

# **85D Excavator Diagnostic**

## **OPERATION AND TEST MANUAL**

### **Compact models 85D**

**TM10754 11SEP15 (ENGLISH)**

**For complete service information also see:**

**JDLink (MTG) Technical Manual                      TM114519**

**85D Excavator Repair                                      TM10755**

**Super Caddy Oil Cleanup Procedure                      CTM310**

**John Deere Construction and Forestry**

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# 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.

**CAUTION:**

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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.

We need your help to continually improve our technical publications. Please copy this page and FAX or mail your comments, ideas and improvements.

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**THANK YOU!**

## Section 9000 - GENERAL INFORMATION

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## Group 01 - Safety

### Recognize Safety Information



#### *Safety Alert Symbols*



**▲ WARNING**

**▲ CAUTION**

#### *Safety Alert Symbols*

**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.

### Follow Safety Instructions

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

Keep safety signs in good condition.

Be sure new equipment components and repair parts include the current safety signs.

Be sure all operators of this machine understand every safety message. Replace operator's manual and safety signs immediately if missing or damaged. Replacement safety signs are available from your authorized dealer.

### Operate Only If Qualified

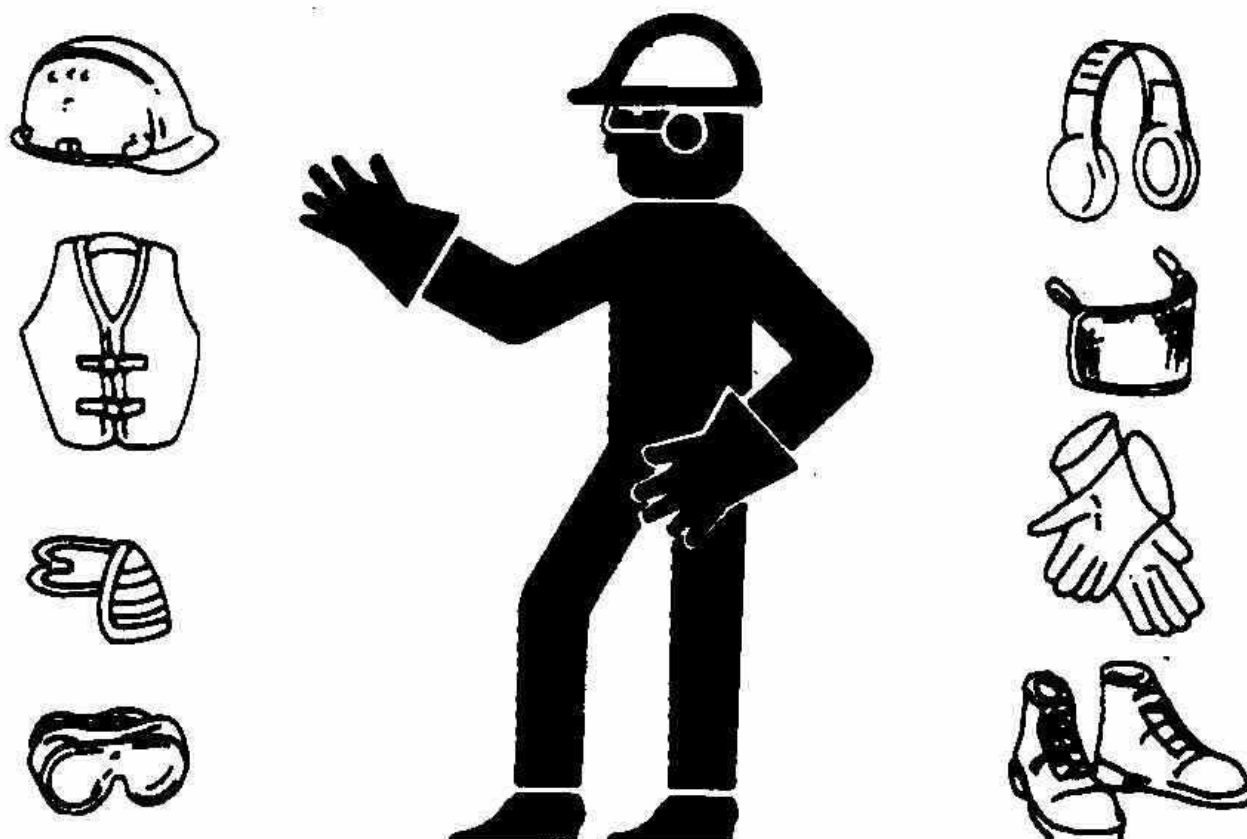
Do not operate this machine unless the operator's manual has been read carefully, and you have been qualified by supervised training and instruction.

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.



