

CAMECO® SP1800B LOADER

REPAIR MANUAL

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manual**

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SAFETY

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SAFETY RECOMMENDATIONS

Safety and You...

We at CAMECO, are very concerned for your safety when you are operating or servicing your equipment. With this in mind, the following section should be read and studied by you. Hopefully you will take every precaution seriously and use good "old-fashioned" common sense before attempting to use or service your equipment.

Of course, CAMECO cannot anticipate every possible circumstance that might involve a potential hazard. The warnings that we provide are, therefore, not all inclusive. If a procedure, tool or work method not specifically recommended by CAMECO is used, you must satisfy yourself that it is safe for you and others and that the machine will not be damaged or made unsafe by the procedures that you choose.

Operation Safety...

The following is a list of safe operation procedures that you should practice at all times.

1. Be sure to read the operation manual and all safety precautions before starting the machine.
2. Dress for the job; any loose clothing, jewelry (especially rings), belts or scarves will present a definite safety hazard.
3. When either stopping or starting the machine, make sure that the area is clear of personnel.
4. Before leaving the machine unattended, lower all implements to the lowest position.
5. *DO NOT* allow riders or any passenger on the machine when it is in operation.
6. Keep a fully charged fire extinguisher on or near the operator's station. It must be easily accessible when needed. Know how to operate it.
7. Keep a fully stocked first aid kit on the operator's station. Know basic first aid.
8. Keep the operation area free of all loose objects, such as tools, lunch kits, soft drink cans, etc.
9. Never allow an open flame within 3.05 M (10 feet) of the equipment.
10. Be sure that all shields, guards, and safety equipment are in their proper place and in good condition.



11. The above symbol identifies all important safety messages on your equipment. When you see this symbol, be alert to the possibility of personal injury. Carefully read any message attached to this symbol.
12. Use step and grab handles when mounting or dismounting the machine. Clean all mud or debris from steps, walkways, and work areas. Always face the equipment when using its steps or ladder.
13. Maintain your CAMECO equipment as if your life depends on it ... it does. Improper lubrication and maintenance can be dangerous and could result in injury or death.

Service Safety...

When the service person or mechanic is unfamiliar with all systems on this machine, extra caution should be used when performing service work. A good working knowledge of the system and component is important for removal or disassembly. The following is a list of basic precautions that should always be observed.

1. Make sure that you read and understand all warning plates and decals before lubricating or performing other maintenance.

SAFETY RECOMMENDATIONS



2. Always wear protective glasses and footwear when working. In particular, wear safety glasses when pounding on any part of the machine or attachments with a hammer. Use protective clothing when welding. *DO NOT* wear any loose fitting or torn clothing. Remove all rings from fingers before working on equipment.
3. Before starting work on the machine, disconnect battery and hang a *DO NOT OPERATE* sign in the operator's station.
4. If at all possible, make all repairs with the machine parked on level ground. Block the machine so that it cannot roll. *DO NOT* work on any machine that is supported only by lift jacks or a hoist.
5. Relieve all pressure in air, oil or water systems before any lines, fittings or related parts are disconnected or removed. Always make sure that all raised components and implements are correctly blocked. Be alert for possible pressure when disconnecting any device from a system that utilizes pressure.
6. Lower all implements to the ground before performing any work on the machine. If this cannot be done, make sure that the implement is properly blocked to prevent it from dropping unexpectedly.
7. To avoid back injuries, use a hoist when lifting components that weight over 23 kgs (50 lbs). When using a hoist, make sure that all hooks are correctly positioned.
8. To avoid burns, be alert for hot parts located on the machine after it has stopped. Be particularly careful of hot fluids in lines, tubes, and components.
9. Be careful when removing cover plates. Gradually loosen the last two bolts or nuts located at the opposite ends of the cover or device. Carefully pry the cover loose to relieve any spring or other tension, before removing it completely.
10. Be careful when removing filler caps, breathers, or plugs on the machine. Hold a rag over the cap or plug to prevent being sprayed or splashed by fluids under pressure.
11. Always use tools that are in good condition. Before performing any service, be sure that you know how to use the proper tools.
12. Replace all fasteners with the same SAE or metric grade. Never substitute a softer part where a hardened part is used, conversely never substitute a harder part where a softer part is used.
13. Take precautions to prevent damage to wiring during removal. After re-installing the wiring, double check to make sure that it was not damaged during removal or installation. Ensure that the wiring does not touch any hot, sharp, or moving parts after it is installed.
14. Ensure that all protective devices and guards are properly installed and are functioning correctly before starting any repairs. If a guard or shield must be removed to perform repair work, use extra caution while working.
15. Escaping fluid under pressure can have sufficient force to penetrate the skin. Therefore, before disconnecting any lines, be sure that all pressure in the system is relieved. Before applying pressure, make sure that all lines, fittings, and connections are tight and undamaged.
16. If you are injured by escaping fluid under pressure, see a doctor at once. A serious infection or reaction may result if proper medical attention is not received immediately.
17. *DO NOT* operate the equipment if any rotating part is damaged or contacts any other part during operation. Any

