

# **CAMECO® SP1850 HIGH REACH LOADER REPAIR MANUAL**

## **Table of Contents**

<b>Section 10-5</b>	<b>Safety</b>
<b>Section 10-10</b>	<b>Specifications</b>
<b>Section 10-15</b>	<b>Torque Specifications</b>
<b>Section 10-20</b>	<b>Fluid Capacities</b>
<b>Section 10-25</b>	<b>General Information</b>
<b>Section 20</b>	<b>Hydrostatic System</b>
<b>Section 30</b>	<b>Hydraulic System</b>
<b>Section 40</b>	<b>Steering System</b>
<b>Section 50</b>	<b>Electrical System</b>
<b>Section 60</b>	<b>Service Points</b>

# CAMECO® SP1850 HIGH REACH LOADER REPAIR MANUAL

## SAFETY

Service Safety .....	10-5-1
Recognize Safety Information .....	10-5-2
Understand Signal Words .....	10-5-2
Follow Safety Instructions .....	10-5-2
Operating The Tractor Safely .....	10-5-3
Prevent Machine Runaway .....	10-5-3
Stopping And Parking Tractor .....	10-5-4
Use Caution On Hillsides .....	10-5-4
Keep Riders Off Machine .....	10-5-4
Wear Protective Clothing .....	10-5-5
Protect Against Noise .....	10-5-5
Handle Fuel Safely — Avoid Fires .....	10-5-5
Prepare For Emergencies .....	10-5-6
Handle Starting Fluid Safely .....	10-5-6
Handle Chemical Products Safely .....	10-5-6
Avoid Contact With Pesticides .....	10-5-7
Stay Clear Of Rotating Drivelines .....	10-5-7
Use Safety Lights And Devices .....	10-5-8
Avoid Contact With Moving Parts .....	10-5-8
Practice Safe Maintenance .....	10-5-9
Freeing A Mired Machine .....	10-5-10
Remove Paint Before Welding Or Heating ....	10-5-10
Avoid Heating Near Pressurized Fluid Lines	10-5-11
Avoid High-pressure Fluids .....	10-5-11
Protect Against High Pressure Spray .....	10-5-11
Service Cooling System Safely .....	10-5-12
Store Attachments Safely .....	10-5-12
Dispose Of Waste Properly .....	10-5-12
Fire Prevention .....	10-5-13
Safety Decals .....	10-5-14
Use Caution On Hillsides .....	10-5-15
Use Caution When Flexing (Extending) Boom .....	10-5-15
Stopping And Parking .....	10-5-16
Service Tires Safely .....	10-5-16
Safety Sign .....	10-5-17
Avoid Electrical Power Lines .....	10-5-17

## SPECIFICATIONS

Engine .....	10-10-1
Transmission .....	10-10-1
Rigid Axle – (Front Axle) .....	10-10-1
Steering Axle – (Rear Axle) .....	10-10-1
Pump Drive (Transmission Mount) .....	10-10-1
Double Gear Pump .....	10-10-2
Variable Displacement Pump (Hydrostatic Transmission) .....	10-10-2
Fixed Displacement Motor .....	10-10-3
Swing Cylinders .....	10-10-3

Flex Cylinder .....	10-10-3
Piler Lift Cylinder .....	10-10-4
Grab Cylinder .....	10-10-4
Lift Cylinder .....	10-10-4
Steering Cylinders .....	10-10-4
Loading System .....	10-10-5
Control Valve - Piler, Flex And Swing .....	10-10-5
Control Valve - Boom Lift And Grab .....	10-10-5
Work Port Reliefs .....	10-10-5
Throttle Valve - Lift .....	10-10-5
Traction System .....	10-10-5
Main System Pressure .....	10-10-5
Hydraulic Schematic .....	10-10-6
SP1850 Drive Hydraulic Schematic .....	10-10-7
SP1850 Electrical Schematic .....	10-10-8