## Wear Protective Equipment



### 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.

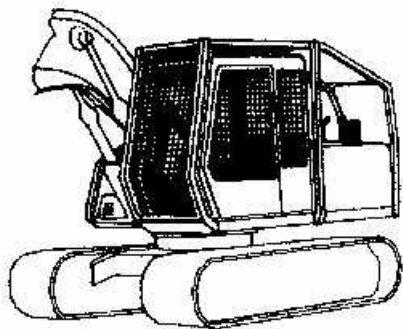
## Avoid Unauthorized Machine Modifications

John Deere recommends using only genuine John Deere replacement parts to ensure machine performance. Never substitute genuine John Deere parts with alternate parts not intended for the application as these can create hazardous situations or hazardous performance. Non-John Deere parts, or any damage or malfunctions resulting from their use, are not covered by any John Deere warranty.

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 the electronic controls of this machine is responsible for establishing that the modification does not adversely affect the machine or its performance.

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.

## Add Cab Guarding for Special Uses



### ***Cab Guarding***

Special work situations or machine attachments may create an environment with falling or flying objects. Working near an overhead bank, doing demolition work, using a hydraulic hammer, or working in a wooded area, for example, may require added guarding to protect the operator.

FOPS (falling object protective structures) and special screens or guarding should be installed when falling or flying objects may enter or damage the machine. Contact your authorized dealer for information on devices intended to provide protection in special work situations.

## **Inspect Machine**



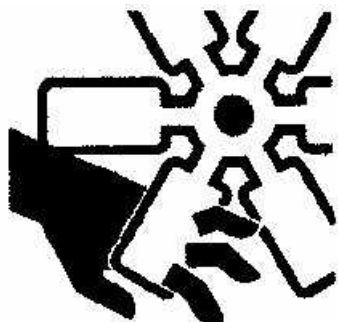
### ***Inspect Machine***

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.

## **Stay Clear of Moving Parts**



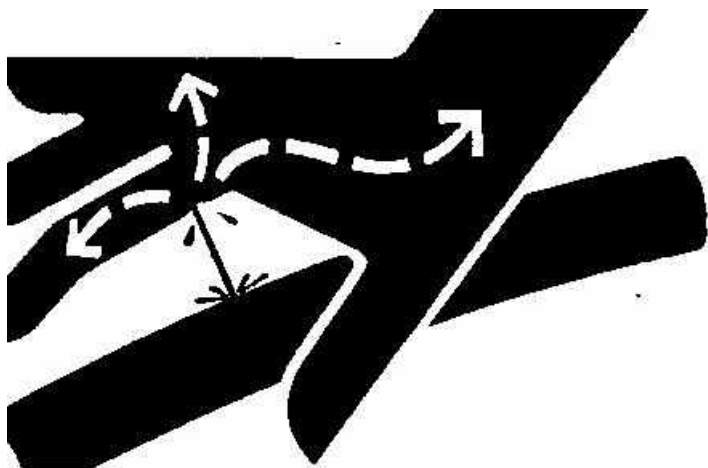
## Stay Clear Of Moving Parts

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.

## Avoid High-Pressure Fluids



### High Pressure

Inspect hydraulic hoses periodically – at least once per year – for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage.

Replace worn or damaged hose assemblies immediately with John Deere approved replacement parts.

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

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

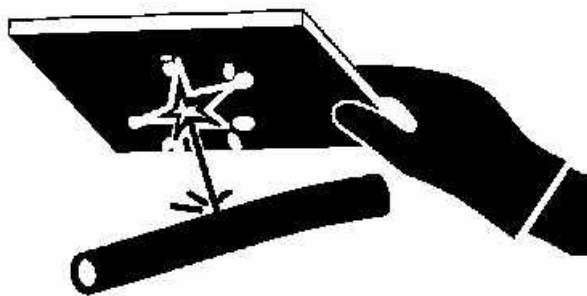
Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available in English from Deere & Company Medical Department in Moline, Illinois, U.S.A., by calling 1-800-822-8262 or +1 309-748-5636.

## Avoid High-Pressure Oils



## Avoid High Pressure Oils



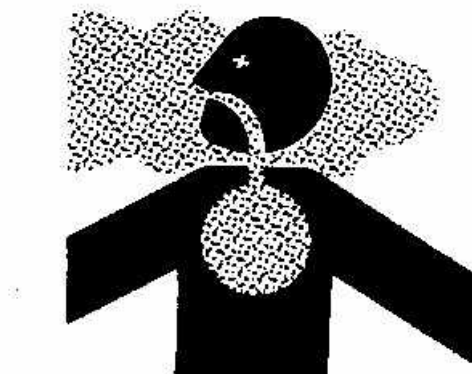
### Avoid High-Pressure Oils

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.

## Beware of Exhaust Fumes



### 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.

## Prevent Fires



### Handle Fuel Safely



### ***Clean Machine Regularly***



### ***Carry A Fire Extinguisher***

**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, exhaust components, 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 multipurpose fire extinguisher on or near the machine. Know how to use extinguisher properly.

## **Prevent Battery Explosions**



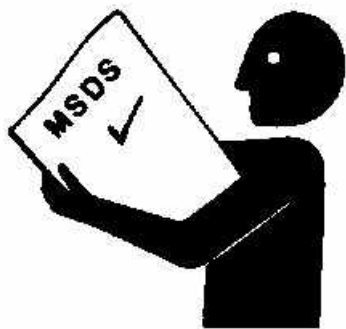
### ***Battery Explosions***

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).

