



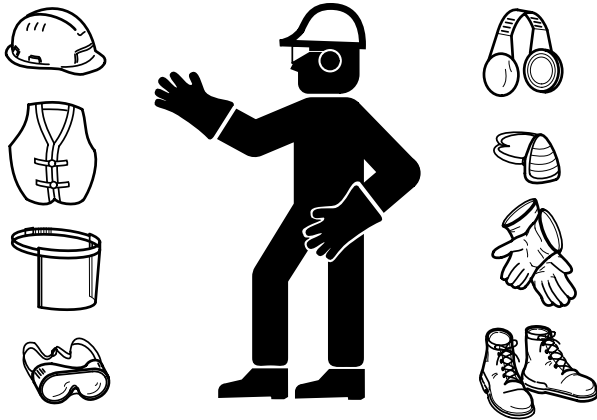
Operation - Engine Starting Procedures

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Before Starting The Engine

NOTICE

You must read and understand the safety signs and safety messages found in Group 1 of this manual before performing any operation or maintenance procedures.



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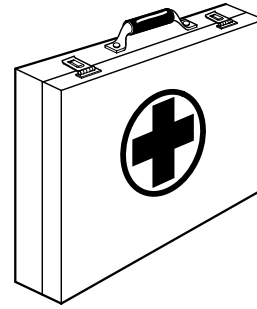
Use recommended protective clothing and safety devices such as gloves, safety boots, safety hat, reflective vests and eye, ear and respiratory protection as required by job conditions.



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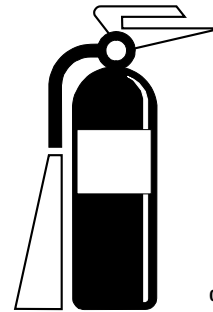
Comply with the instructions in this manual and your company's regulations for the operation of this machine.

YOU MUST BE FULLY TRAINED to operate this machine and its felling attachment.



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Keep a comprehensive and complete first aid kit in an easily accessible place on the machine at all times.



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Maintain a charged fire extinguisher on the machine AND KNOW HOW TO USE IT.

General Pre-Start Inspection

Always perform a general pre-start inspection before starting the machine.

Check around and under the machine for oil or coolant leaks, worn or damaged components and loose bolts or fasteners. Clean up accumulated debris, especially in the engine, pump and exhaust areas where fires are most likely to start.

Check engine oil, hydraulic oil, coolant and fuel levels. When in cold weather conditions, make sure the engine oil and hydraulic oil are the correct viscosity, the coolant is the correct mixture and the diesel fuel is the proper grade for cold weather operation. Refer to the "Lubricant & Fill Capacities" chart in Appendix A.

See "Daily Machine Walk-Around Inspection" in Section 5.2 for detailed daily inspection information.



Master Electrical Disconnect

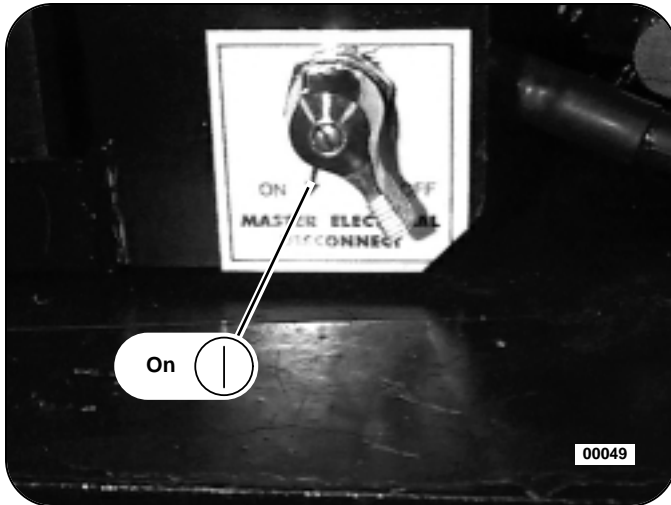



Figure 1: Master Electrical Disconnect Switch

The master electrical disconnect switch must be in the “ON”  position for the engine to start. See Figure 1.

Adjust Operator’s Seat

Adjust the operator’s seat correctly. Full foot pedal travel must be obtained with your back firmly against the seat back. See “Adjusting the Operator’s Seat” in Section 2.1 for detailed seat adjustment information.



Check The Seat Belt

Check the seat belt. Replace any worn or missing components. Tighten or replace loose seat belt mounting hardware.

Check For Proper Control Positions

WARNING

Do not operate the machine with a malfunctioning control. Uncontrolled operation can result in death, serious personal injury or damage to the machine.

Be sure the foot pedals and hand controls are in the centered “neutral” position. Check by moving each control slightly and then releasing it. The control should return to its centered “neutral” position on its own when released.

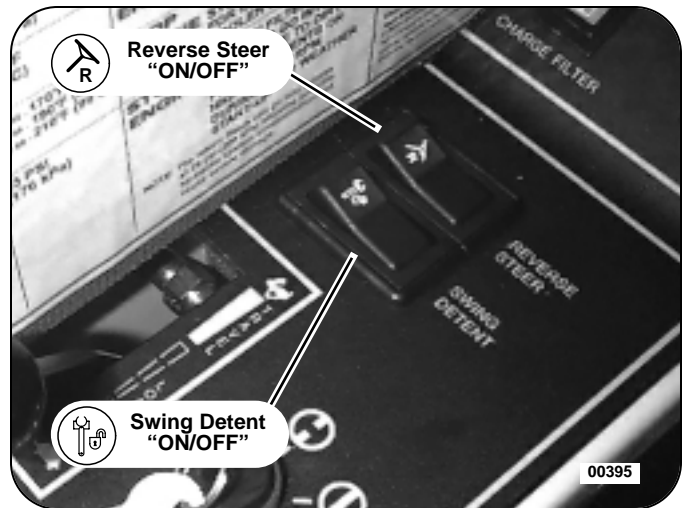


Figure 2: Auxiliary Rocker Switch Bank #1 (Reverse Operation Switches)