## TORQUE SPECIFICATIONS

Suggested Torque Values .....	10-15-1
Suggested Torque Values .....	10-15-1
Torque For Grade 2 Nc Weld Studs .....	10-15-1
Suggested Torque Values And Clamp Loads	10-15-2
Grade Or Property Class Head Marking For Si Bolts .....	10-15-2
Conversion Factors .....	10-15-2
Torque For Sae Bolts And Nuts In — Lb-ft ...	10-15-3
Torque For Sae Bolts And Nuts In — Nm ....	10-15-3
Conversion Factors .....	10-15-3
Torque In Nm X 0.737 = Torque In Lb-ft .....	10-15-3
Torque In Lb-ft X 1.356 = Torque In Nm .....	10-15-3
Torque In Lb-ft X 12 = Torque In Lb-in .....	10-15-3
Torque For Si (Metric) Bolts And Nuts In — Nm .....	10-15-4
Grade Or Property Class Head Markings For Si Bolts .....	10-15-4
Conversions .....	10-15-5
Weight Measure .....	10-15-5
Length Measure .....	10-15-5
Metric (Si*) Measurements .....	10-15-5
Metric To English .....	10-15-5
English To Metric .....	10-15-5
Multiplication Factors .....	10-15-5
Temperature Conversion Chart .....	10-15-5

## FLUID CAPACITIES

Engine .....	10-20-1
Radiator .....	10-20-1
Transmission .....	10-20-1
Rear Steering Axle .....	10-20-1
Front Rigid Axle .....	10-20-1
Hydraulic Tank .....	10-20-1

Fuel Tank .....	10-20-1
Tire Inflation Pressure .....	10-20-1
Pump Drive .....	10-20-1

## GENERAL INFORMATION

Introduction .....	10-25-1
Diagnostic Sections .....	10-25-1
Troubleshooting Tools .....	10-25-1
Troubleshooting .....	10-25-1
Visually Inspect Hydraulic Systems .....	10-25-2
Hydraulic System Testing Precautions .....	10-25-3
Visually Inspect Electrical System .....	10-25-3
Electrical System Safety Precautions .....	10-25-4
Service Supplies .....	10-25-5
Service Tools .....	10-25-7
Tool Set—Mechanics .....	10-25-9
Symbols — Lines, Fluid Storage, Pumps And Motors .....	10-25-10
Symbols — Cylinders And Valves .....	10-25-11
Symbols — Miscellaneous And Methods Of Operation .....	10-25-12
Symbols — Electric Circuit .....	10-25-13

## HYDROSTATIC SYSTEM

The System Circuit .....	20-1
The Basic Closed Circuit .....	20-1
Case Drain And Heat Exchanger .....	20-1
General Description And Cross Sectional Views .....	20-2
Charge Pump .....	20-2
Charge Relief Valve .....	20-2
System Check Valves .....	20-2
Pv With Charge Pump .....	20-2
Charge Pump Components .....	20-2
Pump Charge System .....	20-2
Multi-function Valves .....	20-3
Auxiliary Mounting Pads .....	20-4
Pump Control Options .....	20-4
Hydraulic Displacement Control (Hdc) .....	20-4
Pv With Auxillary Mounting Pad .....	20-4
Pv With Hydraulic Displacement Control .....	20-4
Initial Start-up Procedure .....	20-5
Fluid And Filter Maintenance .....	20-6
System Operation Hot .....	20-7
Neutral Difficult Or Impossible To Find .....	20-7
Hydrostatic Pump .....	20-12
Pump Adjustments .....	20-13
Charge Relief Valve Adjustment .....	20-13
Multi-function Valve Pressure Adjustment ...	20-14
Engaging The Bypass Function .....	20-16
Hydraulic Displacement Control (Hdc) .....	20-17
Shaft Seal And Shaft Replacement .....	20-19
Pump Minor Repairs .....	20-21
Multi-function Valve Cartridges .....	20-21
Charge Relief Valve .....	20-22

