

G-III and D Series Skidders Repair (S.N. 586337—)

TECHNICAL MANUAL G-III and D Series Skidders Repair (Serial No. 586337—)

TM2111 30MAY03 (ENGLISH)



For complete service information also see:

G-III and D Series Skidders Operation and Tests (S.N. 586337—)	TM2110
TEAMMATE™ II 1200, 1400, and 1600 Series Inboard Planetary Axles	CTM43
POWERTECH® 4.5 L & 6.8 L Diesel Engines, Base Engine	CTM104
POWERTECH® 4.5 L & 6.8 L Diesel Engines, Level 12 Electronic Fuel System with DE10 STANADYNE® Pump	CTM331
POWERTECH® 8.1L Diesel Engines, Base Engine	CTM86
POWERTECH® 8.1 L Diesel Engines, Level 9 Electronic Fuel System With High Pressure Common Rail	CTM255
Starting Motors and Alternators	CTM77
40 and 4000 Winches	CTM25
60 and 6000 Winches	CTM41
120 Series Hydraulic Cylinders	TMH120A

**Worldwide Construction
And Forestry Division**

Introduction

Foreword

This manual is written for an experienced technician. Essential tools required in performing certain service work are identified in this manual and are recommended for use.

Live with safety: Read the safety messages in the introduction of this manual and the cautions presented throughout the text of the manual.

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

Technical manuals are divided in two parts: repair and operation and tests. Repair sections tell how to repair the components. Operation and tests sections help you identify the majority of routine failures quickly.

Information is organized in groups for the various components requiring service instruction. At the beginning of each group are summary listings of all applicable essential tools, service equipment and tools, other materials needed to do the job, service parts kits, specifications, wear tolerances, and torque values.

Technical Manuals are concise guides for specific machines. They are on-the-job guides containing only the vital information needed for diagnosis, analysis, testing, and repair.

Fundamental service information is available from other sources covering basic theory of operation, fundamentals of troubleshooting, general maintenance, and basic type of failures and their causes.

DX,TMIFC -19-29SEP98-1/1



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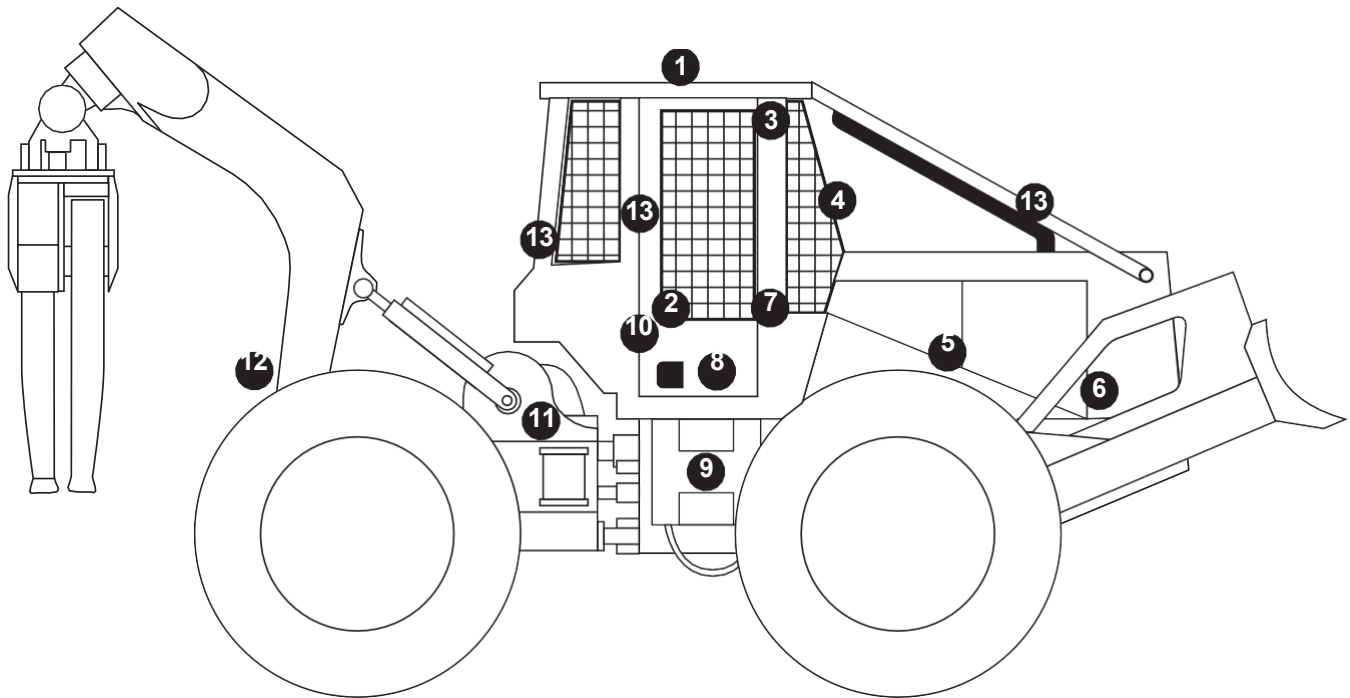
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General Information

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Skidder Safety Features



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Please remember, the operator is the key to preventing accidents.