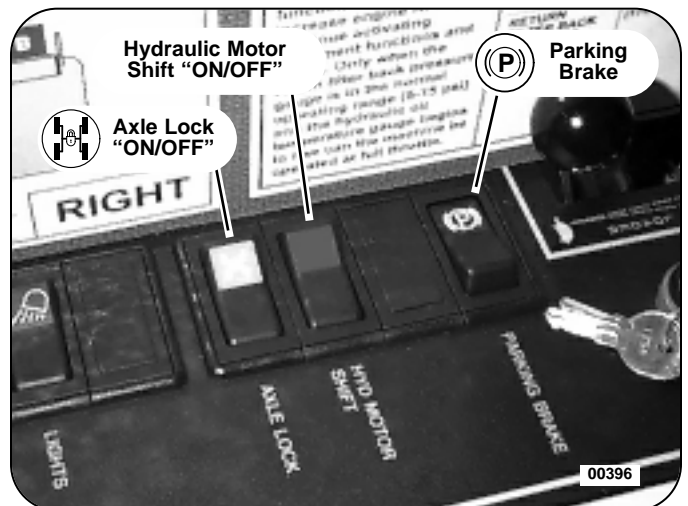


Figure 3: Auxiliary Rocker Switch Bank #2 (Wheel Drive Function Switches)

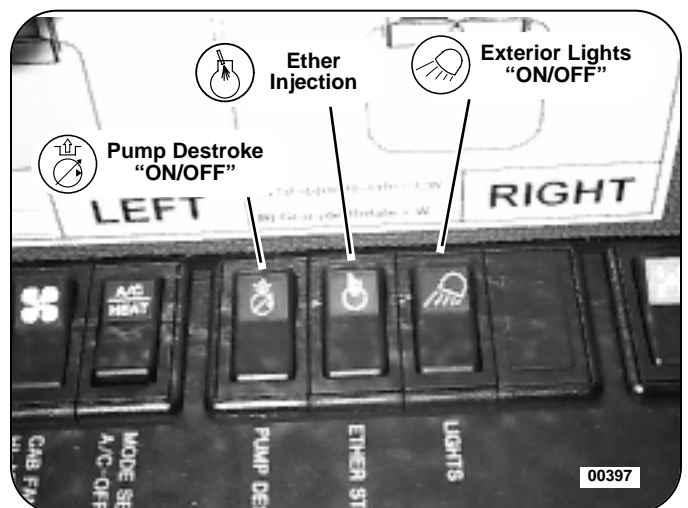
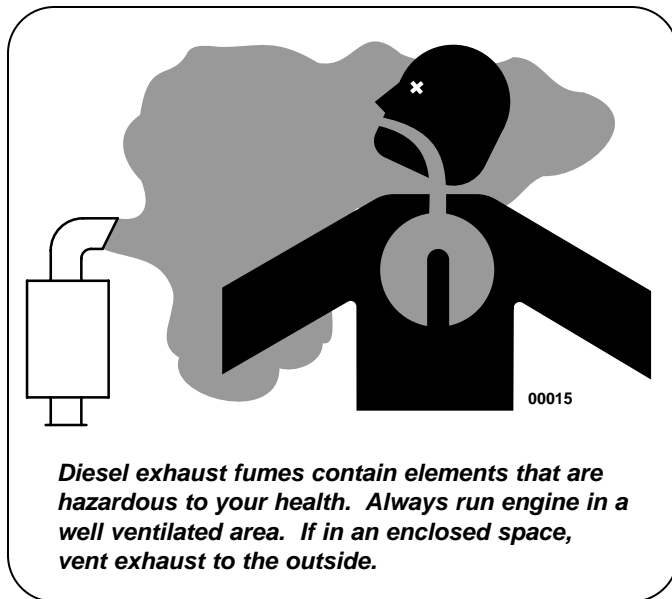


Figure 4: Auxiliary Rocker Switch Bank #3 (Lights & Cold Weather Starting Rocker Switches)


Check the positions of the dash panel rocker switches. All rocker switches should be in the positions as shown in Figures 2 thru 5.




Engine Starting Procedure





NOTICE

Do not operate machine with malfunctioning system monitoring gauges or warning alarm. Severe damage to the machine could result.

1. Set the throttle control to 1/3 range.
2. Turn the ignition key to the "RUN" position .

The Warning alarm  should sound and the red warning indicator on the engine oil pressure gauge  should be lit. If not, turn the ignition key to the "OFF" position  and have the system monitoring gauges and warning alarm checked and corrected before operating the machine.

3. Turn the ignition key to the "START" position .

If the engine does not start after 15-30 seconds of cranking, return ignition key to the "OFF" position  and wait at least 2 minutes before trying to start engine again to allow the starter to cool down.

4. When the engine starts, release the ignition key.

Cold Weather Starting

(Below 32°F (0°C))

When in cold weather conditions, make sure the engine oil and hydraulic oil are the correct viscosity, the coolant is the correct mixture and the diesel fuel is the proper grade for cold weather operation. Refer to the "Lubricant & Fill Capacities" chart in Appendix A.

The engine starting procedure is the same for cold weather conditions. The machine is equipped with a pump destroke feature and may also be equipped with optional equipment that make starting the machine in cold weather easier.



Cold Weather Pump Destroke Switch

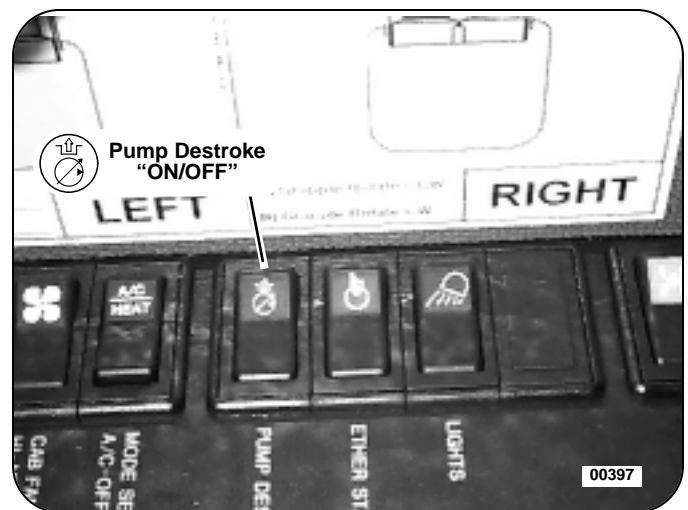


Figure 5: Pump Destroke Switch

The cold weather pump destroke switch electrically destrokes the drive pump for easier cold weather engine starts. See Figure 5. Destroking the drive pump allows the drive and implement pumps to turn freely while the engine cranks. This reduces the load on the cold engine and saves battery life and starters.