## Handle Chemical Products Safely

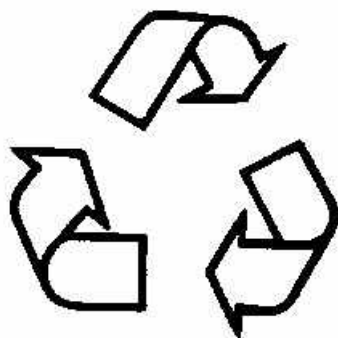


### ***Handle Chemical Products Safely***

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) or go to internet website <http://www.jdmsds.com>. 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.

## Dispose of Waste Properly



### ***Dispose Of Waste Properly***

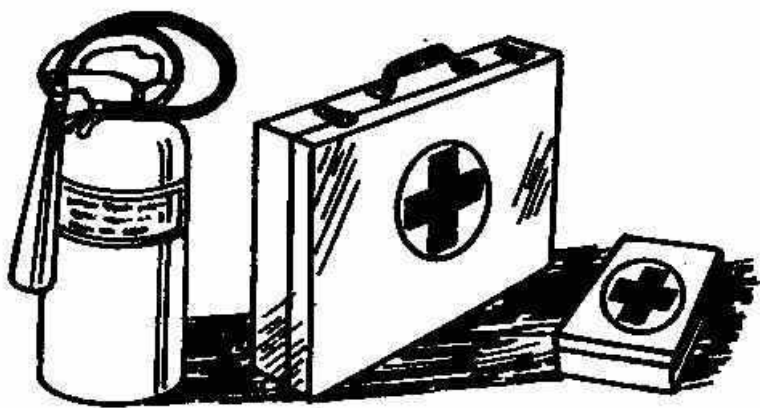
Improper disposal of waste can threaten the environment. Fuel, oils, coolants, filters and batteries used with this machine may be harmful if not disposed of properly.

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.

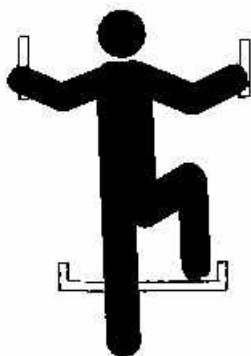
## Prepare for Emergencies

**First Aid Kit**

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.

**Use Steps and Handholds Correctly****Use Handholds and Steps**

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.

**Start Only From Operator's Seat****Operate Only From Operators 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.

## Use and Maintain Seat Belt



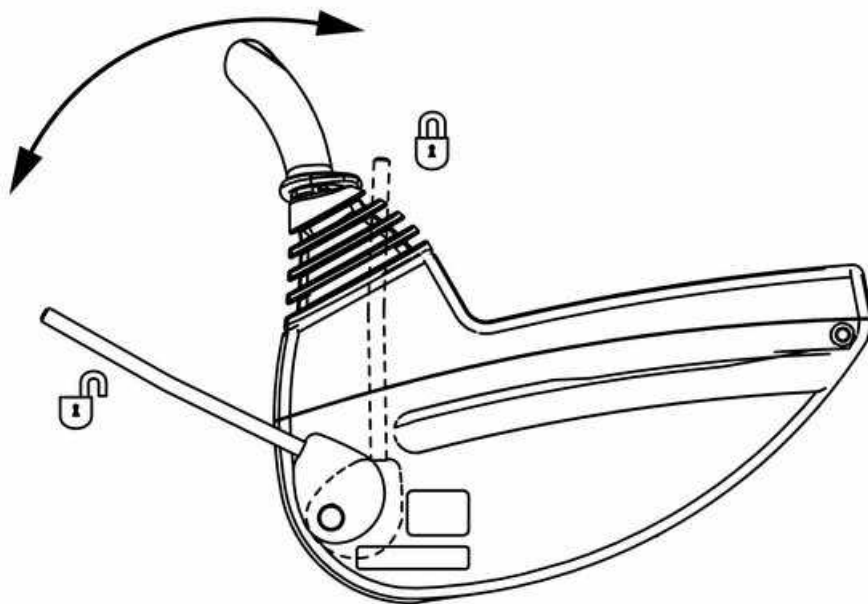
### ***Use and Maintain Seat Belt***

**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.**

## Prevent Unintended Machine Movement



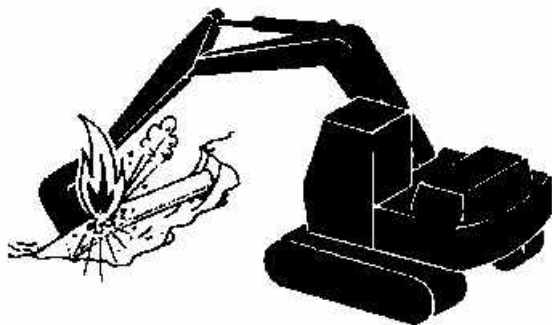
### ***Unintended Machine Movement***

Be careful not to accidentally actuate control levers when coworkers are present. Pull pilot control shutoff lever to locked position during work interruptions. Pull pilot control shutoff lever to locked position and stop engine before allowing anyone to approach machine.