▲ CAUTION ▲
Liquid escaping from a very small hole can be almost invisible. Use wood or cardboard, instead of your hand, when searching for suspected leaks.



SAFETY RECOMMENDATIONS

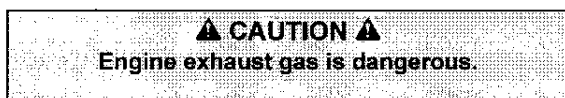
high-speed rotating component that has been damaged or altered, must be checked for balance before operation.

18. Avoid working on equipment with the engine running. If it is absolutely necessary to make checks with the engine running, always use two men: one to operate the controls; the other, where the operator can see him. The transmission must be in neutral, the braking system set and all pertinent safety locks set.

Safety In Your Service Area...

To maintain proper safety procedure in the service area, the following should be observed.

1. Keep the service area clean and dry. Wet or oily floors are slippery and wet spots can be dangerous when working with electrical equipment.



2. Make sure the service area is adequately ventilated. Periodically check the shop exhaust system for leakage.
3. Be sure that all electrical outlets and tools are properly grounded.
4. Use adequate lighting for the job at hand.
5. Be prepared if an accident or fire should occur. Know where the first aid kit and fire extinguishers are located. Know how to use both of them.

Safety When Cleaning Or Storing...

The following practices should be observed whenever you clean or store your equipment.

1. Always stop the engine before cleaning the equipment.

2. Keep the operator's station clean. *DO NOT* use it for a storage area.
3. Avoid a possible fire hazard. Keep the radiator and engine closure screens free of foreign material.
4. Keep all equipment free of dirt and oil. In bad weather beware of snow, ice, and mud on ladders, steps and in operator's station.
5. When preparing the engine for storage, remember that inhibitors are volatile and therefore, dangerous. Seal and tape openings after adding the inhibitor. Keep the inhibitor container tightly closed when not in use.

Safety Nevers...

The following is a list of practices that you should *Never* use.

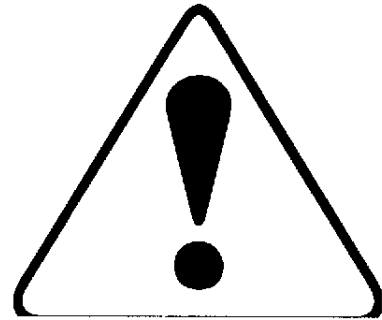
1. *Never* smoke while refueling or handling highly flammable materials.
2. *Never* refuel the engine while it is running. Use care during refueling when the engine is hot.
3. *Never* use open pans of gasoline or diesel fuel for cleaning parts. A good commercial, nonflammable solvent is preferred.
4. *Never* check the charging battery by placing metal objects across the posts. Provide adequate ventilation when charging batteries.
5. *Never* allow sparks or flames near batteries. This includes smoking near the batteries.
6. *Never* check fuel, battery electrolyte, or coolant levels with an open flame nearby.
7. *Never* use an open flame to look for leaks anywhere on the equipment.
8. *Never* use an open flame as a light anywhere on or near the equipment.
9. *Never* adjust the fuel system while the machine is in motion.



