544K
4WD Loader
Operation and Test

(PIN: 1DW544K_ _ _F670308—677548)

OPERATION & TEST TECHNICAL MANUAL

544K 4WD Loader (PIN: 1DW544K_ _ _F670308—677548)

TM13363X19 14JUN18 (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 this symbol is seen on the machine or in this manual, be alert for the potential of personal injury.

Technical manuals are divided in two parts: repair and operation and tests. Repair sections tell how to repair the components. Operation and test sections help to quickly 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.

MM16284,00026ED -19-05JUN18-1/1

Manual Identification—READ THIS FIRST!

IMPORTANT: Use only supporting manuals designated for your specific machine. If an incorrect manual is chosen, improper service may occur. Verify product identification number (PIN) when choosing the correct manual.

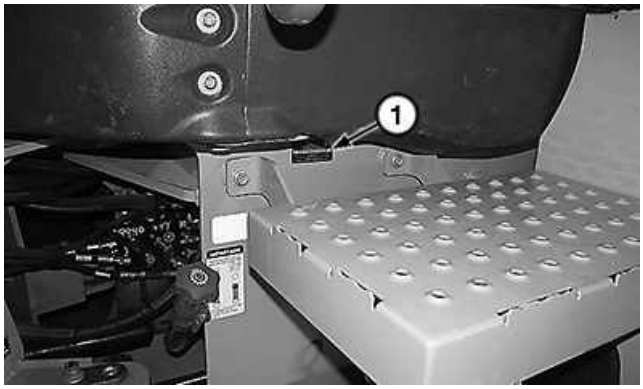
Choosing the Correct Supporting Manuals

John Deere four wheel drive (4WD) loaders are available in different machine configurations based on the various markets into which they are sold. Different supporting manuals exist for different machine configurations.

When necessary, product identification numbers (PINs) are listed on the front covers of 4WD loader manuals. These numbers are used to identify the correct supporting manual for your machine.

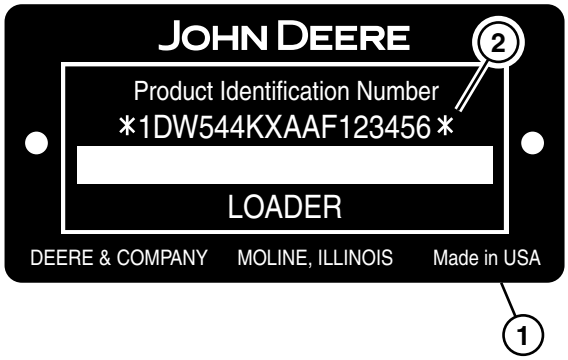
Product Identification Number

The product identification number (PIN) plate (1) is located on the left side of machine in front of the steps. Each machine has a 17-character PIN (2) as shown on this plate.



TX1189779A —UN—08APR15

PIN Plate Location



TX1190031 —UN—10APR15

PIN Plate Example (17-character)

1— PIN Plate

2— 17-Character PIN

Continued on next page

The PIN identifies the producing factory, machine model number, machine option, year of manufacture, engine emission level, and machine serial number.

The following is an example for a 544K machine that meets Final Tier 4 emission levels:

17-Character PIN Example																
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
1	D	W	5	4	4	K	Z	_	_	F	1	2	3	4	5	6

- **(1—3) World Code:** Identifies location where machine is manufactured.

1DW ..... **World Code** (manufacturing location)
1DW ..... Davenport Works
1T8 ..... Thibodaux Works
1T0 ..... Dubuque Works

- **(4—8) Machine Model Identifier:** Identifies model number.

544K ..... **Machine Model Identifier**

NOTE: Characters 7—8 identify series and major machine configuration options. These characters will change from one machine to another.

Z ..... **Machine Option Code**
Z..... Standard Z-Bar
H ..... High Lift Z-Bar
P ..... Powerllel
T..... Tool Carrier

- **(9) Check Letter:** This is a random character assigned by the factory. This is not used in machine identification.

_ ..... **Check Letter** (variable)

- **(10) Manufacturing Year Code:** Identifies year of machine manufacture.

– ..... **Manufacturing Year Code** (variable)
E 2014
F 2015
G 2016
H 2017
I..... 2018

- **(11) Engine Emission Code:** Represents engine emission certification.

