

325 and 328 Skid Steer Loader Operation and Test

OPERATION & TEST TECHNICAL MANUAL

325 and 328 Skid Steer Loader

TM2191 26MAR19 (ENGLISH)


**Worldwide Construction
And Forestry Division**
PRINTED IN U.S.A.

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.

TX,INTR,MB52 -19-12SEP97-1/1

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TX,TM,FAX -19-03JUL01-1/1

Contents

Section 9000—General Information

Group 01—Safety

Section 9001—Diagnostic Trouble Codes (DTCs)

Group 10—Engagement and Monitor Unit (EMU)
Diagnostic Trouble Codes

Group 20—Hydraulic Control Unit (HCU) Diagnostic
Trouble Codes

Group 30—Left Joystick Controller (JSL)

Group 40—Right Joystick Controller (JSR)

Section 9005—Operational Checkout Procedure

Group 10—Operational Checkout Procedure

Section 9010—Engine

Group 05—Theory Of Operation

Group 15—Diagnose Observable Machine Symptoms

Group 25—Tests

Section 9015—Electrical System

Group 05—System Information

Group 10—System Diagrams

Group 15—Sub-System Diagnostics

Group 20—References

Section 9020—Power Train

Group 05—Theory Of Operation

Group 15—Diagnostic Information

Group 25—Tests

Section 9025—Hydraulic System

Group 05—Theory Of Operation

Group 15—Diagnostic Information

Group 25—Tests

Section 9026—Hydrostatic System

Group 05—Theory Of Operation

Group 15—Diagnostic Information

Group 25—Tests

Section 9031—Heating and Air Conditioning

Group 05—Theory Of Operation

Group 15—Diagnostic Information

Group 25—Tests

Section 9900—Dealer Fabricated Tools

Group 99—Dealer Fabricated Tools

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**Section 9000
General Information**

Contents

	Page
Group 01—Safety	
Recognize Safety Information	9000-01-1
Follow Safety Instructions.....	9000-01-1
Operate Only If Qualified	9000-01-1
Wear Protective Equipment.....	9000-01-2
Avoid Unauthorized Machine	
Modifications.....	9000-01-2
Inspect Machine	9000-01-2
Stay Clear of Moving Parts.....	9000-01-2
Avoid High-Pressure Oils	9000-01-3
Beware of Exhaust Fumes	9000-01-3
Prevent Fires	9000-01-4
Prevent Battery Explosions	9000-01-4
Handle Chemical Products Safely.....	9000-01-4
Dispose of Waste Properly	9000-01-5
Prepare for Emergencies.....	9000-01-5
Use Steps and Handholds	
Correctly	9000-01-5
Start Only From Operator's Seat.....	9000-01-5
Use and Maintain Seat Belt.....	9000-01-6
Prevent Unintended Machine	
Movement.....	9000-01-6
Avoid Work Site Hazards.....	9000-01-6
Keep Riders Off Machine	9000-01-7
Avoid Backover Accidents	9000-01-7
Avoid Machine Tip Over	9000-01-7
Operating or Traveling On Public	
Roads	9000-01-8
Add and Operate Attachments	
Safely.....	9000-01-8
Park And Prepare For Service	
Safely.....	9000-01-8
Service Cooling System Safely	9000-01-9
Remove Paint Before Welding or	
Heating	9000-01-9
Make Welding Repairs Safely	9000-01-9
Drive Metal Pins Safely	9000-01-9

Recognize Safety Information

This is the safety alert symbol. When this symbol is noticed on the 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 the 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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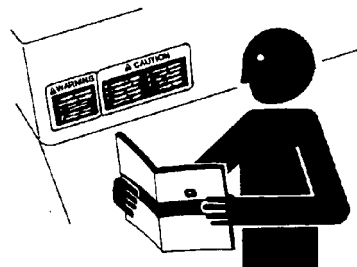
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Follow Safety Instructions

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.



T133556 —UN—24AUG00

TX03679,00016F9 -19-31JAN07-1/1

Operate Only If Qualified

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

Operator should be familiar with the job site and 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 every work situation and work site.