Press down and hold the switch to destroke the drive pump while cranking the cold engine. Release the switch after the engine starts.

Caterpillar Air Intake Heater



Figure 6: Caterpillar Engine Air Intake Pre-Heat

Caterpillar engine installations include an air intake heater which improves the starting performance of the engine in cooler weather. The air intake heater consists of a battery powered heating element located between the aftercooler and intake manifold. A relay, activated by a push-button switch in the dash, supplies power to the heater element. See Figure 6.

NOTICE

Never exceed 30 seconds of pre-heat time before cranking the engine. The heater element uses 90-110 amps of DC current. Pre-heating longer than 30 seconds with no air flow may overheat the power connections or the heater element.

The heater must be pre-heated for up to, but not exceeding, 30 seconds before cranking the engine for starting. Air is warmed as it flows past the heater element during engine cranking. The warm air entering the combustion chamber makes starting the engine faster with less cranking.

In addition to pre-heating, the heater can be used for up to 3 minutes after starting to help the engine run smoother with less white smoke.

Wet Kit (Optional)

NOTICE

The external source of warm water must have the same coolant mixture as the machine's engine. Coolants containing different additives or mixture ratios may result in chemical imbalance and possible engine damage.

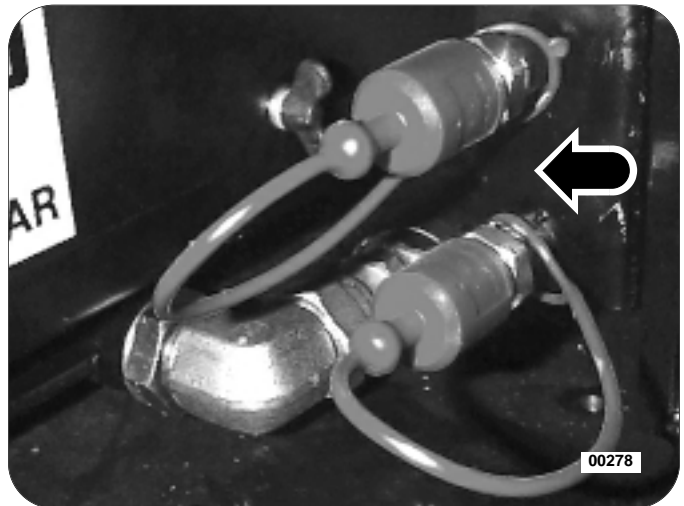


Figure 7: Wet Kit (Optional)

A warm water circulation kit (wet kit) is available to preheat the engine block before starting. The wet kit allows an external warm water source (a properly equipped service vehicle, portable propane water heater, etc.) to be circulated through the machine's cold engine for easier starting. See Figure 7.



Ether Starting Aid (Optional)

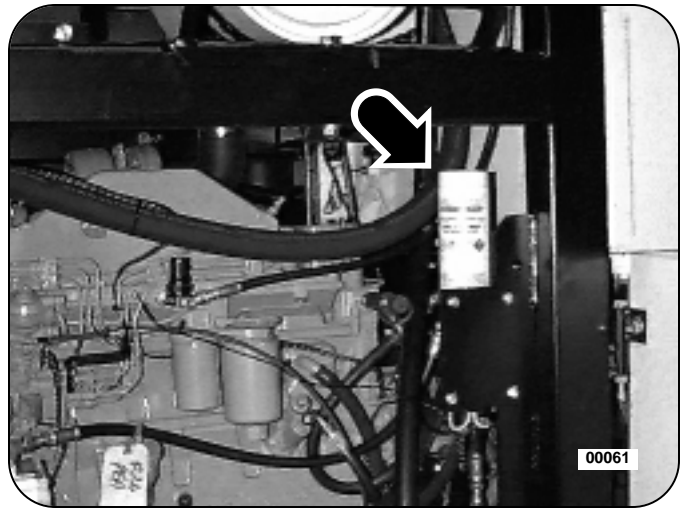


Figure 8: Ether Starting Aid (Optional)

An ether injection kit is available for injecting premeasured amounts of ether into the engine's intake manifold from the cab. The ether cylinder and injector are located behind the perforated swing-out engine guard on the left side of the machine. See Figure 8.

Starting Procedure With Ether Injection

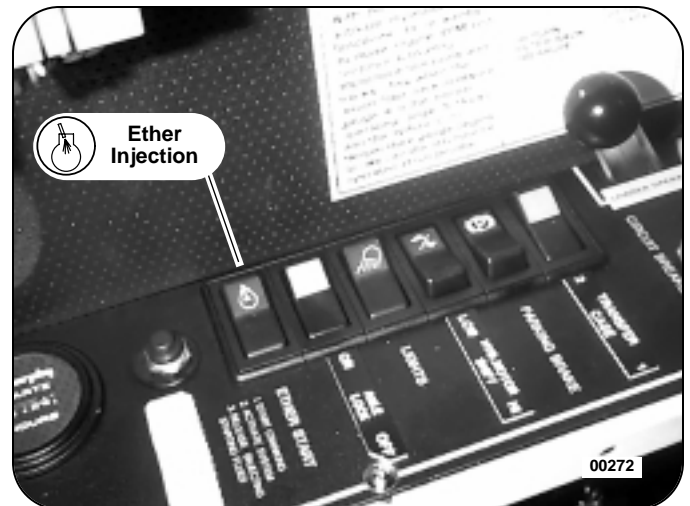



Figure 9: Ether Injection Switch

The ether injection switch is located on the dash panel. See Figure 9. While cranking the engine, push down and hold the top of the ether injection switch  for 2 seconds.