Charge Pump .....	20-23
Installing The Charge Pump .....	20-24
Auxiliary Pad Installation .....	20-26
Auxiliary Pad Conversion .....	20-27
Hydraulic Displacement Controls .....	20-28
Displacement Control Components .....	20-29
Displacement Control Filter Screens .....	20-29
Displacement Control Orifice Check Valve ...	20-29
Displacement Control Orifices .....	20-29
Disassembly Procedures For Variable .....	20-30
Displacement Pump .....	20-30
Reconditioning And Replacement Of Parts ..	20-34
Assembly Procedures For Variable .....	20-38
Displacement Pump .....	20-38

## HYDRAULIC SYSTEM

Double Gear Pump .....	30-1
Pump - Priority End Cover Assembly .....	30-2
Multiple Gear Pump Repair .....	30-3
Suggested Tools .....	30-3
Repair Precautions .....	30-3
Bushing Removal Tool .....	30-3
Seal Removal Tool .....	30-3
Bushing Installation Tool .....	30-3
Special Steel Sleeve .....	30-3
Directional Valve — Boom Swing, Boom Flex and Piler Lift .....	30-4
Seal Installation Tool .....	30-5
Disassembly .....	30-5
Clean and Inspect .....	30-5
Assembly .....	30-6
Assembly .....	30-6
Start Up Procedure .....	30-7
Recommended Test Procedure .....	30-7
Contamination Control .....	30-9
The Effect of Contamination .....	30-9
The Purpose of Hydraulic Fluid .....	30-9
Component Mechanical Clearances .....	30-10
Definition of Contamination .....	30-10
Component Failure States .....	30-10
Typical Clearance Values .....	30-11
Component Contamination Failures .....	30-12
Contaminants in Hydraulic Systems .....	30-13
Hydraulic Oil Storage .....	30-14
Oil Filtration .....	30-14
Hydraulic Components .....	30-14
Aeration and Cavitation .....	30-15
All Hydraulic Functions Slow .....	30-16
No Hydraulic Functions .....	30-16
Pump Not Delivering Oil .....	30-16
Insufficient Pressure Buildup In Pump .....	30-17
Pump Making Noise .....	30-17
Slow Steering—Both Directions .....	30-17
High Steering Effort .....	30-17
Directional Control Valve Can't Get Pressure	30-17

**Thanks very much for your reading,  
Want to get more information,  
Please click here, Then get the complete  
manual**

**JustClickHere** 

**NOTE:**

**If there is no response to click on the link above,  
please download the PDF document first, and then  
click on it.**