F ..... **Engine Emission Code**
C ..... Tier 2 and Stage II
D ..... Tier 3 and Stage III A
E ..... Interim Tier 4 and Stage III B
F ..... Tier 4
G ..... Interim Tier 4 and Stage III A (19-56 kW)
H ..... Final Tier 4 and Stage III A (19-37 kW)
J ..... Final Tier 4 and Stage III A (37-56 kW)
K ..... Final Tier 4 (8-19 kW)

- **(12—17) Machine Serial Number:** Identifies machine serial number. This character will change from one machine to another.

123456 ..... **Machine Serial Number**

WC20922,00051B4 -19-17JAN17-2/2

Contents

Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Section 9000
General Information

Contents

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.

T133555 —UN—15APR13

T133588 —19—28AUG00

TX,RECOGNIZE -19-28JUN10-1/1

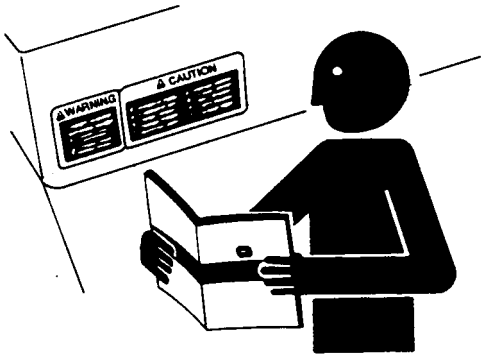
Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Use this operator's manual for correct safety sign placement. Be sure that new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine could impair the function or safety and affect machine life.



TS201 —UN—15APR13

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.

TX,FOLLOW -19-20JAN11-1/1

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.

TX,QUALIFIED -19-18JAN11-1/1

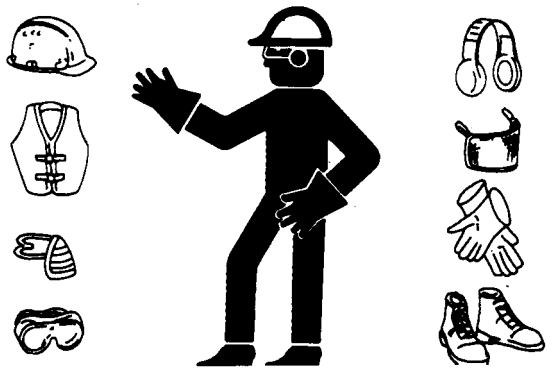
Wear Protective Equipment

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

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

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

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. Radio or music headphones are not suitable to use for hearing protection.



TS206 —UN—15APR13

TX,WEAR,PE -19-22SEP10-1/1

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.

KR46761,00010A9 -19-03OCT16-1/1

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.

T6607AQ —UN—15APR13

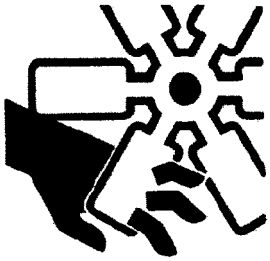
TX,INSPECT -19-08SEP10-1/1

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.



T133592 —UN—15APR13

TX,MOVING,PARTS -19-20JAN11-1/1

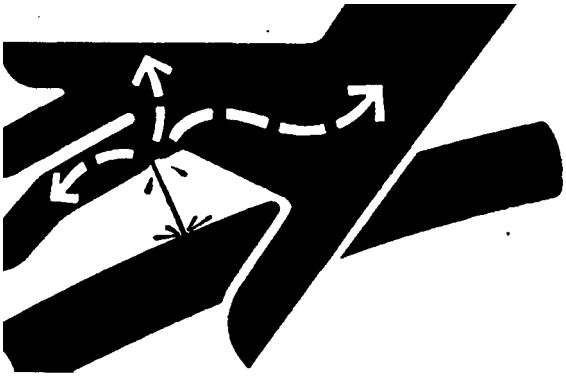
Avoid High-Pressure Fluids

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 from Deere & Company Medical Department in Moline, Illinois, U.S.A.