Recognize Safety Information...

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



Understand Signal Words...

A signal word—*DANGER*, *WARNING*, or *CAUTION*—is used with the safety-alert symbol. *DANGER* identifies the most serious hazards.

Safety signs with signal word *DANGER* or *WARNING* are typically near specific hazards.

General precautions are listed on *CAUTION* safety signs. *CAUTION* also calls attention to safety messages in this manual.



Follow Safety Instructions...

Carefully read all safety messages in this manual and on your equipment. Keep safety signs in good condition. Replace missing or damaged safety signs.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without proper instruction.

Keep your equipment in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and effect machine life.



Protect Bystanders...

Be sure everyone is clear of the equipment before starting engine or moving steering wheel.





SAFETY RECOMMENDATIONS

Use Hand Holds and Steps...

Clean off mud, grease, and any crop residue that may have accumulated on the steps and operator's platform of your equipment. Remember that chains and tools carried on the platform may interfere with pedal operation or cause a slip or fall from the equipment. Remove them.

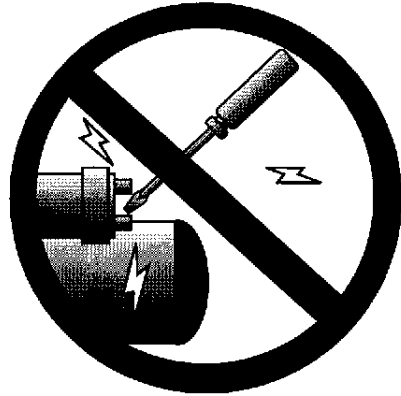


Prevent Machine Runaway...

Avoid possible injury or death from machinery runaway.

DO NOT start engine by shorting across starter terminals. Machine will start in gear if normal circuitry is bypassed.

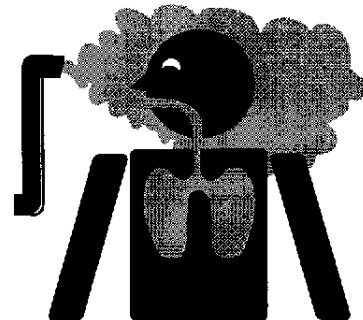
Start engine only from operator's seat, with transmission in neutral or park.



Avoid Exhaust Fumes...

Never run engine in a closed building. Make sure service area is adequately ventilated.

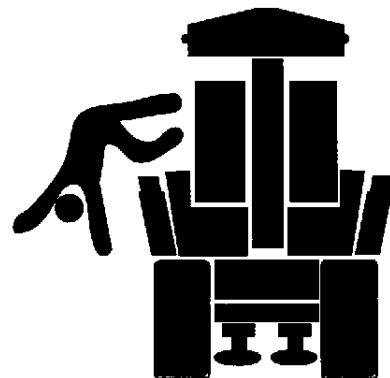
Avoid inhaling exhaust gases produced by a running engine. Exhaust gases, particularly carbon monoxide, may build up. Carbon monoxide is colorless, odorless, and potentially lethal.



Keep Riders Off Machine...

Only allow the operator on the machine. Keep riders off.

Riders on machine are subject to injury such as being struck by foreign objects and being thrown off the machine. Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.





Handle Fuel Safely—Avoid Fires...

Handle fuel with care; it is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks.

Always stop engine before refueling. Fill fuel tank outdoors.

Prevent fires by keeping machine clean of accumulated trash, grease, and debris. Always clean up spilled fuel.



Safely Service Accumulator...

Accumulators contains gas and oil under pressure. To avoid injury from escaping fluid, relieve all pressure from accumulator before disconnecting brake accumulator or brake valve. To do so, open bleed screws and pump brake pedal with engine stopped, until pedal easily goes all the way down.

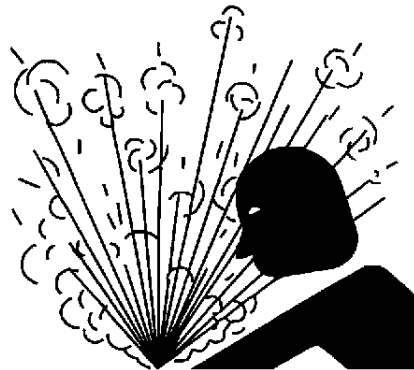
The accumulator is charged with dry nitrogen to at least a pressure of 3450 kPa (35 bar) (500 psi). If it needs recharging, have job done only by a qualified service person and only with dry nitrogen.



Safely Service Cooling System...

Explosive release of fluids from pressurized cooling system can cause serious burns.

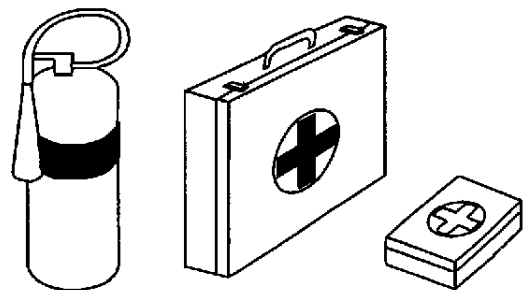
Shut off engine. Remove filler cap when cool enough to touch with bare hand. To relieve pressure, slowly loosen cap to first stop, and then remove completely.



Prepare For Emergencies...

Be prepared if a fire starts. Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.





SAFETY RECOMMENDATIONS

Wear Protective Clothing...

Wear close fitting clothing and safety equipment appropriate to the job.

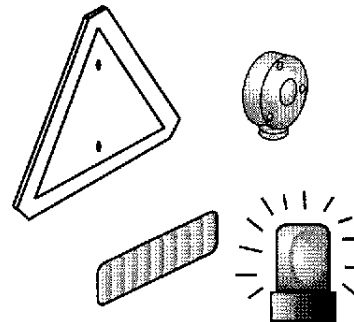
Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine. Do not talk on cellular phone.



Use Safety Lights and Devices...

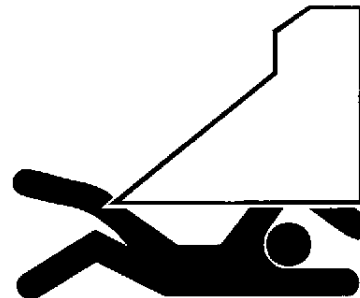
When transporting your machine on a road or highway at night or during the day, use necessary safety lights. Check local government regulations.

Keep safety items in good condition. Replace missing or damaged items.



Use Cylinder Safety Stops...

When working under the equipment, always raise machine all the way up. Apply stops to the lift cylinders and lower equipment onto them. If a hose should bust, the equipment will remain raised.



Practice Safe Maintenance...

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate or service machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil or debris.

Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

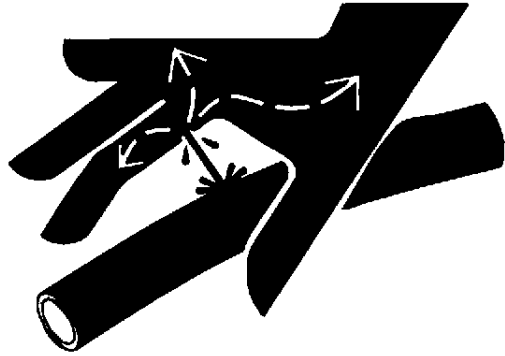




Avoid High-Pressure Fluids...