Always lower work equipment to the ground and pull pilot control shutoff lever to locked position before standing up or leaving the operator's seat. Stop engine before exiting.



## Avoid Work Site Hazards



### Work Site Hazards



### Work Site Hazards



### Work Site Hazards

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

**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 arm 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.** Keep bystanders away from raised booms, attachments, and unsupported loads. Avoid swinging or raising booms, attachments, or loads over or near bystanders. 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. When working close to an excavation, position travel motors away from the hole.

**Reduce machine speed** when operating with tool on or near ground when obstacles may be hidden (e.g., during snow removal or clearing mud, dirt, etc). At high speeds, hitting obstacles (rocks, uneven concrete, or manholes) can cause a sudden stop. Always wear seat belt.

## Keep Riders Off Machine



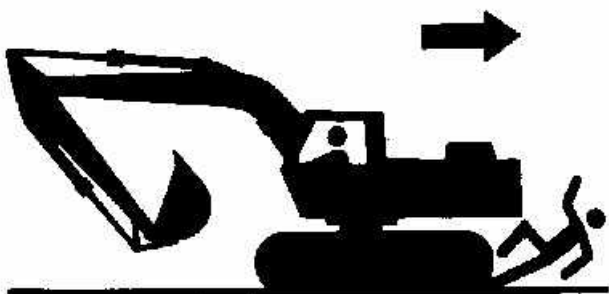
### **Keep Riders Off Machine**

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 the ability to operate machine safely.

## Avoid Backover Accidents



### **Backover Warning**

**Before moving machine, be sure all persons are clear of both travel and swing paths.** Turn around and look directly for best visibility. Use mirrors to assist in checking all around machine. Keep windows and mirrors clean, adjusted, and in good repair.

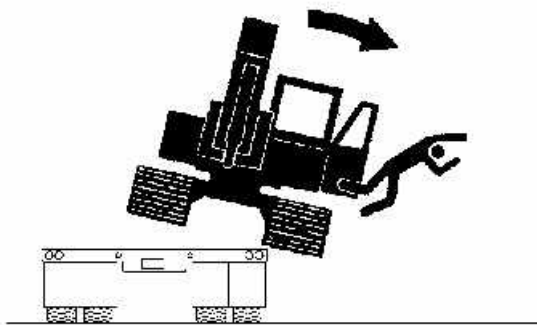
**Be certain travel alarm is working properly.**

**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.

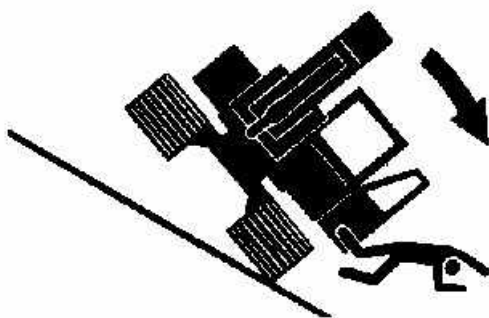
## Avoid Machine Tip Over



### ***Use Seat Belt***



### ***Unloading Machine***



### ***Do Not Jump***

**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.

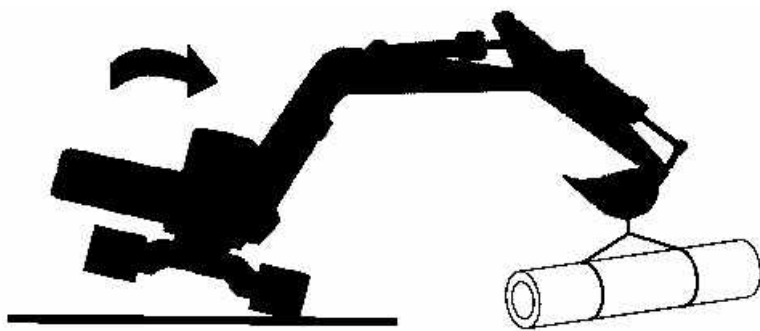
**Load and unload from trucks or trailers carefully.** Be sure truck is wide enough and on a firm level surface. Use loading ramps and attach them properly to truck bed. Avoid trucks with steel beds because tracks slip more easily on steel.

**Be careful on slopes.** Use extra care on soft, rocky or frozen ground. Machine may slip sideways in these conditions. When traveling up or down slopes, keep the bucket on uphill side and just above ground level.

**Be careful with heavy loads.** Using oversize buckets or lifting heavy objects reduces machine stability. Extending a heavy load or swinging it over side of undercarriage may cause machine to tip.

**Ensure solid footing.** Use extra care when operating near banks or excavations that may cave-in and cause machine to tip or fall.

## **Use Special Care When Lifting Objects**



### ***Use Special Care When Lifting Objects***

Never use this machine to lift people.

Never lift a load above another person. Keep bystanders clear of all areas where a load might fall if it breaks free. Do not leave the seat when there is a raised load.

Do not exceed lift capacity limits posted on machine and in this manual. Extending heavy loads too far or swinging over undercarriage side may cause machine to tip over.