X9811 —UN—23AUG88

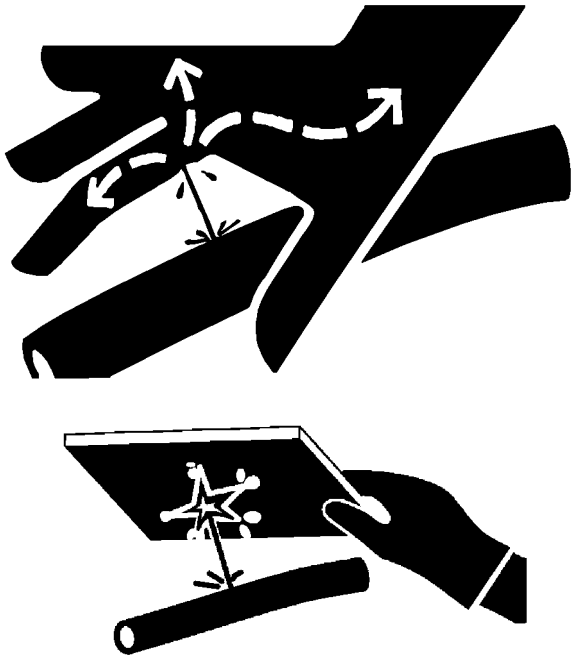
DX,FLUID -19-06OCT16-1/1

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 could result. Contact a knowledgeable medical source or the Deere & Company Medical Department in Moline, Illinois, U.S.A.



T133509 —UN—15APR13

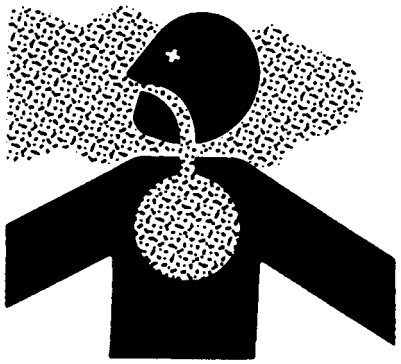
T133840 —UN—20SEP00

TX,HPOILS -19-20JAN11-1/1

Work In Ventilated Area

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

If you do not have an exhaust pipe extension, open the doors and get outside air into the area.



TS220 —UN—15APR13

DX,AIR -19-17FEB99-1/1

Avoid Static Electricity Risk When Refueling

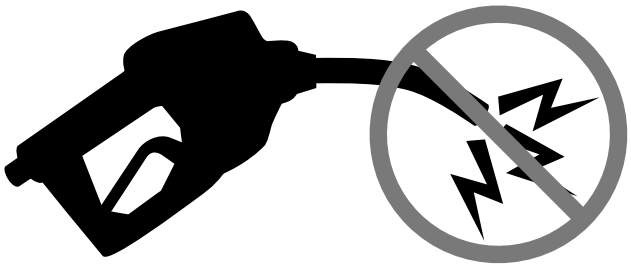
The removal of sulfur and other compounds in Ultra-Low Sulfur Diesel (ULSD) fuel decreases its conductivity and increases its ability to store a static charge.

Refineries may have treated the fuel with a static dissipating additive. However, there are many factors that can reduce the effectiveness of the additive over time.

Static charges can build up in ULSD fuel while it is flowing through fuel delivery systems. Static electricity discharge when combustible vapors are present could result in a fire or explosion.

Therefore, it is important to ensure that the entire system used to refuel your machine (fuel supply tank, transfer pump, transfer hose, nozzle, and others) is properly grounded and bonded. Consult with your fuel or fuel system supplier to ensure that the delivery system is in compliance with fueling standards for proper grounding and bonding practices.

RG22142 —UN—17MAR14



RG21992 —UN—21AUG13

DX,FUEL,STATIC,ELEC -19-12JUL13-1/1

Prevent Fires

Handle Fluids Safely: All fuels, most lubricants, and some coolant mixtures are flammable. Store flammable fluids away from fire hazards. Never refuel machine while smoking or when near sparks or flame.

Clean Machine Regularly: Keep flammable debris (trash, leaves, twigs, straw, and so forth), 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, Tubes, and Wiring: Replace hoses and tubes 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 an extinguisher properly.

Be Aware of the Operating Environment: Airborne debris may contain sparks or embers. Do not operate near any flame.

