

Manual No.:KM-3540DE
Vol. No. :T3540DE-00

350D and 400D Articulated Dump Truck Operation and Tests

**TECHNICAL MANUAL
350D and 400D Articulated Dump**

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Section 9000 General Information

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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 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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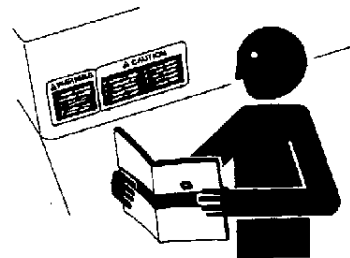
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Follow Safety Instructions

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 -19-14MAR01-1/1

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.

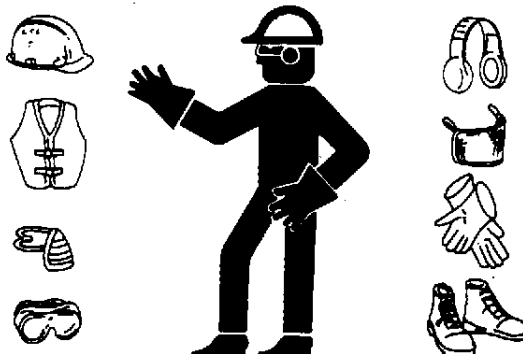
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Wear Protective Equipment

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.



TS206 -JUN-23AUG88

TX03679,00016D0 -19-30OCT00-1/1

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.

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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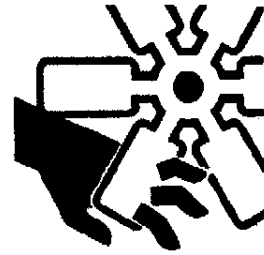
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Stay Clear Of Moving Parts

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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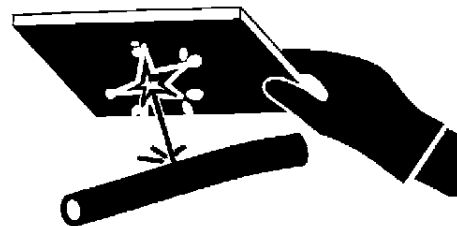
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Avoid High-Pressure Fluids

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 .



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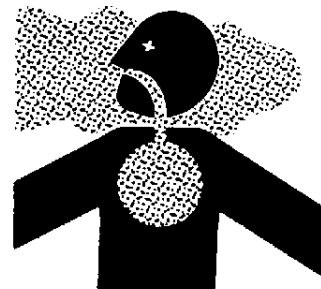
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Beware Of Exhaust Fumes

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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TX03679,00016D4 -19-14SEP00-1/1

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.



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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).



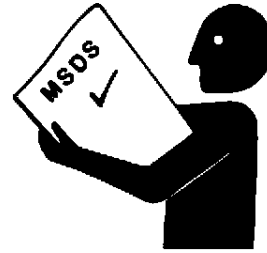
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Handle Chemical Products Safely

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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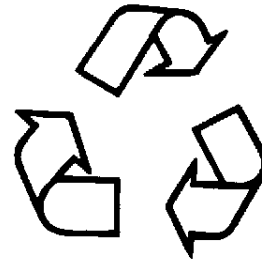
Dispose of Waste Properly

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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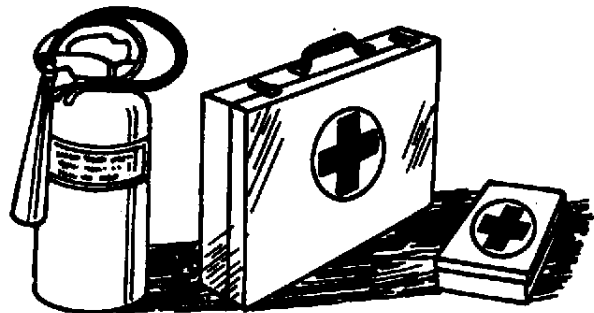
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Prepare for Emergencies

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.



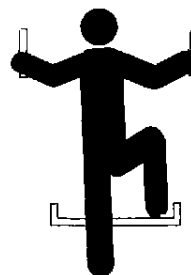
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Use Steps And Handholds Correctly

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.



T133468 -UN-30AUG00

TX03679,00016F2 -19-14SEP00-1/1

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.



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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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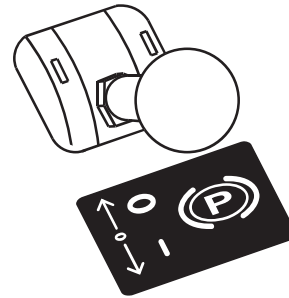
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Prevent Unintended Machine Movement

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

Ensure dump body is lowered during work interruptions. Place transmission control in neutral, engage park brake and stop engine before allowing anyone to approach the machine.

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



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Avoid Work Site Hazards

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.