Use proper rigging to attach and stabilize loads. Be sure slings or chains have adequate capacity and are in good condition. Use tether lines to guide loads and prearranged hand signals to communicate with co-workers.

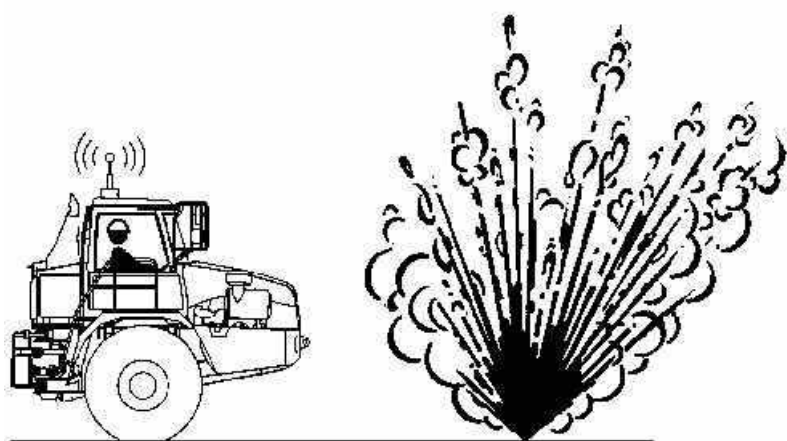
## **Add and Operate Attachments Safely**

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.

## **Prevent Unintended Detonation of Explosive Devices**



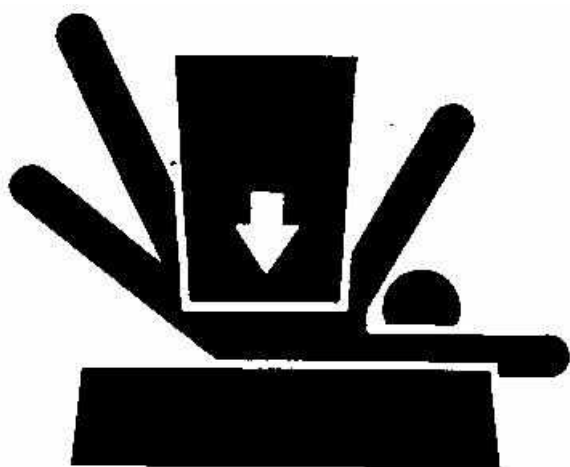
### ***Prevent Unintended Detonation of Explosive Devices***

Avoid serious injury or death from an explosion hazard. Deactivate all cellular or radio frequency devices on equipment stored or operating in an area, such as a blasting zone, where the use of radio transmitting devices are prohibited.

## Park and Prepare for Service Safely



### *Do Not Operate Tag*



### *Support Machine Properly*

**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 and attachments to the ground.
- Place pilot shutoff lever in “lock” position. 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 boom, arm, or other hydraulically actuated 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.

## Service Cooling System Safely



### **Cooling System**

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.

### **Remove Paint Before Welding or Heating**



### **Toxic Fumes**

Avoid potentially toxic fumes and dust.

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

Remove paint before heating:

- Remove paint a minimum of 100 mm (4 in.) from area to be affected by heating. If paint cannot be removed, wear an approved respirator before heating or welding.
- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

Do not use a chlorinated solvent in areas where welding will take place.

Do all work in an area that is well ventilated to carry toxic fumes and dust away.

Dispose of paint and solvent properly.

## Make Welding Repairs Safely



### ***Avoid Heating Near Pressurized Fluid Lines***

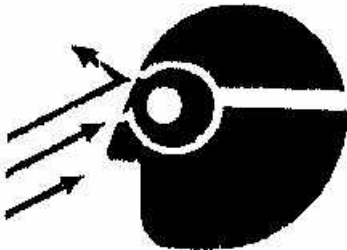
#### ***IMPORTANT:***

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

## Drive Metal Pins Safely



### ***Hardened Metal Parts***

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.



## Section 9001 - DIAGNOSTICS

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## Group 10 - Main Controller (MCF) Diagnostic Trouble Codes

### Main Controller (MCF) Diagnostic Trouble Codes

For additional information on the main controller circuit. [See Main Controller \(MCF\) Circuit Theory of Operation](#). (Group 9015-15.)

Main controller diagnostic trouble codes (DTCs) can be displayed on the monitor, connection with Service Advisor, or by connection with WinDr.

- [See Reading Diagnostic Trouble Codes With Monitor Display](#) (Group 9015-20.)
- [See Reading Diagnostic Trouble Codes With Service ADVISOR Diagnostic Application](#) (Group 9015-20.)

**11000.02- Abnormal EEPROM**

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## Controller Hardware Diagnostics

**( 1 ) Code Check****Action:**

Clear and re-check diagnostic trouble codes.

Is DTC 11000.02-Abnormal EEPROM still present?

**Result:**

**YES:**Code is still present and machine does not operate. Replace main controller (MCF). [See Main Controller \(MCF\) Remove and Install](#). (Group 9015-20.)

