotate up. To open valve (start suction), rotate down.	NOTICE: Do not idle engine with inlet valve closed.
2. Water tank supply valve  c00ic603h.eps	To open valve (send water from the water tank through the pump and wash wand), rotate counterclockwise. To close valve (stop water flow), rotate clockwise.	IMPORTANT: Water tank supply valve or antifreeze supply valve must be open when pump is running or pump will be damaged.
3. Water tank drain  c00ic604h.eps	To drain tank, open valve. Close valve when tank is empty.	
4. Drain/Outlet valve  c00ic127h.eps	To drain tank, rotate down. To close drain, rotate up.	



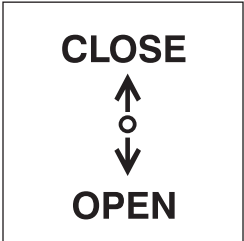
Item	Description	Notes
5. Reverse flow gauge  c00ic131h.eps	Displays reverse flow pressure in PSI.	Gauge can read either reverse flow in PSI or vacuum in inHg, depending on selected machine mode.
6. Antifreeze tank supply valve  c00ic602h.eps	To open valve (send antifreeze through pump and wash wand), rotate counterclockwise. To close valve (stop antifreeze flow), rotate clockwise.	IMPORTANT: Water tank supply valve or antifreeze supply valve must be open when pump is running or pump will be damaged.
7. Vacuum gauge  c00ic131h.eps	Displays blower vacuum reading in inches of mercury. Vacuum relief valve opens when vacuum reaches 15" (381 mm).	Gauge can read either vacuum in inHg or reverse flow in PSI, depending on selected machine mode.

800 Gallon Tank

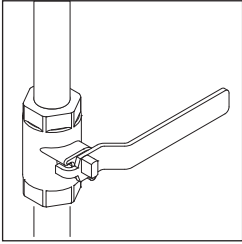
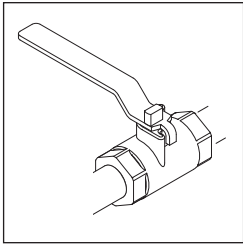
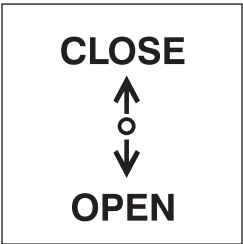
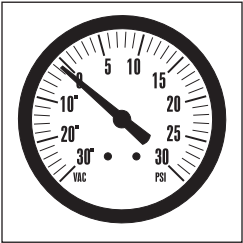


j33om008h.eps

- | | |
|----------------------------|---------------------------------|
| 1. Inlet valve | 5. Reverse flow gauge |
| 2. Water tank supply valve | 6. Antifreeze tank supply valve |
| 3. Water tank drain | 7. Vacuum gauge |
| 4. Drain/Outlet valve | |

Item	Description	Notes
1. Inlet valve 	To close valve (stop suction), rotate up. To open valve (start suction), rotate down.	NOTICE: If hose or tool gets stuck on the ground or material being vacuumed, use tank inlet valve to break suction.

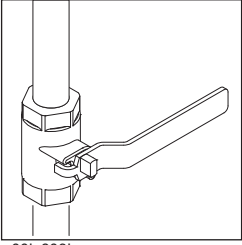
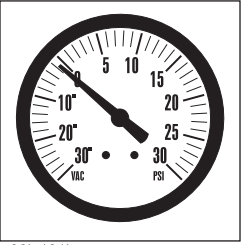
c00ic127h.eps

Item	Description	Notes
2. Water tank supply valve  c00ic603h.eps	To open valve (send water from the water tank through the pump and wash wand), rotate counterclockwise. To close valve (stop water flow), rotate clockwise.	IMPORTANT: Water tank supply valve or antifreeze supply valve must be open when pump is running or pump will be damaged.
3. Water tank drain  c00ic604h.eps	To drain tank, open valve. Close valve when tank is empty.	
4. Drain/Outlet valve  c00ic127h.eps	To drain tank, rotate down. To close drain, rotate up.	
5. Reverse flow gauge  c00ic131h.eps	Displays reverse flow pressure in PSI.	Gauge can read either reverse flow in PSI or vacuum in inHg, depending on selected machine mode.

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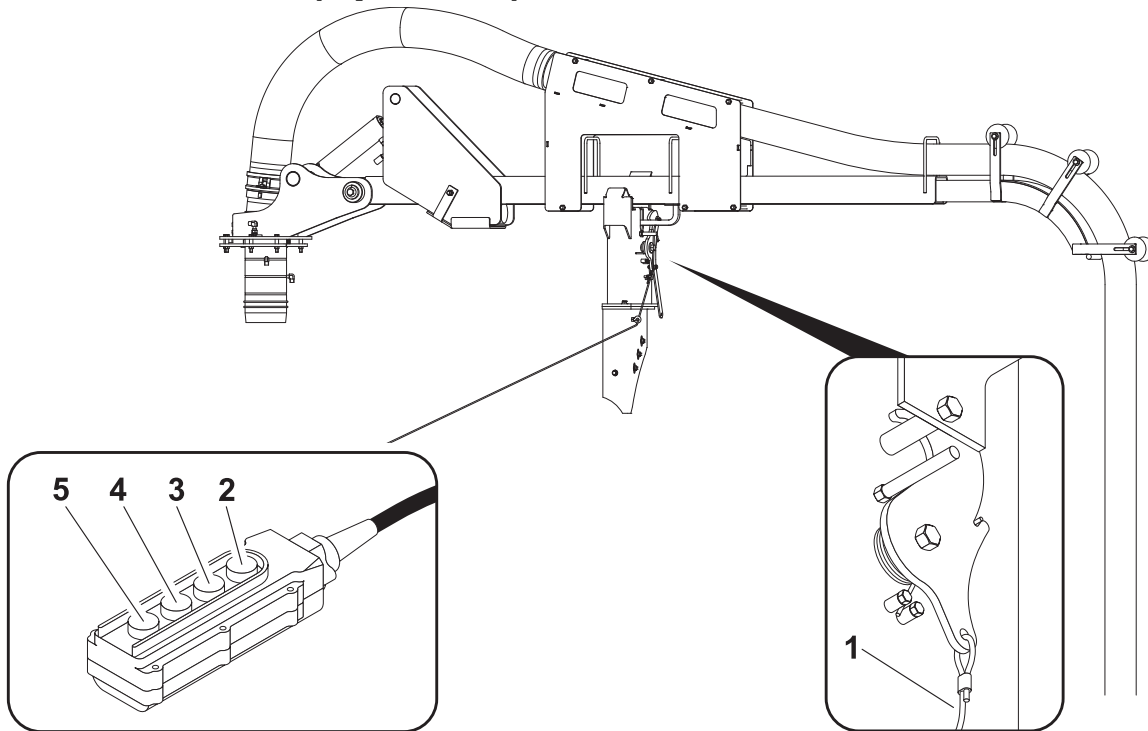
Machine Controls

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Item	Description	Notes
6. Antifreeze tank supply valve  c00ic603h.eps	To open valve (send antifreeze through pump and wash wand), rotate counterclockwise. To close valve (stop antifreeze flow), rotate clockwise.	IMPORTANT: Water tank supply valve or antifreeze supply valve must be open when pump is running or pump will be damaged.
7. Vacuum gauge  c00ic131h.eps	Displays blower vacuum reading in inches of mercury. Vacuum relief valve opens when vacuum reaches 15" (381 mm).	Gauge can read either vacuum in inHg or reverse flow in PSI, depending on selected machine mode.



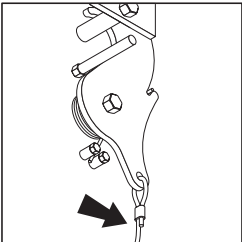
Vacuum Boom (optional)



j35om053h.eps

- | | |
|---------------|-----------------|
| 1. Boom latch | 4. Boom retract |
| 2. Boom up | 5. Boom extend |
| 3. Boom down | |

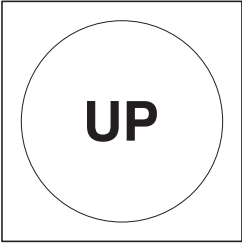
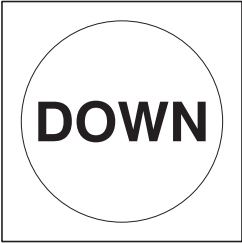
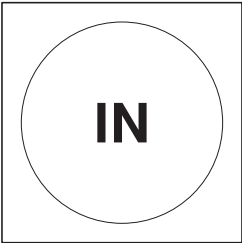
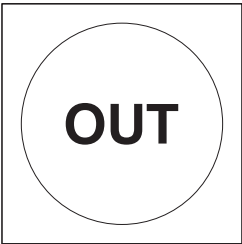
IMPORTANT: The vacuum boom can be controlled with the wireless control module or the tethered controller.

Item	Description	Notes
1. Boom latch  j23om010a.eps	Pull cable to open latch and release boom from saddle. Push boom into latch to lock boom into saddle.	

FX30/FXT30 Operator's Manual

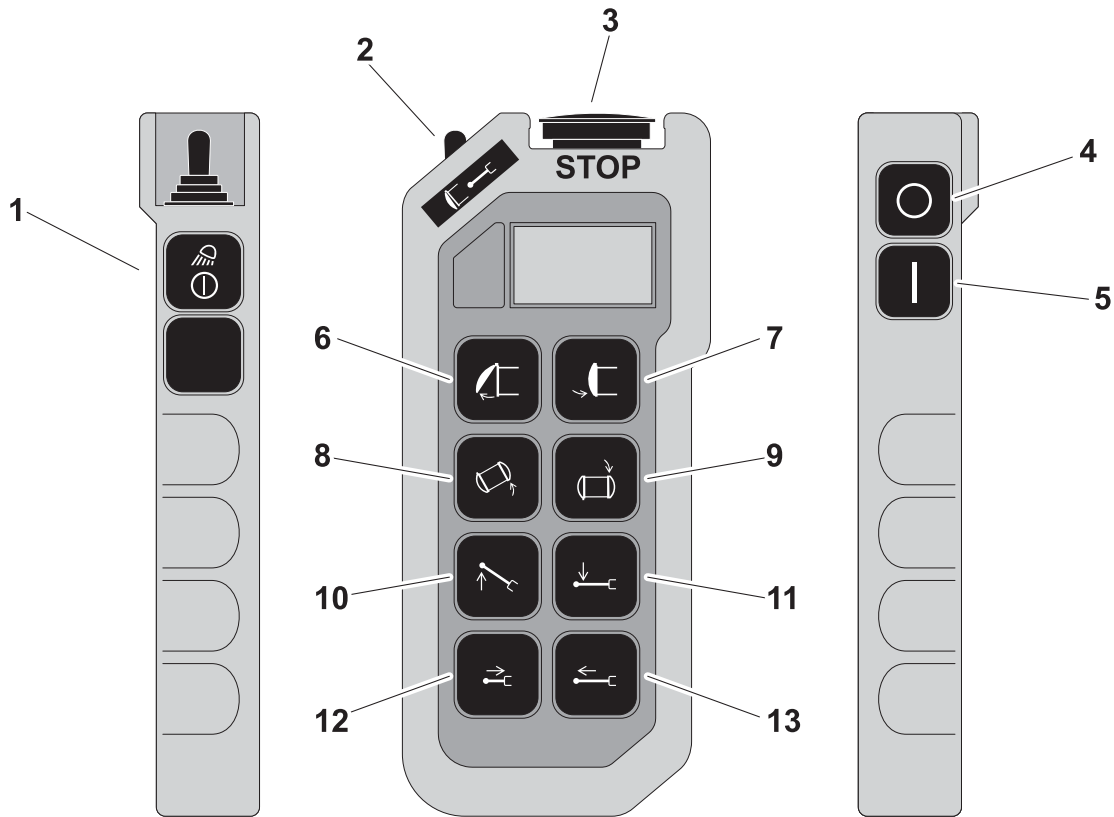
Vacuum Boom (optional)

Controls - 47

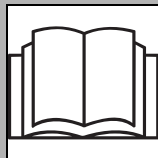
Item	Description	Notes
2. Boom up  c00ic122a.eps	To raise boom, press. To stop movement, release.	NOTICE: - Do not use boom to raise or lower objects. - Do not use boom to break vacuum when hose is stuck to material being vacuumed. Use inlet valve.
3. Boom down  c00ic123a.eps	To lower boom, press. To stop movement, release.	NOTICE: Do not use boom to raise or lower objects.
4. Boom retract  c00ic124a.eps	To retract boom, press. To stop movement, release.	
5. Boom extend  c00ic125a.eps	To extend boom, press. To stop movement, release.	



Wireless Control Module



VacWirelessControl.eps


WARNING

Read operator's manual. Know how to use all controls. Your safety is at stake. 273-475

To help avoid injury: Keep unit in sight when controlling tank or boom with wireless control module.

Item	Description	Notes
1. Light key	To toggle dome and option work light on and off, press.	
2. Boom/Tank selector switch	To activate tank and door controls, move to  To activate boom controls, move to 	
3. Engine stop button	To stop engine, press.	To restart engine, turn ignition switch off and then back on.
4. Receiver power on key	To turn on receiver module and wake up transmitter module, press.	The transmitter goes off after 20 minutes without use. The receiver does not shut off automatically.

FX30/FXT30 Operator's Manual

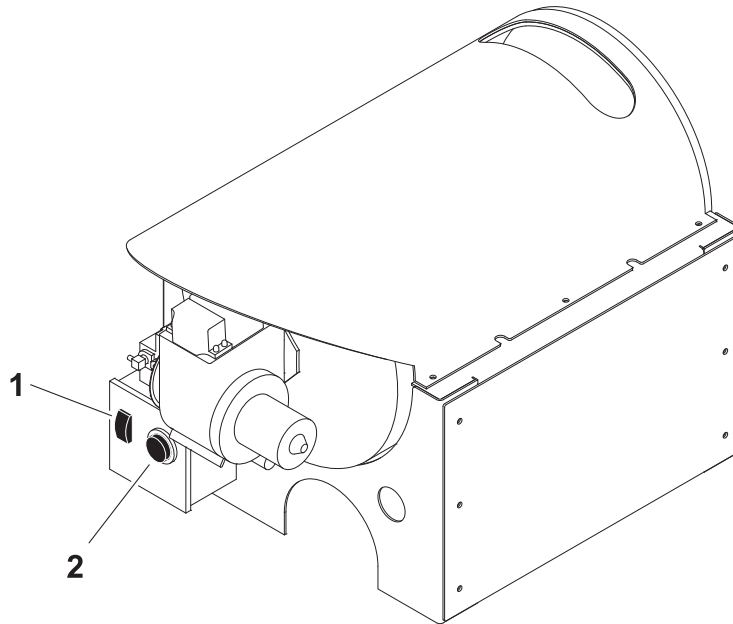
Wireless Control Module

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Item	Description	Notes
5. Receiver power off key	To turn off receiver, press.	The receiver does not shut off automatically. To preserve batteries, turn off receiver when not in use.
6. Door open key	To open vacuum tank door, press.	
7. Door close key	To close vacuum tank door, press.	
8. Tank up key	To raise vacuum tank, press.	IMPORTANT: Do not operate tank lift while trailer is unhitched.
9. Tank down key	To lower vacuum tank, press.	
10. Boom up key	To raise boom, press.	NOTICE: Do not use boom to raise or lower objects.
11. Boom down key	To lower boom, press.	NOTICE: Do not use boom to raise or lower objects.
12. Boom retract key	To retract boom, press.	
13. Boom extend key	To extend boom, press.	



Water Heater (optional)

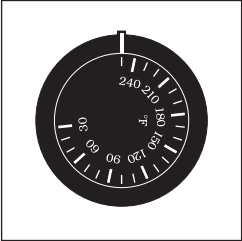


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1. Power switch

2. Temperature control *

* Temperature control not available on tandem-axle truck water heaters.

Item	Description	Notes
1. Power switch	To turn water heater on, press top. Red light will glow. To turn off, press bottom.	NOTICE: Turn power switch off when unit is not in use. Turning off power pack engine does not turn off heater. IMPORTANT: Heater automatically shuts off when water level is too low.
2. Temperature control 	Turn dial to set heater to desired temperature.	Not available on tandem-axle truck water heaters.

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Operation Overview

Chapter Contents

Planning	52
Setting Up at Jobsite	52
Vacuuming	52
Potholing	53
Operating Auxiliary Pneumatic Tools	53
Leaving Jobsite	53
Storing Equipment	53



Planning

1. Gather information about jobsite (page 56).
2. Inspect jobsite (page 57).
3. Check supplies and prepare equipment (page 59).

Setting Up at Jobsite

FX30

1. Prepare jobsite (page 58).
2. Position vacuum excavation unit.
3. Leave unit hitched to towing vehicle or properly stabilized.
4. Block trailer wheels.

FXT30

1. Prepare jobsite (page 58).
2. Position vac truck.
3. Block truck wheels.

Vacuuming

1. Connect hoses (page 66).
2. Start unit (page 71).
3. Position optional vacuum boom (page 72).
4. Remove debris (page 74).
5. Disconnect hoses (page 86).
6. Drain tank (page 79) or unload to another tank (page 81).

Potholing

1. Connect hoses (page 66).
2. Start unit (page 71).
3. Pothole using water (page 75) or air (page 77).
4. Disconnect hoses (page 86).
5. Drain tank (page 79) or unload to another tank (page 81).

Operating Auxiliary Pneumatic Tools

IMPORTANT: Always operate auxiliary pneumatic tools at low air setting.



See air system and pneumatic tool operator's manuals.

Leaving Jobsite

1. Rinse unit and tools (page 85).
2. Stow tools (page 86).

Storing Equipment

1. For cold weather storage, antifreeze vacuum excavation unit (page 84).
2. For long-term storage, disconnect battery disconnect switch (page 38).

Prepare

Chapter Contents

Gather Information 56

- Arrange for Traffic Control 56
- Prepare for Working Near Existing Utilities 56
- Plan for Emergency Services 56

Inspect Jobsite 57

Prepare Jobsite 58

- Prepare Excavation Point 58

Check Supplies and Prepare Equipment 59

- Assemble Accessories 59
- Check Supplies 59
- Prepare Equipment 60



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 ASTM F2413 or ASTM F1117, when tested at 18,000 volts. Tuck legs of pants completely inside boots.
- Gloves must have 17,000 AC maximum use voltage, according to ASTM specification D120.

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.
- Mark proposed path with white paint and have underground utilities located before working. In the US or Canada, call 811 (US) or 888-258-0808 (US and Canada). Also contact any local utilities that do not participate in the One-Call service. In countries that do not have a One-Call service, contact all local utility companies to have underground utilities located.
- 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. 274-050

To help avoid injury:

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

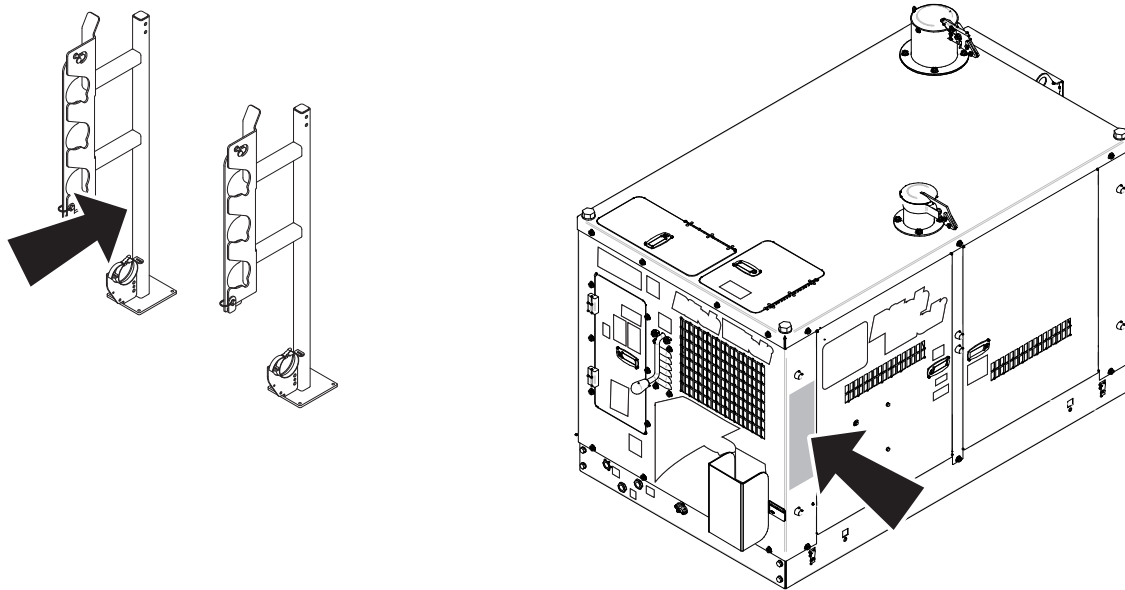
Prepare Excavation Point

- Clear the area to be excavated. Remove rocks or branches too large for vacuum hose.
- Select a solid area to stand on while excavating.

Check Supplies and Prepare Equipment

Assemble Accessories

Fire Extinguisher



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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

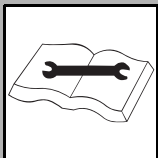
Prepare Equipment

Fluid Levels

- fuel
- hydraulic fluid
- engine coolant
- battery charge
- engine oil
- blower oil

Condition and Function

- all controls



⚠ 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.

- filters (air, oil, hydraulic)
- belts
- hydraulic pump
- blower
- tires
- hoses and valves
- couplers and fittings
- water tanks

Transport

Chapter Contents

Lift 62

- Points 62
- Procedure 62

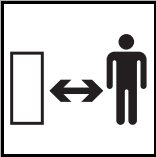
Haul 63

- Inspect Trailer 63
- Hitch Trailer 64
- Unhitch Trailer 64

IMPORTANT: These transport instructions cover the FX30 trailer-mounted version only.



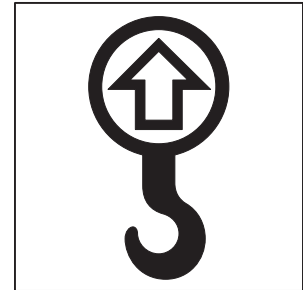
Lift



WARNING Crushing weight could cause death or serious injury. Stay away. 275-326

Points

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

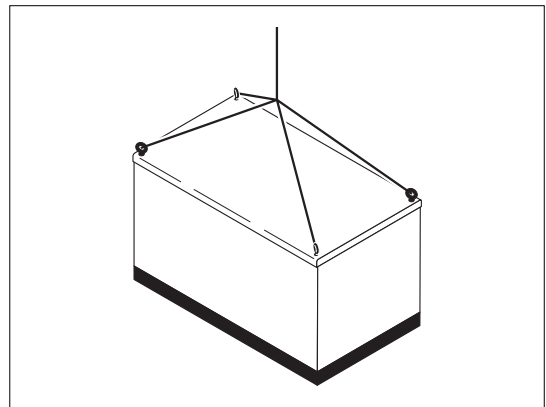


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Procedure

Power Pack

Use a crane capable of supporting 2000 lb (907 kg). Remove bolts on each upper corner and install lift eyes (p/n 105-1391). Lift as shown.