T133552 —UN—15APR13

T133553 —UN—07SEP00

T133554 —UN—07SEP00

TX,PREVENT,FIRE -19-09JUN16-1/1

In Case of Machine Fire

CAUTION: Avoid personal injury from exposed flames. Maintain safe distance.

- Turn the engine off.
- Turn the battery disconnect switch to the OFF position, if equipped.
- If possible, fight the fire using the portable fire extinguisher or other fire suppression equipment, if equipped.
- Ensure that the fire does not spread to the surrounding area. Do not risk injury. If a fire is too far advanced, do not try to extinguish fire.
- Call for help.

TS227 —UN—15APR13

In Case of Machine Fire

CN93077,00000B2 -19-09FEB16-1/1

Prevent Battery Explosions

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

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).

Keep battery electrolyte levels properly maintained.

TS204 —UN—15APR13

Battery Explosions

KR46761,00010B4 -19-26JAN16-1/1

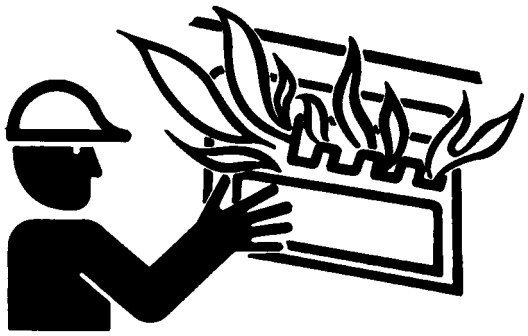
Clean Debris from Machine

Keep engine compartment, radiator, batteries, hydraulic lines, exhaust components, fuel tank, and operator's station clean and free of debris.

Clean any oil spills or fuel spills on machine surfaces.

Temperature in engine compartment could go up immediately after engine is stopped. BE ON GUARD FOR FIRES DURING THIS PERIOD.

Open access door(s) to cool the engine faster, and clean engine compartment.



T6669AG —UN—15APR13

TX,DEBRIS -19-20JAN11-1/1

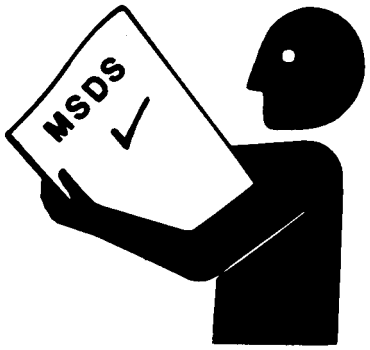
Handle Chemical Products Safely

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with John Deere equipment include such items as lubricants, coolants, paints, and adhesives.

A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.

Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

(See your John Deere dealer for MSDS's on chemical products used with John Deere equipment.)



TS1132 —UN—15APR13

DX,MSDS,NA -19-03MAR93-1/1

Handle Starting Fluid Safely

Starting fluid is highly flammable.

Keep all sparks and flame away when using it. Keep starting fluid away from batteries and cables.

To prevent accidental discharge when storing the pressurized can, keep the cap on the container, and store in a cool, protected location.

Do not incinerate or puncture a starting fluid container.

Do not use starting fluid on an engine equipped with glow plugs or an air intake heater.

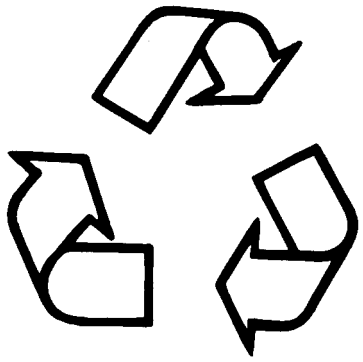
TS1356 —UN—18MAR92

DX,FIRE3 -19-14MAR14-1/1

Decommissioning — Proper Recycling and Disposal of Fluids and Components

Safety and environmental stewardship measures must be taken into account when decommissioning a machine and/or component. These measures include the following:

- Use appropriate tools and personal protective equipment such as clothing, gloves, face shields or glasses, during the removal or handling of objects and materials.
- Follow instructions for specialized components.
- Release stored energy by lowering suspended machine elements, relaxing springs, disconnecting the battery or other electrical power, and releasing pressure in hydraulic components, accumulators, and other similar systems.
- Minimize exposure to components which may have residue from agricultural chemicals, such as fertilizers and pesticides. Handle and dispose of these components appropriately.
- Carefully drain engines, fuel tanks, radiators, hydraulic cylinders, reservoirs, and lines before recycling components. Use leak-proof containers when draining fluids. Do not use food or beverage containers.
- Do not pour waste fluids onto the ground, down a drain, or into any water source.
- Observe all national, state, and local laws, regulations, or ordinances governing the handling or disposal of waste fluids (example: oil, fuel, coolant, brake fluid);



TS1133 —UN—15APR13

filters; batteries; and, other substances or parts. Burning of flammable fluids or components in other than specially designed incinerators may be prohibited by law and could result in exposure to harmful fumes or ashes.

- Service and dispose of air conditioning systems appropriately. Government regulations may require a certified service center to recover and recycle air conditioning refrigerants which could damage the atmosphere if allowed to escape.
- Evaluate recycling options for tires, metal, plastic, glass, rubber, and electronic components which may be recyclable, in part or completely.
- Contact your local environmental or recycling center, or your John Deere dealer for information on the proper way to recycle or dispose of waste.

DX,DRAIN -19-01JUN15-1/1

Exhaust Filter Ash Handling and Disposal

CAUTION: Under federal, state, and local laws or regulations, exhaust filter ash can be classified as a hazardous waste. Hazardous waste must be disposed of in accordance with all applicable federal, state, and local laws or regulations governing hazardous waste disposal. Only a qualified service provider should remove ash from the exhaust filter. Personal protective equipment and clothing, maintained in a sanitary and reliable condition, should be used when handling and cleaning exhaust filter. See your authorized dealer for exhaust filter ash handling and disposal.

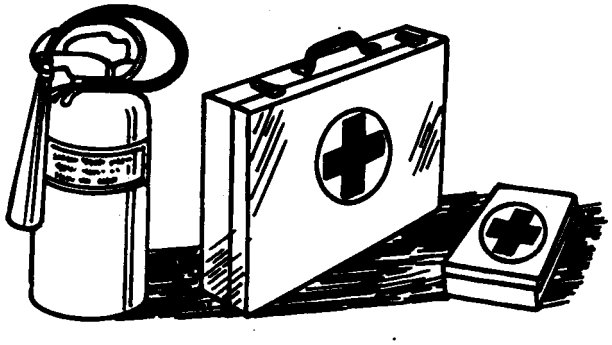
TX,ASH,DISP -19-20JAN11-1/1

Prepare for Emergencies

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

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



TS291 —UN—15APR13

DX,FIRE2 -19-03MAR93-1/1

Add Cab Guarding for Special Uses

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

Additional level II FOPS (falling object protective structure), forestry protection packages, and special screens or guarding should be installed when falling or flying objects could enter or damage the machine. A rear screen should always be used with a winch to protect against a snapping cable. Before operating in any special work environments, follow the operator protection recommendations of the manufacturer of any specialized attachment or equipment. Contact your authorized John Deere dealer for information on protective guarding.

TX,CABGUARD -19-12FEB13-1/1

Park and Prepare for Service Safely

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

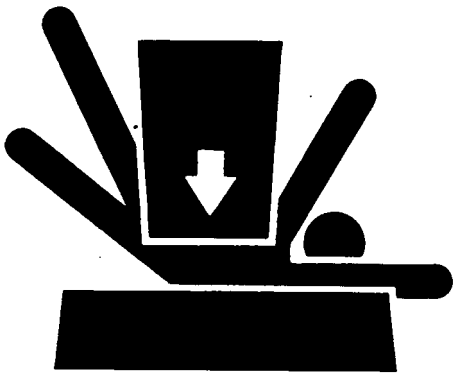
- Park machine on a level surface and lower equipment to the ground.
- Engage park brake.
- Stop engine.
- Install frame locking bar.
- Attach a DO NOT OPERATE tag in an obvious place in the operator's station.

Securely support machine or attachment before working under it.