**YES:**Code is still present but machine is still operable. [Go to Machine Function Check](#).

**NO:**Main controller (MCF) is OK.

**( 2 ) Machine Function Check****Action:**

Is operation of machine normal? [See Operational Checkout](#). (Group 9005-05.)

**Result:**

**YES:**Machine may be operated but it is recommended that the main controller (MCF) be replaced.

**NO:**Main controller (MCF) malfunction. Replace main controller (MCF). [See Main Controller \(MCF\) Remove and Install](#). (Group 9015-20.)

**11001.02- Abnormal RAM**

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## Controller Hardware Diagnostics

**( 1 ) Code Check****Action:**

Clear and re-check diagnostic trouble codes.

Is DTC 11001.02-Abnormal RAM still present?

**Result:**

**YES:**Code is still present and machine does not operate. Replace main controller (MCF). [See Main Controller \(MCF\) Remove and Install](#). (Group 9015-20.)

**YES:**Code is still present but machine is still operable. [Go to Machine Function Check](#).

**NO:**Main controller (MCF) is OK.

**( 2 ) Machine Function Check****Action:**

Is operation of machine normal? [See Operational Checkout](#). (Group 9005-05.)

**Result:**

**YES:**Machine may be operated but it is recommended that the main controller (MCF) be replaced.

**NO:**Main controller (MCF) malfunction. Replace main controller (MCF). [See Main Controller \(MCF\) Remove and Install](#). (Group 9015-20.)

**11002.02- Abnormal A/D Conversion**

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## Controller Hardware Diagnostics

**( 1 ) Code Check****Action:**

Clear and re-check diagnostic trouble codes.

Is DTC 11002.02-Abnormal A/D Conversion still present?

**Result:**

**YES:**Code is still present and machine does not operate. Replace main controller (MCF). [See Main Controller \(MCF\) Remove and Install](#). (Group 9015-20.)

**YES:**Code is still present but machine is still operable. [Go to Machine Function Check](#).

**NO:**Main controller (MCF) is OK.

**( 2 ) Machine Function Check****Action:**

Is operation of machine normal? [See Operational Checkout](#). (Group 9005-05.)

**Result:**

**YES:**Machine may be operated but it is recommended that the main controller (MCF) be replaced.

**NO:**Main controller (MCF) malfunction. Replace main controller (MCF). [See Main Controller \(MCF\) Remove and Install](#). (Group 9015-20.)

**11003.03- Abnormal Sensor Voltage**

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Individual sensor or component diagnostic trouble code (DTC) may also be present within this code. Engine speed dial (R15) may not function correctly when this code is present.

**Abnormal Sensor Voltage Diagnostic Procedure****( 1 ) Voltage Check****Action:**

Turn key switch to OFF position.

Disconnect all 5-volt sensors. [See Main Controller \(MCF\) Circuit Theory of Operation](#) . (Group 9015-15.)

Turn key switch to ON position.

Monitor engine speed dial (R15) voltage while moving the engine speed dial from low idle to high idle. [See Monitor Data Items](#) . (Group 9015-20.)

Does voltage increase steadily as engine speed dial is moved to high idle?

**Result:**

**YES:**Go to Sensor Check.

**NO:** [Go to Machine Harness Check](#) .

**( 2 ) Sensor Check****Action:**

Perform the following:

- Turn key switch to OFF position.
- Connect one 5-volt sensor at a time.
- Turn key switch to ON position.
- Monitor engine speed dial (R15) voltage while moving engine speed dial from low idle to high idle. [See Monitor Data Items](#) . (Group 9015-20.)

Does voltage increase steadily as engine speed dial is moved to high idle?

**Result:**

**YES:**Repeat these steps for each remaining sensor.

**NO:**Replace last sensor that was connected.

**( 3 ) Machine Harness Check****Action:**

Turn key switch to OFF position.

Disconnect cab harness-to-machine harness 52-pin connector (X3). Turn key switch to ON position and monitor engine speed dial voltage.

Does voltage reading steadily increase as engine speed dial (R15) is moved from low idle to high idle?

**Result:**

**YES:**Short circuit in machine harness between main controller and one of the 5-volt sensors. Repair or replace harness. [See Machine Harness \(W2\) Component Location](#) . (Group 9015-10.)

**NO:**Go to Cab Harness Check.

#### **( 4 ) Cab Harness Check**

##### **Action:**

Disconnect cab harness-to-machine harness 52-pin connector (X3) and cab harness-to-main controller 16-pin connector (X31).

Check for continuity between cab harness-to-main controller 16-pin connector (X31) pin 1 and ground and between cab harness-to-main controller 16-pin connector (X31) pin 6 and ground.

Is continuity indicated?

##### **Result:**

**YES:**Short to ground in cab harness. Repair or replace harness. [See Cab Harness \(W1\) Component Location](#) . (Group 9015-10.)

**NO:**Main controller (MCF) malfunction. Replace main controller (MCF). [See Main Controller \(MCF\) Remove and Install](#) . (Group 9015-20.)

**11004.02- Abnormal CAN Communication**

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## Controller Area Network (CAN) Diagnostics

**( 1 ) CAN Harness Check****Action:**

Check harness connections to controllers and between harness.