1. **ROPS/OPS.** Structures designed to help protect the operator are certified to ISO, SAE, and OSHA. Enclosures also deflect sun and rain.
2. **Parking Brake.** Is easily engaged simply by moving the transmission control to the "park" position or pushing the park brake switch. The parking brake engages automatically whenever the engine is stopped.
Engine Start Protection. A neutral start switch allows the engine to start only when the transmission is out-of-gear and the park brake is engaged. The park brake is always engaged during start-up.
3. **Interior Rearview Mirror.** Offers the operator a view of activity behind him.
4. **Front Windshield Wiper.** Wiper cleans windshield area, improving operator visibility in poor weather conditions.

5. **Bypass Start Protection.** Shielding over the starter helps prevent dangerous bypassing starting.
6. **Engine Fan Guard.** A secondary fan guard inside the engine compartment helps prevent contact with the rotating fan blades.
7. **Fire Extinguisher.** A fire extinguisher is provided in the cab.
8. **Operator Manual Holder.** A sealed manual holder keeps manual on machine clean and dry.
9. **Steps.** Wide, skid-resistant provide excellent footing while getting in or out of the operator's station.
10. **Seatbelt Retractors.** Seatbelt retractors help keep belts clean and convenient to use.
11. **Articulation Locking Bar.** A self storing locking bar can be positioned to prevent articulation during servicing or transport.
12. **Backup Alarm.** Alerts bystanders when reverse travel direction is selected by operator.
13. **Handholds.** Large conveniently placed handholds make it easy to enter or exit the operator's station.

Recognize Safety Information

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

Follow the precautions and safe operating practices highlighted by this symbol.

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

On your machine, DANGER signs are red in color, WARNING signs are orange, and CAUTION signs are yellow. DANGER and WARNING signs are located near specific hazards. General precautions are on CAUTION labels.



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Follow Safety Instructions

Read the safety messages in this manual and on the machine. Follow these warnings and instructions carefully. Review them frequently.

Be sure all operators of this machine understand every safety message. Replace operator's manual and safety labels immediately if missing or damaged.



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Operate Only If Qualified

Do not operate this machine unless you have read the operator's manual carefully and you have been qualified by supervised training and instruction.

Familiarize yourself with the job site and your surroundings before operating. Try all controls and

machine functions with the machine in an open area before starting to work.

Know and observe all safety rules that may apply to your work situation and your work site.

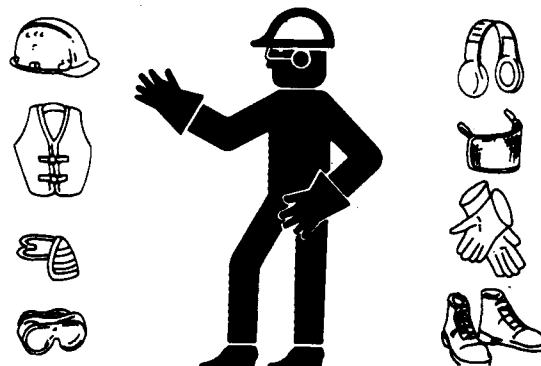
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Wear Protective Equipment

Guard against injury from flying pieces of metal or debris; wear goggles or safety glasses.

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

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



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Avoid Unauthorized Machine Modifications

Modifications of this machine, or addition of unapproved products or attachments, may affect machine stability or reliability, and may create a hazard for the operator or others near the machine.

Always contact an authorized dealer before making machine modifications that change the intended use, weight or balance of the machine, or that alter machine controls, performance or reliability.

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Inspect Machine

Inspect machine carefully each day by walking around it before starting.

Keep all guards and shields in good condition and properly installed. Fix damage and replace worn or broken parts immediately. Pay special attention to hydraulic hoses and electrical wiring.



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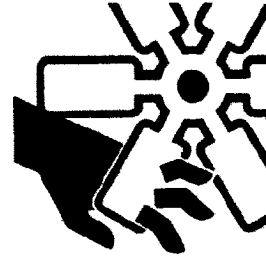
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Stay Clear Of Moving Parts

Entanglements in moving parts can cause serious injury.

Stop engine before examining, adjusting or maintaining any part of machine with moving parts.

Keep guards and shields in place. Replace any guard or shield that has been removed for access as soon as service or repair is complete.



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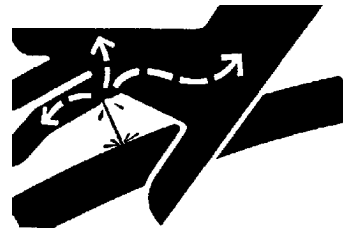
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Avoid High-Pressure Fluids

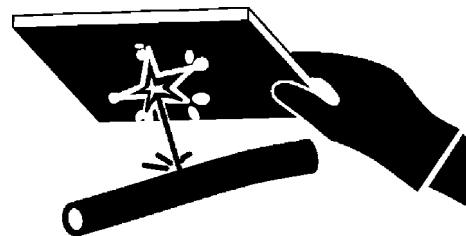
This machine uses a high-pressure hydraulic system. Escaping fluid under pressure can penetrate the skin causing serious injury.

Never search for leaks with your hands. Protect hands. Use a piece of cardboard to find location of escaping fluid. Stop engine and relieve pressure before disconnecting lines or working on hydraulic system.

If hydraulic fluid penetrates your skin, see a doctor immediately. Injected fluid must be removed surgically within hours or gangrene may result. Contact a knowledgeable medical source or the Deere & Company Medical Department in Moline, Illinois, U.S.A.