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FX30/FXT30 Operator's Manual

Lift

Transport - 63

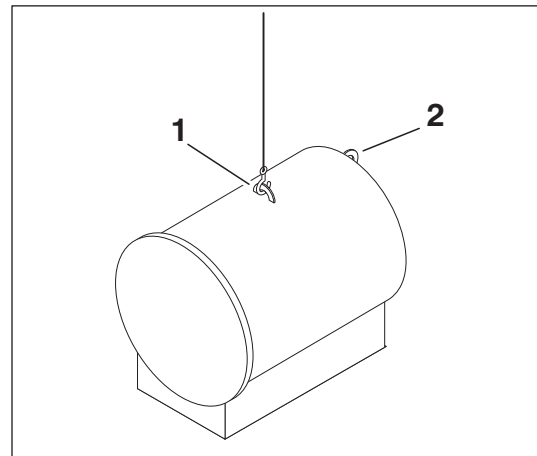
Tank

Use crane capable of supporting the weight shown below.
Use top lift point (1) as shown. Use end lift point (2) to drain tank if machine is disabled.

500 gallon	2000 lb (907 kg)
800 gallon	2500 lb (kg) kg

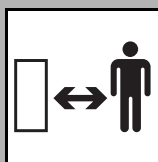
NOTICE:

- Relieve pressure in tank before storing or transporting.
- Only lift empty water or spoils tanks.
- Do not lift tank by vacuum boom, if installed.



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Haul



WARNING
Crushing weight could cause death or serious injury. Stay away. 275-326

Crushing weight could cause death or serious injury. Stay away.

To help avoid injury:

- Do not haul or move trailer unless tank is fully lowered and horizontal. Damage to machine or injury to personnel could occur.
- Do not haul or move trailer unless optional vacuum boom is secured by boom latch. Damage to machine or injury to personnel could occur.
- Do not travel on roads with reducer or any other fitting installed on tank outlet valve. Fitting will extend beyond the rear impact guard and will not be legal for operation on roadways.

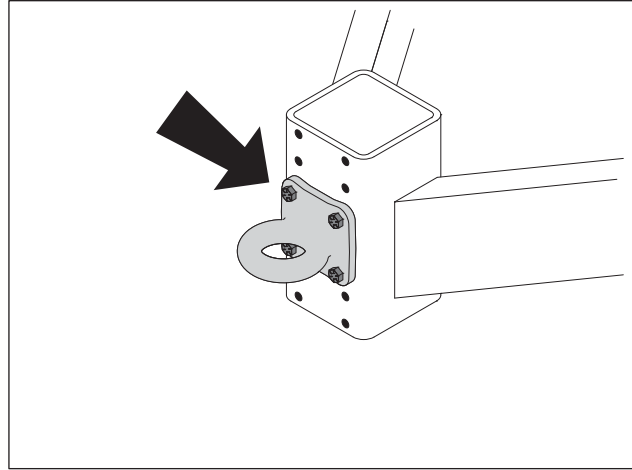
Inspect Trailer

- Check hitch for wear and cracks. Lubricate if needed.
- Check battery for 12V charge.
- Inspect lights for cleanliness and correct operation. Inspect reflectors and replace if needed.
- Check tire pressure. Check lug nut torque with a torque wrench.
- Ensure trailer brakes are adjusted to come on in synchronization with tow vehicle brakes.
- Check ramps (if equipped) and trailer bed for cracks.



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 drawbar, lunette or coupler to tow vehicle hitch and lock in place with lock pin. If needed, adjust drawbar, lunette or coupler height (shown) 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 breakaway switch cable to tow vehicle. Do not connect to pintle hook or hitch ball.
6. Plug trailer electrical connector into tow vehicle connector.
7. Use jack crank to raise jack base and stow.
8. Remove wheel blocks.



TrailerHitchAdjust_T18.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.
4. To unhitch trailer from tow vehicle, reverse "Hitch Trailer" steps.

Vacuum and Pothole

Chapter Contents

Connect Hoses	66
Determine Tank Fill Level	66
• 500-gal Vacuum Tank on T9S Trailer	67
• 500-gal Vacuum Tank on T12S Trailer	68
• 800-gal Vacuum Tank on T18S Trailer	69
• 800-gal Vacuum Tank on T22S Trailer	70
Start Unit	71
• Standard Procedure	71
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Position Vacuum Boom	72
• Precautions Near Electrical Power Lines	72
• Procedure	73
Remove Debris	74
Pothole	75
• With Water	75
• With Air	77
Drain Tank	79
Unload to Another Tank	81
Open/Close Tank Door	82



Connect Hoses

1. Remove vacuum hoses from storage.
2. Connect hoses. Secure all locking clamps.
3. Ensure drain/outlet valve is closed.

Determine Tank Fill Level (FX30 Trailer Only)

Use these reference charts to help determine how full of various materials the vacuum tank can be without overloading trailer. **Exceeding the maximum fill level will overload the trailer.**

Never exceed the trailer capacity. You can exceed the vacuum tank lifting capacity. Drain the tank down to the lifting capacity before lifting tank.

To use these charts, first select the appropriate table based on trailer and vacuum tank size. Next find the material being excavated. If the material being excavated is not listed, find a material with similar density. Then, determine the maximum fill level based on the amount of water in the water tank.

IMPORTANT: For all materials, the vacuum tank should be no more than half full when lifting the tank.

FX30/FXT30 Operator's Manual

Determine Tank Fill Level (FX30 Trailer Only)

Vacuum and Pothole - 67

500-gal Vacuum Tank on T9S Trailer

Values shown include the following options: heater, boom and cyclonic filter. Values will vary for other configurations.

Material	Maximum Vacuum Tank Fill Level	
	Water tank fill level	
	full (80 gal)	empty (0 gal)
wood chips (dry)	100%	100%
snow (dry)	100%	100%
water	81%	96%
light weight mud (8-10 lb/gal)	75%	88%
earth (dry, loose)	70%	83%
caliche	65%	76%
earth, loam	65%	76%
medium weight mud (10-12 lb/gal)	61%	72%
limestone (crushed)	53%	62%
asphalt	51%	59%
sand (dry)	51%	59%
earth (wet, excavated)	51%	59%
heavy weight mud (12-15 lb/gal)	50%	59%
gravel (dry)	49%	58%
shale, riprap	48%	57%
sand (wet)	39%	46%



500-gal Vacuum Tank on T12S Trailer

Values shown include the following options: heater, boom and cyclonic filter. Values will vary for other configurations.

Material	Maximum Vacuum Tank Fill Level	
	Water tank fill level	
	full (200 gal)	empty (0 gal)
wood chips (dry)	100%	100%
snow (dry)	100%	100%
water	100%	100%
light weight mud (8-10 lb/gal)	96%	100%
earth (dry, loose)	90%	100%
caliche	83%	100%
earth, loam	83%	100%
medium weight mud (10-12 lb/gal)	78%	100%
limestone (crushed)	67%	90%
asphalt	65%	87%
sand (dry)	64%	86%
earth (wet, excavated)	64%	86%
heavy weight mud (12-15 lb/gal)	64%	86%
gravel (dry)	63%	84%
shale, riprap	61%	82%
sand (wet)	50%	67%

FX30/FXT30 Operator's Manual
Determine Tank Fill Level (FX30 Trailer Only)

Vacuum and Pothole - 69

800-gal Vacuum Tank on T18S Trailer

Values shown include the following options: heater, boom and cyclonic filter. Values will vary for other configurations.

Material	Maximum Vacuum Tank Fill Level		
Water tank fill level	full (200 gal)	full (300 gal)	empty (0 gal)
wood chips (dry)	100%	100%	100%
snow (dry)	100%	100%	100%
water	100%	97%	100%
light weight mud (8-10 lb/gal)	100%	90%	100%
earth (dry, loose)	94%	84%	100%
caliche	87%	78%	100%
earth, loam	87%	78%	100%
medium weight mud (10-12 lb/gal)	82%	74%	99%
limestone (crushed)	71%	63%	85%
asphalt	67%	61%	81%
sand (dry)	67%	61%	81%
earth (wet, excavated)	67%	61%	81%
heavy weight mud (12-15 lb/gal)	67%	60%	80%
gravel (dry)	65%	59%	79%
shale, riprap	64%	58%	77%
sand (wet)	52%	47%	63%



800-gal Vacuum Tank on T22S Trailer

Values shown include the following options: heater, boom and cyclonic filter. Values will vary for other configurations.

Material	Maximum Vacuum Tank Fill Level		
Water tank fill level	full (200 gal)	full (300 gal)	empty (0 gal)
wood chips (dry)	100%	100%	100%
snow (dry)	100%	100%	100%
water	100%	100%	100%
light weight mud (10 lb/gal)	100%	100%	100%
earth (dry, loose)	100%	100%	100%
caliche	100%	100%	100%
earth, loam	100%	100%	100%
medium weight mud (12 lb/gal)	100%	100%	100%
limestone (crushed)	100%	96%	100%
asphalt	100%	92%	100%
sand (dry)	100%	92%	100%
earth (wet, excavated)	100%	92%	100%
heavy weight mud (14 lb/gal)	96%	89%	100%
gravel (dry)	96%	88%	100%
shale, riprap	95%	88%	100%
sand (wet)	77%	71%	89%

Start Unit

EMERGENCY SHUTDOWN: Turn ignition switch to STOP.

Standard Procedure

1. Open tank inlet valve.

NOTICE: Avoid idling engine with inlet valve closed.

2. If equipped with reverse flow, ensure vacuum is in "vacuum" mode before starting.
3. Insert key into ignition switch.
4. Turn key clockwise. See page 33 for more information.
5. Run engine at low throttle for 5 minutes.

Cold Start Procedure

1. Open tank inlet valve.

NOTICE: Avoid idling engine with inlet valve closed.

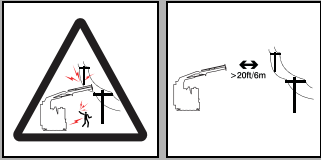
2. If equipped with reverse flow, ensure vacuum is in "vacuum" mode before starting.
3. Insert key into ignition switch.
4. Turn key to on position. Cold start (glow plug) timer indicator will light.
5. Wait for cold start timer indicator to go off.
6. Turn key clockwise to start engine.
7. Run engine at low throttle for 5 minutes.



Position Vacuum Boom

The vacuum boom is optional equipment. Contact your Ditch Witch® dealer to add this option.

Precautions Near Electrical Power Lines



⚠ DANGER Do not get boom near power lines. Death or serious injury will occur. Keep required distance between boom and power lines. Use a spotter. 270-1983

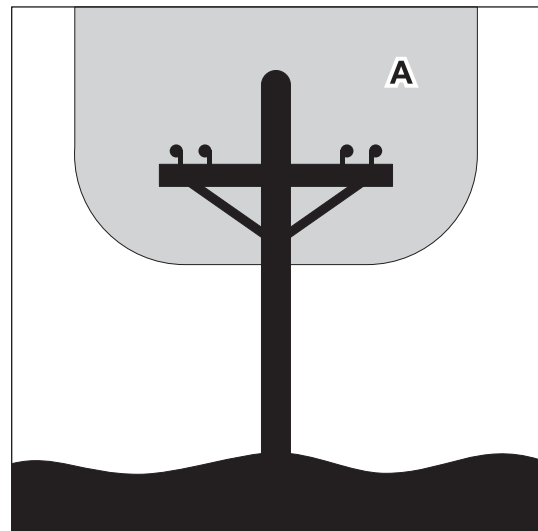
Never operate the boom within 10' (3 m) of electric power lines carrying up to 50 kV. Add 1' (305 mm) of clearance for each additional 30 kV or less (see table on left). Follow OSHA or other guidelines for working around power lines. Also observe minimum clearance requirements during transport (see table on right).

Normal voltage (phase to phase)	Minimum operating clearance required	
up to 50 kV	10'	3 m
51-200 kV	15'	4.6 m
201-350 kV	20'	6 m
351-500 kV	25'	7.6 m
501-750 kV	35'	10.7 m
751-1000 kV	45'	13.7 m

Normal voltage (phase to phase)	Minimum transporting clearance required	
up to 0.75 kV	4'	1.2 m
0.76-200 kV	6'	1.8 m
50-345 kV	10'	3.8 m
346-750 kV	16'	4.9 m
751-1000 kV	20'	6.1 m
unknown	20'	6.1 m

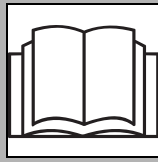
Do not enter the danger zone (A), unless one of the following conditions is met:

- An appointed person has confirmed that the electrical distribution and transmission lines have been de-energized and visibly grounded at the point of work.
- Insulating barriers (not a part of the boom) have been erected to prevent physical contact with the lines.



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Procedure



WARNING

Misuse of machine can cause death or serious injury.
Read and understand operator's manual and all other safety instructions
before use. 273-475

To help avoid injury:

- Latch boom before tilting tank.
- Do not unlatch boom when tank is tilted up.
- If unit is parked on a slope, control boom so it does not swing freely when released.
- Do not use boom to lift or move objects. Using boom in an inappropriate way may damage equipment or injure personnel.
- Do not use boom to break vacuum.
- Do not use the wash wand for digging tasks.

See "Controls" on page 31 to become familiar with the power pack controls and the boom controllers.

1. Start engine.
2. Set hydraulic function switch to BOOM position.
3. Remove vacuum hoses from storage. If using a vacuum boom on a truck, attach provided extension hose to help maneuver the tool.
4. Pull boom latch cable to release boom.
5. Use boom controller to to:
 - raise boom until it clears saddle.
 - extend/retract boom to desired length.
 - raise/lower boom to desired height.
6. Rotate boom by manually swinging it left or right.



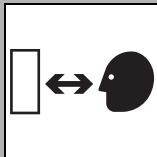
Remove Debris

EMERGENCY SHUTDOWN:

- Use inlet valve to shut off suction.
- Turn ignition switch to STOP.

Procedure

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



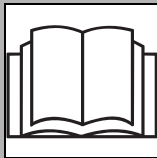
⚠ DANGER

Vacuum can suffocate. Keep hose end away from face. 273-205



⚠ WARNING

Static charge. Fire or explosion will cause death or serious injury. Do not vacuum flammable or combustible substances. 273-483



⚠ WARNING

Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use. 273-475

To help avoid injury:

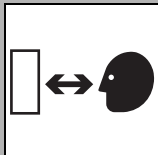
- Do not excavate hazardous or toxic materials. Unit is designed to excavate only soil cuttings, drilling fluids, and other non-toxic waste.
- Move tank inlet valve to break suction when hose or tool gets stuck on the ground or to what is being vacuumed.

3. Open inlet valve if necessary to begin excavation.
4. Use sight glasses to monitor debris level in tank. Vacuum will shut off when tank is full but always heed trailer and tank lifting capacities as indicated on page 66. Engine will remain running.

Pothole

EMERGENCY SHUTDOWN:

- Use inlet valve to shut off suction.
- Turn ignition switch to STOP.



⚠ DANGER

273-205

Vacuum can suffocate. Keep hose end away from face.



⚠ WARNING

273-483

Static charge. Fire or Explosion will cause death or serious injury. Do not vacuum flammable or combustible substances.

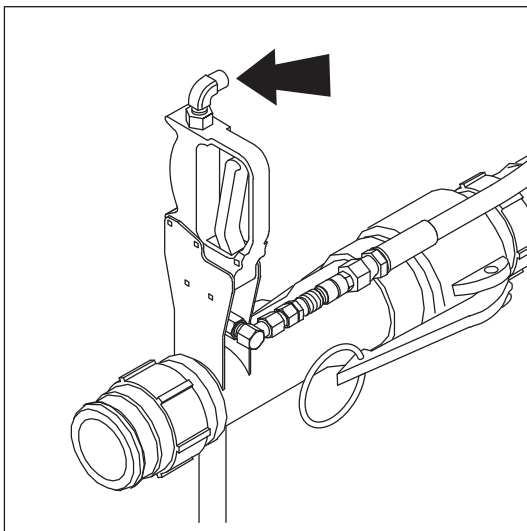
With Water

Set Up

1. Remove 2-in-1 potholing tool or digging lance from storage.
2. Connect water pressure hose.

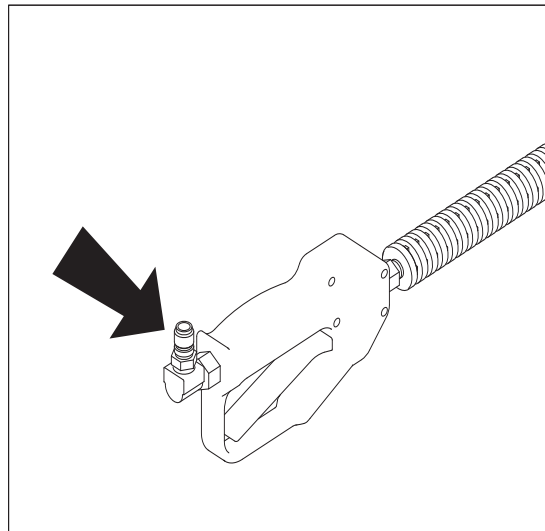


2-in-1 Tool



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Digging Lance



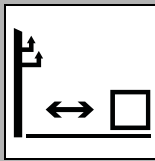
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Operate

1. Start engine.
2. Open water tank valve.

NOTICE: Avoid idling engine with inlet valve closed.

3. Move water pump switch to on.
4. Open inlet valve.
5. Position tool over area to be excavated and begin pothole.



⚠ DANGER

Electric shock will cause death or serious injury.
Stay away.

To help avoid injury: Do not direct wash wand at overhead lines.
Water conducts electricity.

2-in-1 Tool	Digging Lance
- Squeeze water pressure lever to start water pressure. - Work pressurized water in a rocking or circular motion to loosen and excavate soil until hole is at the desired diameter and depth.	- First use digging lance to loosen soil. - Work lance in a rocking or circular motion to excavate soil. - Use digging 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

Pressurized fluid or air could pierce skin and cause severe injury. Refer to operator's manual for proper use.
270-6035

To help avoid injury:

- Wear protective eyewear and clothing.
- Never use fan nozzle to expose utilities.
- Never point or aim the nozzle at yourself or anyone else. Keep nozzle low to the ground but do not allow tip to touch ground or utility.
- Keep nozzle moving over area to be potholed. Never point nozzle at utility continuously.
- Test water pressure on a sample of the utility line material to be exposed. Adjust pressure until no damage occurs to the material. High pressure water can cut utility lines.

FX30/FXT30 Operator's Manual

Pothole

Vacuum and Pothole - 77

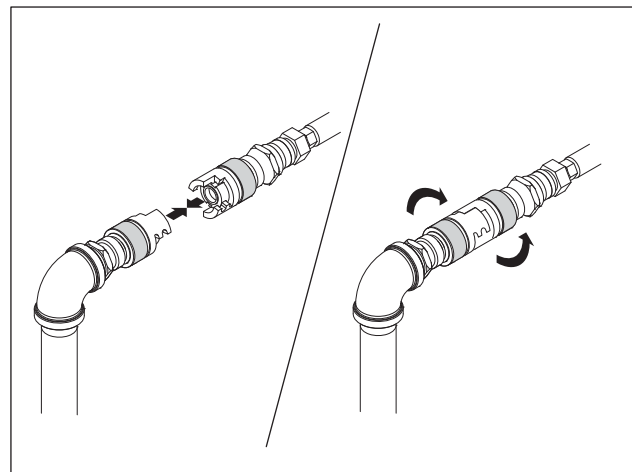
7. Ensure that water sprays from nozzle. If it does not, nozzle may be clogged and pump will not function properly. Clean or replace nozzle as necessary.
8. When freshwater tank is empty, stop operation and turn water pump switch to off.

NOTICE: Do **not** continue to operate with freshwater tank empty. Running water pump with no water will damage pump.

With Air

Set Up

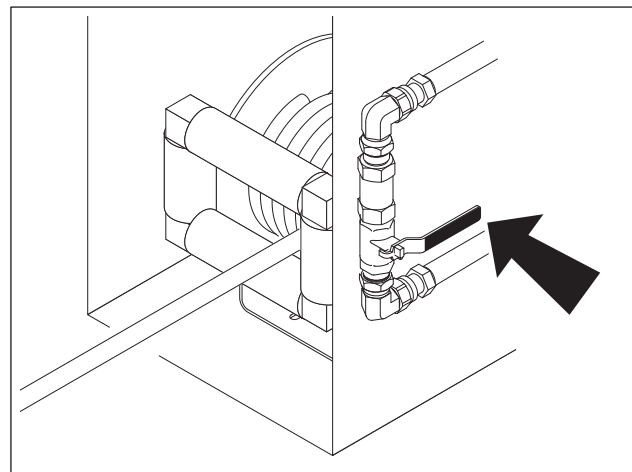
1. Remove air lance from storage.
2. Connect air lance to air hose.
 - Align ends and move together.
 - Twist to engage latch.



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3. Slowly open service valve (shown).

IMPORTANT: Open service valve slowly to prevent velocity fuse from activating. If fuse activates, air pressure at the lance tip will be very low. Close service valve and slowly open it to remedy situation.



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Operate



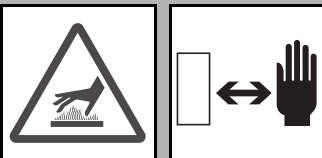
WARNING Pressurized fluid or air could pierce skin and cause severe injury. Refer to operator's manual for proper use. 270-6035

To help avoid injury:

- Wear protective eyewear, face shield and gloves when working with pressurized fluid or air.
- Never point or aim nozzle at yourself or anyone else. Keep nozzle low to the ground but do not allow it to touch ground or utility.
- Check all connections and lines for leakage before using and check nozzle for damage.



WARNING Incorrect pressures may result in death or serious injury. Refer to air tool manual to ensure proper pressures are used. High pressure setting is for air lance only. 270-6891



CAUTION Hot parts may cause burns. Do not touch until cool or wear gloves. 275-355 (2-P), 273-423 (2-P)

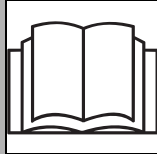
To help avoid injury: Remember that air generates heat. Connections could be hot during and after operation.