Clear codes and re-check DTCs.

Is DTC 11004.02 still present?

**Result:**

**YES:** [Go to Continuity Check MCF and ICF .](#)

**NO:** Main controller (MCF) and harness are OK.

**( 2 ) Continuity Check MCF and ICF****Action:**

Check for continuity between main controller (MCF) pin C4 and information controller (ICF) pin C5.

Check for continuity between main controller (MCF) pin C15 and information controller (ICF) pin C11.

Is there continuity between the connectors?

→NOTE:

Key Switch: Off

**Result:**

**YES:** [Go to Continuity Check MCF and ECF .](#)

**NO:** Open circuit in CAN between main controller (MCF) and information controller (ICF). Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram .](#) (Group 9015-10.)

**( 3 ) Continuity Check MCF and ECF****Action:**

Check for continuity between main controller (MCF) pin C4 and engine control module (ECF) pin 10.

Check for continuity between main controller (MCF) pin C15 and engine control module (ECF) pin 27.

Is there continuity between the connectors?

→NOTE:

Key Switch: Off

**Result:**

**YES:** [Go to Continuity Check MCF and Monitor Unit .](#)

**NO:** Open circuit in CAN between main controller (MCF) and engine control module (ECF). Repair or replace harness. [See Cab](#)



[Harness \(W1\) Wiring Diagram](#). (Group 9015-10.)

#### **( 4 ) Continuity Check MCF and Monitor Unit**

##### **Action:**

Check for continuity between main controller (MCF) pin C4 and monitor controller pin B7.

Check for continuity between main controller (MCF) pin C15 and monitor controller pin B6.

Is there continuity between the connectors?

**→NOTE:**

**Key Switch: Off**

##### **Result:**

**YES:** [Go to MCF Short to Ground Check](#).

**NO:** Open circuit in CAN between main controller (MCF) and monitor controller. Repair or replace harnesses. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

#### **( 5 ) MCF Short to Ground Check**

##### **Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF) and monitor controller.

Check for continuity between main controller (MCF) pin C4 and main controller (MCF) pins A2, A13, B8, and B18.

Check for continuity between main controller (MCF) pin C15 and main controller (MCF) pins A2, A13, B8, and B18.

Is there continuity between the CAN circuit and ground circuit?

**→NOTE:**

**Key Switch: Off**

##### **Result:**

**YES:** CAN circuit short to ground. Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to ECF Short to Ground Check](#).

#### **( 6 ) ECF Short to Ground Check**

##### **Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between engine control module (ECF) pin 10 and pins 2 and 15.

Check for continuity between engine control module (ECF) pin 27 and pins 2 and 15.

Is there continuity between CAN circuit and ground circuit?

**Result:**

**YES:**CAN circuit short to ground.Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to ICF Short to Ground Check](#).

**( 7 ) ICF Short to Ground Check****Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between information controller (ICF) pin C5 and pins C14 and C15.

Check for continuity between information controller (ICF) pin C11 and pins C14 and C15.

Is there continuity between CAN circuit and ground circuit?

**Result:**

**YES:**CAN circuit short to ground.Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to Monitor Controller Short to Ground Check](#).

**( 8 ) Monitor Controller Short to Ground Check****Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between monitor controller pin B7 and pin B11.

Check for continuity between monitor controller pin B6 and pin B11.

Is there continuity between CAN circuit and ground circuit?

**Result:**

**YES:**CAN circuit short to ground.Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to MCF Short to Power Check](#).

**( 9 ) MCF Short to Power Check****Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between main controller (MCF) pin C4 and pins A1, A12, B7, and B17.

Check for continuity between main controller (MCF) pin C15 and pins A1, A12, B7, and B17.

Is there continuity between CAN circuit and power circuit?

**Result:**

**YES:**CAN circuit short to power.Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to ECF Short to Power Check](#).

**( 10 ) ECF Short to Power Check****Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between engine control module (ECF) pin 10 and pins 1 and 17.

Check for continuity between engine control module (ECF) pin 27 and pins 1 and 17.

Is there continuity between CAN circuit and power circuit?

**Result:**

**YES:**CAN circuit short to power.Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to ICF Short to Power Check](#).

**( 11 ) ICF Short to Power Check****Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between information controller (ICF) pin C5 and pins C1 and C2.

Check for continuity between information controller (ICF) pin C11 and pins C1 and C2.

Is there continuity between CAN circuit and power circuit?

**Result:**

**YES:**CAN circuit short to power.Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to Monitor Controller Short to Power Check](#).

**( 12 ) Monitor Controller Short to Power Check****Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between monitor controller pin B7 and A16.

Check for continuity between monitor controller pin B6 and A16.

Is there continuity between CAN circuit and power circuit?

**Result:**

**YES:**CAN circuit short to power.Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to MCF Short to Key Switch Signal Check](#).

**( 13 ) MCF Short to Key Switch Signal Check****Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between main controller (MCF) pin C4 and B16.

Check for continuity between main controller (MCF) pin C15 and B16.

Is there continuity between CAN circuit and key switch signal circuit?

→NOTE:

Key Switch: Off

**Result:**

**YES:**CAN circuit short to key switch signal.Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to ECF Short to Key Switch Signal Check](#).

**( 14 ) ECF Short to Key Switch Signal Check****Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between engine control module (ECF) pin 10 and pin 18.

Check for continuity between engine control module (ECF) pin 27 and pin 18.

Is there continuity between CAN circuit and key switch signal circuit?

→NOTE:

Key Switch: Off

**Result:**

**YES:**CAN circuit short to key switch signal.Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to ICF Short to Key Switch Signal Check](#).

**( 15 ) ICF Short to Key Switch Signal Check****Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor

controller.

Check for continuity between information controller (ICF) pin C5 and C7.

Check for continuity between information controller (ICF) pin C11 and C7.

Is there continuity between CAN circuit and key switch signal circuit?

→NOTE:

Key Switch: Off

### Result:

**YES:** CAN circuit short to key switch signal. Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to Monitor Controller Short to Key Switch Signal Check](#).

### ( 16 ) Monitor Controller Short to Key Switch Signal Check

#### Action:

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between monitor controller pin B7 and A7.

Check for continuity between monitor controller pin B6 and A7.

Is there continuity between CAN circuit and key switch signal circuit?

→NOTE:

Key Switch: Off

### Result:

**YES:** CAN circuit short to key switch signal. Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to MCF CAN High and Low Side Continuity Check](#).

### ( 17 ) MCF CAN High and Low Side Continuity Check

#### Action:

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between main controller (MCF) pins C4 and C15.

Is there continuity between CAN high and low side wires?

→NOTE:

Key Switch: Off

**Result:**

**YES:**CAN wires short circuit.Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to ECF CAN High and Low Side Continuity Check](#).

**( 18 ) ECF CAN High and Low Side Continuity Check****Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between engine control module (ECF) pins 10 and 27.

Is there continuity between CAN high and low side wires?

→NOTE:

Key Switch: Off

**Result:**

**YES:**CAN wires short circuit.Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to ICF CAN High and Low Side Continuity Check](#).

**( 19 ) ICF CAN High and Low Side Continuity Check****Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between ICF pins C5 and C11.

Is there continuity between CAN high and low side wires?

→NOTE:

Key Switch: Off

**Result:**

**YES:**CAN wires short circuit.Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to Monitor Controller CAN High and Low Side Continuity Check](#).

**( 20 ) Monitor Controller CAN High and Low Side Continuity Check****Action:**

Disconnect all connectors to main controller (MCF), information controller (ICF), engine control module (ECF), and monitor controller.

Check for continuity between monitor controller pins B6 and B7.

Is there continuity between CAN high and low side wires?

→NOTE:

Key Switch: Off

### Result:

**YES:** CAN wires short circuit. Repair or replace harness. [See Cab Harness \(W1\) Wiring Diagram](#) and [See Monitor Harness \(W3\) Wiring Diagram](#). (Group 9015-10.)

**NO:** [Go to MCF CAN Resistance Check](#).

### ( 21 ) MCF CAN Resistance Check

### Action:

Connect all connectors except main controller (MCF) connector C (X30).

Check resistance between pin C4 and C15.

Is resistance between 50—70 Ω?

→NOTE:

Key Switch: Off

### Result:

**YES:** [Go to DTC Check](#).

**NO:** [Go to ICF CAN Resistance Check](#).

### ( 22 ) DTC Check

### Action:

Connect connector to main controller (MCF).

Clear DTC and re-check for DTCs.

Is DTC 11004.02-Abnormal CAN Communication still present?

→NOTE:

Key Switch: On

### Result:

**YES:** Main controller (MCF) malfunction. Replace main controller. [See Main Controller \(MCF\) Remove and Install](#). (Group 9015-20.)

**NO:** Check harness connection to main controller (MCF).

### ( 23 ) ICF CAN Resistance Check

**Action:**

Connect all connectors except ICF connector C (X34).

Check resistance between pin C5 and C11.

Is resistance between 50—70 Ω?

**Result:**

**YES:** [Go to DTC Check](#).

**NO:** [Go to ECF CAN Resistance Check](#).

**( 24 ) DTC Check****Action:**

Connect connector to information controller (ICF).

Clear DTC and re-check for DTCs.

Is DTC 11004.02-Abnormal CAN Communication still present?

→**NOTE:**

**Key Switch: On**

**Result:**

**YES:** Information controller (ICF) malfunction. Replace information controller (ICF). [See Information Controller \(ICF\) Remove and Install](#). (Group 9015-20.)

**NO:** Check harness connection to information controller (ICF).

**( 25 ) ECF CAN Resistance Check****Action:**

Connect all connectors except engine control module (ECF) connector X7.

Check resistance between pins 18 and 37.

Is resistance between 110—130Ω?

→**NOTE:**

**Key Switch: Off**

**Result:**

**YES:** [Go to DTC Check](#).

**NO:** [Go to Monitor Controller CAN Resistance Check](#).

**( 26 ) DTC Check****Action:**

Connect connector to engine control module (ECF).



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