Ether Cylinder Replacement

Follow the manufacturer's instructions printed on the ether cylinder for its replacement and proper disposal.

Cold Weather Starting

[Below 0°F (-18°C)]

Additional pre-heating equipment may be required when starting the machine in cold weather conditions below 0°F (-18°C). Such equipment could include an engine block heater, diesel fuel heater, coolant heater or extra battery capacity.

Engine Idling

Avoid unnecessary engine idling. Long idling periods can cause rapid wear of engine parts. Maintain 1000 rpm or more if prolonged idling is necessary.

Engine & Drive Train Break-in Period

A gradual engine break-in period is recommended. During the first 50 hours of operation, run the engine at moderate speeds and avoid prolong idling. Check the system monitoring gauges frequently, paying particular attention to the following gauges:



Engine Water Temperature



Engine Oil Pressure



Hydraulic Oil Temperature



Return Filter Back Pressure



Operation - Engine Starting With Jumper Cables

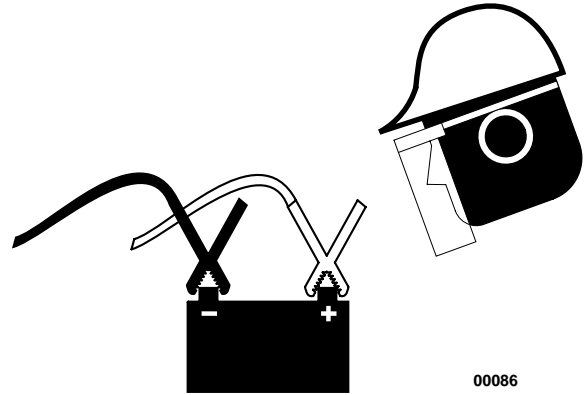
Starting With Jumper Cables:	
Connecting Jumper Cables	4.2.3
Starting A Stalled Machine	4.2.3

Starting With Jumper Cables



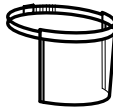
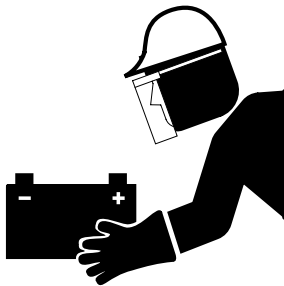
00024

Do not smoke while checking battery electrolyte (acid) level. Keep open flames or sparks away from batteries and where they are stored or charged. Battery fumes are flammable and can explode



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Always wear proper eye and face protection when working with jumper cables. Batteries can explode.



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Always wear protective clothing and suitable eye, face and hand protection when working with batteries.

! WARNING

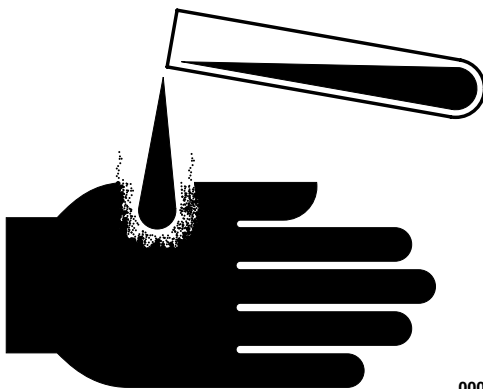
Batteries give off flammable fumes that can explode.

Do not allow ends of the jumper cables to touch each other.

Always connect the battery positive (+) to battery positive (+) and the battery negative (-) to battery negative (-).

Jump only with a battery source of the same voltage used on the machine.

Turn off all lights and accessories on the stalled machine, otherwise, they will operate when the jump source is connected.



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Battery electrolyte (acid) is highly corrosive. Avoid contact with eyes, skin and clothing.

NOTICE

When jump starting from another machine, make sure they do not touch. This will prevent damage to engine bearings and electrical circuits.

Make sure the master electrical disconnect on the stalled machine, if equipped, is in the "ON" position before attaching jumper cables to prevent damage to electrical circuits on the stalled machine.

NOTICE

This machine has a 12 volt starting system. Use only equal voltage to jump start this machine. Use of a higher voltage boost source will damage electrical circuits on this machine.

Connecting Jumper Cables

1. Determine failure of machine to start.
2. If possible, lower booms or other implements to the ground.
3. Make sure the engine on the stalled machine has been shut down and all electrical accessories have been turned off.
4. On the stalled machine, turn master disconnect switch to the "ON" position, if equipped.
5. Move boost machine close enough to the stalled machine for the jumper cables to reach but do not allow machines to touch.
6. Shut-down engine on boost machine.
7. Make sure battery caps are in place and tight on both machines. Make sure battery on stalled machine is not frozen or low on electrolyte.
8. Connect positive (+) red jumper cable to the battery positive (+) post on the stalled machine.

NOTICE

Do not allow positive (+) cable clamps to touch any metal other than the battery terminal.

9. Connect the other end of the positive (+) red jumper cable to the positive (+) battery post on the boost machine.

10. Connect negative (-) black jumper cable to the negative (-) battery post on the boost machine.
11. Connect the other end of the negative (-) black jumper cable to the frame of the stalled machine away from battery, fuel lines, hydraulic lines or moving parts. Do not connect negative (-) black jumper cable to the negative (-) battery post on the stalled machine.

Starting A Stalled Machine

1. Start the engine on the boost machine.
2. Wait a minimum of 2 minutes for the batteries in the stalled machine to partially charge.
3. Attempt to start the stalled machine. See "Engine Starting Procedure" in Section 4.1.
4. Immediately after stalled machine starts, remove jumper cables in reverse order.
5. Complete starting failure analysis on the stalled machine and have necessary repairs made.



Operation - Machine Warm-Up Procedure

Machine Warm-Up Procedure:

Engine Warm-Up	4.3.2
Hydraulic Oil Warm-Up	4.3.2
Oil Cooler Internal Bypass	4.3.3
In-Tank Hydraulic Oil Heater Elements (Optional)	4.3.3

Machine Warm-up Procedure

When the outside air temperature drops below 32°F (0°C) machine warm-up may require up to 15-minutes. When the temperature drops below 0°F (-18°C) machine warm-up may require up to a hour.