1. Locate utility with a locating receiver.
2. Set up air system. See air system operator's manual for information.
3. Connect hoses.
4. Start breaking the soil at the location of the utility. Do not touch the tip of the air lance to anything.
5. Once the hole has been started, vacuum loose soil and begin to work on exposing the sides of the utility next.
6. Vacuum loose soil as needed to expose utility.

Drain Tank

EMERGENCY SHUTDOWN: Turn ignition switch to STOP.

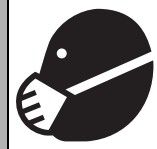
1. Ensure that unit is hitched to vehicle. See "Hitch Trailer" on page 64.
2. Haul unit to approved dumping area.



WARNING Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use. 273-475

To help avoid injury:

- Do **not** unhitch unit from tow vehicle before or during dumping. A freestanding unit can become unstable when tilting tank.
- Do not unlatch door with tank tilted up.
- Do not unlatch vacuum boom (optional) with tank tilted up.



CAUTION Breathing crystalline silica dust may cause lung disease. Cutting, drilling, or working materials such as concrete, sand, or rock containing quartz may result in exposure to silica dust.

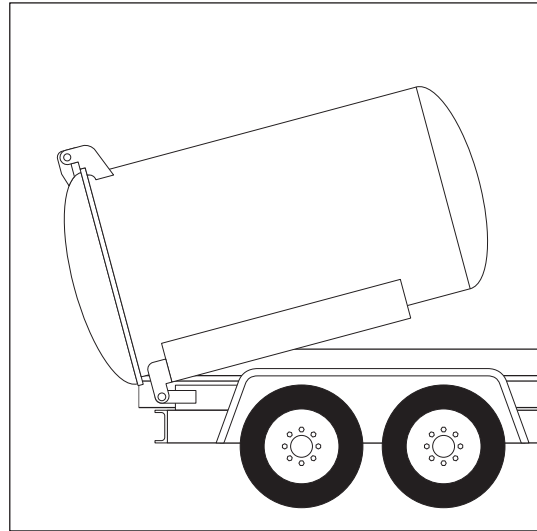
To help avoid injury:

- Use water spray or other means to control dust.
- Use appropriate breathing protection when exposed to silica dust.
- Refer to U.S. Department of Labor Occupational Safety and Health Administration guidelines to learn more about appropriate breathing protection and permissible exposure limits.

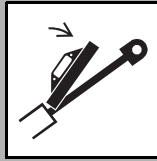
NOTICE: Do not drive with tank or door raised.



3. Open drain/outlet valve and inlet valve.
4. Allow tank to drain in the horizontal position until tank is approximately half drained. Monitor sight glasses.
5. When tank is half drained, start engine and run at low idle.
6. Tilt tank up to help flush solids from tank.
7. Lower tank to the full horizontal position.
8. Close drain/outlet valve and inlet valve.
9. If further draining is necessary, open tank door. See "Open/Close Tank Door" on page 82.



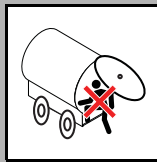
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⚠ WARNING

Crushing can cause death or serious injury. Secure raised part with locking device or stay away. 273-231

10. Tilt tank up fully. Allow tank to drain completely.
11. Connect water pressure hose to wash wand.
12. Turn water pump switch on. Adjust water pressure.
13. Use wash wand to thoroughly rinse inside of tank and around door seal.

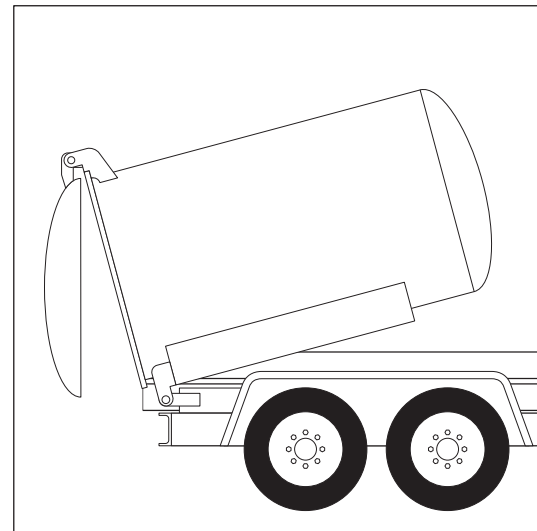


⚠ DANGER

273-200

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

To help avoid injury: Enter tank only if necessary. Follow U.S. Department of Labor guidelines for entering confined spaces.

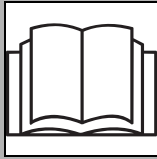


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14. Return tank to the fully lowered horizontal position.
15. Close tank door. See "Open/Close Tank Door" on page 82.

Unload to Another Tank

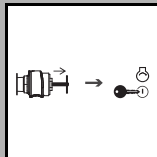
Optional reverse flow mode can be used to transfer vacuumed material to another tank or disposal site.



WARNING Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use. 273-475

To help avoid injury:

- Keep unit in "vacuum" mode unless pressure is needed.
- Restrain hose prior to pressurization. Unrestrained hose may cause property damage, injury or death.
- Do not open fitting cams or valves when tank is pressurized. Flying debris, plugs and doors can cause injury or death.
- Do not open tank door while tank is pressurized.
- Do not use pressure to clear clogs in vacuum hose.



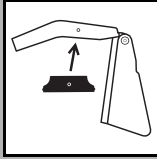
WARNING System may be pressurized. If over pressurized, death or serious injury can occur. Exercise and clean relief before each use. 270-2736

1. Securely connect transfer hose to FX tank. Ensure drain/outlet valve on FX tank is closed.
2. Securely connect other end of transfer hose to offboard tank. Ensure inlet valve on offboard tank is closed and tank is vented.
3. Open FX tank drain/outlet valve. Material may flow into transfer hose.
4. Open offboard tank inlet valve. Move valve handle counterclockwise to engage "reverse flow" mode. Material will flow into offboard tank.
5. Increase throttle as desired to transfer material.
6. When transfer is complete, close FX tank drain/outlet valve.
7. Close offboard tank inlet valve and disconnect hose from offboard tank inlet valve.
8. Move handle clockwise to "vacuum" mode.
9. Open FX tank drain/outlet valve. Material will empty from transfer hose.
10. Close FX tank drain/outlet valve.
11. Disconnect transfer hose from FX tank.



Open/Close Tank Door

Open



WARNING Crushing weight can cause death or serious injury. Pin door lock on linkage before servicing. 270-5216

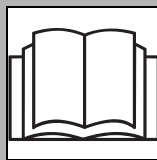
To help avoid injury: Do not raise tank with door held closed only by vacuum. Door may open suddenly.

NOTICE: Do not drive with tank or door raised.

IMPORTANT: Depressurize tank before emptying cyclonic canister, cleaning filter, clearing hoses or opening any doors.

1. If using optional reverse flow mode, turn off engine and ensure handle is down (in VACUUM mode).
2. If tank is tilted, lower tank fully before opening door.
3. Open tank inlet valve.
4. Set hydraulic function switch to door position.
5. Press UP on tethered control.

Close



WARNING Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use. 273-475

1. Press DOWN on tethered control until the linkage on both sides of the tank is fully collapsed.
2. Close tank inlet valve.

Complete the Job



Chapter Contents

Antifreeze Fluid Excavation Unit 84

- Add Antifreeze 84
- Reclaim Antifreeze 84

Rinse Equipment 85

Disconnect 86

Stow Tools 86

Antifreeze Fluid Excavation Unit

Add Antifreeze

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

1. Fill antifreeze tank with a propylene-glycol based antifreeze.
2. Ensure that water tank valve is closed.
3. Open antifreeze tank valve.
4. Connect water pressure hose to wash wand.
5. Start engine.
6. Move water pump switch to on. If freshwater tank is empty, move to bypass.
7. Squeeze wash wand handle and run until antifreeze runs through the wash wand.
8. Move water pump switch to off.
9. Close antifreeze tank supply valve.
10. Turn ignition switch to off.
11. Drain water tank completely.

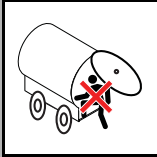
Reclaim Antifreeze

1. Turn water pressure down.
2. Move water pump switch to on.
3. Put end of wash wand in antifreeze tank.
4. Squeeze wash wand handle and run until water comes out of wand.
5. Move water pump switch to off.

Rinse Equipment

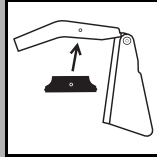


Spray water onto equipment to remove dirt and mud. Use wash wand. Thoroughly rinse inside of tank and around door seal.



⚠ DANGER Confined space will cause suffocation. Use proper procedures for entering or stay away. 273-200

To help avoid injury: Enter tank only if necessary. Follow U.S. Department of Labor guidelines for entering confined spaces.



⚠ WARNING Crushing weight can cause death or serious injury. Pin door lock on linkage before servicing. 270-5216

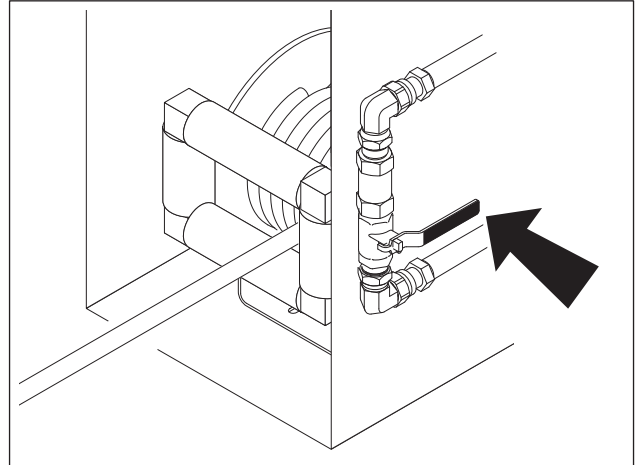
NOTICE: Do not spray water onto operator's console. Electrical components could be damaged. Wipe down instead.

Disconnect

Disconnect and store the vacuum hoses, water pressure hose and air hose (if used).

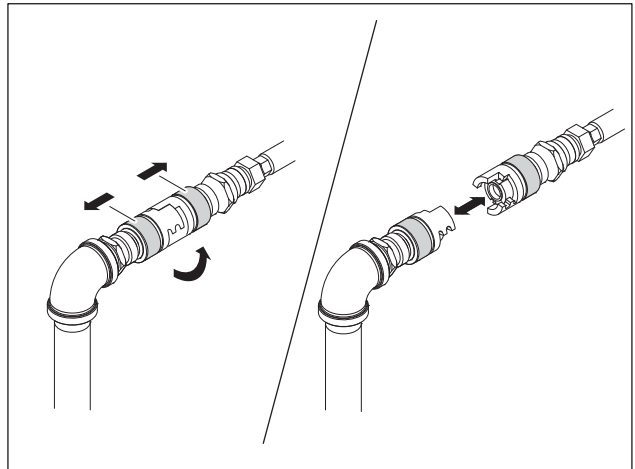
Air Hose:

1. Close service valve (shown).



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2. Disconnect air lance from air hose.
 - Pull back collar on air lance and on air hose.
 - Twist.
 - Pull ends away from each other.



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Stow Tools

Make sure optional vacuum boom, potholing tools, wash wand, and other tools are properly stowed.

Service

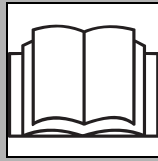
IMPORTANT: This chapter does not cover the air system, auxiliary pneumatic tools, or truck. Please see manufacturer's manuals for servicing information about those products.



Chapter Contents

Service Precautions	88
Recommended Lubricants/Service Key	90
Each Use	93
10 Hour	96
25 Hour.	104
50 Hour	105
100 Hour	110
1000 Hour	114
2000 Hour	118
As Needed	118
200 Mile	126
3,000 Mile.	128
10,000 Mile	130
12,000 Mile.	131

Service Precautions



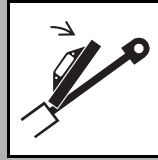
WARNING

Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use. 273-475

To help avoid injury:

- Unless otherwise instructed, all service should be performed with engine off and engine cool.
- Refer to engine manufacturer's manual for engine maintenance instructions.
- Wear personal protective equipment.

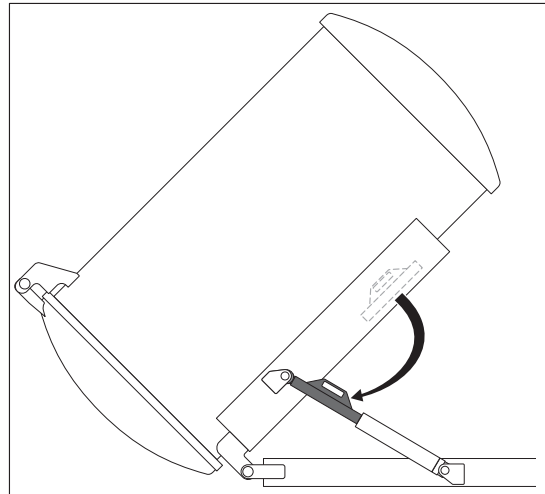
Working Under Raised Debris Tank



WARNING

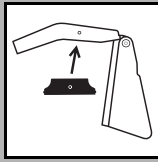
Crushing can cause death or serious injury. Secure raised part with locking device or stay away. 273-231

1. Raise vacuum tank.
2. Remove cylinder lockout tool and place over extended cylinder rod.
3. Lower vacuum tank until load is supported by cylinder lockout tool.



FX_Tank_Raised.eps

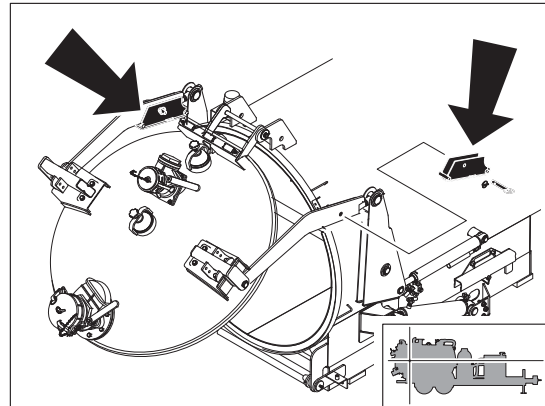
Working Under Raised Tank Door



WARNING Crushing weight can cause death or serious injury. Pin door lock on linkage before servicing. 270-5216



1. Locate door lock tools in tool storage area and bring to rear of tank.
2. Raise tank door completely.
3. Pin door lock tools into place as shown.
4. Lower tank lid until load is supported by door lock tools.



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Welding Precaution

NOTICE: Welding can damage electronics.

- Disconnect battery to prevent damage to battery. Do not turn off battery disconnect switch with engine running, or alternator and other electronic devices may be damaged.
- Connect welder ground clamp close to welding point and make sure no electronic components are in the ground path.
- Always disconnect the Engine Control Unit ground connection from the frame, harness connections to the ECU, and other electronic components prior to welding on machine or attachments.

Washing Precaution

NOTICE: Water can damage electronics. When cleaning equipment, do not spray electrical components with water.

Recommended Lubricants/Service Key

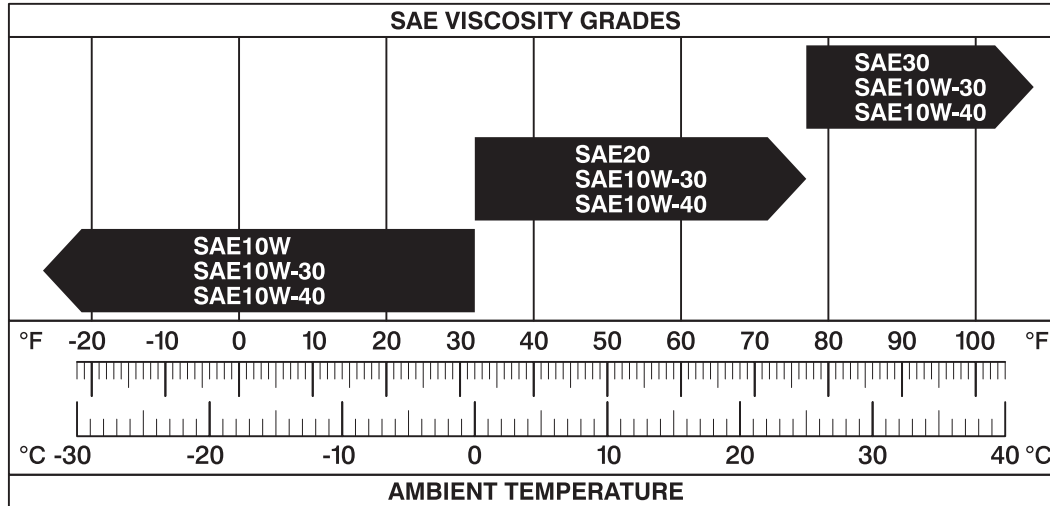
Item	Description		
 DEO	U.S., Canada, EU, Japan: Diesel engine oil meeting or exceeding API service classification CH-4 (CH-4, CI-4, or CJ-4) or ACEA E7 (E6, E7, or E9). See viscosity chart.		
 DEO	Less regulated markets (outside the U.S., Canada, EU, Japan): Diesel engine oil compatible with the sulfur content of the fuel used. If the fuel sulfur content exceeds 500 ppm (500 mg/kg) the oil's base number (TBN) should exceed 10. If the fuel sulfur content exceeds 5000 ppm (5000 mg/kg) the oil change interval should be reduced to every 50 hours. See viscosity chart.		
 DEAC	Low silicate, fully formulated diesel engine antifreeze/coolant meeting ASTM D6210.		
 HTG	High temperature, NLGI #2 premium grade, petroleum-based grease with high temperature resistance and good mechanical stability		
 NDO	30W non-detergent oil		
 SGL	Synthetic gear oil (ISO 100), Ditch Witch® p/n 256-044 See blower manual for more information.		
 THF	Tractor hydraulic fluid, similar to Phillips 66 PowerTran, Mobilfluid 423, Chevron Tractor Hydraulic Fluid, Texaco TDH Oil, or equivalent		
 MPG	Multipurpose grease. Use polyurea based NLGI GC-LB Grade1.5 or lithium based NLGI GC-LB Grade 2.		
DOT	DOT 3 or 4 brake fluid		
	Check level of fluid or lubricant		
	Filter		Check condition
	Adjust, service or test		Change or replace

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 genuine Ditch Witch parts, filters, approved lubricants, TJC, and approved coolants to maintain warranty. Fill to capacities listed in "Specifications" on page 133.

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

IMPORTANT: Use the "Service Record" on page 155 to record all required service to your machine.

Engine Oil Temperature Chart



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Temperature range anticipated before next oil change

Approved Coolant

This unit was filled with Fleetguard® ES Compleat™ coolant (**blue** in color) before shipment from factory. This coolant is available, pre-diluted, from your Ditch Witch® dealer as part number 255-1055. Add or replace with heavy duty diesel engine coolant meeting ASTM D6210.

NOTICE:

- Use only pre-diluted coolant or concentrated coolant mixed with distilled water. Do not use tap water.
- Do not use water or high-silicate automotive-type coolant. This will lead to engine damage or premature engine failure.
- Do not mix heavy-duty diesel engine coolant and automotive-type coolant. This will lead to coolant breakdown and engine damage.

Approved Fuel

U.S., Canada, EU, and Japan



⚠ WARNING

Avoid static electricity when fueling. Ultra Low Sulfur Diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations. Avoid death or serious injury from fire or explosion. Consult with your fuel system supplier to ensure the delivery system is in compliance with fueling standards for proper grounding and bonding practices.

This engine is designed to run on diesel fuel. Use only high quality fuel meeting ASTM D975 No. 2D, EN590, or equivalent. At temperatures below 32°F (0°C) winter fuel blends are acceptable. See the engine operation manual for more information.

NOTICE: Use only Ultra Low Sulfur Diesel (less than 15ppm sulfur content in US and Canada or 10 mg/kg sulfur content in Japan) in this unit. Operating with higher sulfur content will increase emissions and violate regulations.

Biodiesel blends up to 5% (B5) are approved for use in this unit. The fuel used must meet the specifications for diesel fuel shown above. In certain markets, higher blends may be used if certain steps are taken. Extra attention is needed when using biodiesel, especially when operating in cold weather or storing fuel. Contact your Ditch Witch® dealer or the engine manufacturer for more information.

Less Regulated Markets (Outside the U.S., Canada, EU, and Japan)

This engine is designed to run on diesel fuel. Use only high quality fuel meeting ASTM D975 No. 2D, EN590, or equivalent. At temperatures below 32°F (0°C) winter fuel blends are acceptable. See the engine operation manual for more information.

IMPORTANT: Fuel sulfur content should be less than 10,000 ppm (10,000 mg/kg). Worldwide, fuel sulfur regulations vary widely. Fuel used should always comply with local regulations. Prior to shipping, this unit was filled with API CJ-4 DEO. If operating fuel with sulfur content above 500 ppm (500 mg/kg), change oil initially at 50 hours.

Biodiesel blends up to 5% (B5) are approved for use in this unit. The fuel used must meet the specifications for diesel fuel shown above. In certain markets, higher blends may be used if certain steps are taken. Extra attention is needed when using biodiesel, especially when operating in cold weather or storing fuel. Contact your Ditch Witch dealer or the engine manufacturer for more information.

Each Use

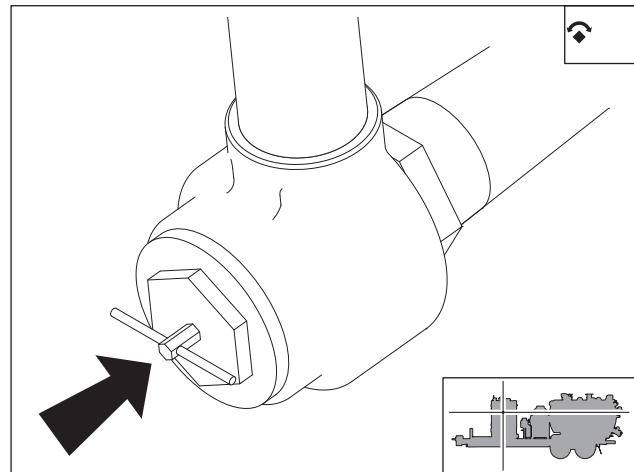
Location	Task	Notes
Vacuum System	Exercise reverse flow relief valve	Optional
	Clean water pump filter	
Trailer	Check torque of hitch bolts	200 ft•lb (271 N•m)
	Check hydraulic brake actuator bolts	If equipped
	Check hydraulic brake fluid level	If equipped; DOT 3 or 4
	Check trailer battery	
	Check tire pressure and lug nut torque	
	Check lights and reflectors	



Vacuum System

Exercise Reverse Flow Relief Valve

Exercise relief valve before each use. Pull valve handle (shown), twist it a few times and release. Also ensure vents on valve are free of mud and other restrictions.