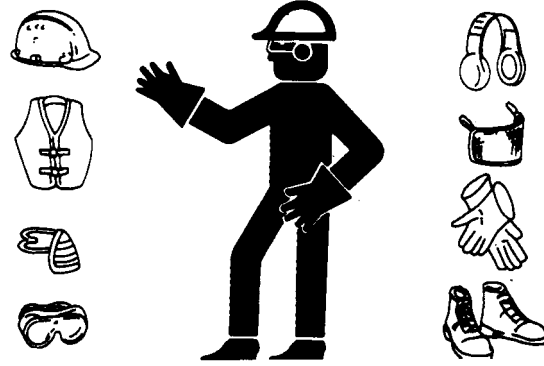
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Wear Protective Equipment

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.



TS206—UN—15APR13

TX03679,00016D0 -19-03JAN07-1/1

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. The installer of any modification which may affect this machine is responsible for establishing that the modification does not adversely

affect the machine or its performance. This applies to all aspects of the machine, including electronic controls.

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.

TX14740,00000FC -19-27FEB04-1/1

Inspect Machine

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

Inspect and Clean the Polycarbonate Windows. See Inspect and Clean Polycarbonate Windows. (Section 4-1.)

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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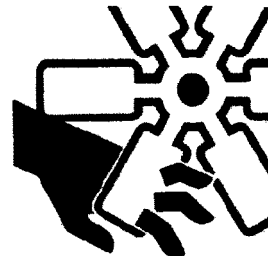
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Stay Clear of Moving Parts

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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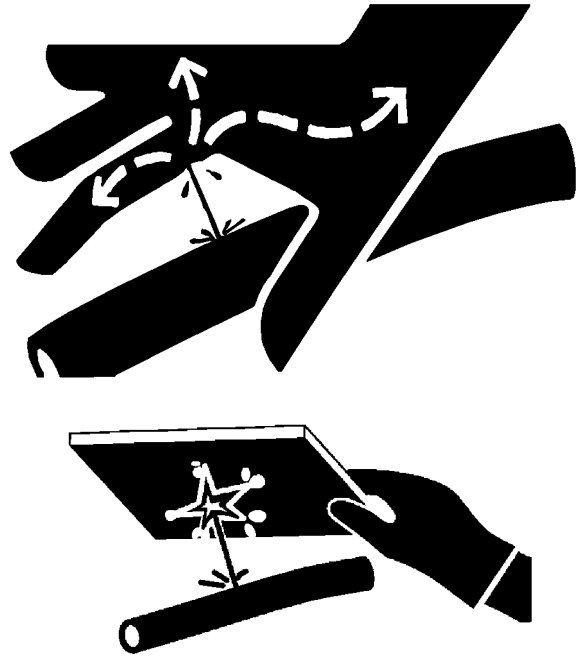
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Avoid High-Pressure Oils

This machine uses a high-pressure hydraulic system. Escaping oil 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 oil. Stop engine and relieve pressure before disconnecting lines or working on hydraulic system.

If hydraulic oil penetrates your skin, see a doctor immediately. Injected oil 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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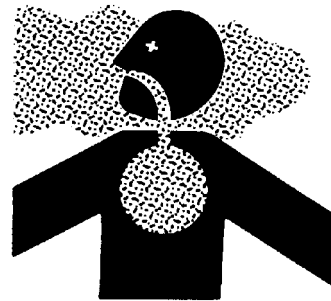
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Beware of Exhaust Fumes

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

If you must operate in an enclosed space, 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.



T133546 —UN—24AUG00

TX03679,00016D4 -19-03NOV08-1/1

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. Never store oily rags or flammable materials inside a machine compartment.

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.

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

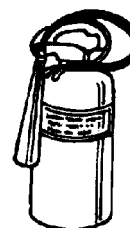
Keep Machine Away From Fire: Maintain a safe distance between sources of fire and the machine so elevated heat, flames or glowing embers never contact any part of the machine, including airborne glowing embers.



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T133554 —UN—07SEP00



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T133552 —UN—15APR13

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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TS204 —UN—15APR13

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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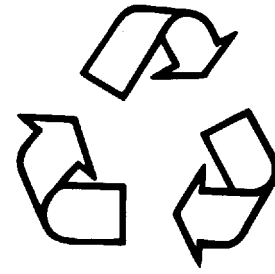
Dispose of Waste Properly

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 authorized dealer for more information.