**Have any questions please write to me:  
[admin@servicemanualperfect.com](mailto:admin@servicemanualperfect.com)**

Directional Control Valve Delivers	
Erratic Pressure .....	30-17
No Response When Steering Wheel Is	
Slowly Turned .....	30-18
Wrong Response To Steering Wheel .....	30-18
Continuous Steering Wheel Rotation .....	30-18
No Response To Steering Wheel .....	30-18
Drive Elements (Coupling, Gears, & Shafts) .	30-19
Hydraulic Cylinder or Motor .....	30-19
Directional Valves .....	30-19
Flow Control Valves .....	30-19
Pressure Relief Valves .....	30-20
Return Lines .....	30-20
Filters .....	30-20
Coolers .....	30-20
Pressure Gauge .....	30-20
Pressure Line .....	30-21
Diesel Engine .....	30-21
Oil Line Leakage .....	30-21
Suction Line - Characteristics .....	30-21
Oil Tank - Hydraulic Fluid .....	30-22
Troubleshooting .....	30-23
Suggested Tools .....	30-24
External Relief Settings .....	30-24
Overhaul .....	30-24
Valve Bank Disassembly .....	30-24
Spool Disassembly .....	30-25
Cleaning, Inspection, And Repair .....	30-26
Assembly .....	30-26
Spool Assembly—Spring Centered .....	30-26
Detented .....	30-27
Valve Section Assembly .....	30-27
Valve Bank Assembly .....	30-27
Section Disassembly .....	30-27
Preparation of Parts .....	30-28
Section Assembly .....	30-28
Troubleshooting .....	30-30
Oil Leaks At End Of Spool .....	30-30
Spool Does Not Return To Neutral .....	30-30
No Motion, Slow or Jerky Action Of	
Hydraulic System .....	30-30
No Relief Valve Action (High Pressure) .....	30-30
Load Will Not Hold .....	30-30
Directional Valve — Boom Lift and	
Grab Open/Close .....	30-31
Style 1 with Exterior Locking Collar .....	30-32
Tools and Supplies .....	30-33
Disassembly — Style 1 Cylinders .....	30-33
Clean And Inspect .....	30-33
Assembly — Style 1 Cylinders .....	30-34
Cylinder Leak Test .....	30-35
Test Cylinder .....	30-35
Optional Cushion Theory Of Operation .....	30-35
Adjustment .....	30-35
Style 2 Head Screws into Tube Assembly .....	30-36
Disassembly — Style 2 Cylinders .....	30-37
Clean and Inspect .....	30-37
Assembly — Style 2 Cylinders .....	30-37
Hydraulic Cylinder Diagnostics .....	30-38
Grab Cylinder .....	30-42
 <b>STEERING SYSTEM</b>	
Repair Instructions .....	40-2
Necessary Tools .....	40-2
Disassembly .....	40-2
Clean And Inspect .....	40-3
Reassembly .....	40-3
Troubleshooting .....	40-5
Slow Steering, Hard Steering or Loss of	
Power Assist .....	40-5
Wander: Loader Will Not Stay In A	
Straight Line .....	40-5
Drift: Loader Veers Slowly In One Direction .	40-5
Slip: A Slow Movement Of Steering Wheel	
Fails To Cause Any Movement Of The	
Steered Wheels .....	40-5
Hang-Up: Temporarily Hard Steering .....	40-5
Soft Steering .....	40-5
Erratic Steering .....	40-6
Free Wheeling: Steering Wheel Turns Freely	
With No Feeling Of Pressure And No Action	
On Steered Wheels .....	40-6
Free Wheeling: Steering Wheel Turns With Slight	
Resistance But Results In Little Or No Steered	
Wheel Action .....	40-6
Excessive Free Play At Steering Wheel .....	40-6
Excessive Free Play At Steered Wheels .....	40-6
Binding Or Poor Centering Of Steering	
Wheel .....	40-6
Steering Valve Locks-up .....	40-7
Steering Wheel Oscillates Or Turns By Itself	40-7
Steered Wheels Turn In Wrong Direction When	
Operator Activates Steering Wheel .....	40-7
 <b>ELECTRICAL SYSTEM</b>	
Visually Inspect Electrical System .....	50-1
Safety Precautions .....	50-1
Specifications .....	50-2
Theory Of Operation .....	50-2
Cleaning Battery Posts .....	50-2
Jumping The Battery .....	50-3
Charging The Batteries .....	50-3
Precautions For Alternators .....	50-3
Inspection .....	50-4
Shorted Circuit .....	50-4
High Resistance Or Open Circuits .....	50-4
Grounded Circuits .....	50-4
Ignition Switch Test .....	50-4
Alternator Output Check .....	50-4
Starter Solenoid Check .....	50-5