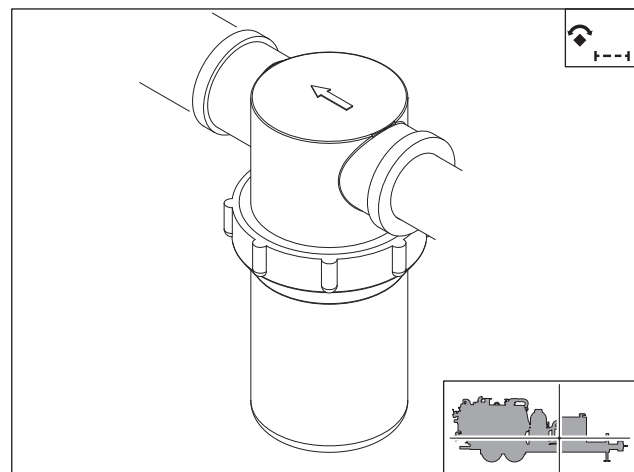


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Clean Water Pump Filter

Clean water pump filter every 10 hours and replace as needed.

1. Open filter housing.
2. Remove element and rinse housing thoroughly with water.
3. Inspect element for signs of collapse and for brittle or broken rubber seals on the ends of the element. Replace as needed. See page 118.
4. Replace element and close filter housing.

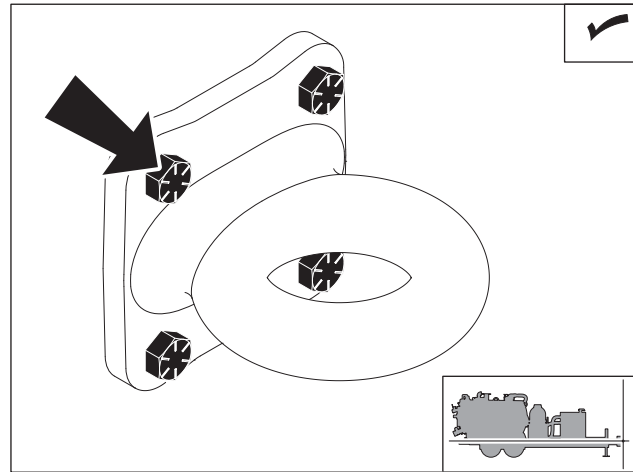


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Trailer

Check Hitch Bolts

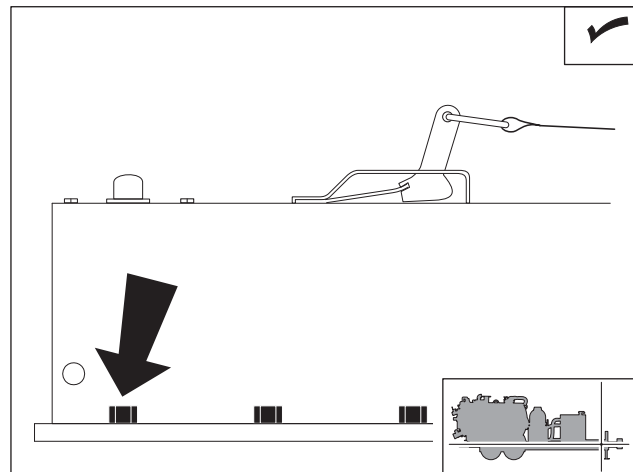
Check torque of trailer hitch bolts. Torque varies by trailer model. Refer to "Specifications" beginning on page 133.



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Check Hydraulic Brake Actuator Bolts

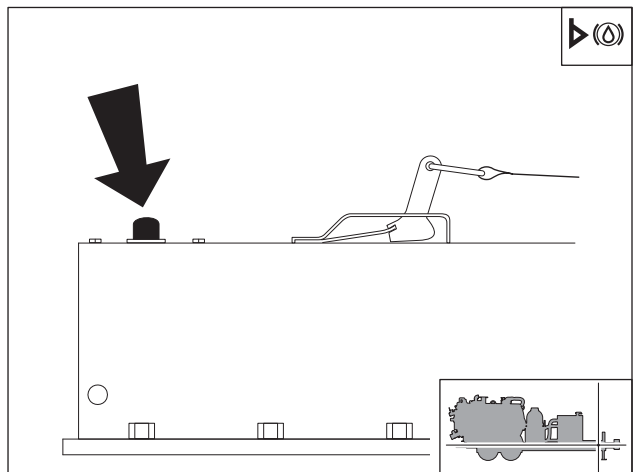
Check hydraulic brake actuator bolts. Tighten if loose.



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Check Hydraulic Brake Fluid Level

Check hydraulic brake fluid level at master cylinder cap (shown) each use. Fluid should be visible at top of master cylinder. Add DOT 3 or DOT 4 brake fluid and bleed brakes as needed. See page 122.



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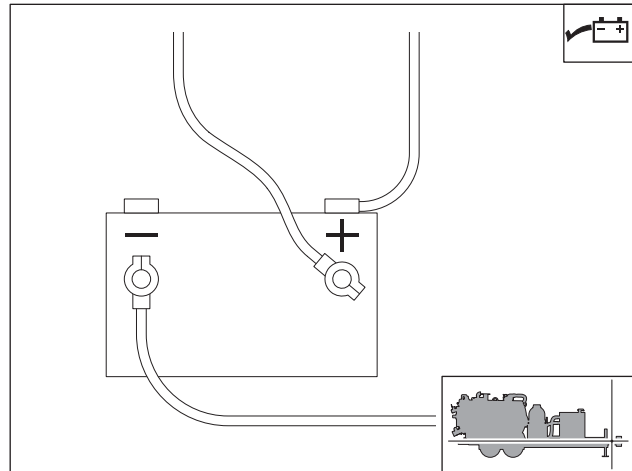
FX30/FXT30 Operator's Manual

Each Use

Service - 95

Check Trailer 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.



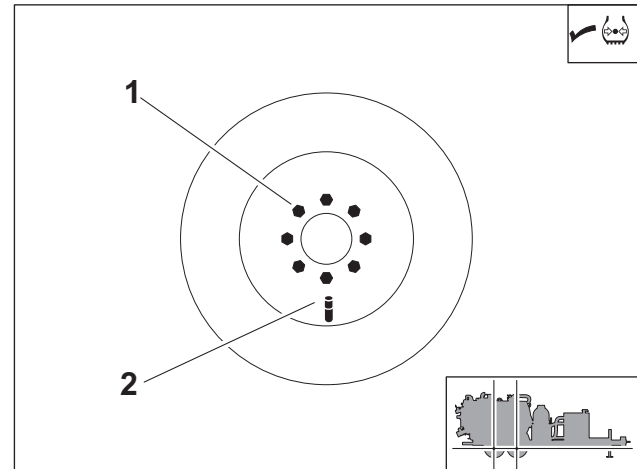
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Check Trailer Tire Pressure and Lug Nut Torque

Check tire pressure (2) and lug nut (1) torque. See below for correct pressure and torque. To verify trailer model, see the certification plate located on the trailer tongue.

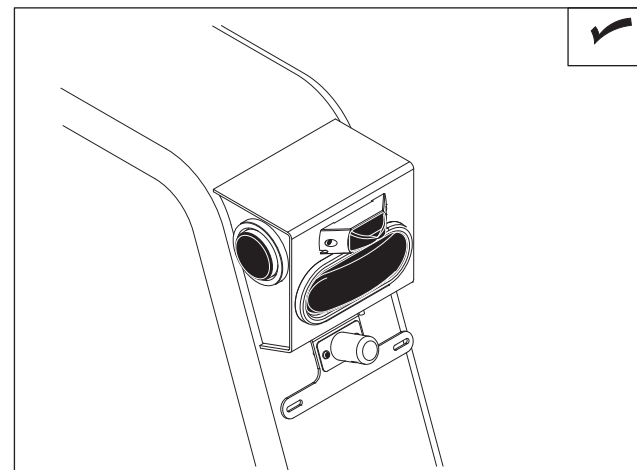
Trailer	Pressure	Torque
T9S, T9SH, T12S	80 psi (5.5 bar)	95 ft•lb (129 N•m)
T18S	125 psi (8.6 bar)	300 ft•lb (407 N•m)
T22S	125 psi (8.6 bar)	300 ft•lb (407 N•m)



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Check Trailer Lights and Reflectors

Check lights and reflectors for correct operation and cleanliness.



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10 Hour

Location	Task	Notes
VACUUM SYSTEM	Check engine air filter service indicator	
	Check engine oil level	DEO
	Check coolant level	DEAC
	Clean dust ejector valve	
	Check hydraulic hoses	
	Check hydraulic fluid level	THF
	Check blower oil level	SGL
	Check blower belt tension	
	Check water pump oil level	NDO
	Check tension of water pump belts	
	Clean vacuum air filter	
	Check spray nozzle	
	Drain cyclonic separator canister	
DEBRIS TANK	Check strobe light	
	Check vacuum tank door seals/fittings	
	Check tank deflector	

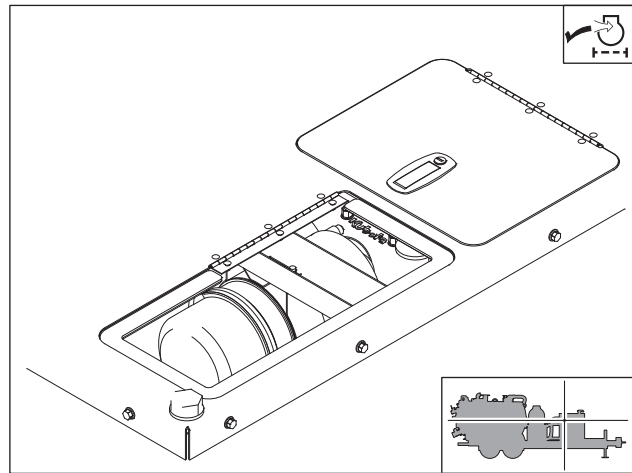
Vacuum System

Check Engine Air Filter Service Indicator

Check air filter restriction indicator every 10 hours. Change air filter elements when air filter restriction indicator (shown) reaches the red zone.

NOTICE: Only open the air filter canister when air restriction is indicated. Change the elements, do not attempt to clean them.

- Compressed air or water may damage filter element.
- Tapping filter elements to loosen dirt may damage the element.



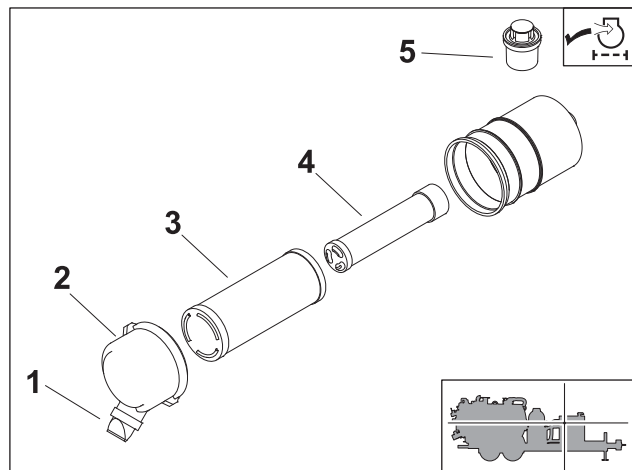
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AirFilterIndicator.eps

To change:

1. Remove air filter cover (2) and remove elements (3, 4).
2. Wipe inside of housing and wash cover.
3. Insert new elements.
4. Replace cover.
5. Wipe dust ejector valve (1).
6. Reset air filter restriction indicator (5).

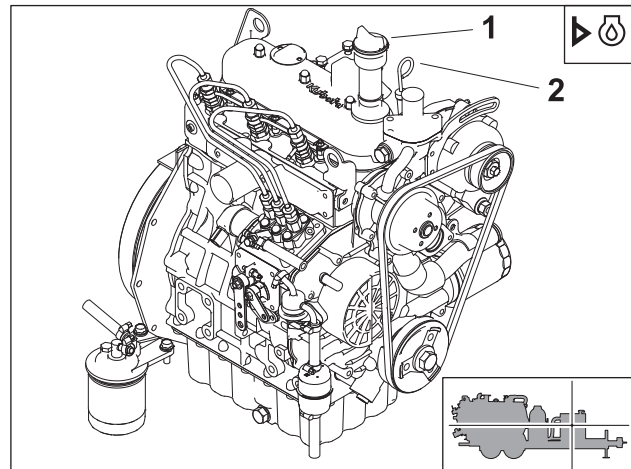


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Check Engine Oil Level

While engine oil is warm, check oil level at dipstick (2) every 10 hours. Add DEO at fill (1) as necessary to keep oil level at highest line on dipstick.

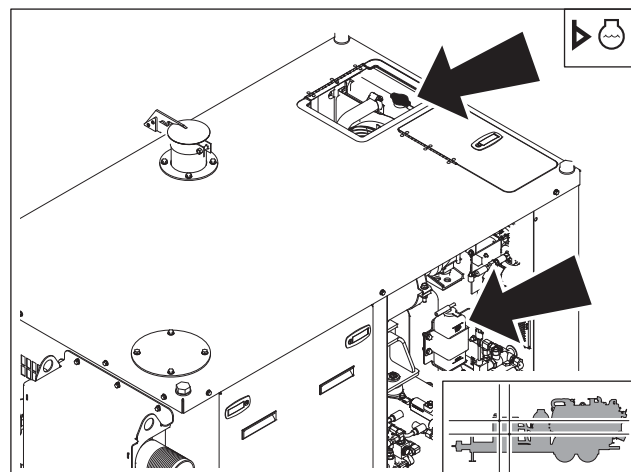


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Check Coolant Level

Check coolant level every 10 hours. Add coolant at top of cooler as needed to maintain level between LOW and FULL marks on overflow bottle.

Use only manufacturer approved coolant.
"Approved Coolant" on page 91.

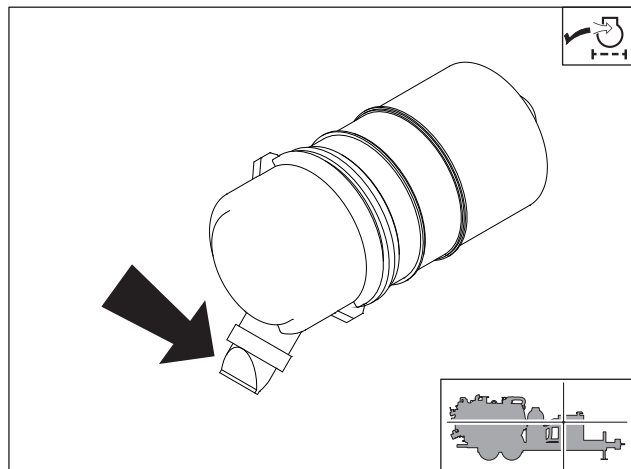


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Clean Dust Ejector Valve

Clean dust trap (shown) every 10 hours.

Check dust ejector valve (shown) every 10 hours of operation. Ensure that valve is not inverted, damaged, plugged, or cracked.



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Check Hydraulic Hoses



WARNING

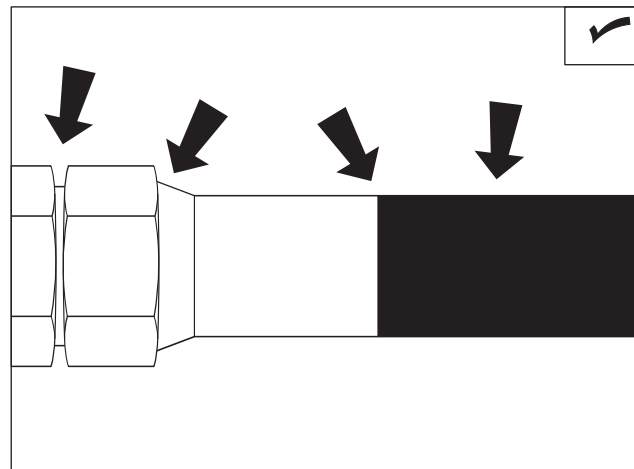
Pressurized fluid or air could pierce skin and cause severe injury. Refer to operator's manual for proper use. 270-6035



To help avoid injury:

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

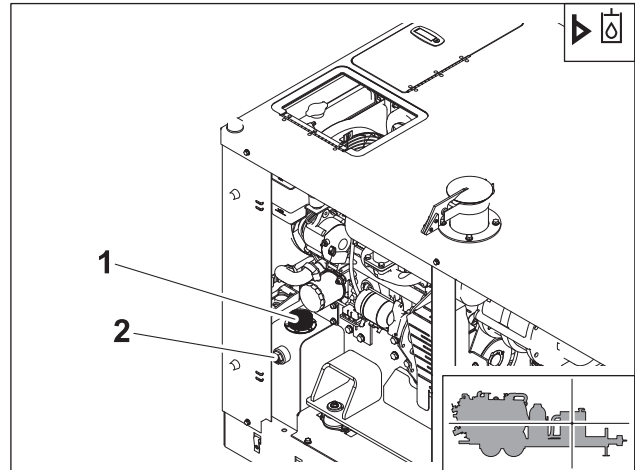
Check hydraulic hoses for leaks every 10 hours.



CheckHoses.eps

Check Hydraulic Fluid Level

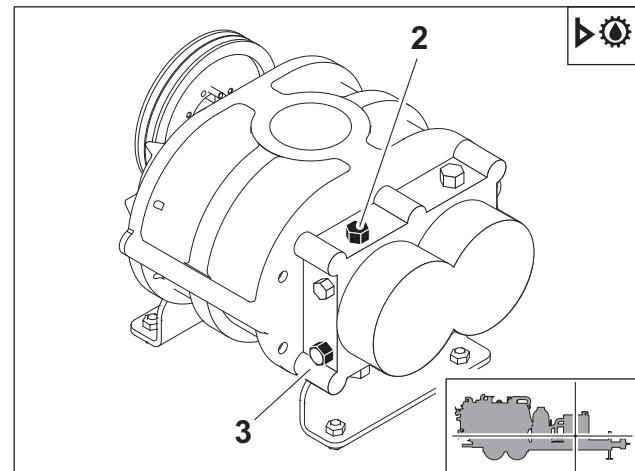
Check hydraulic fluid level every 10 hours. Maintain fluid level at sight glass (2) when engine is off and fluid is cool. Add THF at hydraulic fluid fill (1) as necessary.



j33om077h.eps

Check Blower Oil Level

With frame level, check blower oil at sight glass (3) every 10 hours. Add SGL at fill (2) as necessary to maintain oil level at halfway point on sight glass. Do not overfill.



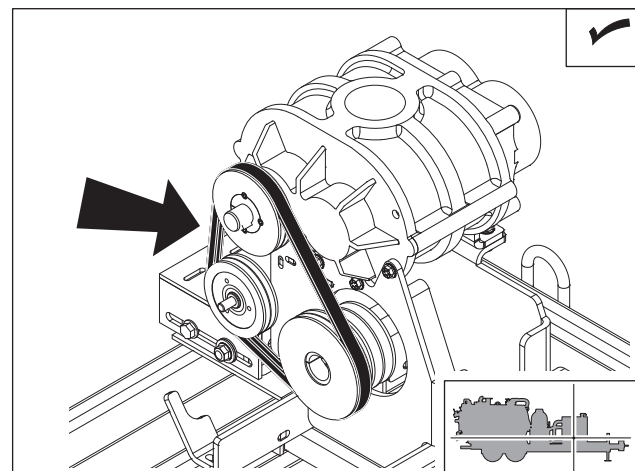
j33om019h.eps

Check Blower Belt Tension

Check belt every 10 hours for correct tension, damage or wear.

To tension belt:

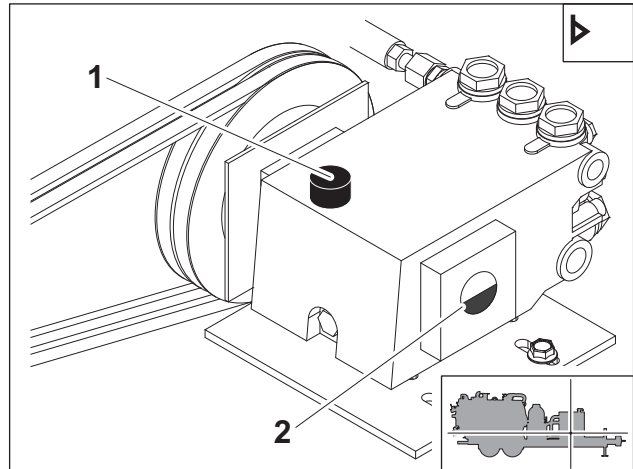
1. Install a torque wrench into one of the square holes in the tensioner arm and apply 30 ft•lb (41 N•m) of torque.
2. Tighten the cross bolt to 80 ft•lb (108 N•m).
3. Tighten the bolt in the slot to 80 ft•lb (108 N•m).



j33om020h.eps

Check Water Pump Oil Level

With frame level, check water pump oil at sight glass (2) every 10 hours. Add NDO at fill (1) as necessary to keep oil at halfway mark on sight glass.



j33om021h.eps

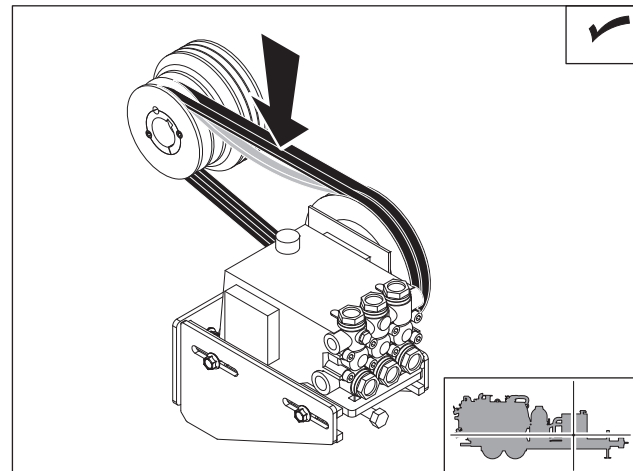


Check Water Pump Belt Tension

Check belt every 10 hours for correct tension, damage or wear. Contact your equipment dealer for adjustment or belt replacement.

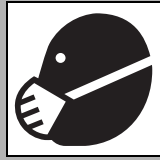
To check:

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 .125-.25" (3-6 mm).



j33om023h.eps

Clean Vacuum Air Filter



CAUTION

Breathing crystalline silica dust may cause lung disease. Cutting, drilling, or working materials such as concrete, sand, or rock containing quartz may result in exposure to silica dust.