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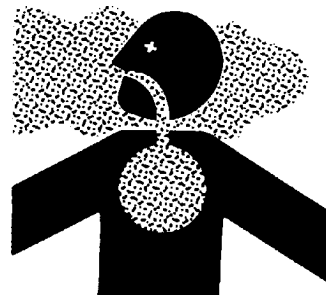
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Beware Of Exhaust Fumes

Prevent asphyxiation. Engine exhaust fumes can cause sickness or death.

If you must operate in a building, provide adequate ventilation. Use an exhaust pipe extension to remove the exhaust fumes or open doors and windows to bring outside air into the area.



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Prevent Fires

Handle Fuel Safely: Store flammable fluids away from fire hazards. Never refuel machine while smoking or when near sparks or flame.

Clean Machine Regularly: Keep trash, debris, grease and oil from accumulating in engine compartment, around fuel lines, hydraulic lines and electrical wiring. Store rags and other combustible materials in a safe, fireproof location. Use only nonflammable products for cleaning the machine or components.

Maintain Hoses and Wiring: Replace hydraulic hoses immediately if they begin to leak, and clean up any oil spills. Examine electrical wiring and connectors frequently for damage.

Remove Debris And Clean The Surrounding Area: Before starting repair work, such as welding, clear the area of any debris or flammable material.

Keep A Fire Extinguisher Available: Always keep a multipurpose fire extinguisher on or near the machine. Know how to use extinguisher properly.



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T133553 -UN-07SEP00

T133554 -UN-07SEP00

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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.



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Prevent Battery Explosions

Battery gas can explode. Keep sparks, lighted matches, and open flame away from the top of battery.

Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).



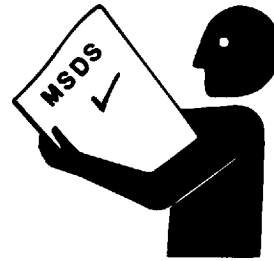
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Handle Chemical Products Safely

Exposure to hazardous chemicals can cause serious injury. Under certain conditions, lubricants, coolants, paints and adhesives used with this machine may be hazardous.

If uncertain about safe handling or use of these chemical products, contact your authorized dealer for a Material Safety Data Sheet (MSDS). The MSDS describes physical and health hazards, safe use procedures, and emergency response techniques for chemical substances. Follow MSDS recommendations to handle chemical products safely.



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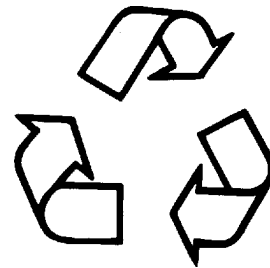
Dispose of Waste Properly

Improper disposal of waste can threaten the environment. Fuel, oils, coolants, filters and batteries used with this machine may be harmful if not disposed of properly.

Never pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants can damage the atmosphere. Government regulations may require using a certified service center to recover and recycle used refrigerants.

If uncertain about the safe disposal of waste, contact your local environmental or recycling center or your dealer for more information.



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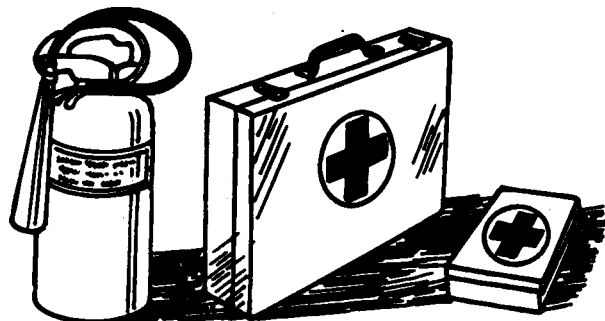
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Prepare for Emergencies

Be prepared if an emergency occurs or 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.



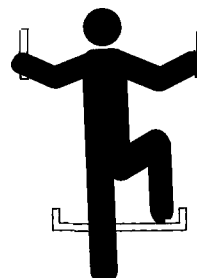
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Use Steps And Handholds Correctly

Prevent falls by facing the machine when you get on and off. Maintain 3-point contact with steps and handrails. Never use machine controls as handholds.

Use extra care when mud, snow, or moisture present slippery conditions. Keep steps clean and free of grease or oil. Never jump when exiting machine. Never mount or dismount a moving machine.



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Start Only From Operator's Seat

Avoid unexpected machine movement. Start engine only while sitting in operator's seat. Ensure all controls and working tools are in proper position for a parked machine.

Never attempt to start engine from the ground. Do not attempt to start engine by shorting across the starter solenoid terminals.



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Use And Maintain Seat Belt

Use seat belt when operating machine. Remember to fasten seat belt when loading and unloading from trucks and during other uses.

Examine seat belt frequently. Be sure webbing is not cut or torn. Replace seat belt immediately if any part is damaged or does not function properly.

The complete seat belt assembly should be replaced every three years, regardless of appearance.