Starter Motor Check .....	50-5
Start Switch Check (Push Button) .....	50-5
Horn Switch Check .....	50-5
Horn Check .....	50-5
Nothing Works .....	50-5
Some Electrical Components Work .....	50-5
Starter Will Not Crank Engine .....	50-5
Engine Cranks Slowly .....	50-5
Starter Turns, But Engine Will Not Crank .....	50-6
Starter Still Runs After Engine Starts .....	50-6
Low Battery Output .....	50-6
Starter Solenoid Chatters .....	50-6
Noisy Alternator .....	50-6
Gauge Does Not Work (Applies To All Gauges) .....	50-6
Horn Does Not Work .....	50-7
Oil Pressure Sending Unit .....	50-8
Oil Pressure Switch .....	50-8
Engine Coolant Temperature Gauge Sender .....	50-8
Engine Coolant Temperature Switch .....	50-8
Hydraulic Oil Temperature Sender .....	50-9
Fuel Sending Unit .....	50-9
Hydraulic Filter Pressure Switch .....	50-9
Air Filter Restriction Switch .....	50-9

## **SERVICE**

Initial Start-up .....	60-1
After First 100 Hours Of Operation .....	60-1
Every 10 Hours Or Daily Operation .....	60-1
Every 70 Hours Of Operation .....	60-2
Every 140 Hours – 2 Weeks Of Operation .....	60-2
Every 250 Hours – Monthly Operation .....	60-2
Every 500 Hours – 2 Months Of Operation .....	60-2
Every 1000 Hours – 4 Months Of Operation .....	60-2
As Necessary .....	60-2
Axle Maintenance .....	60-13
Maintenance Points .....	60-13
Maintenance Intervals .....	60-13

## **AXLE MAINTENANCE and REPAIR**

..... See Supplements on CD

## SAFETY

---

### Service Safety

When a service person or mechanic is unfamiliar with all systems on this tractor, extra caution should be used when performing service work. A good working knowledge of the system and its components 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.
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 this *DO NOT START* sign in the operator's station.



### IMPORTANT:

- Before climbing on machine, ensure that no one is working in or on it.
- Ensure that all operators blow the horn several times before starting the machine.
- Ensure that any persons near the machine know that when the horn blows, the machine is about to be started, and to move away as soon as possible.

# SAFETY

---

## 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 of DANGER, WARNING, or CAUTION is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located 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 machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

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

Keep your machine in proper working condition. Any unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.





---

## SAFETY

---

### OPERATING THE TRACTOR SAFELY

Careless use of the tractor can result in unnecessary accidents. Be alert to hazards of tractor operation. Understand causes of accidents and take every precaution to avoid them. Most common accidents are caused from:

- Tractor roll-over
- Improper starting procedures
- Crushing and pinching during hitching
- Collisions with other motor vehicles
- Falling from tractor
- Place transmission in neutral and apply park brake before dismounting.

**Note: Leaving transmission in gear with engine stopped will not prevent the tractor from moving.**

Avoid accidents by taking the following precautions:

- Put transmission in PARK before dismounting. Leaving transmission in gear with engine stopped will NOT prevent the tractor from moving.
- Be sure everyone is clear of tractor and attached equipment before starting engine.
- Never try to get on or off a moving tractor.
- When tractor is left unattended, apply park brake, lower implements to the ground, stop the engine, and remove the key.
- Never go near an operating implement.



### 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.

NEVER start engine while standing on ground. Start engine only from operator's seat, with transmission in neutral.



## SAFETY

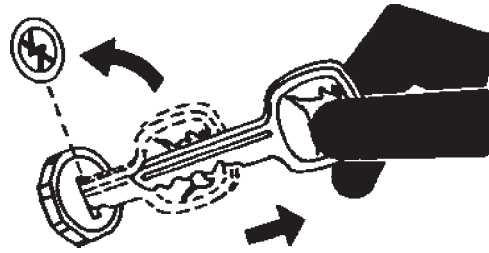
---

### STOPPING AND PARKING TRACTOR

Tractor roll-over, collisions, runaway tractors, and people being crushed under machines and implements can happen when operators ignore safety.