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before removing hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks.

If *ANY* fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury, or gangrene may result.



Use Caution On Hillsides...

Avoid holes, ditches, and obstructions which may cause the machine to tip, especially on hillsides.

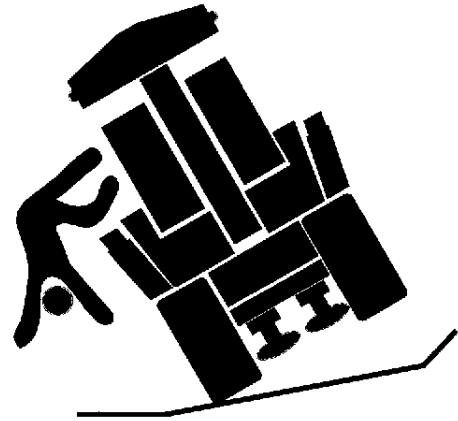
Never drive near the edge of a gully or steep embankment—it may cave in.

Be especially careful when using single wheels. The danger of an overturn increases greatly with narrow tread, 2032 mm (80") or less, and high speed.

For hillside operation, always use front and rear dual wheels. Avoid sharp, uphill turns.

Keep hydraulic oil level at upper level when operating on hillsides. Low oil level might result in loss of steering. If this should happen, hold brakes, shift to *NEUTRAL*, apply park brake, stop engine, and add hydraulic oil to proper level.

Before operating on extremely steep slopes, fill hydraulic system beyond overfull sight glass 4 to 8 L (1 to 2 gal). This is particularly important when using large hydraulic cylinders, due to the volume of oil used to extend them.





SAFETY RECOMMENDATIONS

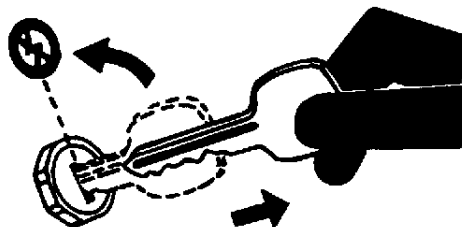
Stopping and Parking...

Your ability to stop your machine and park it safely is just as important as being able to get it underway safely.

Equipment upsets, collisions, runaway tractors, and people being crushed under machines can happen when operators ignore safety.

To avoid these accidents, take some precautions:

- ◆ Signal before stopping, turning, or slowing down on highways.
- ◆ Pull over to right-hand shoulder of highway before stopping, if possible.
- ◆ Slow down before braking.
- ◆ Pump brakes when stopping on slippery surfaces like ice, snow, mud, or loose gravel.
- ◆ Shift to park or set parking brake.
- ◆ Lower all equipment when leaving machine.
- ◆ Turn off all electrical switches and remove key.



Service Tires Safely...

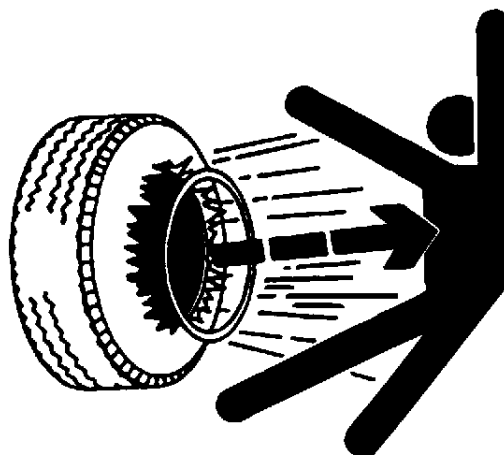
Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and *NOT* in front of or over the tire assembly. Use a safety cage if available.