- Do not support machine with boom, bucket, or other hydraulically actuated equipment.
- Do not support machine with cinder blocks or wooden pieces that can crumble or crush.
- Do not support machine with a single jack or other devices that could 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

TX,PARK,4WD -19-28JUN10-1/1

Clean Exhaust Filter Safely

During exhaust filter cleaning operations, the engine may run at elevated idle and hot temperatures for an extended period of time. Exhaust gases and exhaust filter components reach temperatures hot enough to burn people, or ignite or melt common materials.

Keep machine away from people, animals, or structures which may be susceptible to harm or damage from hot exhaust gases or components. Avoid potential fire or explosion hazards from flammable materials and vapors near the exhaust. Keep exhaust outlet away from people and anything that can melt, burn, or explode.

Closely monitor machine and surrounding area for smoldering debris during and after exhaust filter cleaning.

Adding fuel while an engine is running can create a fire or explosion hazard. Always stop engine before refueling machine and clean up any spilled fuel.

Always make sure that engine is stopped while hauling machine on a truck or trailer.

Contact with exhaust components while still hot can result in serious personal injury.

Avoid contact with these components until cooled to safe temperatures.

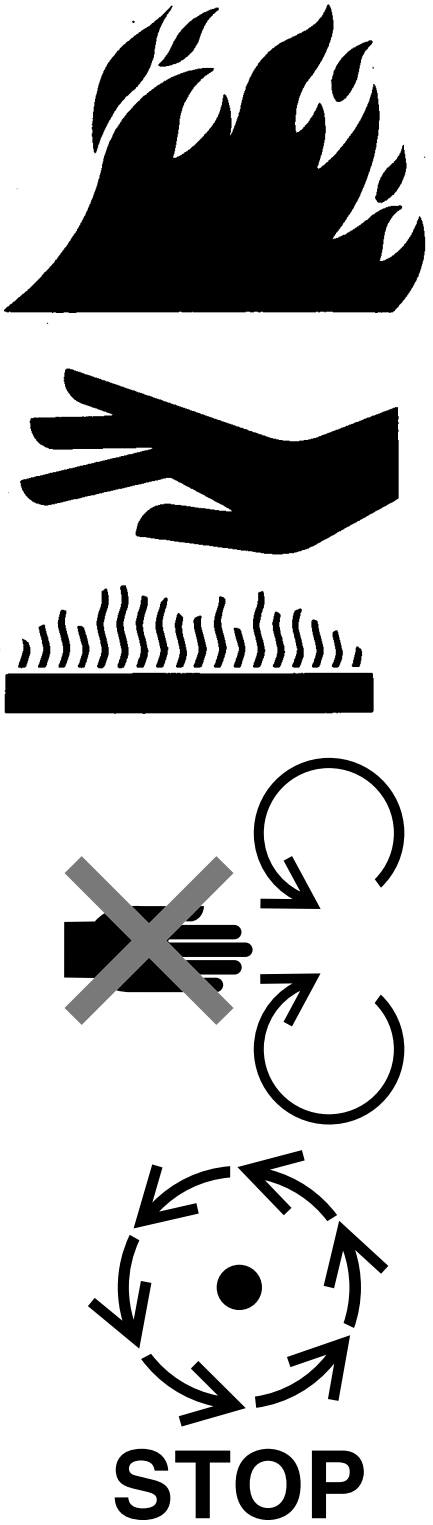
If service procedure requires engine to be running:

- Only engage power-driven parts required by service procedure
- Ensure that other people are clear of operator station and machine

Keep hands, feet, and clothing away from power-driven parts.

Always disable movement (neutral), set the parking brake or mechanism and disconnect power to attachments or tools before leaving the operator's station.

Shut off engine and remove key (if equipped) before leaving the machine unattended.



TS227 —UN—15APR13
TS271 —UN—23AUG88
TS1693 —UN—09DEC09
TS1695 —UN—07DEC09

DX,EXHAUST,FILTER -19-12JAN11-1/1

Service Cooling System Safely

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

Do not service radiator through the radiator cap. Only fill through the surge tank filler cap. Shut off engine. Only remove surge tank filler cap when cool enough to touch with bare hands. Slowly loosen cap to relieve pressure before removing completely.