To help avoid injury:

- Use water spray or other means to control dust.
- Use appropriate breathing protection when exposed to silica dust.
- Refer to U.S. Department of Labor Occupational Safety and Health Administration guidelines to learn more about appropriate breathing protection and permissible exposure limits.

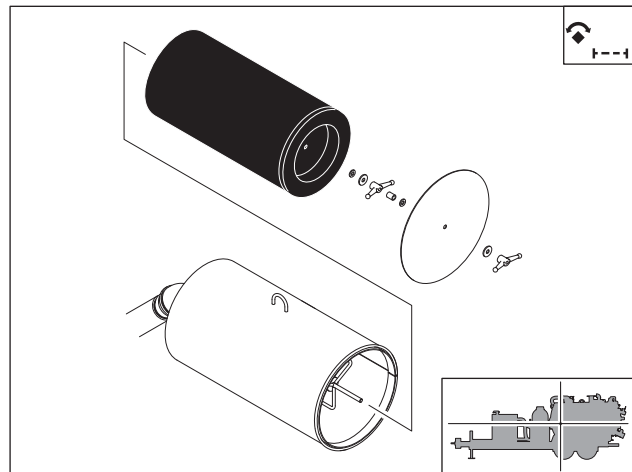
Clean filter every 10 hours or as needed.

To clean filter:

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

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

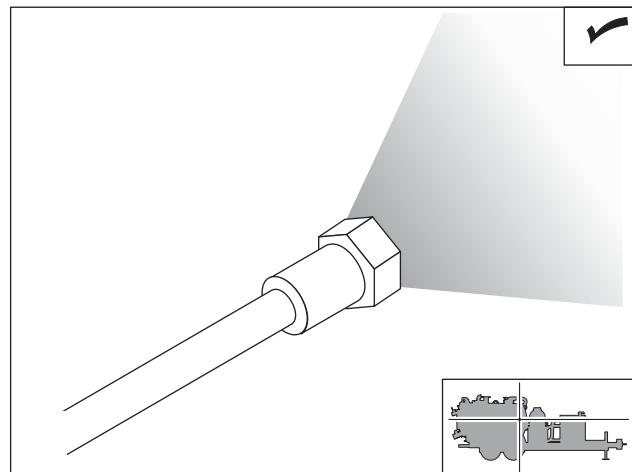
3. Allow filter to dry completely before returning to canister.



j33om024h.eps

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.



j33om026h.eps

FX30/FXT30 Operator's Manual

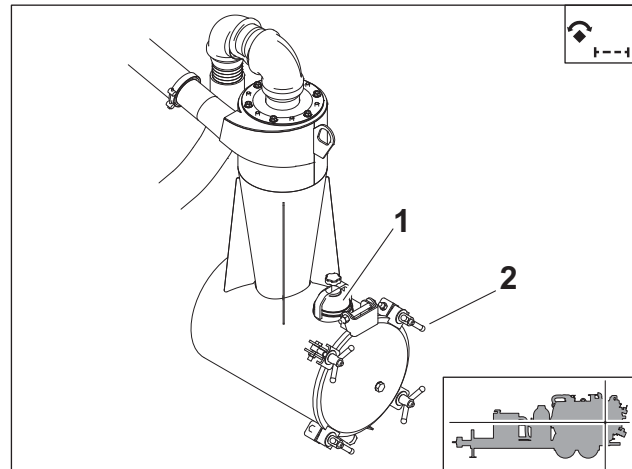
10 Hour

Service - 103

Drain Filter Canister

IMPORTANT: Depressurize tank before emptying cyclonic canister, cleaning filter, clearing hoses or opening any doors.

Drain canister at drain (2) every 10 hours or, for units equipped with cyclonic separator (shown), when water is visible in sight glass (1).



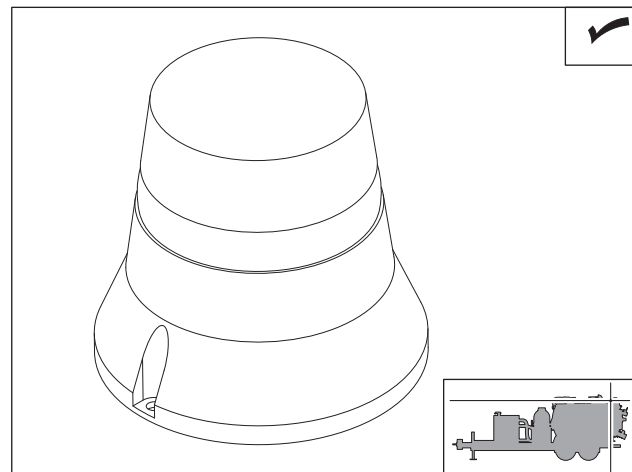
j33om025h.eps



Debris Tank

Check Strobe Light

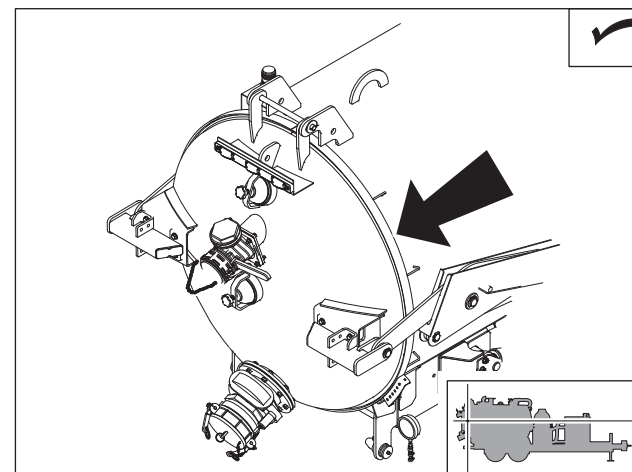
Check strobe light for proper function every 10 hours. When ignition is on, strobe light should be flashing. Repair if necessary.



j33om027h.eps

Check Vacuum Tank Door Seals and Fittings

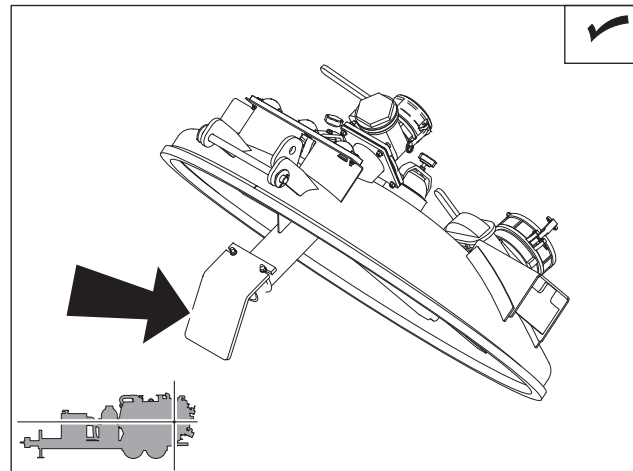
Check door seal every 10 hours for wear or damage. Repair if necessary. Check for leaks and loose fittings every 10 hours. Repair or replace if necessary.



j33om028h.eps

Check Tank Deflector

Check tank deflector every 10 hours for buildup, wear, or damage. Clean or replace as needed.



j33om048h.eps

25 Hour

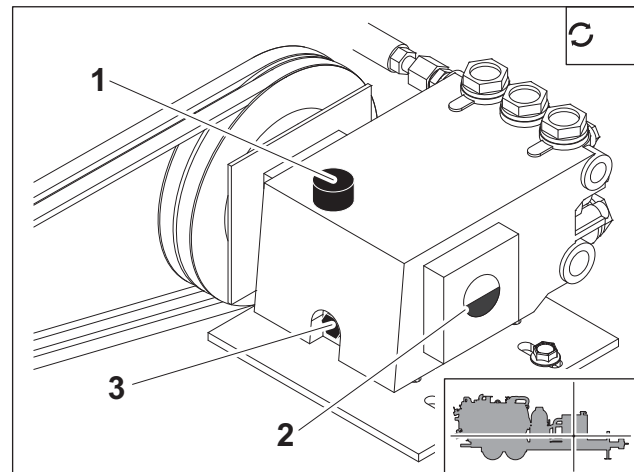
Location	Task	Notes
VACUUM SYSTEM	Change water pump oil	Initial service, NDO

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 (3) while oil is warm.
- Add NDO at fill (1) until oil is at halfway mark on sight glass (2).



j33om029h.eps

FX30/FXT30 Operator's Manual
50 Hour

Service - 105

50 Hour

Location	Task	Notes
VACUUM SYSTEM	Change engine oil and filter	Initial service, DEO
	Change fuel filters	Initial service
	Check and adjust fan belt tension	
	Check radiator	
	Check battery	
	Check water pressure hoses	
	Lube blower bearings	
DEBRIS TANK	Lube tank pivot pins	
VACUUM BOOM	Lube boom pivot	Boom is optional equipment

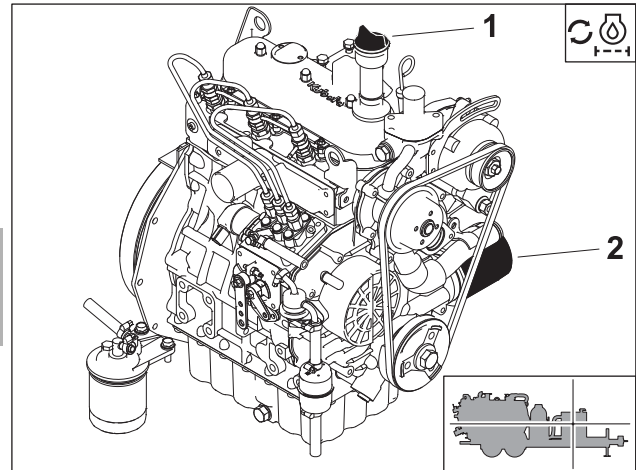


Vacuum System

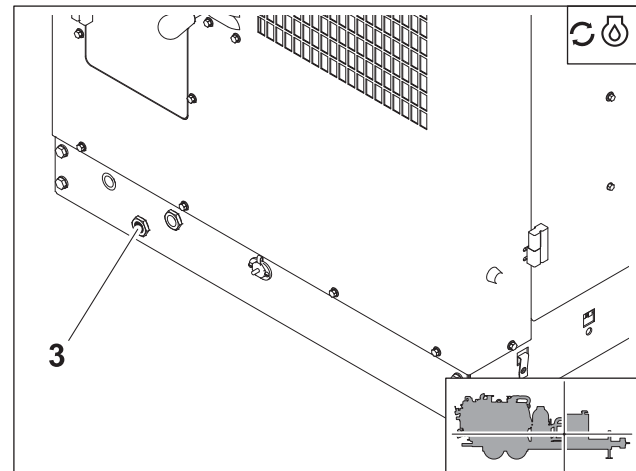
Change Engine Oil and Filter (Initial Service)

Change engine oil and filter after 50 hours, and every 150 hours thereafter. Drain oil (3), change filter (2), and add 4.2 qt (4 L) of DEO at fill (1).

IMPORTANT: Use oil specified in temperature chart found in "Recommended Lubricants/Service Key" on page 90.



j33om078h.eps



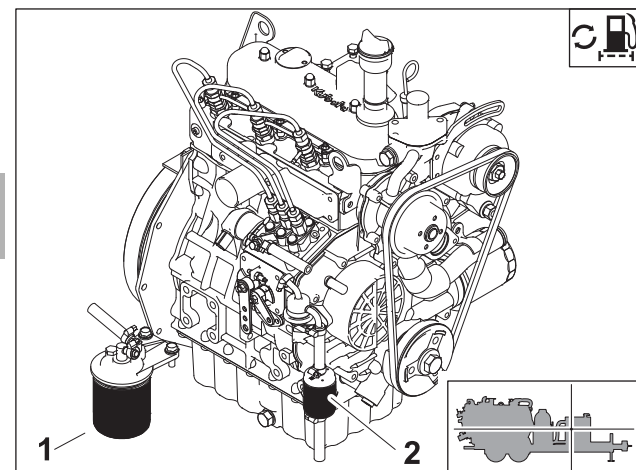
j33om071h.eps

Change Fuel Filters (Initial)

Replace filters (1, 2) after the first 50 hours of operation, and every 100 hours thereafter.

IMPORTANT: Do not prefill filters with diesel. Use hand pump to prime.

1. Remove filter.
2. Install new filter. Apply fuel oil thinly over the gasket and hand-tighten.
3. Bleed air from the injection pump. (See engine manufacturer's manual for instructions.)



j33om079h.eps

FX30/FXT30 Operator's Manual

50 Hour

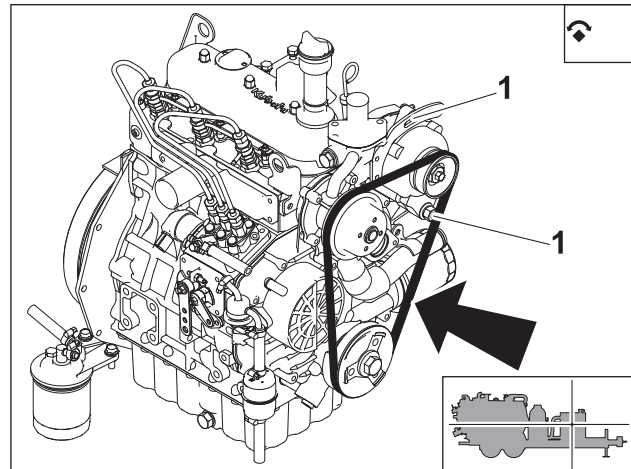
Service - 107

Check and Adjust Fan Belt Tension

Check belt tension every 50 hours. Belt is properly tensioned when it moves about 1/4-3/8" (7-9 mm) when pushed at the long span (shown).

To adjust:

1. Loosen two alternator bolts (1).
2. Adjust position to allow belt to slip off.
3. Install new belt.
4. Adjust position to tighten belt.
5. Tighten bolts.
6. Check tension.



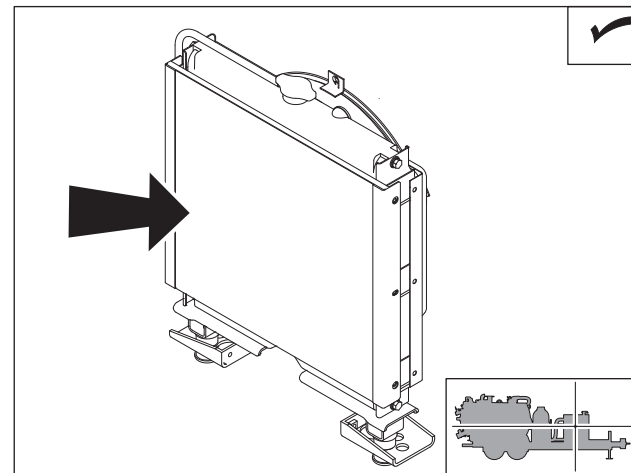
j33om080h.eps



Check Radiator

Check radiator for dirt, grass, and other foreign matter every 50 hours. Check more often if operating in dusty or grassy conditions. Clean fins with compressed air or spray wash.

IMPORTANT: Be careful not to damage fins with high pressure air or water.



j33om035h.eps

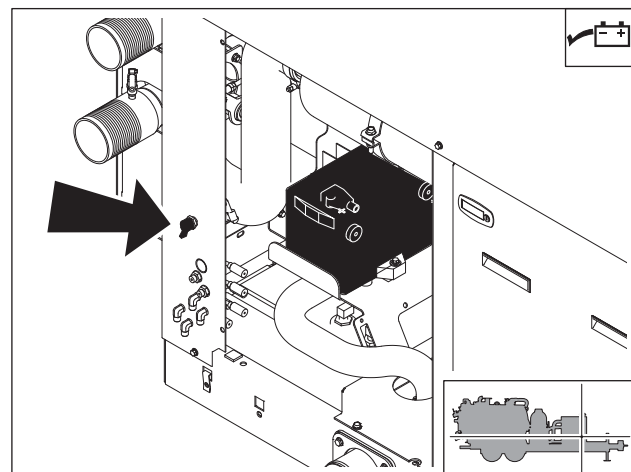
Check Battery

Keep battery clean and free of corrosion.

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

If battery will not hold charge, see your equipment dealer for replacement battery.

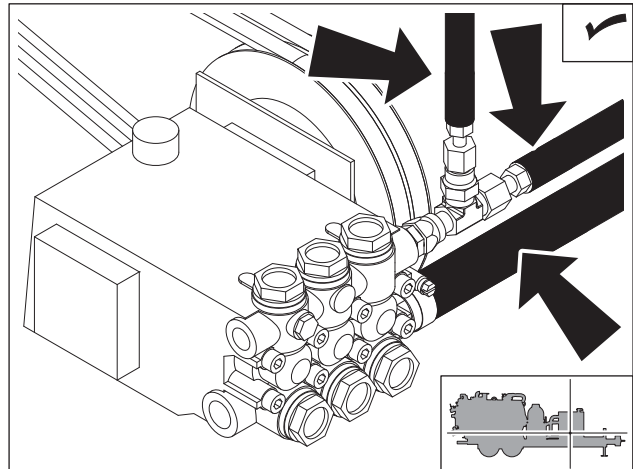
IMPORTANT: Use battery disconnect switch (shown) when servicing, welding, and during long-term storage.



j33om081h.eps

Check Water Pressure Hoses

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

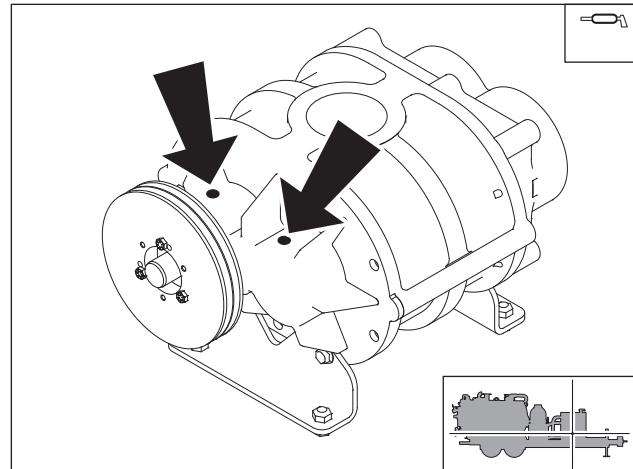


j33om037h.eps

Lube Blower Bearings

Wipe two zerks clean and lube every 500 hours with HTG. 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.

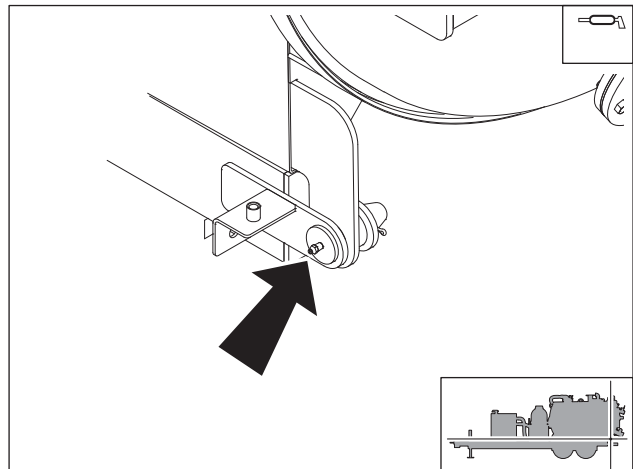


j33om038h.eps

Debris Tank

Lube Tank Pivot Pins

Lube two pins every 50 hours with MPG.



j33om039h.eps

FX30/FXT30 Operator's Manual

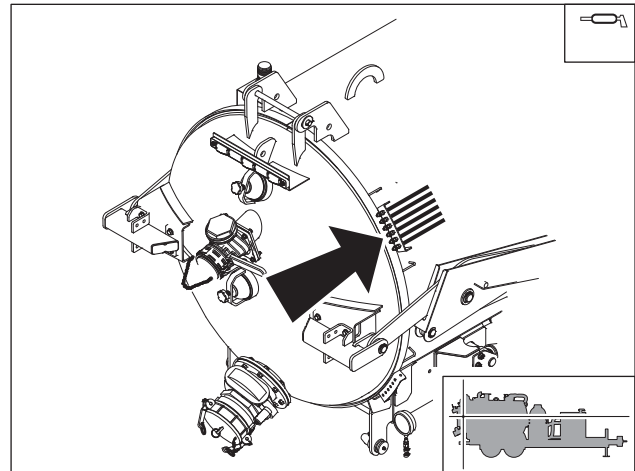
50 Hour

Service - 109

Vacuum Boom

Lube Boom Pivot

Lube six zerks every 50 hours with MPG.



j33om061h.eps



100 Hour

Location	Task	Notes
VACUUM SYSTEM	Change fuel filters	
	Change blower oil	initial service, SGL
	Change hydraulic fluid	initial service, THF
	Change water pump oil	NDO
DEBRIS TANK	Check tank mounting bolts	
VACUUM BOOM	Check structure	Boom is optional equipment
	Check boom deflector and plate seal	

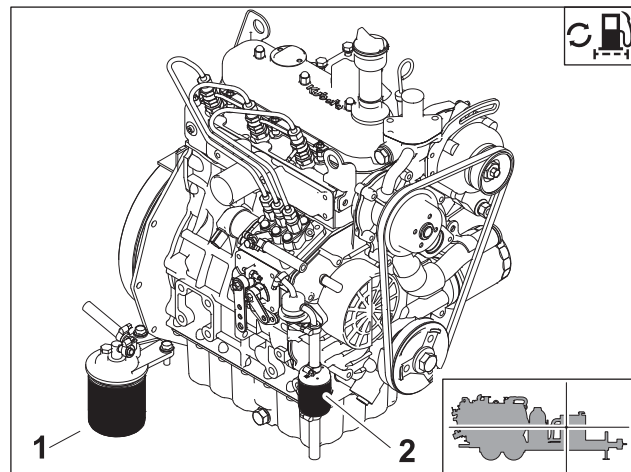
Vacuum System

Change Fuel Filters

IMPORTANT: Do not prefill filters with diesel. Use hand pump to prime.

Replace filters (1, 2) every 100 hours.

1. Remove filter.
2. Install new filter. Apply fuel oil thinly over the gasket and hand-tighten.
3. Bleed air from the injection pump. (See engine manufacturer's manual for instructions.)