To avoid these accidents, take some precautions:

- Signal before stopping, turning, or slowing down on public roads
- Pull over to side of road before stopping
- Slow down before braking
- Pump brakes when stopping on slippery surfaces
- Be careful when towing and stopping heavy loads
- Shift to park or apply parking brake
- Lower all equipment when leaving tractor
- Remove key

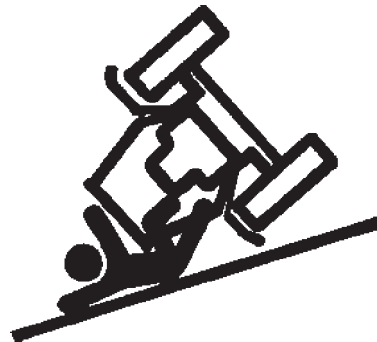


### USE CAUTION ON HILLSIDES

Avoid holes, ditches, and obstructions which may cause tractor roll-over, especially on hillsides. Avoid sharp turns on hills.

Never drive near the edge of a gully or steep embankment.

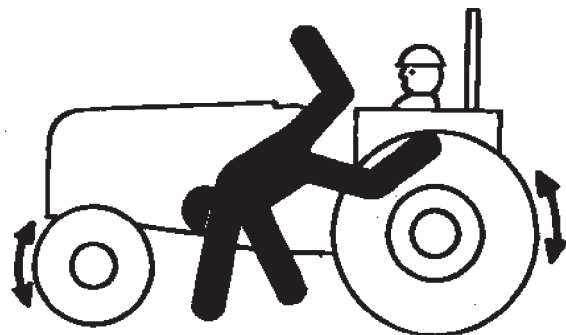
Driving out of a ditch, mired condition, or up a steep slope could cause tractor to tip over rearward. Back out of these situations if possible.



### 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 of the machine. Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.



---

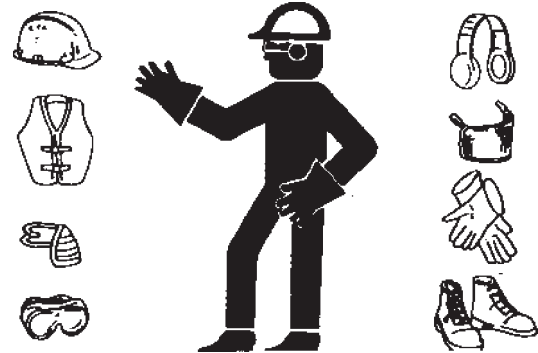
## SAFETY

---

### 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.



### PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment of loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



### HANDLE FUEL SAFELY ó 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 machine. Fill fuel tank outdoors.

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



## SAFETY

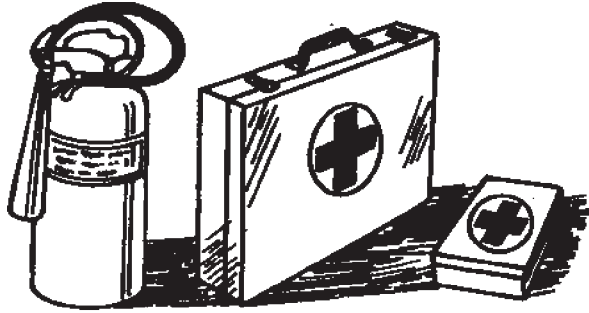
---

### 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.



### HANDLE STARTING FLUID SAFELY

Starting fluid is highly flammable.

Keep all sparks and flame away when using it. Keep starting fluid away from batteries and cables.

To prevent accidental discharge when storing the pressurized can, keep the cap on the container, and store in a cool, protected location.

Do not incinerate or puncture a starting fluid container.



### HANDLE CHEMICAL PRODUCTS SAFELY

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with John Deere equipment include such items as lubricants, coolants, paints, and adhesives.

A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.

Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

(See your John Deere dealer for MSDSs on chemical products used with John Deere equipment.)