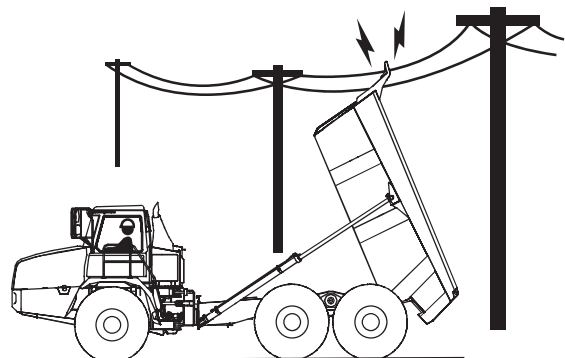
Avoid contact with overhead obstacles or overhead electrical lines. Never move any part of machine or load closer than 3 m (10 ft) plus twice the line insulator length to overhead wires.

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.

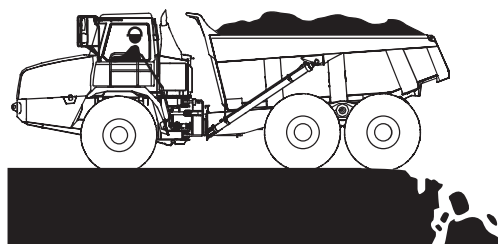
Operate only on solid footing with strength sufficient to support machine. Be especially alert working near embankments or excavations, or when dump body is in raised position.

Avoid working on stockpiles that could collapse under machine.

Use caution when backing up to berms.



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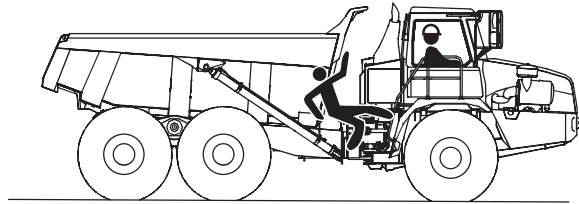
Keep Riders Off Machine

Use seat belt at all times.

Only allow operator on machine except when necessary for instruction or short periods of observation.

Riders are subject to injury. They may fall from machine, be caught between machine parts, or be struck by foreign objects. They also may obstruct operator's view or impair his ability to operate machine safely.

Use the instructional seat only to accommodate trainers or persons needing to observe machine operation for short periods.



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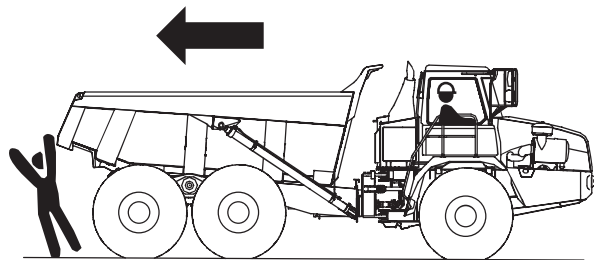
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Avoid Backover Accidents

Before moving machine, be sure all persons are clear of machine path. Where conditions permit, raise dump body for better visibility to the rear. Use mirrors to assist in checking all around machine. Keep windows and mirrors clean, adjusted, and in good repair.

Be certain backup 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.



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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.

Use extra care when dump body is raised. Machine stability is greatly reduced when dump body is raised. Drive slowly. Avoid sharp turns and uneven ground.

Be careful on slopes and soft, rocky, or frozen ground. Traction and stability are reduced by slopes and adverse terrain. Avoid piles of dirt and banks or excavations that may cave in and cause the machine to tip or fall.

Do not overload the machine. Oversize loads reduce machine stability, increase tire flex, and erode travel surfaces. Braking capability and brake life are also reduced.

If machine tips, carefully inspect brake and hydraulic lines, electrical wiring, and machine structure before operating.



**USE
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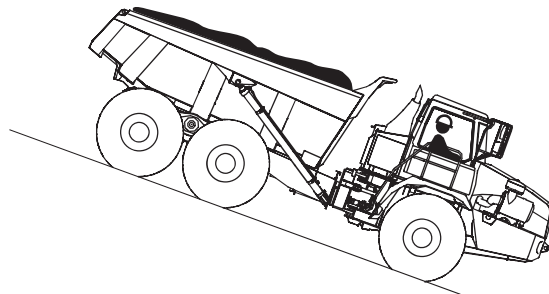
Operating on Slopes

Avoid sideslope travel whenever possible.

Check service brake condition frequently when operating on slopes.

Select low gear speed before starting down slope. The maximum slope you can operate on will be limited by ground conditions and load being handled.

Use transmission retarder (if equipped) or exhaust brake and service brakes, to control speed. Sudden brake application with a loaded dump body could cause loss of machine control.



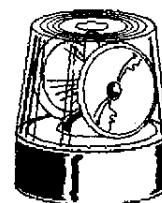
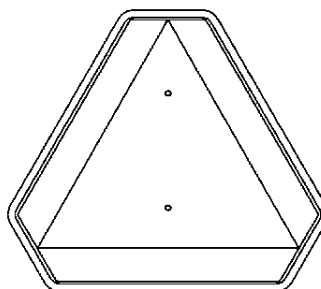
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Operating Or Traveling On Public Roads

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. Mirrors are especially important for the operator when on roadways.

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.