TS281 —UN—15APR13

TX,SURGE -19-19JAN11-1/1

Service Tires Safely

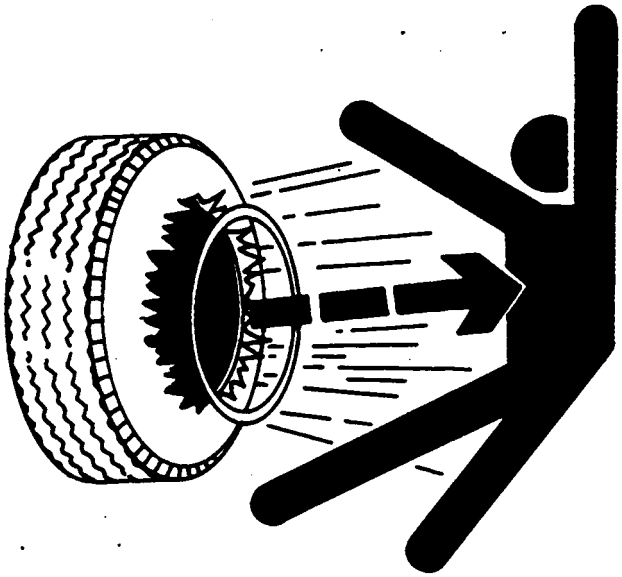
Explosive separation of a tire and rim parts can cause serious injury or death.

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—15APR13

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

Remove Paint Before Welding or Heating

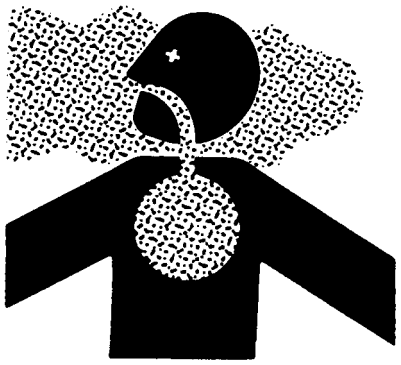
Avoid potentially toxic fumes and dust.

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.



TS220 —UN—15APR13

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

Dispose of paint and solvent properly.

DX,PAINT -19-24JUL02-1/1

Make Welding Repairs Safely

IMPORTANT: Disable electrical power before welding. Turn off main battery switch and disconnect positive (+) and negative (-) battery cables.

Do not weld or apply heat on any part of a reservoir or tank that has contained oil or fuel. Heat from welding and cutting can cause oil, fuel, or cleaning solution to create gases which are explosive, flammable, or toxic.

Avoid welding or heating near pressurized fluid lines. Flammable spray may result and cause severe burns if pressurized lines malfunction 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.

T133547 —UN—15APR13

Heating Near Pressurized Fluid Lines

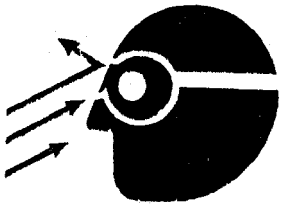
Make sure there is good ventilation. Wear eye protection and protective equipment when welding.

KR46761,00010AD -19-22JAN16-1/1

Drive Metal Pins Safely

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

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



T133738 —UN—15APR13

TX,PINS -19-20JAN11-1/1

Section 9001
Diagnostics

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Engine Control Unit (ECU) Diagnostic Trouble Codes

The diagnostic trouble code (DTC) number is indicated by a Suspect Parameter Number (SPN) and a Failure Mode Indicator (FMI) number. In the example **000091.03**, 91 is the SPN and 03 is the FMI number.

Diagnostic trouble codes can be displayed using the advanced display unit (ADU) or by using Service ADVISOR™.

- See Display Unit—Main Menu—Codes. (Operator's Manual.)
- See Reading Diagnostic Trouble Codes with Service ADVISOR™ Diagnostic Application. (Group 9015-15.)

For in-depth diagnostics on machine specific ECU diagnostic trouble codes, see specific code diagnostic procedures in this group. Additional engine control unit DTC diagnostic procedures for John Deere 6.8 L Final Tier 4 OEM Diesel Engines are located in the component technical manual, See PowerTech™ 6068 OEM Diesel Engines (Final Tier 4/Stage IV platform). (CTM120019.)

M44215 —UN—07SEP88

Engine Component Technical Manuals

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JK05397,000125B -19-21MAY15-1/1

000091.03 — Engine Throttle Short to Power

Engine control unit (ECU) measures more than 4.75 volts on analog throttle position sensor (B14) circuit.