---

## SAFETY

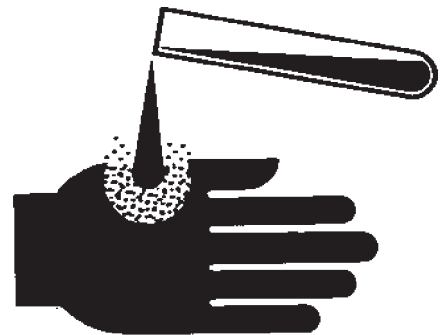
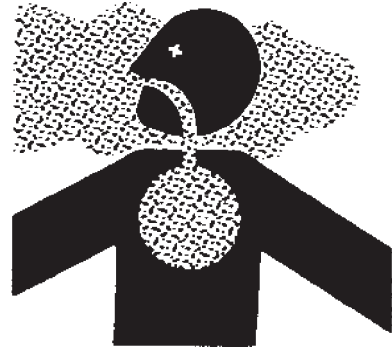
---

### AVOID CONTACT WITH PESTICIDES

This enclosed cab does not protect against inhaling harmful pesticides. If pesticide use instructions require respiratory protection, wear an appropriate respirator inside the cab.

Before leaving the cab, wear personal protective equipment as required by the pesticide use instructions. When re-entering the cab, remove protective equipment and store either outside the cab in a closed box or some other type of sealable container or inside the cab in a pesticide resistant container, such as a plastic bag.

Clean your shoes or boots to remove soil or other contaminated particles prior to entering the cab.



### STAY CLEAR OF ROTATING DRIVELINES

Entanglement in rotating driveline can cause serious injury or death

Keep tractor master shield and driveline shields in place at all times. Make sure rotating shields turn freely.

Wear close fitting clothing. Stop the engine and be sure driveline is stopped before making adjustments.

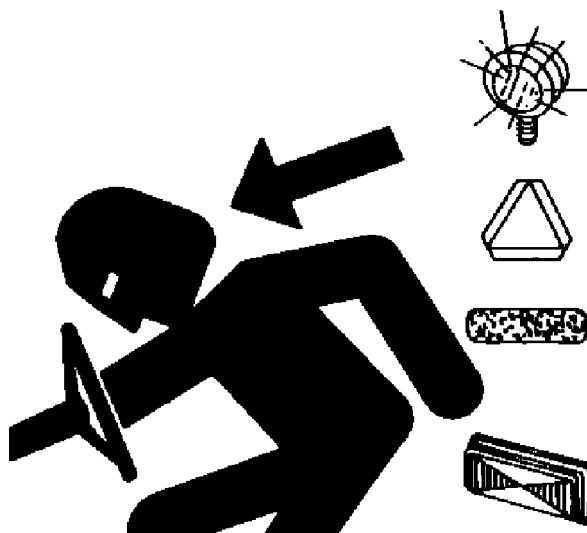


## SAFETY

### USE SAFETY LIGHTS AND DEVICES

Prevent collisions between other road users, slow moving tractors with attachments or towed equipment, and self-propelled machines on public roads. Frequently check for traffic from the rear, especially in turns, and use hand signals or turn signal lights.

Use headlights, flashing warning lights, and turn signals day and night. Follow local regulations for equipment lighting and marking. Keep lighting and marking visible and in good working order. Replace or repair lighting and marking that has been damaged or lost. An implement safety lighting kit is available from your John Deere dealer.



### AVOID CONTACT WITH MOVING PARTS

Keep hands, feet, and clothing away from power driven parts. Never clean, lubricate, or adjust machine when it is running.



---

## SAFETY

---

### PRACTICE SAFE MAINTENANCE

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

Never lubricate, service, or adjust machine while it is moving. Keep hand, 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.



---

## SAFETY

---

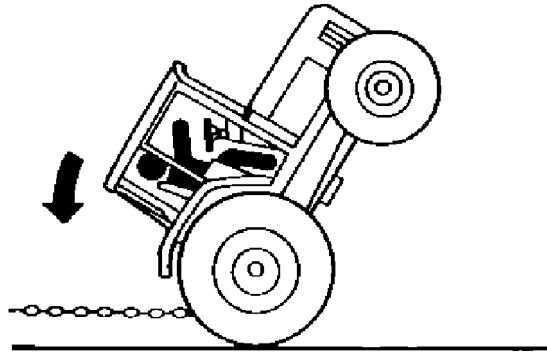
### FREEING A MIRED MACHINE

Attempting to free a mired machine can involve safety hazards such as the mired tractor tipping rearward, the towing tractor overturning, and the tow chain or cable failing and recoiling from its stretched condition.

Back your tractor out if it gets mired down in mud. Unhitch any towed implements. Dig mud from behind the rear wheels. Place boards behind the wheels to provide a solid base and try to back out slowly. If necessary, dig mud from the front of all wheels and drive slowly ahead.

If necessary to tow with another unit, use a long chain or cable. Inspect the chain or cable for flaws. Make sure all parts of towing devices are of adequate size and strong enough to handle the load.

Always hitch to the drawbar of the towing unit. Before moving, clear the area of people. Apply power smoothly to take up the slack: a sudden pull could snap any towing device causing it to whip or recoil dangerously.



### REMOVE PAINT BEFORE WELDING OR HEATING

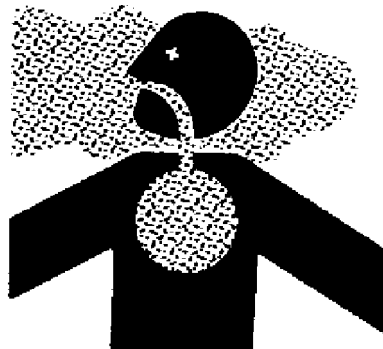
Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heating:

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.





---

## SAFETY

---

### AVOID HEATING NEAR PRESSURIZED FLUID LINES

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.



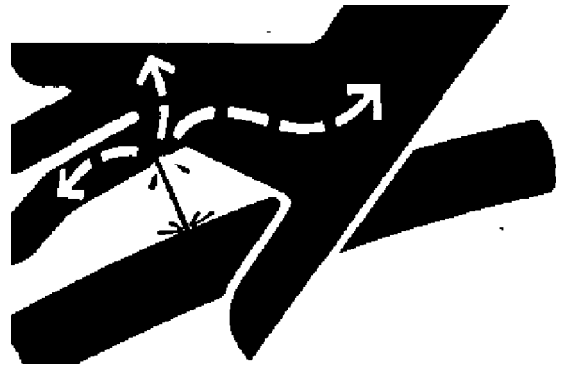
### AVOID HIGH-PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

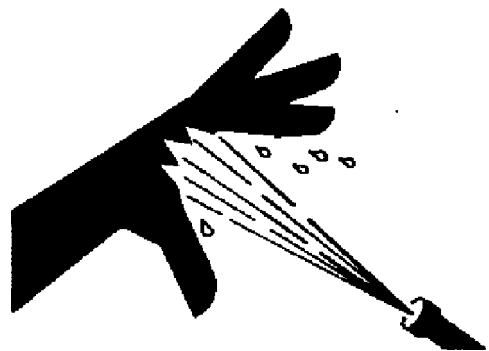
If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



### PROTECT AGAINST HIGH PRESSURE SPRAY

Spray from high pressure nozzles can penetrate the skin and cause serious injury. Keep spray from contacting hands or body.

If an accident occurs, see a doctor immediately. Any high pressure spray injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



---

## SAFETY

---

### SERVICE COOLING SYSTEM SAFELY

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

Shut off engine. Only remove filter cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.



### STORE ATTACHMENTS SAFELY

Stored attachments such as dual wheels, cage wheels, and loader can fall and cause serious injury or death.

Securely store attachments and implements to prevent falling. Keep playing children and bystanders away from storage area.



### DISPOSE OF WASTE PROPERLY

Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.