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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.

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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.
- Lower dump body unless raised position is required for service.
- Engage park brake.
- Stop engine and remove key.
- Attach a “Do Not Operate” tag in an obvious place in the operator’s station.
- Install the articulation safety locking bar.
- Install service locks if dump body or cab are raised for service.

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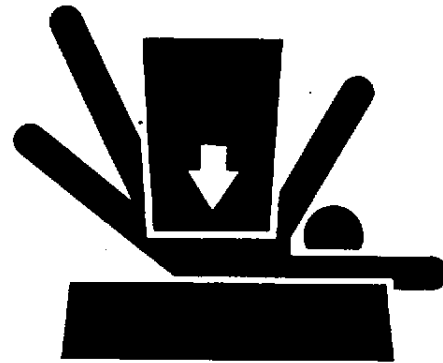


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Securely support machine before working under it.

Install wheel chocks to ensure machine cannot move backward or forward during service.

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



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Service Tires Safely

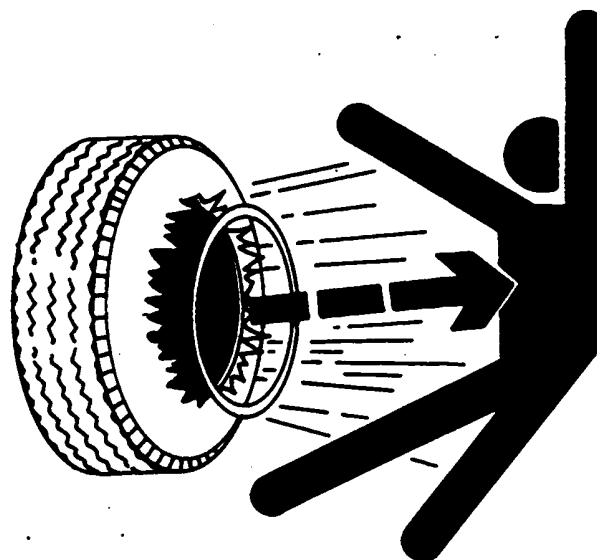
Explosive separation of a tire and rim parts can cause serious injury or death.

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

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

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

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



TS211 -UN-23AUG88

DX,RIM -19-24AUG90-1/1

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.



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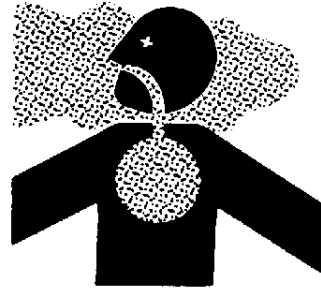
DX,RCAP -19-04JUN90-1/1

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.



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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.



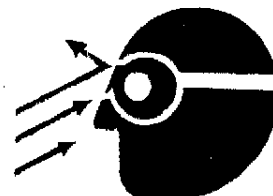
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Drive Metal Pins Safely

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.



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Safety

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Section 9005 Operational Checkout Procedure

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Operational Checkout

Use this procedure to check operation of the machine. This procedure is designed so you can make a quick check of machine operation while performing specific checks from the operator's seat.

Should you experience a problem with the machine, you will find helpful diagnostic information in this checkout that will help pinpoint the cause.

A location will be required which is level and has adequate space to complete the checks. No tools or equipment are needed to perform the checkout procedure.

Complete the necessary visual checks (oil levels, oil condition, external leaks, loose hardware, linkage, wiring, etc.) prior to doing the operational checkout. The machine must be at operating temperature for many of the checks.

Start at the top of the left column and read completely down column before performing check. Follow this sequence from left to right. In the far right column, if no problem is found, you will be instructed to go to next check. If a problem is indicated, you will be referred to either a group in this manual for a specific test or the repair manual for a repair procedure.

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① Operational Checks—Key Switch ON, Engine OFF

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Operational Checkout Procedure

<p>Gauges and Indicator Lights Check</p>	<p>With battery disconnect switch ON, turn key switch to ON position.</p> <p>Do all indicator lights come ON or flash?</p> <p>Do all gauges and speedometer move to center position?</p> <p>Do all sections of monitor liquid crystal display's appear?</p> <p>Do all sections of transmission control display and mode button indicator light come ON?</p> <p>Does audible alarm come ON?</p> <p><i>NOTE: Cold start indicator light will remain ON for a maximum of 20 seconds in low ambient temperature conditions.</i></p> <p><i>Air pressure indicator light may remain ON, depending on system air pressure.</i></p> <p>After 3 seconds, do all gauges and displays return to normal operation mode and audible alarm go OFF?</p> <p>Do all indicator lights, except for secondary steering (marked emergency steering), battery charge, and park brake, go OFF?</p>	<p>YES: Go to next check.</p> <p>NO: Check circuit breakers and fuses. Reset tripped breakers and/or replace fuses as necessary.</p> <p>Check indicator light bulbs. Replace if necessary.</p> <p>Go to Monitor Display Unit Circuit Theory of Operation. (See Group 9015-15.)</p> <p>-- -1/1</p>
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