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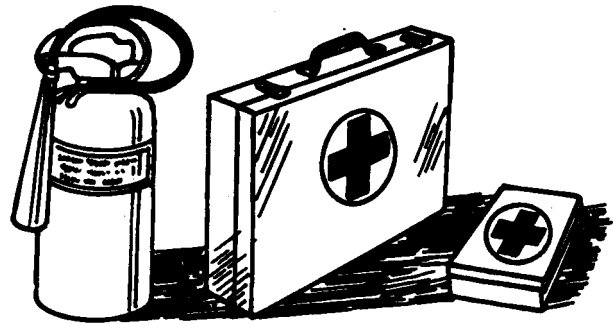
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Prepare for Emergencies

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.



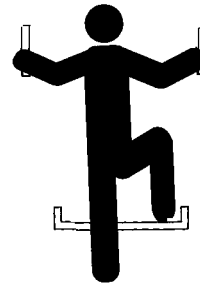
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Use Steps and Handholds Correctly

Prevent falls by facing the machine when getting 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.



T133468—UN—15APR13

TX03679,00016F2 -19-24APR13-1/1

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.



T133715—UN—15APR13

TX03679,0001799 -19-22APR10-1/1

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 3 years, regardless of appearance.



USE SEAT BELT

T133716 —19—17APR13

TX03679,00016DD -19-03NOV08-1/1

Prevent Unintended Machine Movement

Be careful not to accidentally actuate controls when co-workers are present.

Lower all equipment to the ground during work interruptions. Press park brake to park position “P” to engage park brake before allowing anyone to approach the machine.

Follow these same precautions before standing up, leaving the operator's seat, or exiting the machine.



T194377A —UN—26AUG03

TX14740,000006A -19-09JUL03-1/1

Avoid Work Site Hazards

Avoid contact with gas lines, buried cables and water lines. Call utility line location services to identify all underground utilities before starting work.

Prepare work site properly. Avoid operating near structures or objects that could fall onto the machine. Clear away debris that could move unexpectedly if run over.

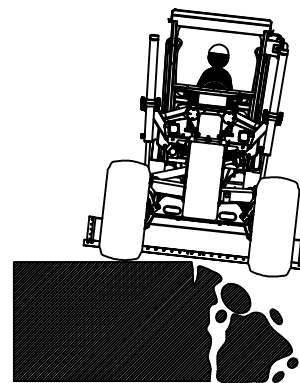
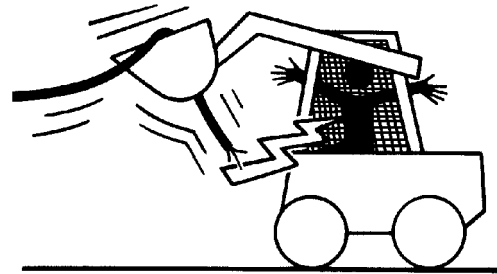
Avoid boom or attachment contact with overhead obstacles or overhead electrical lines. Never move machine closer than 3 m (10 ft) plus twice the line insulator length to overhead wires.

Keep bystanders clear at all times. Use barricades or a signal person to keep vehicles and pedestrians away. Use a signal person if moving machine in congested areas or where visibility is restricted. Always keep signal person in view. Coordinate hand signals before starting machine.

Operate only on solid footing with strength sufficient to support machine. Be especially alert working near embankments or excavations.

Avoid working under over-hanging embankments or stockpiles that could collapse under or on machine.

Reduce machine speed when operating with tool on or near ground when obstacles may be hidden (ie, during snow removal).



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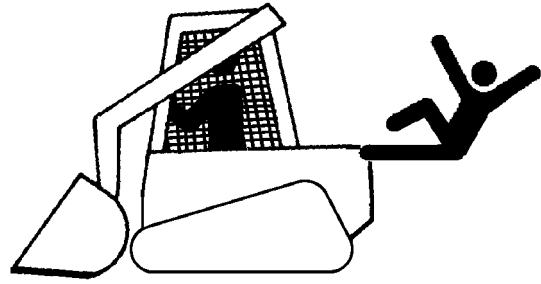
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Keep Riders Off Machine

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 their ability to operate machine safely.



Keep Riders Off Machine

T211522—UN—02JUN05

VD76477,0000045 -19-03SEP15-1/1

Avoid Backover Accidents

Before moving machine, be sure that all persons or vehicles are clear of machine path. Turn around and look directly for best visibility. Keep windows clean.

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.



Avoid Backover Accidents

T211523—UN—02JUN05

VD76477,0000044 -19-24MAY16-1/1

Avoid Machine Tip Over

Use seat belt at all times.

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

Load and unload from trucks or trailers carefully. Ensure that 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. Balance loads so weight is evenly distributed and load is stable. Carry tools and loads close to the ground to aid in visibility and lower center of gravity. Use extra care on wet, soft, rocky, or frozen ground.

Know the capacity of the machine. Do not overload. Be careful with heavy loads. Using oversize buckets or lifting heavy objects reduces machine stability.

Ensure solid footing. Use extra care in soft ground conditions or on structures that may not uniformly support the tracks, especially when raising the boom. Do not operate close to banks or open excavations that may cave in and cause machine to tip or fall.



Use Seat Belt

**USE
SEAT
BELT**



Avoid Machine Tip Over

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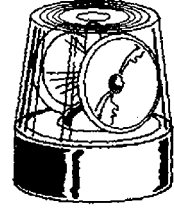
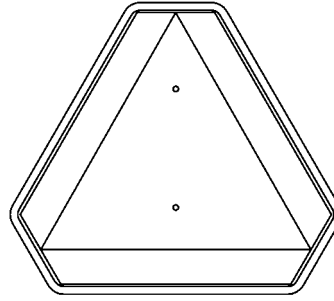
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Operating or Traveling On Public Roads

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—15APR13

TX17994,0000223 -19-11MAR02-1/1

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.

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Park And Prepare For Service Safely

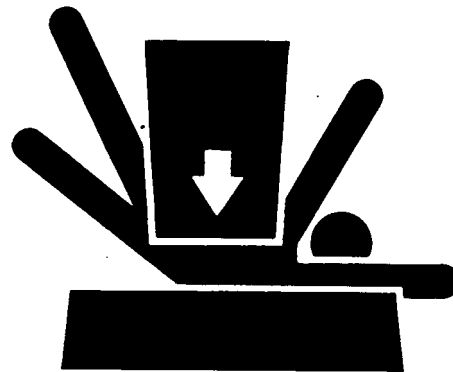
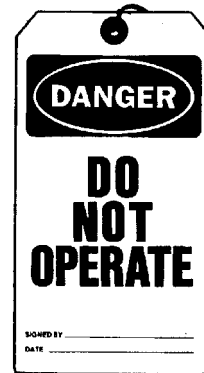
Warn others of service work. Always park and prepare your machine for service or repair properly.

- Park machine on a level surface and lower equipment to the ground.
- Engage park brake. Stop engine and remove key.
- 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 equipment.
- 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—17APR13

TS229—UN—23AUG88

TX14740,0000101 -19-27FEB04-1/1

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 —UN—15APR13

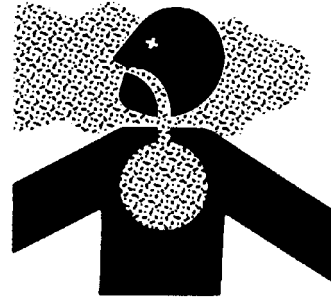
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Remove Paint Before Welding or Heating

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

TX17994,0000228 -19-11MAR02-1/1

Make Welding Repairs Safely

IMPORTANT: 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.



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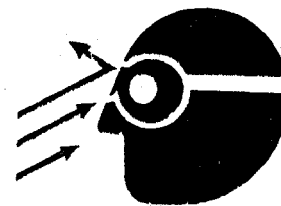
Make sure there is good ventilation. Wear eye protection and protective equipment when welding.

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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—15APR13

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Section 9001

Diagnostic Trouble Codes (DTCs)

Contents

	Page		Page
Group 10—Engagement and Monitor Unit (EMU) Diagnostic Trouble Codes			
Engagement and Monitor Unit (EMU) Diagnostic Trouble Codes—Standard Controls.....	9001-10-1	Glow Plug Relay Output Open or Shorted to Power Diagnostic Procedure.....	9001-10-10
F9D0 — Coolant Temperature Sensor Input at 0 Volts	9001-10-1	F9J9 — Glow Plug Relay Output Shorted to Ground.....	9001-10-12
Coolant Temperature Sensor Input at 0 Volts Diagnostic Procedure	9001-10-1	Glow Plug Relay Output Shorted to Ground Diagnostic Procedure.....	9001-10-13
F9D5 — Coolant Temperature Sensor Input at 5 Volts	9001-10-2	F9K8 — Auto Shutdown Relay Output Open or Shorted to Power	9001-10-14
Coolant Temperature Sensor Input at 5 Volts Diagnostic Procedure	9001-10-2	Auto Shutdown Relay Output Open or Shorted to Power Diagnostic Procedure.....	9001-10-14
F965 — Fuel Level Sensor Input at 5 Volts	9001-10-3	F9K9 — Auto Shutdown Relay Output Shorted to Ground.....	9001-10-16
Fuel Level Sensor Input at 5 Volts Diagnostic Procedure.....	9001-10-3	Auto Shutdown Relay Output Shorted to Ground Diagnostic Procedure.....	9001-10-16
F974 — Alternator Voltage Out of Range High	9001-10-4	F9M9 — Engagement and Monitor Unit (EMU) Warning Alarm Output Shorted to Ground.....	9001-10-17
Alternator Voltage Out of Range High Diagnostic Procedure.....	9001-10-4	Engagement and Monitor Unit (EMU) Warning Alarm Output Shorted to Ground Diagnostic Procedure.....	9001-10-17
F980 — Hydraulic Oil Temperature Sensor Input at 0 Volts	9001-10-5	Engagement and Monitor Unit (EMU) Diagnostic Trouble Codes—EH Controls	9001-10-18
Hydraulic Oil Temperature Sensor Input at 0 Volts Diagnostic Procedure.....	9001-10-5	000070.02 — Park Brake Release Input Erratic or Bad Data.....	9001-10-18
F985 — Hydraulic Oil Temperature Sensor Input at 5 Volts	9001-10-5	Park Brake Release Input Erratic or Bad Data Diagnostic Procedure.....	9001-10-18
Hydraulic Oil Temperature Sensor Input at 5 Volts Diagnostic Procedure.....	9001-10-6	000070.04 — Park Brake Release Input Out of Range Low	9001-10-20
F9P8 — Park Brake Output Open or Shorted to Power	9001-10-6	Park Brake Release Input Out of Range Low Diagnostic Procedure	9001-10-20
Park Brake Output Open or Shorted to Power Diagnostic Procedure.....	9001-10-6	000096.03 — Fuel Level Sensor Out of Range High	9001-10-21
F9P9 — Park Brake Output Shorted to Ground	9001-10-8	Fuel Level Sensor Out of Range High Diagnostic Procedure.....	9001-10-21
Park Brake Output Shorted to Ground Diagnostic Procedure.....	9001-10-8	000096.04 — Fuel Level Sensor Out of Range Low	9001-10-22
F9H8 — Hydraulic Output Open or Hydraulic Output Shorted to Power	9001-10-9	Fuel Level Sensor Out of Range Low Diagnostic Procedure.....	9001-10-22
Hydraulic Output Open or Hydraulic Output Shorted to Power Diagnostic Procedure.....	9001-10-9	00100.01 — Engine Oil Pressure Data Below Normal	9001-10-23
F9H9 — Hydraulic Output Shorted to Ground	9001-10-10	Engine Oil Pressure Data Below Normal Diagnostic Procedure.....	9001-10-24
Hydraulic Output Shorted to Ground Diagnostic Procedure.....	9001-10-10		
F9J8 — Glow Plug Relay Output Open or Shorted to Power	9001-10-10		

Continued on next page

Page	Page
000100.03 — Engine Oil Pressure Out of Range High9001-10-25	Alarm Output Out of Range High Diagnostic Procedure.....9001-10-39
Engine Oil Pressure Out of Range High Diagnostic Procedure.....9001-10-25	001347.05 — Fuel Valve Relay Output Out of Range Low9001-10-40
000107.00 — Engine Air Filter Switch Data Above Normal.....9001-10-26	Fuel Valve Relay Output Out of Range Low Diagnostic Procedure9001-10-40
Engine Air Filter Switch Data Above Normal Diagnostic Procedure.....9001-10-26	001347.06 — Fuel Valve Relay Output Out of Range High9001-10-42
000107.03 — Engine Air Filter Switch Out of Range High9001-10-27	Fuel Valve Relay Output Out of Range High Diagnostic Procedure9001-10-42
Engine Air Filter Switch Out of Range High Diagnostic Procedure9001-10-27	001504.04 — Seat Switch Input Out of Range Low9001-10-43
000110.00 — Engine Coolant Temperature Data Above Normal.....9001-10-28	Seat Switch Input Out of Range Low Diagnostic Procedure.....9001-10-43
Engine Coolant Temperature Data Above Normal Diagnostic Procedure.....9001-10-28	001508.00 — Hydraulic Oil Temperature Data Above Normal.....9001-10-44
000110.03 — Engine Coolant Temperature Out of Range High.....9001-10-29	Hydraulic Oil Temperature Data Above Normal Diagnostic Procedure.....9001-10-44
Engine Coolant Temperature Out of Range High Diagnostic Procedure.....9001-10-29	001508.03 — Hydraulic Oil Temperature Out of Range High.....9001-10-44
000110.04 — Engine Coolant Temperature Out of Range Low.....9001-10-30	Hydraulic Oil Temperature Out of Range High Diagnostic Procedure.....9001-10-45
Engine Coolant Temperature Out of Range Low Diagnostic Procedure.....9001-10-30	001508.04 — Hydraulic Oil Temperature Out of Range Low.....9001-10-45
000158.00 — System Voltage Data Above Normal9001-10-31	Hydraulic Oil Temperature Out of Range Low Diagnostic Procedure.....9001-10-45
System Voltage Data Above Normal Diagnostic Procedure.....9001-10-31	001550.05 — AC Compressor Clutch Output Out of Range Low9001-10-46
000158.01 — System Voltage Data Below Normal9001-10-32	AC Compressor Clutch Output Out of Range Low Diagnostic Procedure.....9001-10-46
System Voltage Data Below Normal Diagnostic Procedure.....9001-10-32	001550.06 — AC Compressor Clutch Output Out of Range High.....9001-10-48
000162.04 — 2-Speed Switch Input Out of Range Low9001-10-33	AC Compressor Clutch Output Out of Range High Diagnostic Procedure.....9001-10-48
2-Speed Switch Input Out of Range Low Diagnostic Procedure9001-10-33	001713.00 — Hydraulic Filter Restriction Switch Data Above Normal.....9001-10-49
000676.05 — Glow Plug Relay Output Out of Range Low9001-10-34	Hydraulic Filter Restriction Switch Data Above Normal Diagnostic Procedure.....9001-10-49
Glow Plug Relay Output Out of Range Low Diagnostic Procedure9001-10-34	001713.03 — Hydraulic Oil Filter Out of Range High9001-10-50
000676.06 — Glow Plug Relay Output Out of Range High9001-10-36	Hydraulic Oil Filter Out of Range High Diagnostic Procedure.....9001-10-50
Glow Plug Relay Output Out of Range High Diagnostic Procedure9001-10-36	001856.04 — Seat Belt Switch Input Out of Range Low9001-10-51
000920.05 — Alarm Output Out of Range Low9001-10-38	Seat Belt Switch Input Out of Range Low Diagnostic Procedure9001-10-52
Alarm Output Out of Range Low Diagnostic Procedure.....9001-10-38	002228.09 — No HCU Data on CAN Bus Abnormal Data Range9001-10-52
000920.06 — Alarm Output Out of Range High9001-10-39	