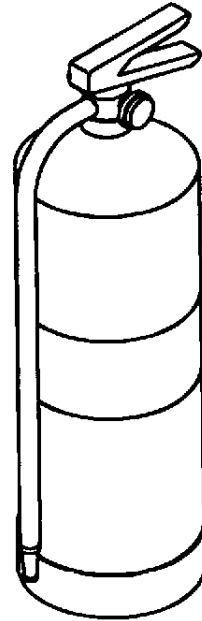
Check wheels for low pressure, cuts, bubbles, damaged rims, or missing lug bolts and nuts.





Fire Prevention...

1. Machines should be cleaned of debris at least daily, particularly around engine, exhaust, and driveline components.
2. Machines should be inspected at least daily for potential fire hazards at electrical, exhaust, driveline, fuel, hydraulic, and brake systems. Repairs should be made immediately.
3. Operating personnel must be instructed on what to do when a fire starts, how to use the fire extinguisher, and must follow such instructions. Operators should be required to demonstrate an ability to use fire suppression equipment.
4. Hydraulic leaks, accumulation of grease, fuel, and oil (including spillage) should be eliminated immediately.
5. The radiator and the engine cooling system should be cleaned and serviced daily to maintain moderate engine temperatures.
6. Any portable extinguisher or fire suppression system carried on the machine, that has been used, should be recharged or replaced before the machine resumes operation.
7. Prior to welding or brazing on any part of the machine, the part and the surrounding area should be cleaned and a fire extinguisher should be made readily available.
8. Smoking, open flames, etc., should not be permitted around any machine during fueling operations and/or when the fuel system is open to the atmosphere.
9. Fire prevention features provided by CAMECO should be maintained in operational condition and should be used to supplement the operator's fire prevention efforts. In no case should the features be used, or assumed, as replacements for diligent operator efforts at preventing fires.





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SP1800 SPECIFICATIONS

Engine...

(Eng.Ref. 0821350930)

Type.....	John Deere 6068D
Cylinders.....	6 (in line)
Displacement	6.8 L (414 cu.in.)
Horsepower	112 hp @ 2200 RPM
Peak Torque	285 lb.ft (386 Nm) @ 2200 RPM
Oil Pressure.....	50 psi (345 kPa) (Normal)
Oil Temperature	240°F (115 °C) in pan (Normal)
Coolant Flow	64 GPM (240 L/m) @ 2200 RPM

Transmission...

(Eng.Ref. 0460023768)

Type.....	4 Speed Manual
Gearing	
1 ST	7.91 : 1
2 ND	3.85 : 1
3 RD	2.52 : 1
4 TH	1.22 : 1

Rigid Axle – (Front Axle)...

(Eng.Ref.0381352754,1354593)

Type.....	Inboard Planetary Gear Drive
	Standard Differential
Reduction Ratio.....	18.62 : 1

Steering Axle – (Rear Axle)...

(Eng. Ref. 0381352755)

Type.....	Planetary Steering Axle
	Limited Slip Differential
Reduction Ratio.....	19.05 : 1

Pump Drive ...

(Eng. Ref. 0471351154)

Type.....	Single
Reduction.....	1 : 1
Pump Rotation	Enginewise



Double Vane Pump...

(Eng. Ref. 0030036776)

Displacement:

Shaft End Pump - Maximum 3.37 cu.in./rev (55.2 cc/rev)
Cover End Pump - Maximum 2.22 cu.in./rev (36.3 cc/rev)

Speed:

Maximum @ max displacement 2700 RPM

Pressure:

Maximum @ max speed, max displacement 3000 psi (206.8 bar)

Rotation:

Viewed from shaft end Right Hand

Typical Performance:

Shaft End Pump

Input Horsepower @ 2250 psi, 2350 RPM 45 Hp (33.5 kW)
Delivery @ 2250 psi, 2350 RPM 27 GPM (102 L/min)

Cover End Pump

Input Horsepower @ 2250 psi, 2350 RPM 32 Hp (23.8 kW)
Delivery @ 2250 psi, 2350 RPM 18 GPM (68.1 L/min)

Weight:

Normal 45 lb (20.4 kg)