Alarm Level:

- Warning Lamp

JZ81662,0001509 -19-21APR16-1/5

Engine Throttle Short to Power Diagnostic Procedure

JZ81662,0001509 -19-21APR16-2/5

❶ **Intermittent Check**	Does diagnostic trouble code (DTC) periodically “go away”?	**YES:** DTC is intermittent. See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.) **NO:** Go to Short Circuit Check.

Continued on next page

JZ81662,0001509 -19-21APR16-3/5

2 Short Circuit Check	Ignition OFF. Disconnect analog throttle position sensor (B14) connector. See Load Center Harness (W3) Component Location. (Group 9015-10.) Ignition ON. Check circuit E012 WHT for voltage between pin A on analog throttle position sensor (B14) connector and machine ground. Is voltage more than approximately 5 volts?	**YES:** Circuit E012 WHT is short to power in load center harness. Repair or replace harness. See Load Center Harness (W3) Wiring Diagram and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.) **NO:** Go to Harness Check.

JZ81662,0001509 -19-21APR16-4/5

3 Harness Check	Turn battery disconnect switch OFF. Disconnect analog throttle position sensor (B14) connector. See Load Center Harness (W3) Component Location. (Group 9015-10.) Disconnect engine control unit (ECU) connector (X5503). See Engine Harness (W6) Component Location. (Group 9015-10.) Check circuit E012 WHT for continuity between pin 10 on ECU connector (X5503) and remaining pins on ECU connector (X5503). Is continuity indicated?	**YES:** Circuit E012 WHT is short to circuit with continuity indicated. Repair or replace harness. See Load Center Harness (W3) Wiring Diagram and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.) **NO:** Program controller.

JZ81662,0001509 -19-21APR16-5/5

000091.04 — Engine Throttle Open or Short

Engine control unit (ECU) measures less than 0.25 volts on analog throttle position sensor (B14) circuit.

Alarm Level:

- Warning Lamp

JZ81662,000150A -19-21APR16-1/7

Engine Throttle Open or Short Diagnostic Procedure

JZ81662,000150A -19-21APR16-2/7

1 Intermittent Check	Does diagnostic trouble code (DTC) periodically “go away”?	**YES:** DTC is intermittent. See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.) **NO:** Go to Component Check.

Continued on next page

JZ81662,000150A -19-21APR16-3/7

2 Component Check	Ignition OFF. Disconnect analog throttle position sensor (B14) connector. See Load Center Harness (W3) Component Location. (Group 9015-10.) Measure resistance between pins A and B on analog throttle position sensor (B14). See Load Center Harness (W3) Wiring Diagram. (Group 9015-10.) Measure resistance between pins A and C on analog throttle position sensor (B14). Compare resistance to specification. See Electrical Component Specifications. (Group 9015-25.) Is resistance within specification?	**YES:** Go to Open Circuit Check. **NO:** Analog throttle position sensor (B14) malfunction. Replace sensor.

JZ81662,000150A -19-21APR16-4/7

3 Open Circuit Check	Ignition OFF. Disconnect analog throttle position sensor (B14) connector. See Load Center Harness (W3) Component Location. (Group 9015-10.) Disconnect engine control unit (ECU) connector (X5503). See Engine Harness (W6) Component Location. (Group 9015-10.) Check circuit E012 WHT for continuity between pin A on analog throttle position sensor (B14) connector and pin 10 on ECU connector (X5503). See Load Center Harness (W3) Wiring Diagram and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.) Is continuity indicated?	**YES:** Go to Short Circuit Check. **NO:** Circuit E012 WHT is open. Repair or replace harness. See Load Center Harness (W3) Wiring Diagram and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.)

JZ81662,000150A -19-21APR16-5/7

4 Short Circuit Check	Ignition OFF. Disconnect analog throttle position sensor (B14). See Load Center Harness (W3) Component Location. (Group 9015-10.) Ignition ON. Check circuit E012 WHT for continuity between pin A on analog throttle position sensor (B14) connector and machine ground. See Load Center Harness (W3) Wiring Diagram. (Group 9015-10.) Is continuity present?	**YES:** Circuit E012 WHT is short to ground. