7, 8, 8A, 10, & 10A BACKHOES

HYDRAULIC SYSTEM REQUIREMENTS AND SPECIFICATIONS

Hydraulic Pump Flow Rates

650 . . . . . 18.2 L/min, (4.8 gpm), 2600 RPM—Eng.
650 w/Power Steering . . . . . 14.6 L/min (3.7 gpm), 2600 RPM—Eng.
750 . . . . . 21.6 L/min (5.7 gpm), 2400 RPM—Eng.
750 w/Power Steering . . . . . 17.4 L/min (4.6 gpm), 2400 RPM—Eng.
755 . . . . . 15.4 L/min (3.9 gpm), 3200 RPM—Eng.
850 (9 cc) . . . . . 23.5 L/min (6.2 gpm), 2600 RPM—Eng.
850 (9 cc) w/Power Steering . . . . . 16.7 L/min (4.4 gpm), 2600 RPM—Eng.
850 (11 cc) . . . . . 28.8 L/min (4.4 gpm), 2600 RPM—Eng.
850 (11 cc) w/Power Steering . . . . . 22 L/min (5.8 gpm), 2600 RPM—Eng.
855 . . . . . 15.4 L/min (3.9 gpm), 3200 RPM—Eng.
950, 1050 (9 cc) w/Power Steering . . . . . 14.8 L/min (3.9 gpm), 2400 RPM—Eng.
950, 1050 (11 cc) . . . . . 26.5 L/min (7.0 gpm), 2400 RPM—Eng.
950, 1050 (11 cc) w/Power Steering . . . . . 19.7 L/min (5.2 gpm), 2400 RPM—Eng.
5200, 5300, 5400 . . . . . 43.2 L/min (11.4 gpm), 2500 RPM—Eng.
570 Skid-Steer Loader . . . . . 27.2 L/min (7.2 gpm), 2500 RPM—Eng.
575 Skid-Steer Loader . . . . . 30.3 L/min (8.0 gpm), 2800 RPM—Eng.
675 Skid-Steer Loader . . . . . 53.0 L/min (14.0 gpm), 2800 RPM—Eng.

BACKHOE HYDRAULIC SPECIFICATIONS

Main System Relief Valve

Test Engine Speed . . . . . 1500 RPM
Pressure
7 Backhoe . . . . . 11713 (10680 min.)kPa (117.3 [106.9 min.] bar) (1700 [1550 min.] psi)
8 & 8A Backhoe . . . . . 14124.5 [13091.5 min.] kPa (141.5 [131.1 min.] bar) (2050 [1900 min.] psi)
10A Backhoe . . . . . 15847 [14814 min.] kPa (158.7 [148.3 min.] bar) (2300 [2150 min.] psi)

Circuit Relief Valve Setting

Boom and Dipperstick
7 Backhoe . . . . . 14469 ±689 kPa (79 ±5 bar) (2100 ±100 psi)
8, 8A, 10 and 10A Backhoe . . . . . 19981 ±689.5 kPa (179.5 ±6.5 bar) (2600 ±100 psi)
Shim Sizes
7 and 8, 8A Backhoe . . . . . 1.02 mm (0.04 in.), 0.51 mm (0.02 in.), (0.254 mm (0.01 in.)

Crossover Relief Valve Setting

Test Engine Speed . . . . . 800 RPM
7, 8, and 8A Backhoe . . . . . 7407—8440 kPa (74.2—84.5 bar) (1075—1225 psi)
10 and 10A Backhoe . . . . . 10335—11369 kPa (103.5—113.9 bar) (1500—1650 psi)

Boom

Restrictor Orifice I.D.
7 Backhoe . . . . . 1.575 mm (0.062 in.)
8 and 8A Backhoe . . . . . 1.88 mm (0.074 in.),
10 and 10A Backhoe . . . . . 1.88 mm (0.074 in.)

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TROUBLESHOOTING

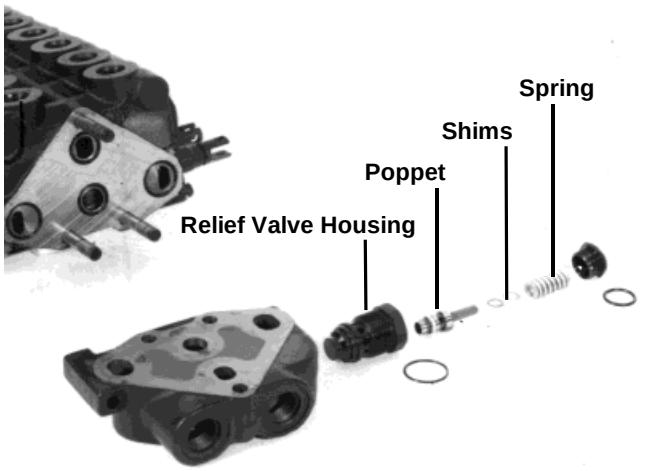
Problem or Symptom / Check or Solution	Backhoe will not operate	Backhoe loses power	Loss of power in any one cylinder	Loss of power in boom or dipperstick only	Loss of power in swing cylinders only	Cannot obtain full swing	Slow operation	Spongy, jerking operation	Boom, dipperstick or bucket cylinders drop under load when valve is neutral
Low oil level/wrong viscosity/ air in system	●	●					●	●	
No hydraulic pressure	●	●							
Improper hose connection	●	●							
Excessive back pressure, check for restriction between outlet and reservoir	●	●					●		
System relief valve malfunctioning	●	●			●		●		
Loose or leaking connectors/ hoses (see Miscellaneous Sec.)		●	●		●				
Oil bypassing in cylinder		●	●		●				
Hydraulic system malfunction		●					●	●	
Pinched/restricted hydraulic hoses (see Miscellaneous Sec.)		●	●		●				
Control not positioned full open			●	●	●			●	
Load check valve leaking			●	●					●
Worn valve section		●	●		●			●	
Circuit relief valve malfunctioning		●		●					
Anti-cavitation check valve/ball stuck or not seating properly				●					●
Cross-over relief valve malfunctioning		●			●			●	
Bent piston rod or swing linkage interference						●		●	
Engine speed too slow		●						●	
Foreign material in backhoe valve swing restrictor orifices								●	

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REPAIR

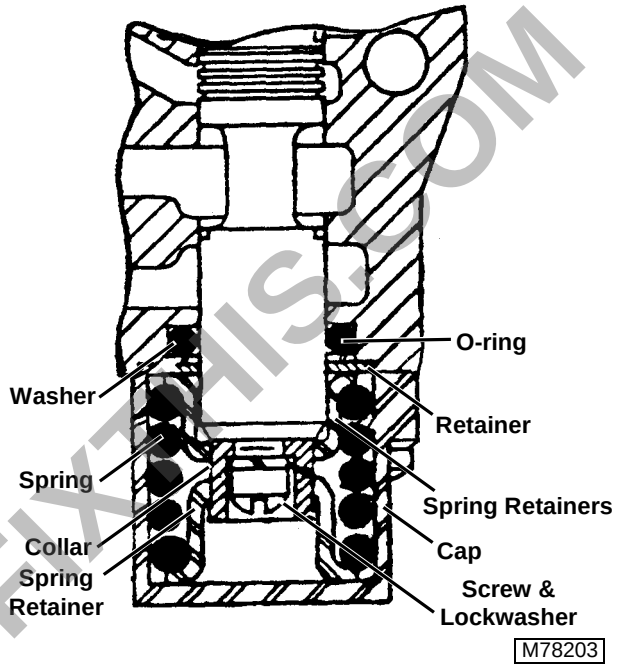
SYSTEM RELIEF VALVE INSPECTION (7, 8, 8A AND 10A BACKHOES ONLY)



1. Remove inlet/outlet housing from valve assembly.
2. Remove relief valve housing and disassemble valve.
3. Check for broken spring or damaged poppet. Replace valve if necessary.
4. Use valve seal kit to replace all seals, washers, and O-rings.
5. 7 Backhoe: Reinstall same number and size of shims that were removed to maintain 105—117 bar (10687—11713 kPa) (1550—1700 psi) relief pressure.
6. 8 & 8A Backhoe: Reinstall same number and size of shims that were removed to maintain 131—141 bar (13101—14134 kPa) (1900—2050 psi) relief pressure.
7. 10A Backhoe: Reinstall same number and size of shims that were removed to maintain 148—159 bar (14813—15847 kPa) (2150—2300 psi) relief pressure.
8. If tests indicate valve relief pressure must be adjusted, add or subtract shims. Shims are available in 1.02 mm (0.04 in.), 0.51 mm (0.02 in.), and 0.254 mm (0.01 in.) sizes.

SPOOL REMOVAL

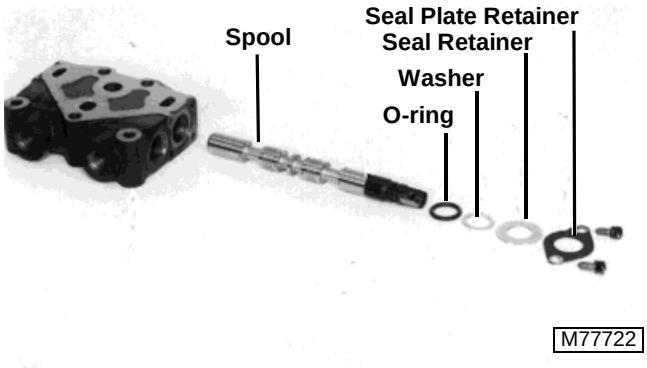
NOTE: Spools in the six valve sections are identical. However, each spool MUST be installed in the valve section from which it was removed.



1. Remove cap.

NOTE: Spring is compressed.

2. Hold opposite end of spool and remove screw and lock washer.
3. Remove collar, spring retainers, spring, seal retainer, washer and O-ring.



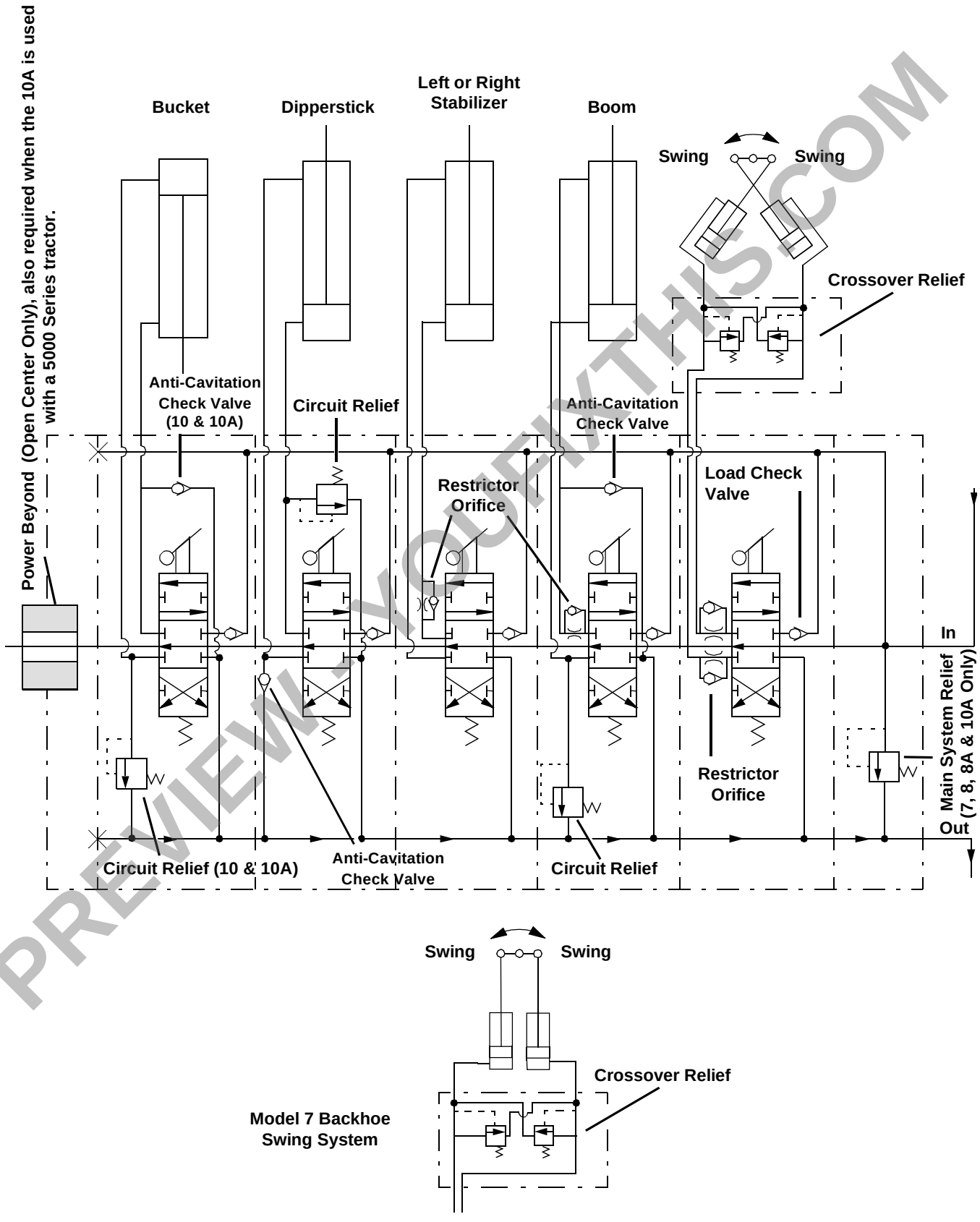
4. Remove seal plate retainer, seal retainer, washer and O-ring.
5. Carefully slide spool from valve section.