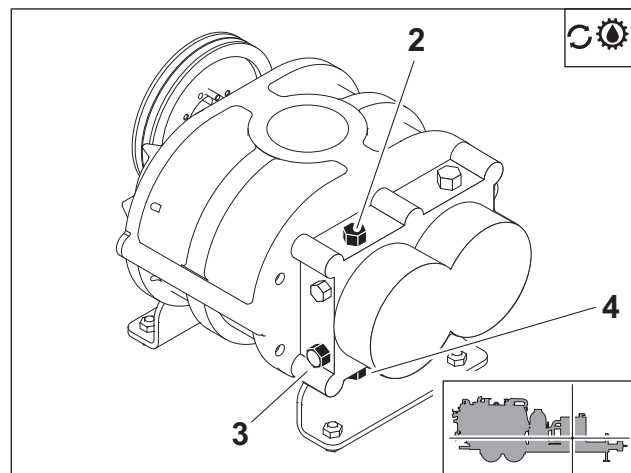


j33om079h.eps

Change Blower Oil

Change oil after the first 100 hours of operation, and every 1000 hours thereafter. Change oil more frequently if working in dusty conditions.

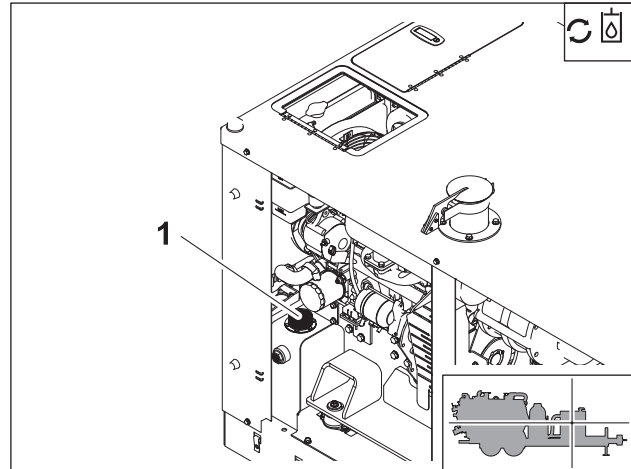
- Drain at drain plug (4) while oil is warm.
- Add with SGL at fill (2) until oil is at halfway point on sight glass (3).



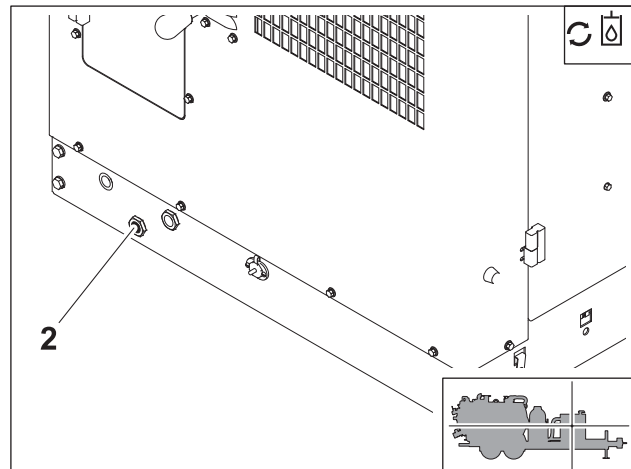
j33om041h.eps

Change Hydraulic Fluid

Change hydraulic fluid after the first 100 hours, and every 1000 hours thereafter. Drain hydraulic fluid (2), add THF at hydraulic fluid fill (1) until level is midway at sight glass.



j33om082h.eps

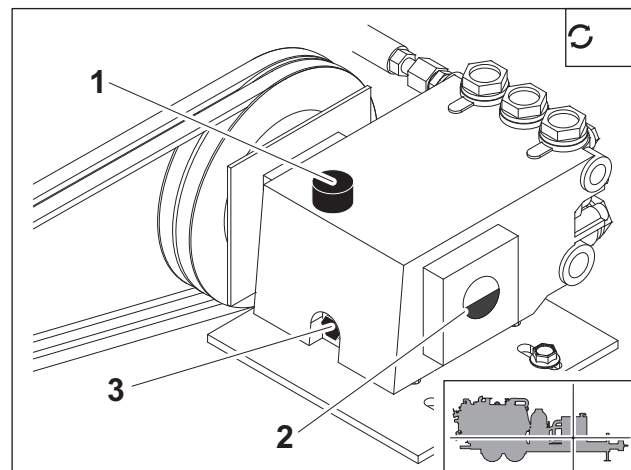


j33om083h.eps

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.
- Add with NDO at fill (1) until oil is at halfway mark on sight glass.



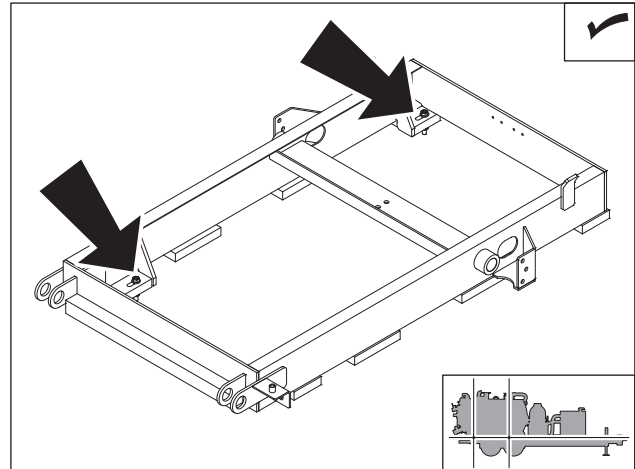
j33om029h.eps



Debris Tank

Check Tank Mounting Bolts

Check vacuum tank mounting bolts (shown, both sides) every 100 hours for looseness and damage. Tighten or replace as needed.

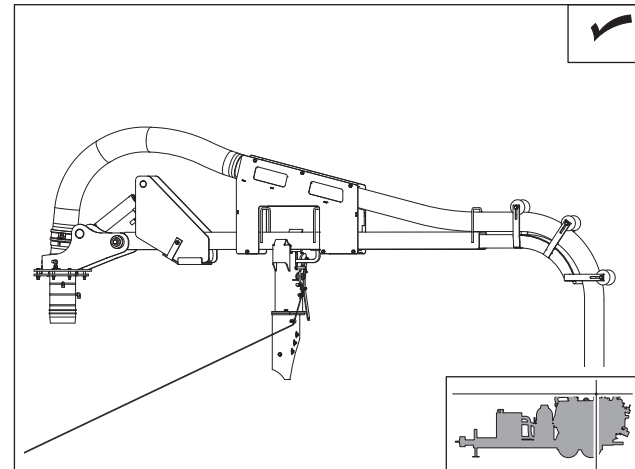


j33om066h.eps

Vacuum Boom

Check Structure

Check vacuum boom and structure every 100 hours. Check welds. Replace or repair if there are any signs of damage.



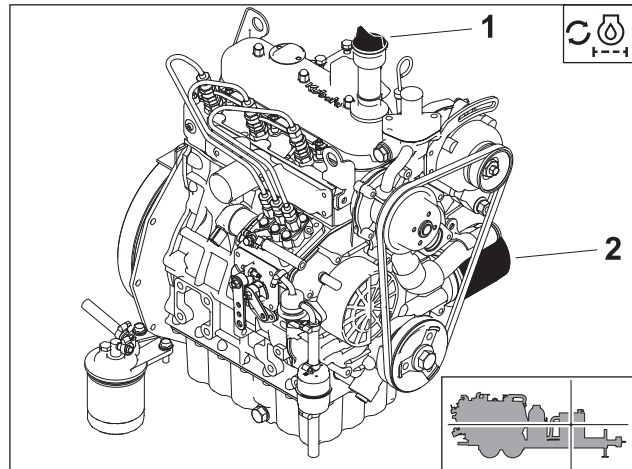
j33om043h.eps

150 Hour

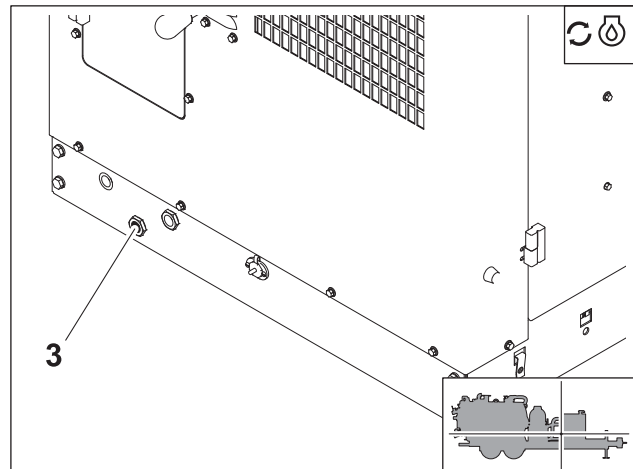
Change Engine Oil and Filter (Regular Service)

Change engine oil and filter every 100 hours. Drain oil (3), change filter (2), and add 4.2 qt (4 L) of DEO at fill (1).

IMPORTANT: Use oil specified in temperature chart found in "Recommended Lubricants/Service Key" on page 90.



j33om078h.eps



j33om071h.eps



1000 Hour

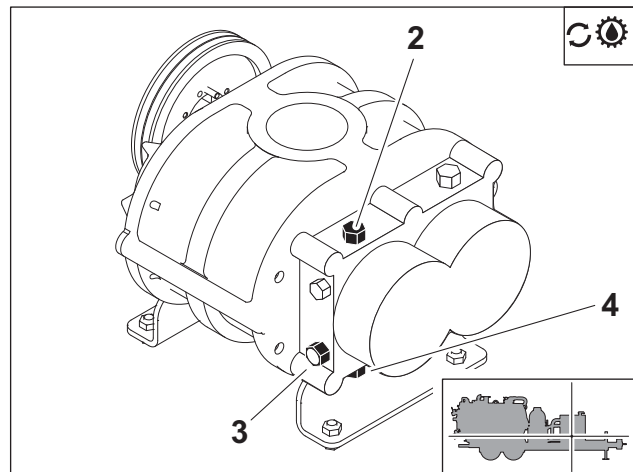
Location	Task	Notes
VACUUM SYSTEM	Change blower oil	SGL
	Change hydraulic fluid	THF

Vacuum System

Change Blower Oil

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

- Drain at drain plug (4) while oil is warm.
- Add with SGL at fill (2) until oil is at halfway point on sight glass (3).



j33om041h.eps

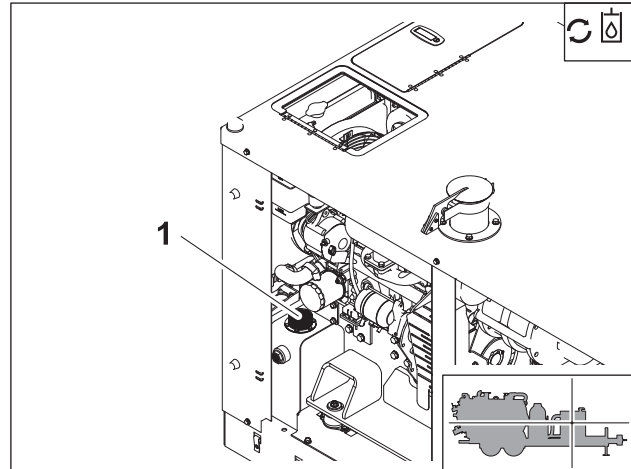
FX30/FXT30 Operator's Manual

1000 Hour

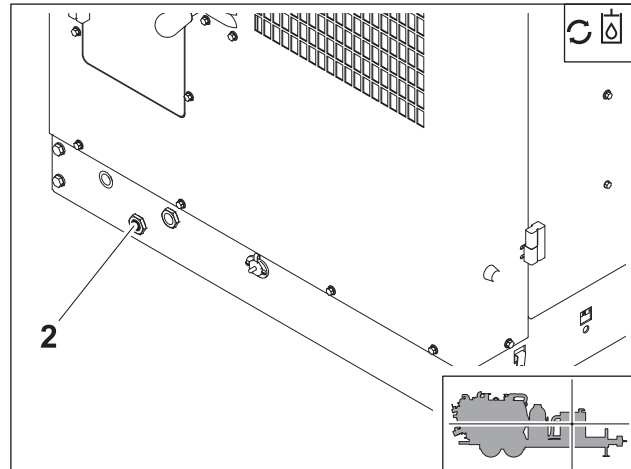
Service - 115

Change Hydraulic Fluid

Change hydraulic fluid every 1000 hours. Drain hydraulic fluid (2), add THF at hydraulic fluid fill (1) and check level.



j33om082h.eps



j33om083h.eps



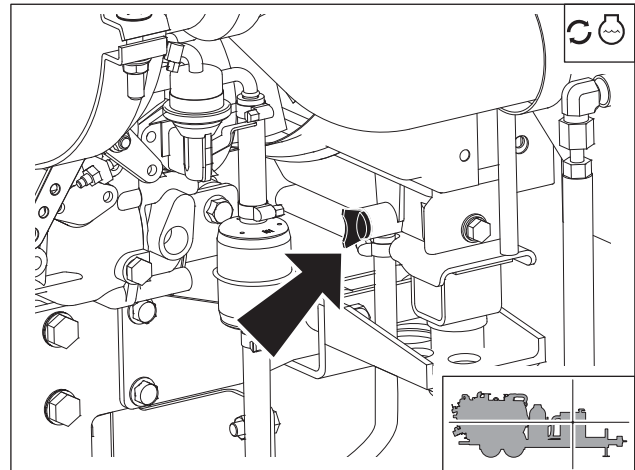
2000 Hour

Location	Task	Notes
VACUUM SYSTEM	Change coolant	DEAC
	Replace water pump belts	
	Replace blower belt	

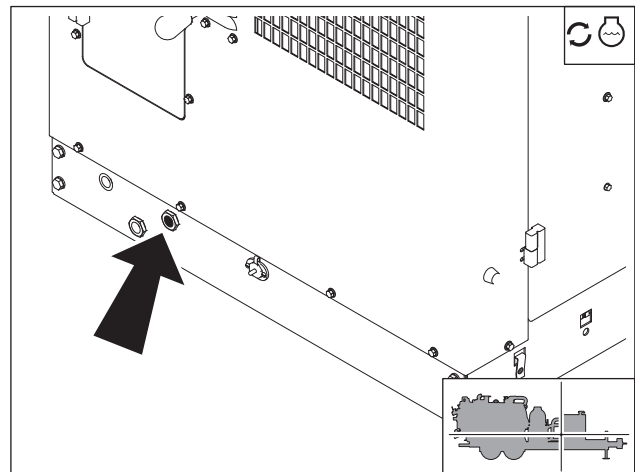
Vacuum System

Change Coolant

Drain coolant and add DEAC at radiator fill every 2000 hours. To drain, open shut-off valve (top). Catch fluid at drain (bottom).



j33om044h.eps



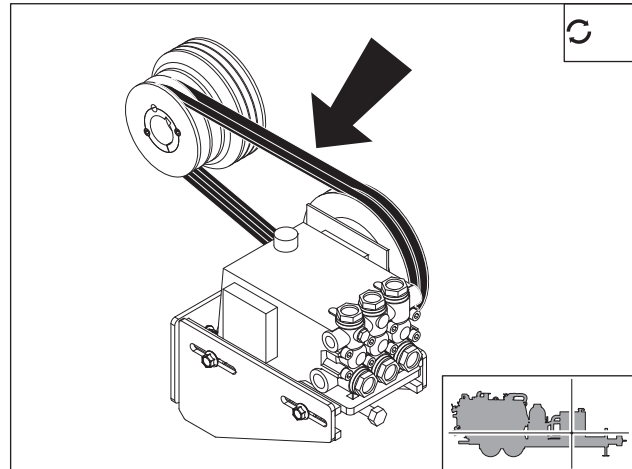
j33om072h.eps

FX30/FXT30 Operator's Manual **2000 Hour**

Service - 117

Replace Water Pump Belts

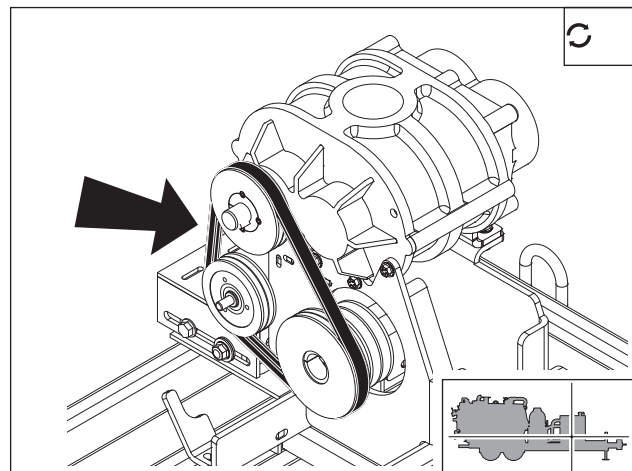
Replace belt every 2000 hours.



j33om046h.eps

Replace Blower Belt

Replace belt every 2000 hours.



j33om045h.eps



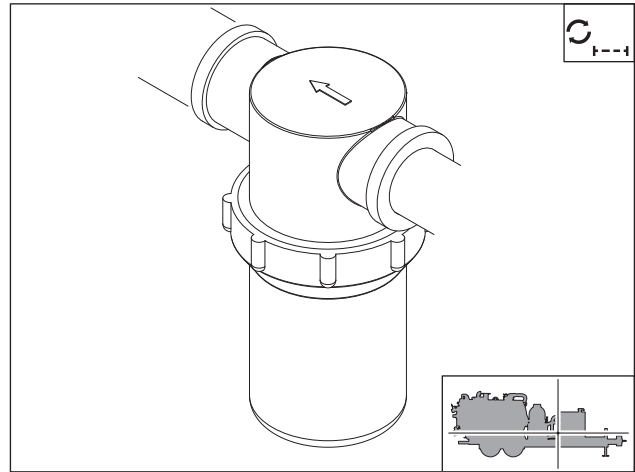
As Needed

Location	Task	Notes
VACUUM SYSTEM	Change water pump filter	
	Lube blower for long-term storage	
	Change blower relief air filter	
	Empty cyclonic separator canister	
	Lube reverse flow 4-way valve	MPG
	Change wireless remote module batteries	3 AA
DEBRIS TANK	Clean primary shutoff valve	
TRAILER	Add surge brake fluid	DOT 3 or 4
	Check battery	
	Charge battery	

Vacuum System

Change Water Pump Filter

1. Open filter housing.
2. Remove element and rinse housing thoroughly with clean water.
3. Install new element and close filter housing.



j33om047h.eps

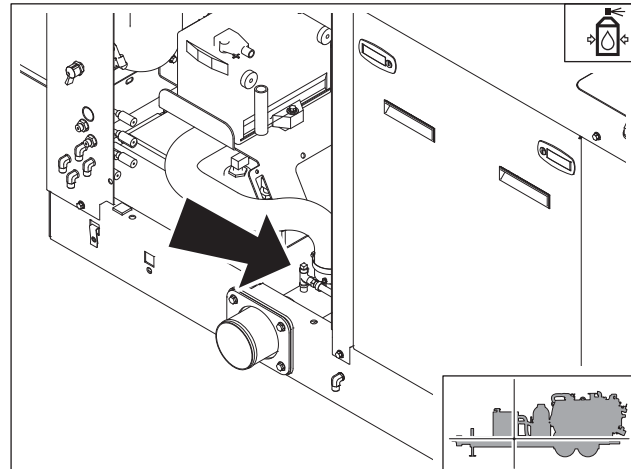
FX30/FXT30 Operator's Manual As Needed

Service - 119

Lube Blower for Long-term Storage

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

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.



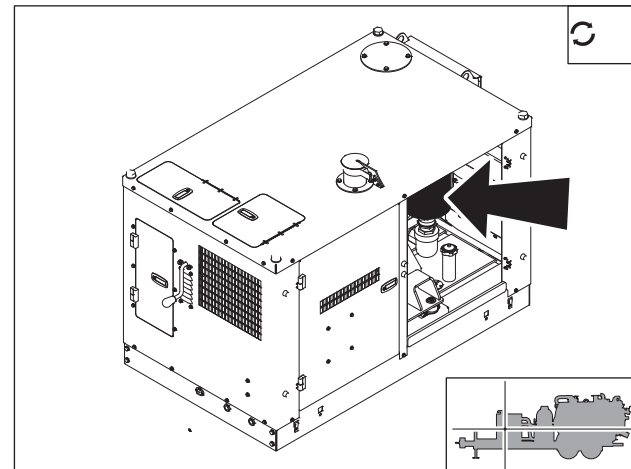
j33om084h.eps

Change Blower Relief Air Filter

Check air filter whenever vacuum gauge goes over 16" (406 mm) of mercury. Change as needed.

NOTICE: Operating system above 16" (406 mm) of mercury may result in blower damage.

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

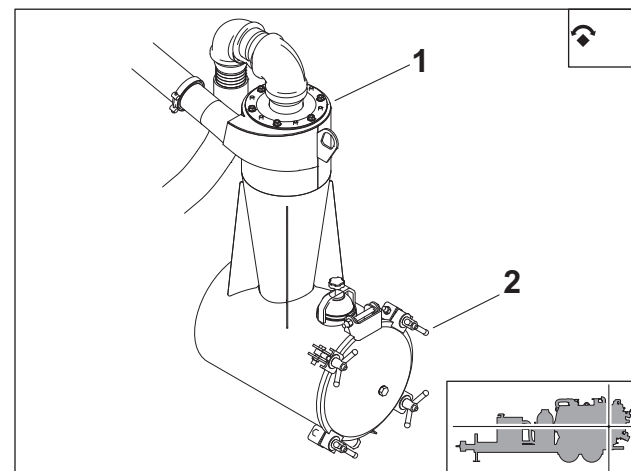


j33om064h.eps

Empty Cyclonic Separator Canister

IMPORTANT: Depressurize tank before emptying cyclonic canister, cleaning filter, clearing hoses or opening any doors.

Empty cyclonic separator canister (2) as needed. Open door and dump tank. Clean out cyclone through access door (1) as needed.

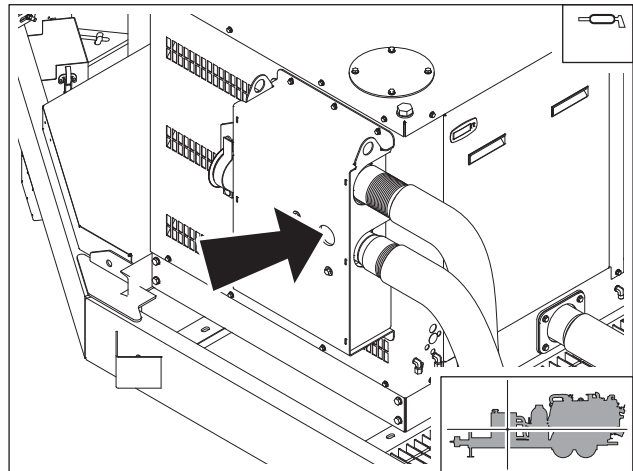


j33om065h.eps



Lube Reverse Flow 4-Way Valve

Lube reverse flow 4-way valve at zerk (shown) with MPG as needed. Also open left access panel of power unit and lube zerk on other side of valve.