USE SEAT BELT

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Prevent Unintended Machine Movement

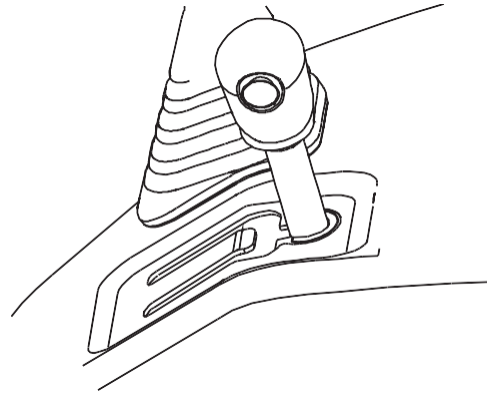
Be careful not to accidentally actuate controls. Move transmission out of gear and lower all equipment to the ground during work interruptions. Follow these steps before allowing co-workers to approach the machine, before standing up, leaving the operator's seat, or exiting the machine:

For machines with transmission lever "park" position:

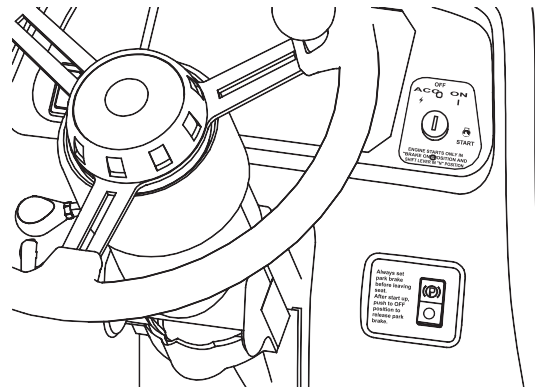
- Lower equipment to the ground
- Move transmission lever to "park"
- Be sure locking sleeve engages console
- Stop the engine

For machines with separate "park brake" switch:

- Lower equipment to the ground
- Move gear selector to neutral position
- Press park brake switch to "on"
- Stop the engine



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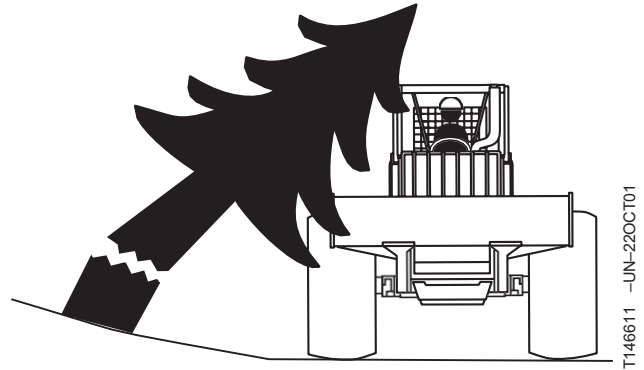
Avoid Work Site Hazards

Plan your operation before starting work. Check skidding trails and landings for stumps, large rocks, drop-offs, muddy areas and standing water. Carefully examine overhead for trees and branches that might fall or strike the operator's station. Take precautions to avoid these hazards.

Be sure co-workers and bystanders are clear of machine before operating. Keep co-workers a safe distance away when skidding, because logs may kick-out unexpectedly.

Use extra care if you must drive over logs or saplings that may be dislodged or spring-up against the machine or bystanders.

Do not operate under low-hanging electrical wires. Contact may cause serious injury or death by electrocution.



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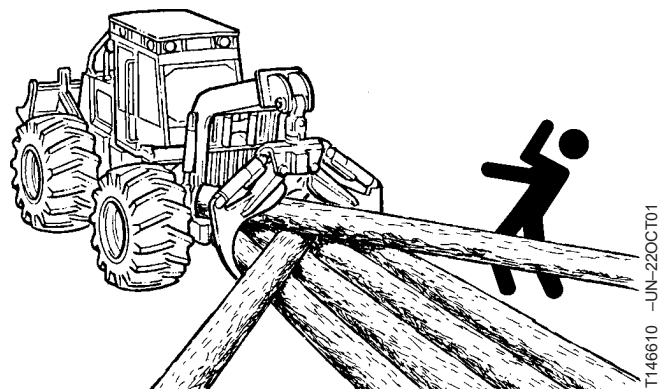
Operate Machine Safely

Wear the seat belt when operating this machine. Do not operate the machine if all elements of the operator protective structure (OPS) are not in place and in good repair.

Use extra care around landings where bystanders are more likely to be present. Do not skid logs past people that are not a safe distance away from logs that may swing or kick-out.

Use extra care when backing-up with logs attached. Make sure the delimbing grate is in good repair and bystanders are a safe distance away.

Be careful when operating in muddy or frozen conditions because the machine may slide or tip more easily. Avoid side slopes when possible. Drive straight up or down slopes to reduce the possibility of tipping.



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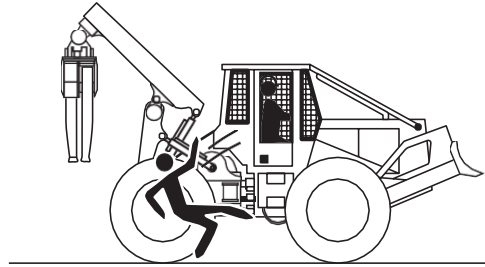
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Keep Riders Off Machine

Only allow operator on machine.

Riders are subject to injury. They may fall from machine, be caught between machine parts, or be struck by foreign objects.

Riders may obstruct operator's view or impair his ability to operate machine safely.



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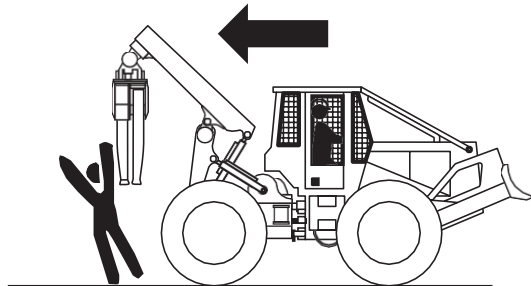
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Avoid Backover Accidents

Before moving machine, be sure all persons are clear of machine path. Turn around and look directly for best visibility. Use mirror to assist in checking around machine. Keep windows and mirror clean, adjusted, and in good repair.

Be certain reverse warning alarm is working properly.

Use a signal person when backing if view is obstructed or when in close quarters. Keep signal person in view at all times. Use prearranged hand signals to communicate.



T145264 -UN-06SEP01

TX03679,0001801 -19-31OCT01-1/1

Avoid Machine Tip Over

Use seat belt at all times.

Do not jump if the machine tips. You will be unlikely to jump clear and the machine may crush you.

Load and unload from trucks or trailers carefully. Be sure truck is wide enough and on a firm level surface. Use loading ramps and attach them properly to truck bed.

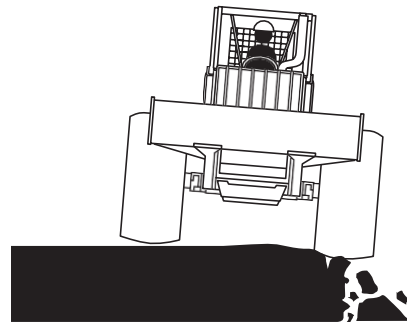
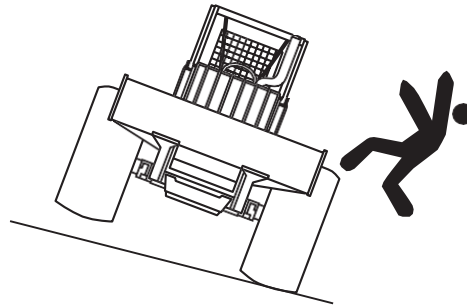
Be careful on slopes. Avoid sharp turns. Avoid stumps, rocks and drop-offs when possible. Use extra care on soft, uneven or frozen ground.

Do not overload. Know the capacity of the machine. Be careful with heavy loads which may affect machine stability.

Ensure solid footing. Use extra care in soft ground conditions that may not uniformly support the wheels. Do not operate close to banks that may cave in and cause machine to tip or fall.



USE SEAT BELT



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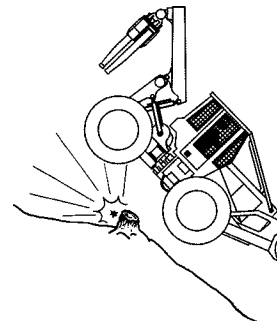
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Operating on Slopes

Avoid side slope travel whenever possible. When working on steep slopes, travel as straight up and down as possible to prevent machine tip over.

Select low gear speed before starting down slope. The slope on which you can operate safely will be limited by ground condition and the load being handled. Use service brakes to control speed.



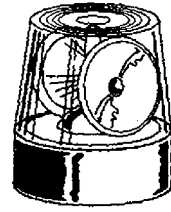
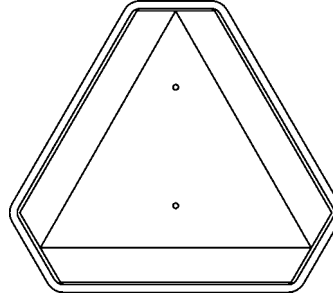
T145730 -UN-20SEP01

TX03679,0001803 -19-31OCT01-1/1

Operating Or Traveling On Public Roads

Machines that work near vehicle traffic or travel slower than normal highway speeds must have proper lighting and markings to assure they are visible to other drivers.

Install additional lights, beacons, slow moving vehicle (SMV) emblems, or other devices and use as required to make the machine visible and identify it as a work machine. Check state and local regulations to assure compliance. Keep these devices clean and in working condition.



T141891 -UN-22MAY01

TX03679,00017C8 -19-14JUN01-1/1

Inspect and Maintain ROPS

A damaged roll-over protective structure (ROPS) should be replaced, not reused.

The protection offered by ROPS will be impaired if ROPS is subjected to structural damage, is involved in an overturn incident, or is in any way altered by welding, bending, drilling, or cutting.

If ROPS was loosened or removed for any reason, inspect it carefully before operating the machine again.

To maintain the ROPS:

- Replace missing hardware using correct grade hardware.
- Check hardware torque.
- Check isolation mounts for damage, looseness or wear; replace them if necessary.
- Check ROPS for cracks or physical damage.

TX03679,000179F -19-20APR01-1/1

Keep the Operator Protective Structure (OPS) in Place

It is important to keep the operator protective structure (OPS) in place (doors, screens, windows, windshield, etc.) to minimize hazards from whipping or intruding objects. To maintain OPS protection, replace damaged parts immediately.

Replace 3-piece hard-coated polycarbonate windshield only with LEXAN® Margard 5000 or equivalent.

The protection offered by OPS will be impaired if OPS is subjected to structural damage, is involved in an overturn incident, or is altered by welding, bending, drilling, or cutting. Damaged OPS components should be replaced, not reused.

Keep all bolts and attaching hardware tight.

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TX,90,JC297 -19-31OCT01-1/1

Add And Operate Attachments Safely

Always verify compatibility of attachments by contacting your authorized dealer. Adding unapproved attachments may affect machine stability or reliability, and may create a hazard for others near the machine.

Ensure that a qualified person is involved in attachment installation. Add guards to machine if operator protection is required or recommended. Verify

that all connections are secure and attachment responds properly to controls.

Carefully read attachment manual and follow all instructions and warnings. In an area free of bystanders and obstructions, carefully operate attachment to learn its characteristics and range of motion.

TX03679,00016F0 -19-14SEP00-1/1

Park And Prepare For Service Safely

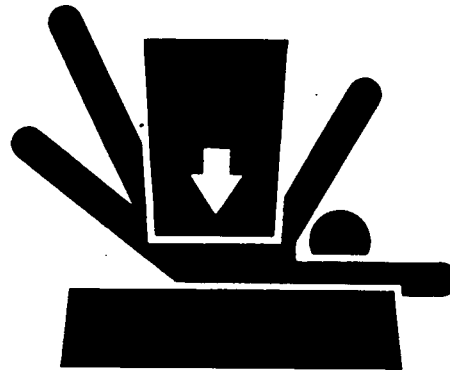
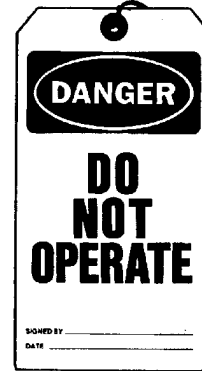
Warn others of service work. Always park and prepare your machine for service or repair properly.

- Park machine on a level surface and lower equipment to the ground.
- Engage park brake.
- Stop engine and remove key.
- Install frame locking bar.
- Attach a “Do Not Operate” tag in an obvious place in the operator’s station.

Securely support machine or attachment before working under it.

- Do not support machine with any hydraulically actuated tools or attachments.
- Do not support machine with cinder blocks or wooden pieces that may crumble or crush.
- Do not support machine with a single jack or other devices that may slip out of place.

Understand service procedures before beginning repairs. Keep service area clean and dry. Use two people whenever the engine must be running for service work.



T133332 -19-14DEC01

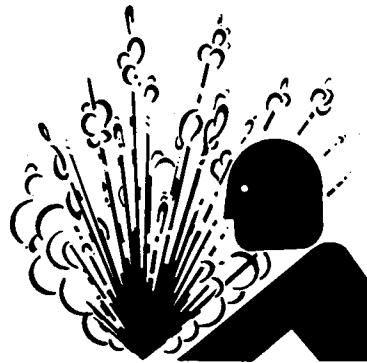
TS229 -JUN-23AUG88

TX03679,0001809 -19-18SEP01-1/1

Service Cooling System Safely

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

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



TS281 -JUN-23AUG88

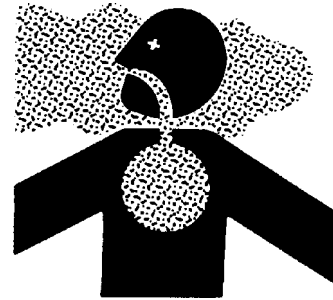
DX,RCAP -19-04JUN90-1/1

Remove Paint Before Welding or Heating

Hazardous fumes can be generated when paint is heated by welding or using a torch. Dust from sanding or grinding paint can also be hazardous.

Remove paint to at least 76 mm (3 in.) from area to be heated. Wear an approved respirator when sanding or grinding paint. If a solvent or paint stripper is used, wash area with soap and water. Remove solvent or paint stripper containers from work area and allow fumes to disperse at least 15 minutes before welding or heating.

Work outside or in a well-ventilated area. Dispose of waste, paint and solvents properly.



T133546 -UN-24AUG00

TX03679,0001732 -19-06SEP00-1/1

Make Welding Repairs Safely

NOTE: Disable electrical power before welding. Turn off main battery switch or disconnect positive battery cable. Separate harness connectors to engine and vehicle microprocessors.

Avoid welding or heating near pressurized fluid lines. Flammable spray may result and cause severe burns if pressurized lines fail as a result of heating. Do not let heat go beyond work area to nearby pressurized lines.

Remove paint properly. Do not inhale paint dust or fumes. Use a qualified welding technician for structural repairs. Make sure there is good ventilation. Wear eye protection and protective equipment when welding.



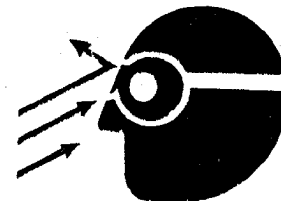
T133547 -UN-31AUG00

TX03679,00016D5 -19-02OCT00-1/1

Drive Metal Pins Safely

Always wear protective goggles or safety glasses and other protective equipment before striking hardened parts. Hammering hardened metal parts such as pins and bucket teeth may dislodge chips at high velocity.

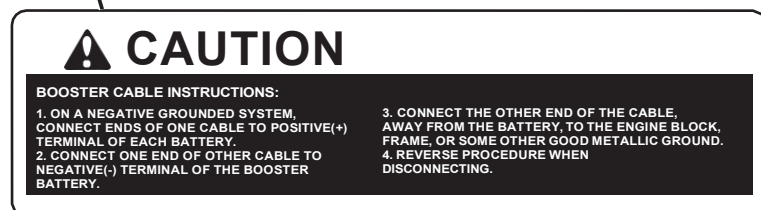
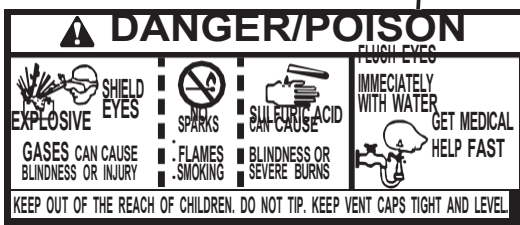
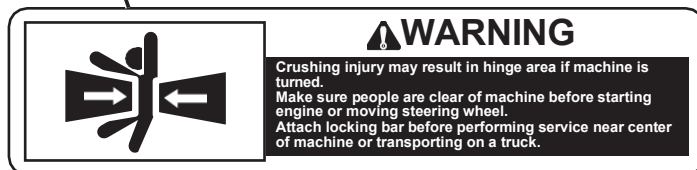
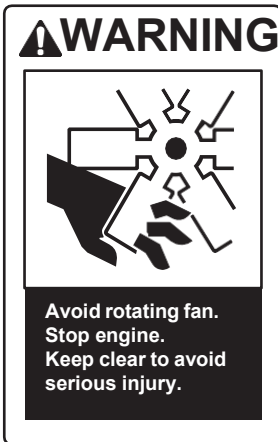
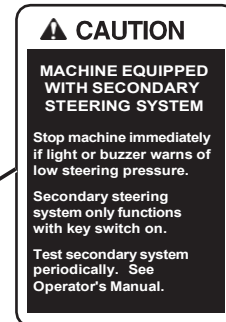
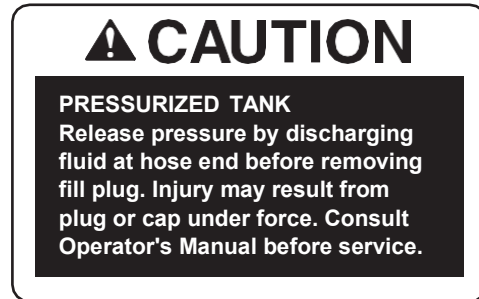
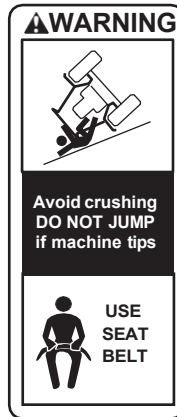
Use a soft hammer or a brass bar between hammer and object to prevent chipping.



T133738 -UN-14SEP00

TX03679,0001745 -19-25SEP00-1/1

Safety Signs



T164308

T164308 -19-24JAN03

Continued on next page

OUC1079,0000567 -19-15NOV02-1/2

⚠ CAUTION

1. AVOID DEATH OR SERIOUS INJURY - Read and understand Operator's Manual before operating this machine.
2. Operate machine only from operator's seat.
3. Before leaving operator's seat:
 - Lower Equipment to ground.
 - Apply Park Brake.
 - Stop Engine.
4. DO NOT permit riders.

⚠ CAUTION



PREVENT MACHINE FIRES

Keep engine compartment and other machine areas free of trash and debris. Clean daily.

Check for fuel or oil leaks every day. Repair and clean up spills immediately.

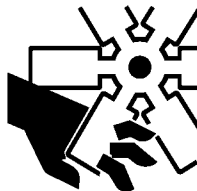
Keep fire extinguishers on machine and properly maintained. Recharge immediately after use.

⚠ WARNING



- Crushing injury could result.
- Do not ride on machine.

⚠ WARNING



Avoid rotating fan. Stop engine. Keep clear to avoid serious injury.

⚠ CAUTION

PRESSURIZED

DO NOT OPEN HOT

Remove Slowly

15 P.S.I.

⚠ WARNING

- Contains spring under load.
- Prevent injury from sudden release by removing capscrews evenly.

⚠ WARNING

Avoid injury from escaping fluid. Contents of this accumulator are under pressure.

1. Refer to proper Machine Model Technical Manual for removal and installation procedure.
2. This accumulator is charged with DRY NITROGEN by the manufacturer and is NOT Rechargeable.

Maximum Working Pressure
22060 kPa [3200 PSI]

⚠ DANGER



Start only from seat in park or neutral. Starting in gear kills.

⚠ WARNING



Crushing injury may result in hinge area if machine is turned. Make sure people are clear of machine before starting engine or moving steering wheel. Attach locking bar before performing service near center of machine or transporting on a truck.

T164307

T164307 -19-24/JAN03

OOU1079,0000567 -19-15NOV02-2/2

Hardware Torque Specifications

Check cap screws and nuts to be sure they are tight. If hardware is loose, tighten to torque shown on the following charts unless a special torque is specified.

04T,90,K271 -19-08AUG91-1/1

Keeping ROPS Installed Properly

CAUTION: Make certain all parts are reinstalled correctly if the roll-over protective structure (ROPS) is loosened or removed for any reason.

The protection offered by ROPS will be impaired if ROPS is subjected to structural damage, is involved in an overturn incident, or is in any way altered by welding, bending, drilling, or cutting. A damaged ROPS should be replaced, not reused.

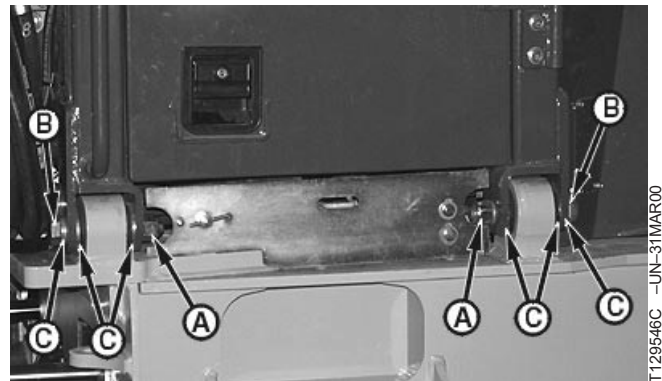
IMPORTANT: Do not over-tighten cap screws as clevis will be deformed.

Install lock nuts (A) onto cap screws (B) until full thread engagement is achieved so nut, washers (C), and head of cap screw are flush against each clevis.

Tighten pin locking cap screws (D) to specification.

Keeping ROPS Installed Properly—Specification

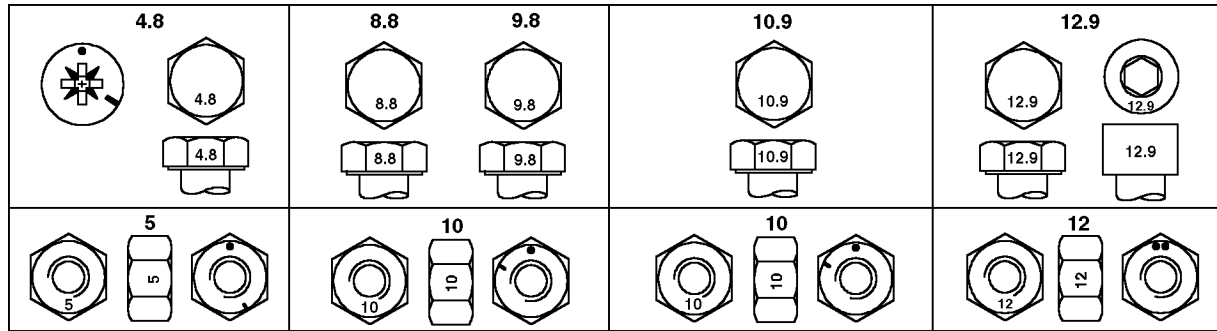
Pin Locking Cap Screw—Torque 130 N•m (95 lb-ft)



A—Lock Nut (2 used) B—
Cap Screw (2 used) C—
Washer (As required)
D—Pin Locking Cap Screw (2 used)

CED,OUO1079,98 -19-26MAY00-1/1

Metric Bolt and Cap Screw Torque Values



Top, Property Class and Head Markings; Bottom, Property Class and Nut Markings

Size	Class 4.8		Class 8.8 or 9.8		Class 10.9		Class 12.9	
	Lubricated ^a N·m(lb-ft)	Dry ^b N·m(lb-ft)	Lubricated ^a N·m(lb-ft)	Dry ^b N·m(lb-ft)	Lubricated ^a N·m(lb-ft)	Dry ^b N·m(lb-ft)	Lubricated ^a N·m(lb-ft)	Dry ^b N·m(lb-ft)
M6	4.7 (3.5)	6 (4.4)	9 (6.6)	11.5 (8.5)	13 (9.5)	16.5 (12.2)	15.5 (11.5)	19.5 (14.5)
M8	11.5 (8.5)	14.5 (10.7)	22 (16)	28 (20.5)	32 (23.5)	40 (29.5)	37 (27.5)	47 (35)
M10	23 (17)	29 (21)	43 (32)	55 (40)	63 (46)	80 (59)	75 (55)	95 (70)
M12	40 (29.5)	50 (37)	75 (55)	95 (70)	110 (80)	140 (105)	130 (95)	165 (120)
M14	63 (46)	80 (59)	120 (88)	150 (110)	175 (130)	220 (165)	205 (150)	260 (190)
M16	100 (74)	125 (92)	190 (140)	240 (175)	275 (200)	350 (255)	320 (235)	400 (300)
M18	135 (100)	170 (125)	265 (195)	330 (245)	375 (275)	475 (350)	440 (325)	560 (410)
M20	190 (140)	245 (180)	375 (275)	475 (350)	530 (390)	675 (500)	625 (460)	790 (580)
M22	265 (195)	330 (245)	510 (375)	650 (480)	725 (535)	920 (680)	850 (625)	1080 (800)
M24	330 (245)	425 (315)	650 (480)	820 (600)	920 (680)	1150 (850)	1080 (800)	1350 (1000)
M27	490 (360)	625 (460)	950 (700)	1200 (885)	1350 (1000)	1700 (1250)	1580 (1160)	2000 (1475)
M30	660 (490)	850 (625)	1290 (950)	1630 (1200)	1850 (1350)	2300 (1700)	2140 (1580)	2700 (2000)
M33	900 (665)	1150 (850)	1750 (1300)	2200 (1625)	2500 (1850)	3150 (2325)	2900 (2150)	3700 (2730)
M36	1150 (850)	1450 (1075)	2250 (1650)	2850 (2100)	3200 (2350)	4050 (3000)	3750 (2770)	4750 (3500)

^a "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings.

^b "Dry" means plain or zinc plated without any lubrication.

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 property class.

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

Make sure fastener 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.