Continued on next page

Page	Page
No HCU Data on CAN Bus	Hydraulic Valve Power 1 to HCU
Abnormal Data Range Diagnostic	Out of Range High Diagnostic
Procedure.....9001-10-52	Procedure.....9001-10-67
003413.04 — Door Switch Input Out of	523693.03 — Aux Hyd Channel 1 Input
Range Low9001-10-53	Out of Range High9001-10-69
Seat Switch Input Out of Range Low	Aux Hyd Channel 1 Input Out of Range
Diagnostic Procedure.....9001-10-53	High Diagnostic Procedure9001-10-69
003597.03 — 5 Volt Sensor Supply 1	523693.04 — Aux Hyd Channel 1 Input
Out of Range High9001-10-54	Out of Range Low9001-10-70
5 Volt Sensor Supply 1 Out of Range	Aux Hyd Channel 1 Input Out of Range
High Diagnostic Procedure9001-10-54	Low Diagnostic Procedure9001-10-70
003597.04 — 5 Volt Sensor Supply 1	523694.03 — Aux Hyd Channel 2 Input
Out of Range Low9001-10-55	Out of Range High9001-10-70
5 Volt Sensor Supply 1 Out of Range	Aux Hyd Channel 2 Input Out of Range
Low Diagnostic Procedure9001-10-55	High Diagnostic Procedure9001-10-70
520194.13 — Machine Model ID Wrong	523694.04 — Aux Hyd Channel 2 Input
or Missing Calibrate Error9001-10-56	Out of Range Low9001-10-71
520850.04 — Over Ride Switch Input	Aux Hyd Channel 2 Input Out of Range
Out of Range Low9001-10-56	Low Diagnostic Procedure9001-10-71
Over Ride Switch Input Out of Range	523694.12 — Aux Hyd Channel 2 Input
Low Diagnostic Procedure9001-10-56	Device Fault9001-10-72
521050.04 — Aux Flow On-Off Switch	Aux Hyd Channel 2 Input Device Fault
Input Out of Range Low9001-10-57	Diagnostic Procedure.....9001-10-72
Aux Flow On-Off Switch Input Out	523917.05 — Two Speed Output Out
of Range Low—EH Control	of Range Low9001-10-73
Machines.....9001-10-57	Two Speed Output Out of Range Low
522379.05 — Park Brake Release	Diagnostic Procedure.....9001-10-73
Output Out of Range Low9001-10-58	523917.06 — Two Speed Output Out
Park Brake Release Output Out	of Range High9001-10-73
of Range Low Diagnostic	Two Speed Output Out of Range High
Procedure.....9001-10-58	Diagnostic Procedure.....9001-10-73
522379.06 — Park Brake Release	523935.05 — Aux Hyd Extend Output
Output Out of Range High.....9001-10-60	Out of Range Low9001-10-75
Park Brake Release Output Out	Aux Hyd Extend Output Out of Range
of Range High Diagnostic	Low Diagnostic Procedure9001-10-75
Procedure.....9001-10-60	523935.06 — Aux Hyd Extend Output
522398.02 — Park Brake Run Switch	Out of Range High9001-10-77
Input Erratic or Bad Data.....9001-10-61	Aux Hyd Extend Output Out of Range
Park Brake Release Input Erratic	High Diagnostic Procedure9001-10-77
or Bad Data Diagnostic	523941.05 — Aux Hyd Retract Output
Procedure.....9001-10-61	Out of Range Low9001-10-79
522398.04 — Park Brake Run Switch	Aux Hyd Extend Output Out of Range
Input Out of Range Low9001-10-63	Low Diagnostic Procedure9001-10-79
Park Brake Release Input Out of Range	523941.06 — Aux Hyd Retract Output
Low Diagnostic Procedure9001-10-63	Out of Range High9001-10-81
523217.06 — Hydraulic Valve Power 3	Aux Hyd Retract Output Out of Range
to HCU Out of Range High.....9001-10-64	High Diagnostic Procedure9001-10-81
Hydraulic Valve Power 3 to HCU	524225.04 — Remote Start Input Out
Out of Range High Diagnostic	of Range Low9001-10-83
Procedure.....9001-10-64	Remote Start Input Out of Range Low
523218.06 — Propel Valve Power 2 to	Diagnostic Procedure.....9001-10-83
HCU Out of Range High.....9001-10-65	524264.11 — Checksum Error
Propel Valve Power 2 to HCU	Unknown Fault9001-10-84
Out of Range High Diagnostic	Checksum Error Unknown Fault
Procedure.....9001-10-66	Diagnostic Procedure.....9001-10-84
523219.06 — Hydraulic Valve Power 1	
to HCU Out of Range High.....9001-10-67	