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BACKHOE HYDRAULIC SYSTEM

NOTE: Model 8, 8A, 10 & 10A swing system shown.

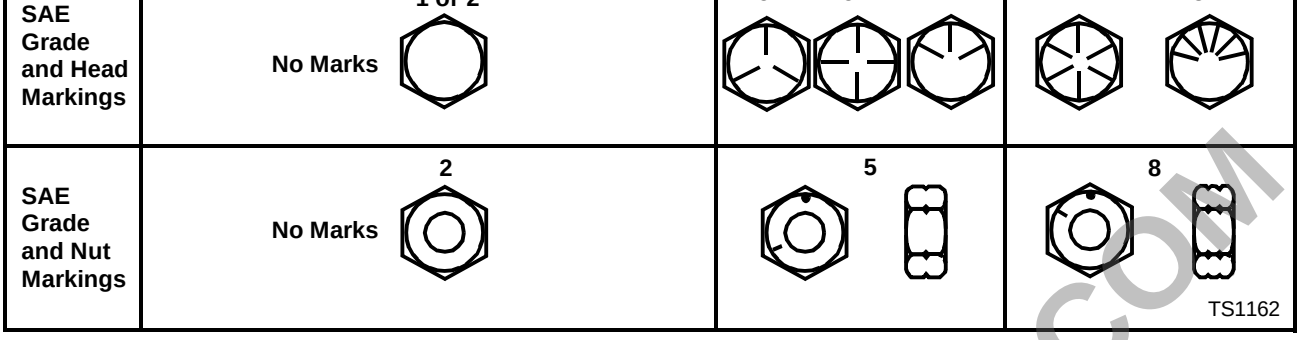


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UNIFIED INCH TORQUE VALUES

SAE Grade and Head Markings	No Marks 1 or 2[b]	5 5.1 5.2	8 8.2
SAE Grade and Nut Markings	No Marks 2	5	8



Size	Grade 1				Grade 2[b]				Grade 5, 5.1 or 5.2				Grade 8 or 8.2			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft
1/4	3.8	2.8	4.7	3.5	6	4.4	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.7	9.8	7.2	12	9	15.5	11.5	19.5	14.5	25	18.5	28	20.5	35	26
3/8	13.5	10	17.5	13	22	16	27.5	20	35	26	44	32.5	49	36	63	46
7/16	22	16	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	305	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head.

Tighten toothed or serrated-type lock nuts to the full torque value.

[a] *"Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.*

[b] *Grade 2 applies for hex cap screws (not hex bolts) up to 152 mm (6 in.) long. Grade 1 applies for hex cap screws over 152 mm (6 in.) long, and for all other types of bolts and screws of any length.*

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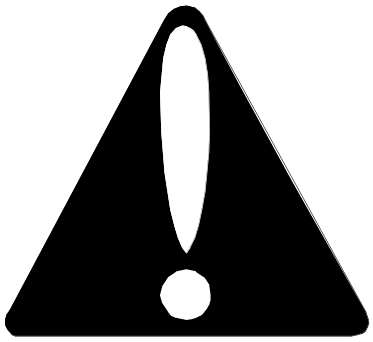
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RECOGNIZE SAFETY INFORMATION



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.

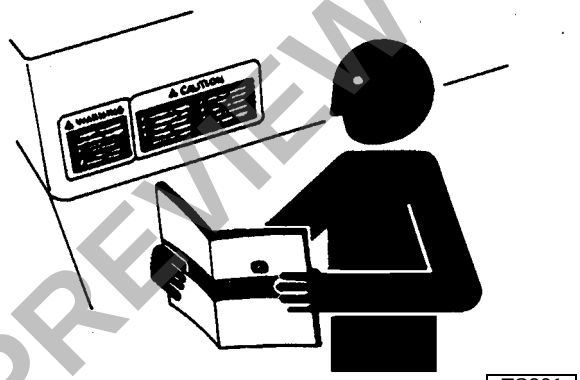
Follow recommended precautions and safe servicing practices.

Understand Signal Words

A signal word—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.

REPLACE SAFETY SIGNS



TS201

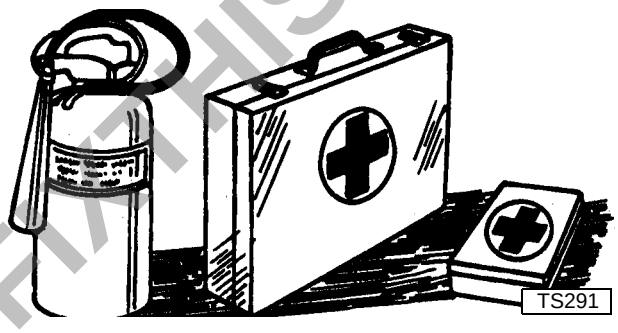
Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.

HANDLE FLUIDS SAFELY-AVOID FIRES

Be Prepared For Emergencies



TS227



TS291

When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

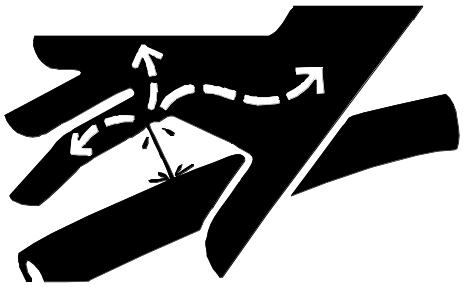
Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

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USE CARE AROUND HIGH-PRESSURE FLUID LINES

Avoid High-pressure Fluids



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

Avoid injury from escaping fluid under pressure by stopping the engine and relieving pressure in the system before disconnecting or connecting 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.

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.

USE SAFE SERVICE PROCEDURES

Wear Protective Clothing

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

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

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



Service Machines Safely

Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.

Use Proper Tools

Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards. Use power tools only to loosen threaded parts and fasteners. For loosening and tightening hardware, use the correct size tools. **DO NOT** use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches. Use only service parts meeting John Deere specifications.

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