Engine Warm-Up

NOTICE

Operating the engine at full throttle when cold can damage the piston rings and increase wear on all engine parts. Allow the engine to warm-up before operating at full throttle.

Warm-up the engine at low idle for at least 5 minutes. Slowly operate the implement functions to help speed the warm-up of hydraulic components.

Hydraulic Oil Warm-Up




NOTICE

Cavitation and extreme damage to piston pumps and motors may result from operating the hydraulic system at full capacity when the hydraulic oil is too cold to flow easily. Warm-up the hydraulic system before operating at full capacity.

Variable displacement hydraulic pumps only pump oil when a control is activated. Just letting the engine idle will not warm the hydraulic oil.

Forcing oil over a relief generates a lot of heat. To prevent valve overheating when warming hydraulic oil, do not operate a function over relief longer than 15 seconds at a time and allow at least 5-10 seconds between function activations for recovery..

The following procedure should be used to warm-up the hydraulic oil when the outside air temperature drops below 32°F (0°C) or when the hydraulic functions are slow or sluggish at start-up.

1. Begin procedure with the engine running at low idle. Check the system monitoring gauges and warning lights frequently throughout the procedure.
2. Activate and hold the **LOADER BUCKET CLOSE**  function to force oil over relief and generate heat. To prevent valve overheating, do not operate over relief longer than 15 seconds at a time and allow at least 5-10 seconds between activations for recovery.
3. Intermittently operate the **LOADER BUCKET CLOSE**  function over relief and slowly operating the other implement functions to break down the oil's viscosity and circulate the warm oil.
4. As the hydraulic oil warms, increase engine rpm and continue activating the **LOADER BUCKET CLOSE**  and other implement functions. Also begin slowly operating the wheel drive.
5. Only when the return filter back pressure gauge reaches its normal operating range of 5 - 15 PSI (35 - 105 kPa) and the hydraulic oil temperature gauge begins to rise can the machine be operated at full throttle.

Oil Cooler Internal Bypass

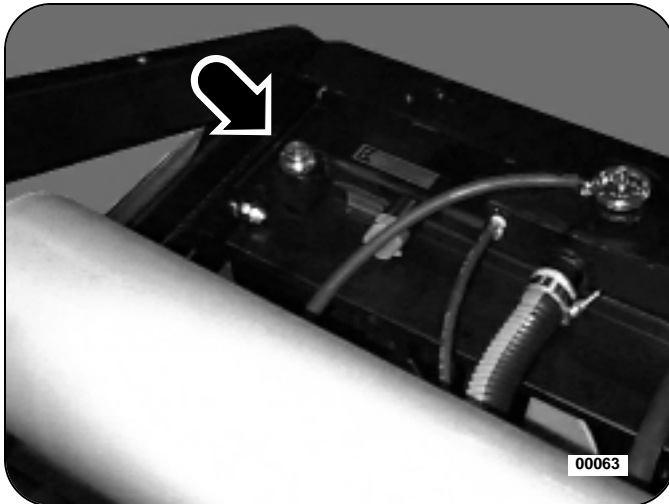


Figure 1: Oil Cooler Internal Bypass
(ROPS panel and muffler panel removed for clarity)

TIMBCO Hydro-Skidders are equipped with an oil cooler internal bypass to help speed the warm-up of hydraulic oil and prevent high case drain pressure in the pumps during start-up.

If the return oil pressure through the oil cooler exceeds 50 PSI (345 kPa), or return oil temperature is below 120 - 140°F (50 - 61°C), a relief valve in the oil cooler opens and diverts the oil directly to tank. As the oil warms and resistance through the oil cooler becomes less, the relief will close and oil will go through the oil cooler. See Figure 1.

In-Tank Hydraulic Oil Heater Elements (Optional)

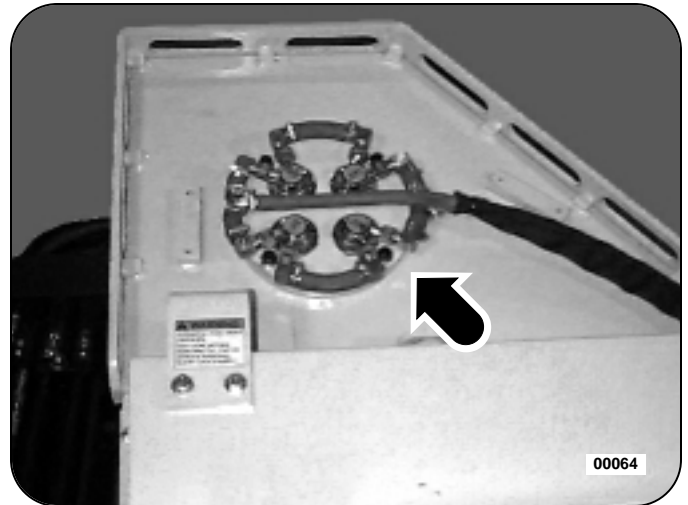


Figure 2: In-Tank Hydraulic Oil Heater Elements
(Shown with cover removed for clarity)

The in-tank hydraulic oil heater elements operate the same as the optional wet kit. An assembly of four elements is installed into the hydraulic tank. Quick-disconnect hook-ups are provided to allow warm water from an external source (properly equipped service vehicle, portable propane water heater, etc.) to be circulated through the cold hydraulic tank. See Figure 2.

A bolt-on cover is installed over the heater elements for protection.



Operation - Operating The Hydro-Skidder

Operating The Machine:	
General	4.4.2
Changing Direction Forward And Reverse	4.4.2
Excessively Wet And Muddy Ground Conditions	4.4.2
Frozen Ground Conditions	4.4.2
Parking The Machine	4.4.3
Stopping The Engine	4.4.3

Operating The Machine General

NOTICE

You must read and understand the safety signs and safety messages found in Group 1 of this manual before performing any operation or maintenance procedures.



Stay in control of the machine at all times.

Use the wheel drive motor high displacement lock when traveling on grades and in very soft ground conditions.

Reduce speed when working in tight quarters or when breaking over a rise.

When traveling, always keep the boom as low as possible to the ground for maximum stability.

Changing Direction Forward And Reverse

Forward and reverse directional changes at full throttle are possible. However, for operator comfort and maximum service life of the drive train components, reducing engine speed is recommended.

Excessively Wet And Muddy Ground Conditions

NOTICE

The drive shaft u-joints and carrier bearings, axle drive shaft yoke bearings, and axle articulation bearings should be lubricated daily if the machine is working in very damp conditions or the drive shaft is submerged in water or mud during operation. Greasing daily will help keep water out of these areas.

Frozen Ground Conditions

NOTICE

In freezing conditions, park the machine where it will not freeze into the ground.

NOTICE

DO NOT attach pulling chains around the axles if attempting to free the machine when stuck or frozen into the ground. Damage to the axles may result. Use only the towing points provided. See Section 4.5 for towing instructions

When parking the machine in freezing conditions, planks or forest debris can be placed under the wheels to prevent them from freezing into the ground. This is especially important when chains or tracks are installed around the wheels and the boom cannot be used to help free the machine. Also place planks or forest debris under the loader bucket or cutting attachment to prevent it from freezing into the ground.

Parking The Machine

NOTICE

When parking the machine, select a spot where the ground is level. Do not park on a hillside or any incline.

When freezing conditions are expected, do not park machine in loose or wet soil which could freeze around the wheels or in the wheel chains or tracks when installed.

1. Select a level spot to park the machine. If it is necessary to park on an incline, the wheels must be blocked securely.



After each day/shift's operation dirt and debris should be cleaned from the wheels.

2. Reduce engine speed to low idle.
3. Open the loader bucket and lower it to the ground.

Stopping The Engine

NOTICE

Stopping the engine immediately after it has been working under load can result in overheating and accelerated component wear. Allow engine to cool down while running at low idle before shutting down.

1. With the machine parked, run the engine at low idle for a few minutes to allow it to cool down. Stopping the engine immediately after working under load can result in overheating and accelerated component wear.
2. Turn the ignition key to the OFF  position. Remove the ignition key and place in safe-keeping.
3. If the machine is to be parked for a greater length of time, such as overnight, switch off the master electrical disconnect  or disconnect the positive (+) battery cable.



Operation - Towing Procedures

! WARNING

Serious personal injury or death could result when towing a disabled machine incorrectly. Contact your Timbco dealer or the factory before beginning any towing procedure.

Important Information	4.5.2
Towing Instructions:	
Machine Has Engine Power, No Failure Of The Wheel Drive Pump Or Motor	4.5.3
Machine Has No Engine Power, Mechanical Failure Of Axle	4.5.4

Important Towing Information

WARNING

Serious personal injury or death could result when towing a disabled machine incorrectly. Contact your Timbco dealer or the factory before beginning any towing procedure.

Block the wheels to prevent movement before releasing the parking brakes or disconnecting the driveshafts. The machine can roll free if the wheels are not blocked.

Follow the recommendations below to properly perform the towing procedure.

CAUTION

Relieve the hydraulic tank and line pressure before any disassembly.

Even after the machine has been turned off, the hydraulic oil can still be hot enough to burn. Allow the hydraulic oil time to cool before draining.

NOTICE

Tow the machine only in an emergency situation or if there has been an engine failure or major mechanical failure in an axle.

If there has been a hydraulic failure of the wheel drive pump, wheel drive motor, or a mechanical failure of the transfer case, it is much better to replace the component without towing the machine. Towing a machine with a failed wheel drive pump or motor will likely contaminate other major hydraulic components in the hydrostatic wheel drive circuit while towing.

Only tow a disabled machine a short distance and no faster than 1.2 mph (1,9 km/h). Always haul the machine if long distance moving is required.

Shielding must be provided on the towing machine to protect the operator if the tow line or bar should break.

DO NOT allow an operator on the machine being towed unless the operator can control the steering and/or braking.

Before towing, be sure the tow line or bar is in good condition and has enough strength for the towing situation involved. Use a towing line or bar with a capacity at least 1.5 times the gross weight of the towing machine, for a disabled machine stuck in mud or when towing on a grade.

Attach towing cable to towing hook found on either end of the machine.

DO NOT use a chain for pulling. A chain link can break causing possible personal injury. Use a wire rope cable with loop or ring ends. Use an observer in a safe position to stop the pulling procedure if the cable starts to break or unravel. Stop pulling whenever the pulling machine moves without moving the towed machine.

Keep the tow line angle to a minimum. DO NOT exceed a 30° angle from the straight ahead position.

Quick machine movement could overload the tow line or bar and cause it to break. Gradual and smooth machine movement will work better.

Normally, the towing machine should be as large as the disabled machine. Satisfy yourself that the towing machine has enough brake capacity, weight and power to control both machines for the grade and distance involved.

To provide sufficient control and braking when moving a disabled machine downhill, a larger machine or additional machines connected to the rear could be required. This will prevent the disabled machine from rolling uncontrolled.

A towed machine, when loaded, must be equipped with its own brake system operable from the operator's compartment.

Towing Instructions

Only tow a disabled machine a short distance and no faster than 1.2 mph (1,9 km/h). Always haul the machine if long distance moving is required.

Machine Has Engine Power, No Failure Of The Wheel Drive Pump Or Motor

NOTICE

To tow the machine, both axle drive shaft connections must be disconnected.

Do not operate the wheel drive with the driveshafts disconnected. Damage to the drive shafts could result.

Use the following procedure only if there has been no hydraulic failure of the wheel drive pump, wheel drive motor, or in case of an emergency.

Required Tools List

- Operator or another mechanic
- 11/32" & 3/4" wrenches

Before You Begin ...

Review all Warnings, Cautions, Notices and Important Information on Page 4.5.2 before beginning any towing procedures.

Ready The Machine For Towing

1. Block all wheels to prevent movement of the machine while disengaging the parking brake and disconnecting the drive shafts.
3. Open the swing-out pump access guard to access the mono-block valve. See Figure 1.
4. Locate the parking brake solenoid cartridge in port "SV3" of the mono-block valve. See Figure 2. Use the 11/32" wrench to disconnect the wire lead to the solenoid coil to prevent the parking brake from releasing.
5. With the wheels blocked, use the 3/4" wrench to disconnect the drive shafts at the front and rear axles.

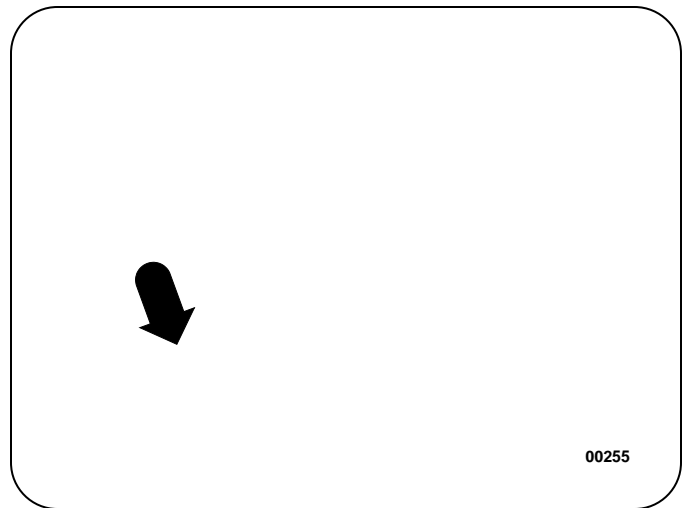


Figure 1: Swing-Out Pump Access Guard

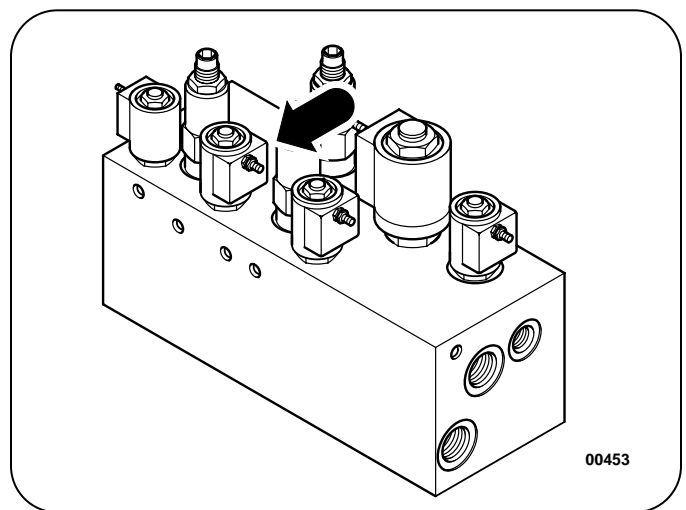


Figure 2: Parking Brake Solenoid Cartridge

NOTE: DO NOT disconnect the drive shafts anywhere but at the axle yokes. Disconnecting the drive shaft elsewhere may damage the driveshaft when it rotates with the axle during towing.

6. Connect the towing line or bar. Be sure the towing machine is suitable for towing the disabled machine.
7. Re-connect the wire lead to the parking brake solenoid coil and secure the swing-out pump access guard.
8. Start the engine. Be sure the parking brake is engaged and apply full travel brakes.

9. Remove blocking from the wheels.
10. Release the parking brake.
11. The disabled machine is now ready to be towed. Use the travel brake and steering function to control the machine as it is being towed.

After Towing

1. Set the parking brake and block all wheels to prevent movement of the machine while repairs are being made.
2. Disconnect the wire lead to the solenoid coil to prevent parking brake from releasing.
3. Perform necessary repairs to the machine.

After Repairs Have Been Made

1. With the wheels blocked and the parking brake solenoid disconnected, re-connect the drive shafts at the front and rear axles.
2. With the wheels blocked, re-connect the wire lead at the parking brake solenoid coil.
3. Remove blocking from the wheels.
4. The machine is now ready for testing and normal service.

Machine Has No Engine Power, Mechanical Failure Of Axle

Use the following procedure only if there has been no hydraulic failure of the wheel drive pump, wheel drive motor, or in case of an emergency.

Required Tools List

- Operator or another mechanic
- 9/16", 11/16", 3/4", 7/8" & 15/16" wrenches
- 18mm & 24mm wrenches
- (4) #8 ORSF plugs, Timbco PN# 16032
- Oil absorbant clean-up rags (plenty)

Before You Begin ...

Review all Warnings, Cautions, Notices and Important Information on Page 4.5.2 before beginning any towing procedures.

Ready The Machine For Towing

1. Review all Warnings, Cautions, Notices and Important Information on Page 4.5.2 before beginning the towing procedure.
2. Block all wheels to prevent movement of the machine while disengaging the parking brake and disconnecting the drive shafts.

The parking brake must be released to tow the a disabled machine. This can be done two ways. The best way is to use the manual parking brake releases provided on each axle differential, See step #3. If this cannot be done, the parking brake can be released by manually pressurizing the brake release lines, See step #6.

NOTE: Pressurizing the parking brake line will require a modified grease gun or some other means to pressurize the line to 800 psi (5,51 Mpa)

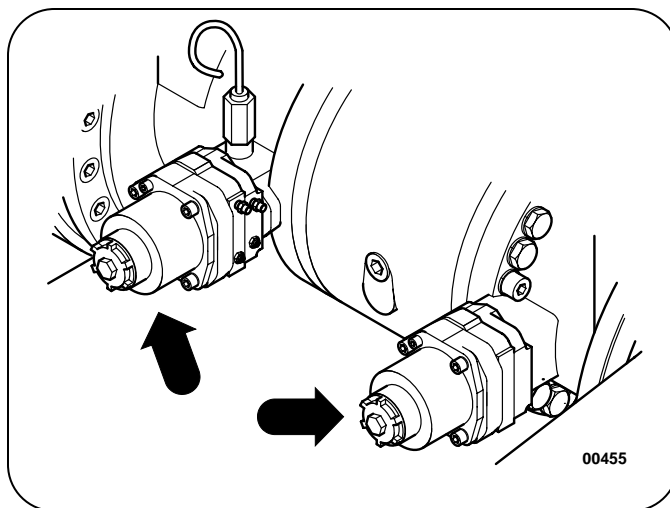


Figure 3: Axle Parking Brake Housings



Figure 4: Parking Brake Manual Release Screws

3. Using the 3/4" wrench, remove the bolts securing the access covers over the axle parking brake housings on both axles. See Figure 3.
4. Use the 24mm wrench to access the manual parking brake releases. See Figure 4. The screws are provided behind the parking brake housing covers.
5. With the wheels blocked, use the 18mm wrench to turn the parking brake manual release screws clock-wise all the way in to release the parking brake. Do this for both the front and rear axles. Go to step #9.