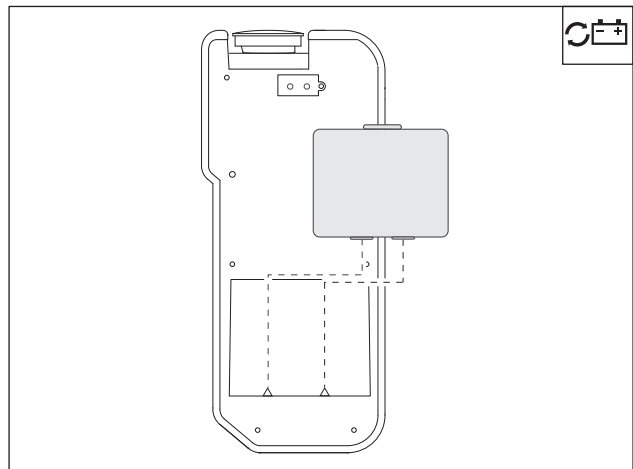
j33om088h.eps

Change Wireless Control Module Batteries

Change batteries in wireless control module as needed. Unit requires 3 AA batteries.

To change:

1. Insert 3 AA batteries into the slots on the back of the battery adapter case housing as indicated on the case.
2. Slide the battery adapter into the battery compartment as shown.



VacWirelessControlBattery.eps

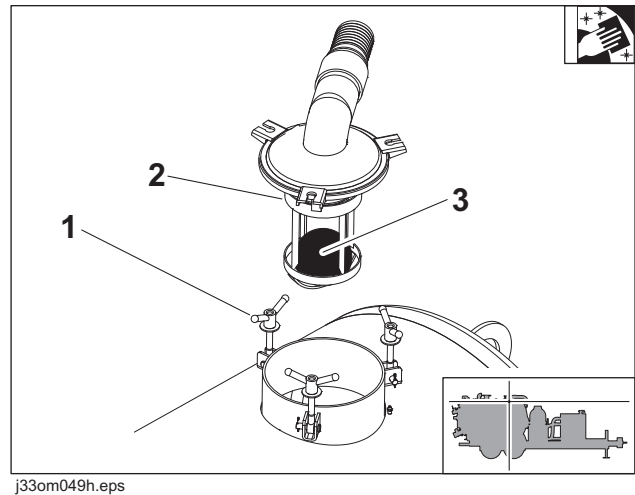
Debris Tank

Clean Primary Shut-off Valve

Clean primary shut-off valve as needed. Replace primary shut-off valve as needed.

To clean:

1. Open tank door. See "Open/Close Tank Door" on page 82.
2. Spray valve housing inside vacuum tank with high-pressure water.
3. Store water pressure hose.
4. Close tank door. See "Open/Close Tank Door" on page 82.



To remove:

1. Loosen three wingnuts (1) and pull out valve housing (2).
2. Remove ball (3).
3. Clean ball and housing with high-pressure water.
4. Replace ball and housing.
5. Tighten wingnuts.

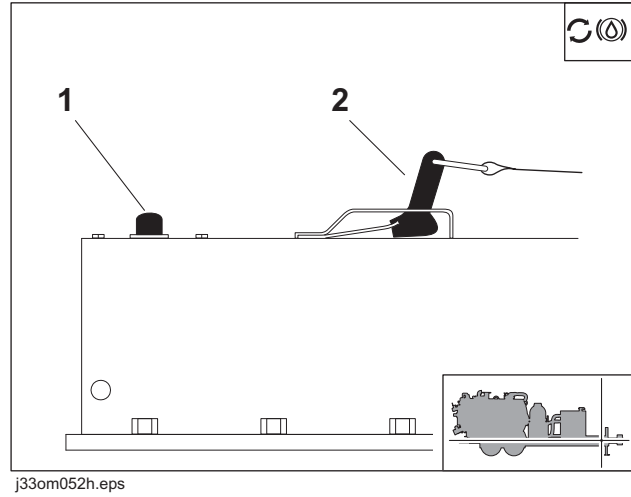


Trailer

Add Surge Brake Fluid

Add surge brake fluid at cap (1) as needed and bleed brakes.

1. Remove lever guide and flat emergency lever spring by removing two 5/16" hex head bolts and lock washers.
2. Using short strokes, pull forward on emergency lever (2) until brake fluid in master cylinder stops bubbling.
3. Attach bleeder hose to bleeder valve on one wheel and submerge other end of hose into a transparent container partially filled with brake fluid.
4. Loosen bleeder valve one turn and use emergency lever to pump master cylinder. Continue to pump the lever until bubbles no longer appear in brake fluid in container.



NOTICE: Check fluid level in master cylinder every 4-5 strokes and add fluid as necessary to keep master cylinder at least half full while bleeding brakes.

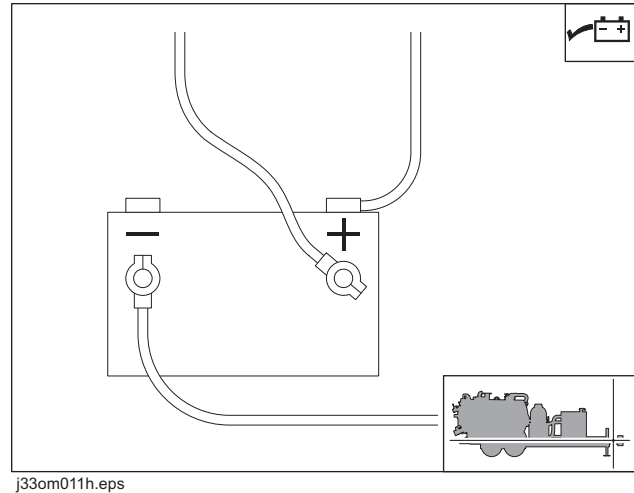
5. When bubbles stop, close bleeder valve and repeat process on remaining wheels.
6. After all wheels have been bled, fill master cylinder and attach cap securely.
7. Install emergency lever spring and lever guide using hex head bolts and lock washers.
8. Test brakes.
 - Pull emergency lever forward until it locks into its second notch.
 - Attempt to rotate all wheels in forward direction.
 - If any wheel rotates, adjust brakes.

Check Battery

Check battery as needed. Keep battery clean and terminals free of corrosion.

To clean:

1. Turn battery disconnect switch, if equipped, to the off position.
2. Ensure that no ignition sources are near batteries.
3. Loosen and remove battery cable clamps carefully, **negative (-)** cable first.
4. Clean cable clamps and terminals to remove dull glaze.
5. Check for signs of internal corrosion in cables.
6. Connect battery cable clamps, **positive (+)** cable first.
7. Tighten any loose connections.
8. Ensure that battery tiedowns are secure.
9. Turn battery disconnect switch to the on position.



WARNING

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

To help avoid injury: Do not create sparks and do not short across battery terminals for any reason.

Charge Battery



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

To help avoid injury:

- Use a single 12V maximum source for charging. Do not connect to rapid chargers or dual batteries.
- Use caution and wear personal protective equipment such as safety eyewear, when charging or cleaning battery.
- Keep sparks, flames, and any ignition source away from batteries at all times. Internal contents are extremely hazardous. Leaking fluid is corrosive. Battery may be explosive at higher temperatures.
- NEVER lean over battery when making connections.
- Do not allow vehicles to touch when charging.
- Do not attempt to charge a battery that is leaking, bulging, heavily corroded, frozen, or otherwise damaged.
- NEVER short-circuit battery terminals for any reason or strike battery posts or cable terminals.
- Refer to MSDS for additional information regarding this battery.

Before You Start

Electronic components can be easily damaged by electrical surges. Jump starting can damage electronics and electrical systems, and is not recommended. Try to charge the battery instead. Use quality large diameter jumper cables capable of carrying high currents (400 amps or more). Cheap cables may not allow enough current flow to charge a dead/discharged battery.

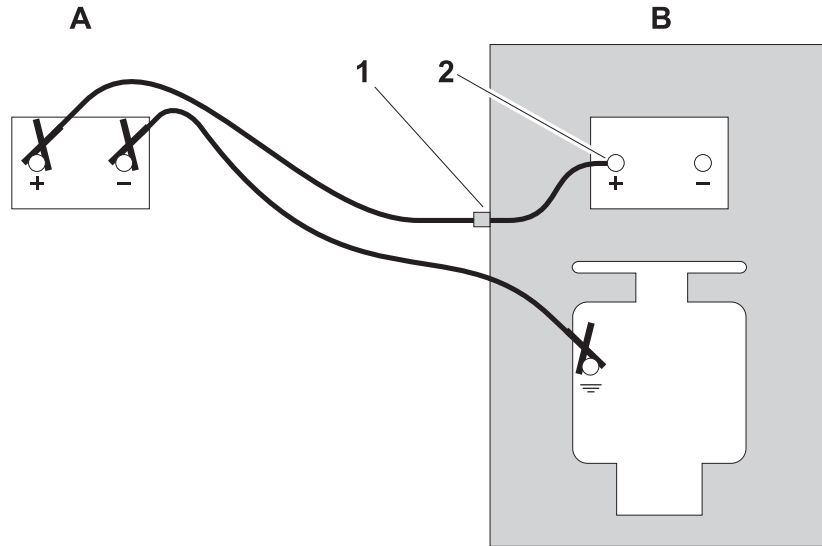
Read all steps thoroughly and review illustration before performing procedure.

FX30/FXT30 Operator's Manual **As Needed**

Service - 125

Charging Procedure (Engine Off)

1. Park service vehicle close to disabled equipment but do not allow vehicles to touch. Engage parking brake in both vehicles.
2. Turn the ignition switch to the OFF position in both vehicles, and turn off all electrical loads. Disconnect the machine controller.



3. Inspect battery in disabled vehicle (B) for signs of cracking, bulging, leaking, or other damage. Connect red positive (+) jumper cable clamp to positive (+) post (2) of battery in disabled vehicle first.

IMPORTANT: Some equipment may have a positive jumper cable terminal (1) located externally. If so equipped, connect red positive (+) jumper cable clamp to terminal.

4. Connect the other red positive (+) jumper cable clamp to positive (+) post of battery (A) in the service vehicle.
5. Connect black negative (-) cable clamp to negative (-) post of battery (A) in service vehicle.
6. Connect the other black negative (-) cable clamp to the engine or frame ground on the disabled vehicle, at least 12" (305 mm) from the failed battery, as shown.
7. Operate service vehicle engine at 1500-2000 rpm for a few minutes to build an electrical charge in the failed battery.
8. Stop engine in service vehicle.
9. Remove jumper cables from the service vehicle, black negative (-) clamp first. Do not allow clamps to touch.
10. Remove black negative (-) cable clamp from the disabled engine or frame ground first.
11. Remove red positive (+) cable clamp from the disabled vehicle positive (+) battery post last.
12. Reconnect machine controller and try to start disabled vehicle.

If the disabled vehicle did not start, check for loose or corroded battery cable connections. Poor connections will prevent current from charging the failed battery. Clean terminals and posts if necessary and repeat steps above.



200 Mile

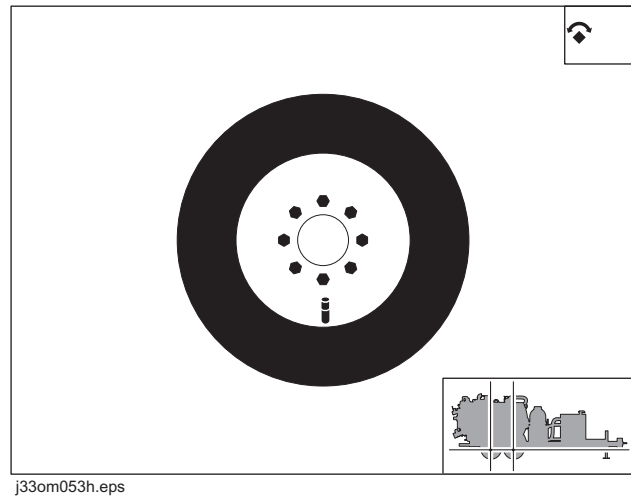
Location	Task	Notes
Trailer	Adjust electric brakes	Initial
	Adjust hydraulic brakes	Initial

Trailer

Adjust Electric Brakes (Initial)

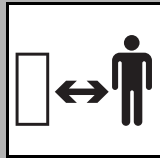
Adjust brakes after 200 miles (320 km).

1. Place adequate jack stands under frame rails and remove wheels.
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.



Adjust Hydraulic Brakes (Initial)

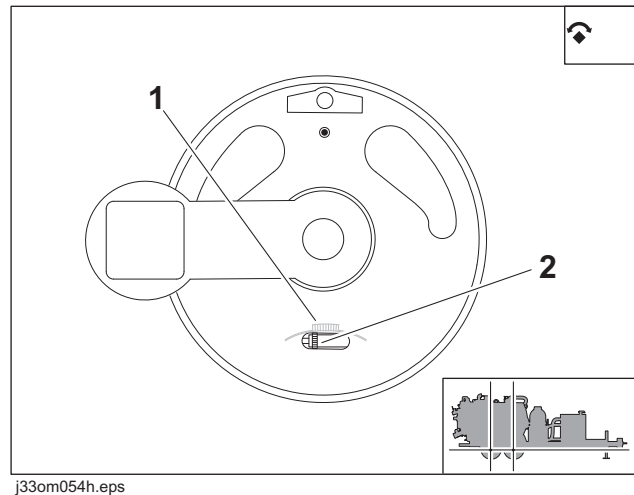
Adjust hydraulic brakes after 200 miles (320 km).



WARNING
Crushing weight could cause death or serious injury. Stay away. 275-326



1. Use a jack and suitable jack stands to raise wheels so that wheels can be rotated by hand.
2. Rotate wheel forward by hand to reposition free backing primary brake shoe.
3. Remove adjusting plug from backing plate at wheel.
4. Use a slender screwdriver or similar tool to push the adjuster screw spring (1) away from the adjuster assembly.
5. At the same time, use a brake adjusting tool to tighten adjuster assembly (2). Adjust until brake linings become tight enough that wheel cannot be turned by hand, then back off 11 clicks for brakes that have not been used, and 15 clicks for brakes already burnished in.
6. Rotate wheel forward by hand. Wheel should rotate freely.
7. Replace adjusting plug in backing plate.
8. Repeat adjustment procedure at each wheel. To ensure even braking, make sure that all wheels have approximately the same amount of drag.



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3000 Mile

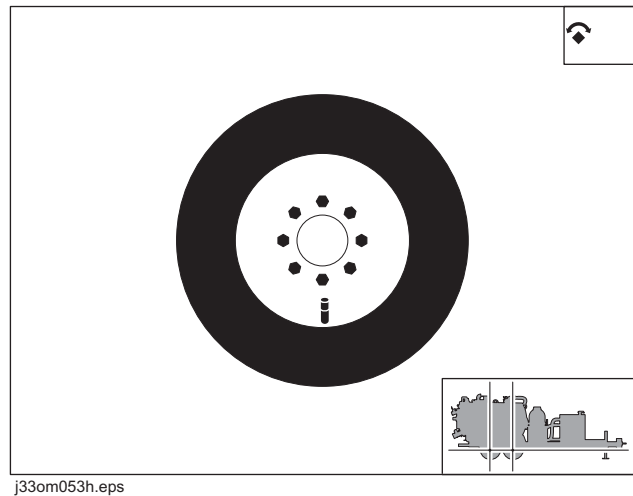
Location	Task	Notes
Trailer	Adjust electric brakes	
	Adjust hydraulic brakes	

Trailer

Adjust Electric Brakes

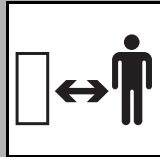
Adjust brakes every 3000 miles (5000 km).

1. Place adequate jack stands under frame rails and remove wheels.
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.



Adjust Hydraulic Brakes

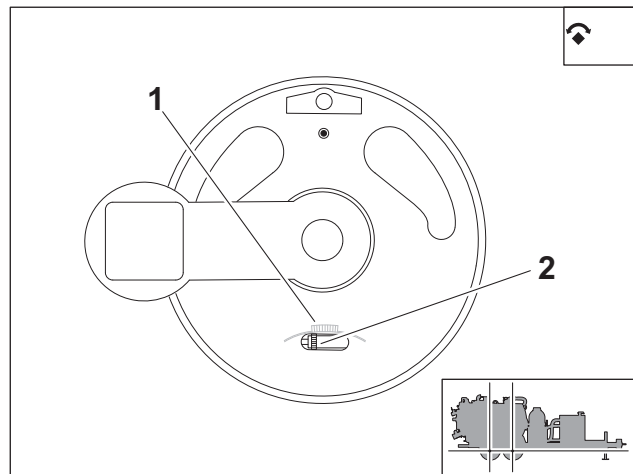
Adjust hydraulic brakes every 3000 miles (5000 km).



WARNING
Crushing weight could cause death or serious injury. Stay
away. 275-326



1. Use a jack and suitable jack stands to raise wheels so that wheels can be rotated by hand.
2. Rotate wheel forward by hand to reposition free backing primary brake shoe.
3. Remove adjusting plug from backing plate at wheel.
4. Use a slender screwdriver or similar tool to push the adjuster screw spring (1) away from the adjuster assembly.
5. At the same time, use a brake adjusting tool to tighten adjuster assembly (2). Adjust until brake linings become tight enough that wheel cannot be turned by hand, then back off 11 clicks for brakes that have not been used, and 15 clicks for brakes already burnished in.
6. Rotate wheel forward by hand. Wheel should rotate freely.
7. Replace adjusting plug in backing plate.



8. Repeat adjustment procedure at each wheel. To ensure even braking, make sure that all wheels have approximately the same amount of drag.

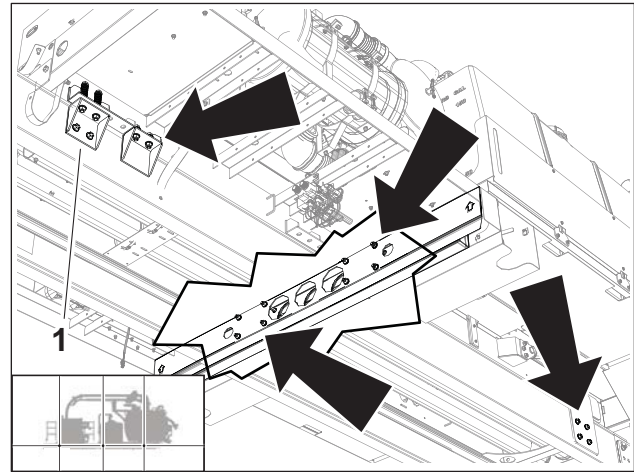
10,000 Mile

Location	Task	Notes
Truck	Check mounting bolts and springs	
	Check accessory mounting bolts	

Truck

Check Mounting Bolts and Springs

Check mounting bolts and springs (shown, underneath and both sides) every 100 hours for looseness and damage. Springs (1) should be 3" (76 mm). Loosen or tighten bolt to adjust spring length. Tighten all other indicated hardware to 240 ft•lb (325 N•m).



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Check Accessory Mounting Bolts

Check accessory (fender, hitch, water heater, bumper, skid extension, front tool rack) mounting bolts every 100 hours for looseness and damage. Tighten or replace as needed.

FX30/FXT30 Operator's Manual

12,000 Mile

Service - 131

12,000 Mile

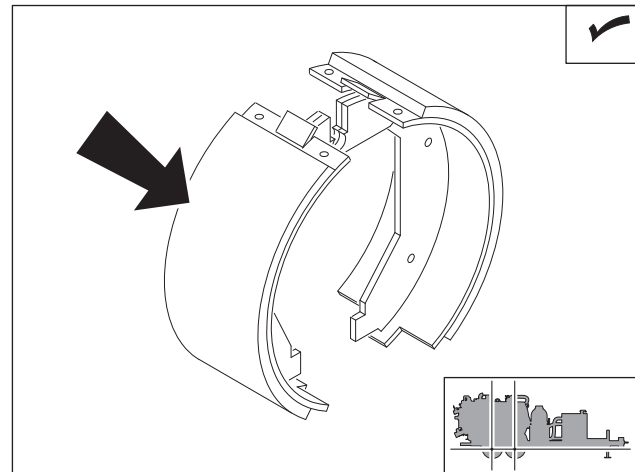
Location	Task	Notes
Trailer	Inspect brake shoes and linings	
	Adjust and lubricate bearings	



Trailer

Inspect Brake Shoes and Linings

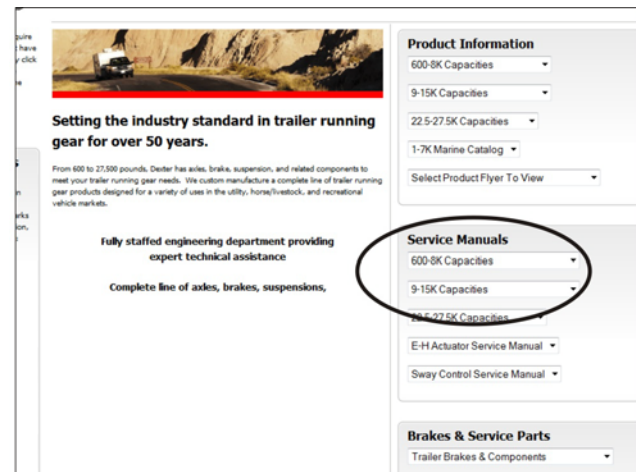
Inspect shoes and linings every 12 months or 12,000 miles (20 000 km) for wear. When lining is worn to 1/16" (2 mm) or less, replace linings. Replace shoe and lining if contaminated by oil.



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Adjust and Lubricate Bearings

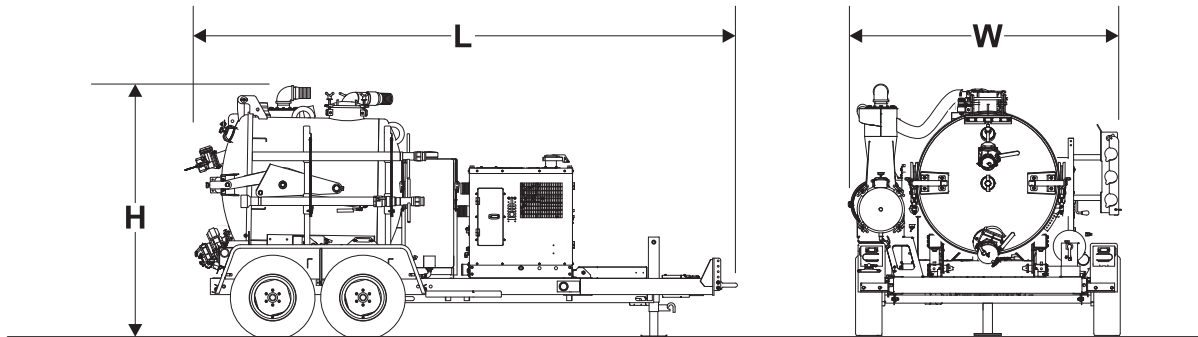
See the your Dexter® Operation Maintenance Service manual for more information. If you do not have that manual, go to the literature section on the Dexter Axle website (www.dexteraxle.com/literature1) for instructions. In the Service Manuals box, select the "Hubs, Drums and Bearings" publication from the drop down menu under the correct capacity for your trailer.



DexterWeb.jpg

Specifications

FX30-500



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Dimensions		U.S.	Metric
L	Length, T9S or T9SH trailer	200 in	5.1 m
H	Height	86 in	2.3 m
W	Width	96 in	2.2 m
Dry weight *		5740 lb	2604 kg
Weight with all tanks filled with water *		10,480 lb	4754 kg

* Options included on weight calculation: no options with 80 gal water tank on T9S trailer.

NOTICE: Do not transport vac system and T9S, T9SH trailer with full water tank and full vac tank. Doing so will exceed the trailer's rated Gross Motor Vehicle Weight.

Vac Tank	U.S.	Metric
Capacity	500 gal	1893 L
Length	62 in	1.6 m
Diameter	50 in	1.3 m
Drain valve size	6 in	152 mm
Inlet valve size	4 in	102 mm

Engine		U.S.	Metric
Kubota D1105-E3B, diesel, EPA Tier 4 emissions			
	Cooling medium	liquid	
	Injection	indirect	
	Aspiration	natural	
	Number of cylinders	3	
	Displacement	68.6 in ³	1.12 L
	Bore	3.07 in	78 mm
	Stroke	3.09 in	78.5 mm
Engine manufacturer's gross power rating (per SAE J1995)		24.8 hp	18.5 kW
Estimated net power rating (per SAE 1349)		23.5 hp	17.5 kW
Rated engine speed		3000 rpm	3000 rpm
Hydraulic system		U.S.	Metric
Pressure		2500 psi	172 bar
Drive type		engine-driven gear pump	
Tank lift cylinder size (2)		3 in	76 mm
Maximum tilt angle		45°	45°
Battery			
SAE res. cap. 110 min; SAE cold crank @ 0°F (-18°C) 800A, 12V electrical system			
Vacuum system		U.S.	Metric
Drive type		belt	
Displacement		576 cfm	16.3 m ³ /min
Maximum vacuum		15 in Hg	381 mm Hg
Filter type		washable polyester	
Filter area		100 ft ²	9.3 m ²
Suction hose size		3 in	76 mm

FX30/FXT30 Operator's Manual

FX30-500

Specifications - 135

Water system	U.S.	Metric
Maximum pressure	3000 psi	207 bar
Flow	4.2 gpm	16 L/min
Hose reel capacity (locking)	50 ft	15.2 m
Antifreeze	50/50 water/antifreeze mix	
Clutch type	electric with auto de-clutch	

Fluid capacities	U.S.	Metric
Engine oil with filter	4.2 qt	4 L
Fuel tank	15 gal	57 L
Vacuum pump	1.5 qt	1.4 L
Hydraulic reservoir	4 gal	15.1 L
Water tank	80 gal	303 L

Noise levels

This machine can generate sound levels exceeding 80 dBA. Always wear appropriate hearing protection when operating machine. Find sound power and pressure information at www.ditchwitch.com, or contact customersupport@ditchwitch.com.



T9S, T9SH Trailer		U.S.	Metric
Dimensions			
	Clearance (at jack foot pad)	12 in	305 mm
	Adj. coupler height	18-24 in	457-610 mm
	Width between fenders	76 in	1.9 m
	Width outside fenders	96 in	2.4 m
General			
	Number of axles	2	
	Coupler (square mount drawbar)	3 in or 2.5 in	76 mm or 64 mm
	Type of brakes	electric or hydraulic surge	
	Lug nut torque	90-120 ft•lb	122-163 N•m
	Hitch bolt torque	160 ft•lb	217 N•m
	Electrical system	12V DC	
Tire			
	ST235/85R16, E	80 psi	5.5 bar
Load rating			
	Tongue weight (empty water, empty vac)	1348 lb	611 kg
	Tongue weight (full water, empty vac)	1527 lb	693 kg
	Tongue weight (full vac, empty water)	1202 lb	545 kg
	GVWR (gross vehicle weight rating)	10,000 lb	4536 kg
	GAWR (gross axle weight rating, each)	5000 lb	2273 kg

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

FX30/FXT30 Operator's Manual

FX30-500

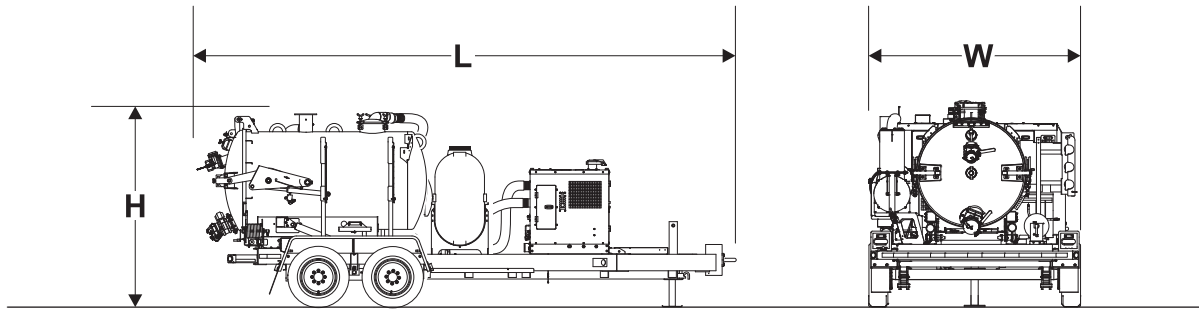
Specifications - 137

T12SE Trailer		U.S.	Metric
Dimensions			
	Clearance (at jack foot pad)	12 in	305 mm
	Adj. coupler height	18-24 in	457-610 mm
	Width between fenders	76 in	1.9 m
	Width outside fenders	96 in	2.4 m
General			
	Number of axles	2	
	Coupler (square mount drawbar)	3 in or 2.5 in	76 mm or 64 mm
	Type of brakes	electric or hydraulic surge	
	Lug nut torque	90-120 ft•lb	122-163 N•m
	Hitch bolt torque	160 ft•lb	217 N•m
	Electrical system	12V DC	
Tire	LT215/85R16 load range E	80 psi	5.5 bar
Load rating			
	Tongue weight (empty water, empty vac)	815 lb	370 kg
	Tongue weight (full water, empty vac)	1200 lb	544 kg
	Tongue weight (full vac, empty water)	1645 lb	746 kg
	GVWR (gross vehicle weight rating)	12,000 lb	5443 kg
	GAWR (gross axle weight rating, each)	7000 lb	3175 kg

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



FX30-800



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Dimensions		U.S.	Metric
L	Length	233 in	4.9 m
H	Height	92 in	2.3 m
W	Width	100.5 in	2.6 m
Dry weight *		8245 lb	3740 kg
Weight with all tanks filled with water *		16,460 lb	7466 kg

* Options included on weight calculation: reverse flow with 200 gal water on T18S trailer.

Vac Tank	U.S.	Metric
Capacity	800 gal	3028 L
Length	98 in	2.5 m
Diameter	50 in	1.3 m
Drain valve size	6 in	152 mm
Inlet valve size	4 in	102 mm

FX30/FXT30 Operator's Manual

FX30-800

Specifications - 139

Engine		U.S.	Metric
Kubota D1105-E3B, diesel, EPA Tier 4 emissions			
	Cooling medium	liquid	
	Injection	indirect	
	Aspiration	natural	
	Number of cylinders	3	
	Displacement	68.6 in ³	1.12 L
	Bore	3.07 in	78 mm
	Stroke	3.09 in	78.5 mm
Engine manufacturer's gross power rating (per SAE J1995)		24.8 hp	18.5 kW
Estimated net power rating (per SAE 1349)		23.5 hp	17.5 kW
Rated engine speed		3000 rpm	3000 rpm

Hydraulic system		U.S.	Metric
Pressure		2500 psi	172 bar
Drive type		engine-driven gear pump	
Tank lift cylinder size (2)		3 in	76 mm
Maximum tilt angle		45°	45°

Battery			
SAE res. cap. 110 min; SAE cold crank @ 0°F (-18°C) 800A, 12V			

Vacuum system		U.S.	Metric
Drive type		belt	
2-Lobe blower displacement		576 cfm	16.3 m ³ /min
Maximum vacuum		15 in Hg	405 mm Hg
Filter type		washable polyester	
Filter area		100 ft ²	9.3 m ²
Suction hose size		3 in	76 mm



Water system	U.S.	Metric
Maximum pressure	3000 psi	207 bar
Flow	4.2 gpm	16 L/min
Hose reel capacity (locking)	50 ft	15.2 m
Antifreeze	50/50 water/antifreeze mix	
Clutch type	electric with auto de-clutch	

Fluid capacities	U.S.	Metric
Engine oil with filter	4.2 qt	4 L
Fuel tank	15 gal	57 L
Vacuum pump	1.5 qt	1.4 L
Hydraulic reservoir	4 gal	15.1 L
Water pump oil	41 oz	1.2 L
Water tank	200 gal	757 L

Noise levels

This machine can generate sound levels exceeding 80 dBA. Always wear appropriate hearing protection when operating machine. Find sound power and pressure information at www.ditchwitch.com, or contact customersupport@ditchwitch.com.

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Specifications - 141

T18S Trailer		U.S.	Metric
Dimensions			
	Clearance (at jack foot pad)	12 in	305 mm
	Adj. coupler height	17-26 in	432-660 mm
	Width between fenders	82 in	2.10 m
	Width outside fenders	102 in	2.60 m
General			
	Number of axles	2	
	Coupler (square mount drawbar)	3 in or 2.5 in	76 mm or 64 mm
	Type of brakes	electric	
	Lug nut torque	275-325 ft•lb	372-441 N•m
	Hitch coupler bolt torque	200 ft•lb	271 N•m
	Electrical system	12V DC	
Tire			
	215/75R-17.5, H16TL	125 psi	8.6 bar
Load rating			
	Tongue weight (empty water, empty vac)	1964 lb	891 kg
	Tongue weight (full water, empty vac)	1980 lb	898 kg
	Tongue weight (full vac, empty water)	960 lb	435 kg
	Tongue weight, maximum	3100 lb	1406 kg
	GVWR (gross vehicle weight rating)	18,000 lb	8172 kg
	GAWR (gross axle weight rating, each)	8,000 lb	3632 kg

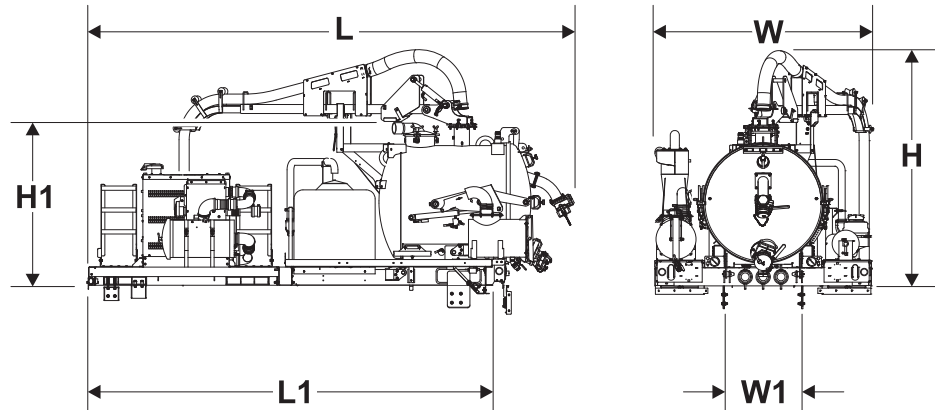
Load ratings for speeds up to 65 mph (104 km/h).



T22S Trailer		U.S.	Metric
Dimensions			
	Clearance (at jack foot pad)	17 in	432 mm
	Adj. coupler height	22-31 in	559-787 mm
	Width between fenders	81 in	2.1 m
	Width outside fenders	102 in	2.6 m
General			
	Number of axles	2	
	Coupler (square mount drawbar)	3 in	76 mm
	Type of brakes	electric	
	Lug nut torque	275-325 ft•lb	373-441 N•m
	Hitch bolt torque	200 ft•lb	271 N•m
	Electrical system	12V DC	
Tire			
	ST235/75R17.5, H16TL	125 psi	8.6 bar
Load rating			
	Tongue weight (empty)	2390 lb	1084 kg
	Tongue weight (full water)	2715 lb	1232 kg
	Max tongue load	3500 lb	1588 kg
	GVWR (gross vehicle weight rating)	22,000 lb	9979 kg
	GAWR (gross axle weight rating, each)	10,000 lb	4536 kg

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

FXT30-500



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Dimensions		U.S.	Metric
L	Overall length	214 in	5.4 m
L1	Length sitting on truck frame	178 in	4.5 m
H	Height with boom	93 in	2.4 m
H1	Height without boom	72 in	1.8 m
W	Overall width	96 in	2.4 m
W1	Width sitting on truck frame	34 in	864 mm
Dry weight *		5372 lb	2437 kg
Weight with all tanks filled with water *		11,210 lb	5085 kg

* Options included on weight calculation: 200-gallon water

Truck Information	U.S.	Metric
Axle requirement: single		
Recommended truck GVWR	25950 lb	11771 kg

Vac Tank	U.S.	Metric
Capacity	500 gal	1893 L
Length	62 in	1.6 m
Diameter	50 in	1.3 m
Drain valve size	6 in	152 mm
Inlet valve size	4 in	102 mm

Engine	U.S.	Metric
Deutz D2.9L4, diesel, Tier 4		
Cooling medium	water	
Aspiration	natural	
Number of cylinders	4	
Displacement	178 in ³	2.9 L
Bore	3.62 in	92 mm
Stroke	4.33 in	110 mm
Engine manufacturer's gross power rating (per SAE J1995)	49 hp	36.5 kW
Estimated net power rating (per SAE 1349)	39 hp	29 kW
Rated engine speed	2600 rpm	2600 rpm
Emissions compliance	EPA Tier 4	EU Stage IIIA

Hydraulic system	U.S.	Metric
Pressure	2500 psi	172 bar
Drive type	engine-driven gear pump	
Tank lift cylinder size (2)	2.5 in	63.5 mm
Maximum tilt angle	45°	45°

Battery
SAE res. cap. 110 min; SAE cold crank @ 0°F (-18°C) 800A, 12V electrical system

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Specifications - 145

Vacuum system	U.S.	Metric
Drive type	belt	
Displacement	576 cfm	16.3 m ³ /min
Maximum vacuum	15 in Hg	381 mm Hg
Filter type	washable polyester	
Filter area	100 ft ²	9.3 m ²
Suction hose size	3 in	76 mm



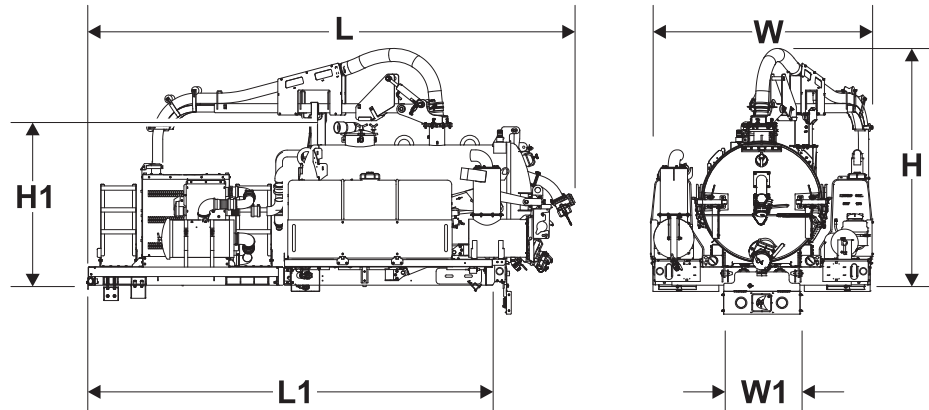
Water system	U.S.	Metric
Maximum pressure	3000 psi	207 bar
Flow	4.2 gpm	16 L/min
Hose reel capacity (locking)	50 ft	15.2 m
Antifreeze	50/50 water/antifreeze mix	
Clutch type	electric with auto de-clutch	

Fluid capacities	U.S.	Metric
Engine oil with filter	4.2 qt	4 L
Fuel tank	15 gal	57 L
Vacuum pump	1.5 qt	1.4 L
Hydraulic reservoir	4.2 gal	15.9 L
Water tank	200 gal	757 L

Noise levels

This machine can generate sound levels exceeding 80 dBA. Always wear appropriate hearing protection when operating machine. Find sound power and pressure information at www.ditchwitch.com, or contact customersupport@ditchwitch.com.

FXT30-800



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Dimensions		U.S.	Metric
L	Overall length	214 in	5.4 m
L1	Length sitting on truck frame	178 in	4.5 m
H	Height with boom	93 in	2.4 m
H1	Height without boom	72 in	1.8 m
W	Overall width	96 in	2.4 m
W1	Width sitting on truck frame	34 in	864 mm
Dry weight *		5903 lb	2677.5 kg
Weight with all tanks filled with water *		15,911 lb	7217 kg

* Options included on weight calculation: 400-gal water

Truck Information	U.S.	Metric
Axle requirement: single		
Recommended truck GVWR	33000 lb	14968.5 kg

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FXT30-800

Specifications - 147

Vac Tank	U.S.	Metric
Capacity	800 gal	3028 L
Length	98 in	2.5 m
Diameter	50 in	1.3 m
Drain valve size	6 in	152 mm
Inlet valve size	4 in	102 mm



Engine	U.S.	Metric
Deutz D2.9L4, diesel, Tier 4		
Cooling medium	water	
Aspiration	natural	
Number of cylinders	4	
Displacement	178 in ³	2.9 L
Bore	3.62 in	92 mm
Stroke	4.33 in	110 mm
Engine manufacturer's gross power rating (per SAE J1995)	49 hp	36.5 kW
Estimated net power rating (per SAE 1349)	39 hp	29 kW
Rated engine speed	2600 rpm	2600 rpm
Emissions compliance	EPA Tier 4	EU Stage IIIA

Hydraulic system	U.S.	Metric
Pressure	2500 psi	172 bar
Drive type	engine-driven gear pump	
Tank lift cylinder size (2)	2.5 in	63.5 mm
Maximum tilt angle	45°	45°

Battery
SAE res. cap. 110 min; SAE cold crank @ 0°F (-18°C) 800A, 12V

Vacuum system	U.S.	Metric
Drive type	belt	
2-Lobe blower displacement	576 cfm	16.3 m ³ /min
Maximum vacuum	15 in Hg	405 mm Hg
Filter type	washable polyester	
Filter area	100 ft ²	9.3 m ²
Suction hose size	3 in	76 mm

Water system	U.S.	Metric
Maximum pressure	3000 psi	207 bar
Flow	4.2 gpm	16 L/min
Hose reel capacity (locking)	50 ft	15.2 m
Antifreeze	50/50 water/antifreeze mix	
Clutch type	electric with auto de-clutch	

Fluid capacities	U.S.	Metric
Engine oil with filter	4.2 qt	4 L
Fuel tank	15 gal	57 L
Vacuum pump	1.5 qt	1.4 L
Hydraulic reservoir	4.2 gal	15.9 L
Water pump oil	41 oz	1.2 L
Water tank	400 gal	1514 L

Noise levels

This machine can generate sound levels exceeding 80 dBA. Always wear appropriate hearing protection when operating machine. Find sound power and pressure information at www.ditchwitch.com, or contact customersupport@ditchwitch.com.

Air System

10 Series

- Truck PTO driven
- 200 CFM (5.6 m³/min)
- Selectable operating pressure - 100 or 200 psi (689 or 1379 kPa)
- Air hose: 3/4 in (19 mm), 50 ft (15 m) long
- Approximate weight: 650 lb (295 kg)



12 Series

- Truck PTO driven
- 300 CFM (8.5 m³/min)
- Selectable operating pressure - 100 or 250 psi (689 or 1724kPa)
- Air hose: 1.0 in (25 mm), 50 ft (15 m) long
- Approximate weight: 1200 lb (544 kg)

Countries in the European Union should have received a Declaration of Conformity (DOC) with this machine similar to the example below.

The Charles Machine Works, Inc.
PO Box 66
1959 West Fir Avenue
Perry, Oklahoma, USA 73077-0066
Phone: 580 572 3784
FAX: 580 572 3525

Declares that the product:

Model: **Ditch Witch® XXXX**
Type: **(machine type)**
Engine Power: **xxx kW**
Serial Number: **CMWXXXXXXXXXXXXXX**

Conforms to the requirements of:

2006/42/EC Machinery Directive
2004/108/EC Electromagnetic Compatibility Directive
2000/14/EC Noise Emission Directive

Measured sound power level (Annex V): **xxx dBA**
Guaranteed sound power level (Annex V): **xxx dBA**

The Technical Construction File is maintained at the manufacturer's location.

The manufacturer's European representative is:

Ditch Witch Barcelona
International Underground Systems, S.L.
C/EL PLA, 130 * Poligon Industrial El Pla
08980 Sant Feliu De Llobregat * Spain
Phone: +34 93 632 7344
FAX: +34 93 632 7343

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 Ditch Witch factory that fail due to a defect in material or workmanship within one (1) year of first commercial use. 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 Ditch Witch Product Support (DWPS) or its authorized dealer. DWPS will provide the location of its inspection facilities or its nearest authorized dealer upon inquiry. DWPS 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 the Ditch Witch factory.

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 the DWPS department, P.O. Box 66, Perry, OK 73077-0066, or contact your local dealer.

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

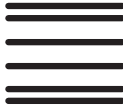
If your equipment was purchased through a Ditch Witch dealer, there is no need to read further.

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

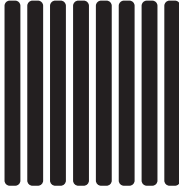
This will enable you to receive updates on this equipment as well as information on new products of interest.

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**



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

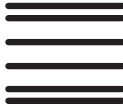
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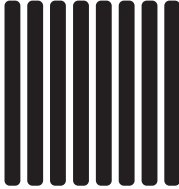
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FIRST CLASS PERMIT NO 23 PERRY OKLAHOMA

POSTAGE WILL BE PAID BY

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



Ditch Witch® Registration Card

Please Type or Print All Information

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

Ditch Witch® Registration Card

Please Type or Print All Information

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

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Appendix

Chapter Contents

Tire Safety Information