Continued on next page

	Page
Group 20—Hydraulic Control Unit (HCU)	
Diagnostic Trouble Codes	
Hydraulic Control Unit (HCU)	
Diagnostic Trouble Codes	9001-20-1
000091.03 — Throttle Sensor Out of	
Range High	9001-20-1
000091.03—Throttle Sensor Out	
of Range High Diagnostic	
Procedure.....	9001-20-1
000091.04 — Throttle Sensor Out of	
Range Low	9001-20-2
000091.04—Throttle Sensor Out	
of Range Low Diagnostic	
Procedure.....	9001-20-2
000091.16 — Throttle Sensor	
Moderately High Value	9001-20-2
000091.16—Throttle Sensor	
Moderately High Value Diagnostic	
Procedure.....	9001-20-2
000091.18 — Throttle Sensor	
Moderately Low Value.....	9001-20-3
000091.18—Throttle Sensor	
Moderately Low Value Diagnostic	
Procedure.....	9001-20-3
000168.03 — Unswitched Power Input	
Out of Range High	9001-20-4
Unswitched Power Input Out of Range	
High Diagnostic Procedure	9001-20-4
000168.04 — Unswitched Power Input	
Out of Range Low	9001-20-5
Unswitched Power Input Out of Range	
Low Diagnostic Procedure	9001-20-5
000190.12 — Engine Speed Sensor	
Device Fault.....	9001-20-5
Engine Speed Sensor Device Fault	
Diagnostic Procedure.....	9001-20-5
000237.02 — Vehicle Identification	
Erratic or Bad Data.....	9001-20-6
001594.00 — Left Speed Sensor Input	
Data Above Normal.....	9001-20-6
Left Speed Sensor Input Data	
Above Normal Diagnostic	
Procedure.....	9001-20-6
001594.01 — Left Speed Sensor Input	
Data Below Normal	9001-20-7
Left Speed Sensor Input Data	
Below Normal Diagnostic	
Procedure.....	9001-20-7
001594.02 — Left Speed Sensor Input	
Erratic or Bad Data.....	9001-20-8
Left Speed Sensor Input Erratic or Bad	
Data Diagnostic Procedure	9001-20-9
001594.14 — Left Speed Sensor	
Input	9001-20-11
Left Speed Sensor Input Diagnostic	
Procedure.....	9001-20-11

001595.00 — Right Speed Sensor	
Input Data Above Normal	9001-20-12
Right Speed Sensor Input Data	
Above Normal Diagnostic	
Procedure.....	9001-20-12
001595.01 — Right Speed Sensor	
Input Data Below Normal	9001-20-13
Right Speed Sensor Input Data	
Below Normal Diagnostic	
Procedure.....	9001-20-13
001595.14 — Right Speed Sensor	
Input	9001-20-15
Right Speed Sensor Input Diagnostic	
Procedure.....	9001-20-15
002201.09 — Right Joystick CAN Data	
Abnormal Data Rate.....	9001-20-16
Right Joystick CAN Data	
Abnormal Data Rate Diagnostic	
Procedure.....	9001-20-16
002213.09 — Left Joystick CAN Data	
Abnormal Data Rate.....	9001-20-17
Left Joystick CAN Data Abnormal Data	
Rate Diagnostic Procedure	9001-20-17
002392.05 — Backup Alarm Output	
Out of Range Low	9001-20-17
Backup Alarm Output Out of Range	
Low Diagnostic Procedure	9001-20-17
002660.07 — Right Joystick X-axis	
Mechanical Fault.....	9001-20-18
Right Joystick Mechanical Fault	
Diagnostic Procedure.....	9001-20-18
002661.07 — Right Joystick Y-axis	
Mechanical Fault.....	9001-20-19
Right Joystick Mechanical Fault	
Diagnostic Procedure.....	9001-20-19
002697.07 — Left Joystick Mechanical	
Fault	9001-20-19
Left Joystick Mechanical Fault	
Diagnostic Procedure.....	9001-20-19
002698.07 — Left Joystick Mechanical	
Fault	9001-20-20
Left Joystick Mechanical Fault	
Diagnostic Procedure.....	9001-20-20
003597.03 — 5 Volt Sensor Supply 1	
Out of Range High	9001-20-20
5 Volt Sensor Supply 1 Out of Range	
High Diagnostic Procedure	9001-20-20
003597.04 — 5 Volt Sensor Supply 1	
Out of Range Low	9001-20-22
5 Volt Sensor Supply 1 Out of Range	
Low Diagnostic Procedure	9001-20-22
003597.03 — 5 Volt Sensor Supply 2	
Out of Range High	9001-20-23
5 Volt Sensor Supply 2 Out of Range	
High Diagnostic Procedure	9001-20-23
003597.04 — 5 Volt Sensor Supply 2	
Out of Range Low	9001-20-25

Continued on next page