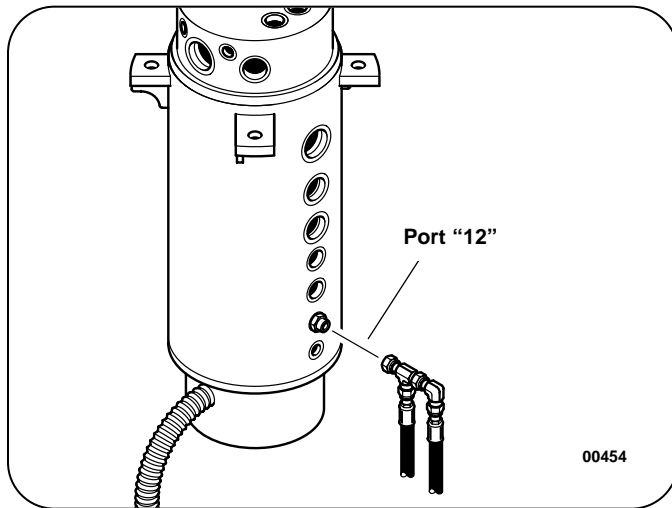


Figure 5: Brake Release Line At Rotary Manifold

6. Locate the parking brake release lines where they enter the rotating manifold at lower port "12". See Figure 5.
7. Using the 9/16" and 11/16" wrenches, crack the connection between the tee and straight connector to let any pressure escape, then remove the tee and cap the connector to prevent any contamination from entering the hydraulic system.
8. With the wheels blocked, use a modified grease gun, See Figure 6, or other pressure source to pressurize the parking brake lines to at least 800 psi (5,51 Mpa). This will release the parking brake at both axles.
9. With the wheels blocked, use the 3/4" wrench to disconnect the drive shafts at the front and rear axles.

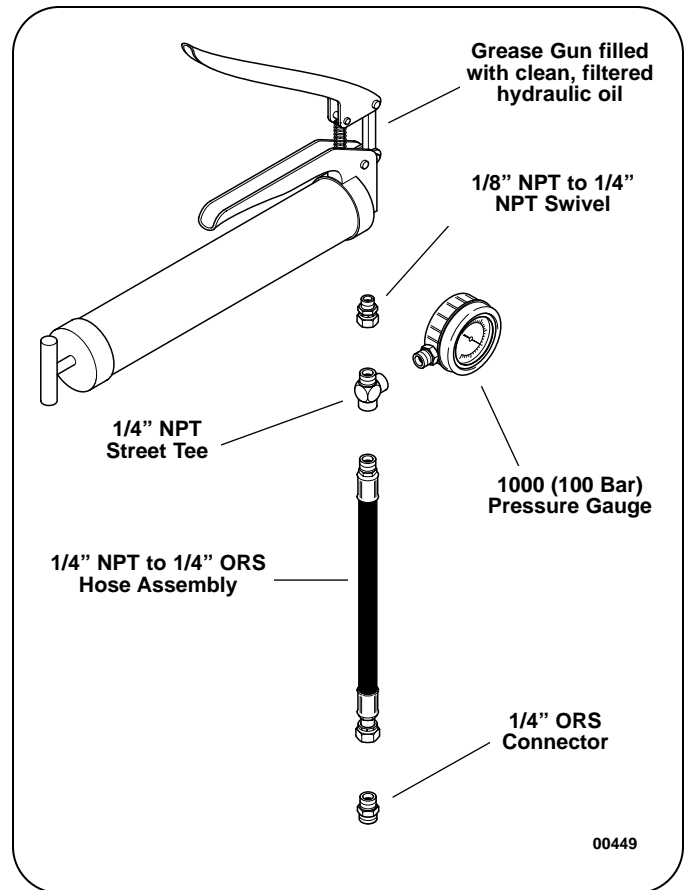


Figure 6: Typical Grease Gun Modification

NOTE: DO NOT disconnect the drive shafts anywhere but at the axle yokes. Disconnecting the driveshaft elsewhere may damage the driveshaft when it rotates with the axle during towing.

10. Clean away all debris from the area around the steer cylinder hose connections. Pack the area with plenty oil-absorbant rags to catch oil spills.

NOTE: As the disabled machine follows the towing machine, oil will be forced out of the steer cylinders during articulation.

11. Using the 7/8" and 15/16" wrenches, disconnect the hoses to both steer cylinders. Plug all hoses but leave the fittings uncapped. This will allow the machine to articulate and follow the towing machine without engine power.

12. Connect the towing line or bar. Be sure the towing machine is suitable for towing the disabled machine and has the braking power for itself and the disabled machine.
13. Remove blocking from the wheels.
14. The disabled machine is now ready to be towed.

After Towing

1. Block all wheels to prevent movement of the machine while the parking brake is being set and repairs are being made.
2. If the manual parking brake release screws were used, turn them out counter-clockwise to set the parking brake at both axles.

If the parking brake lines were pressurized by hand, release pressure on the lines to set the parking brake at both axles. After the parking brakes are set, re-connect the tee at the manifold port.

3. Perform necessary repairs to the machine.

After Repairs Have Been Made

1. With the wheels blocked and the parking brake set, re-connect the drive shafts at the front and rear axles.
2. Remove blocking from the wheels.
3. The machine is now ready for testing and normal service.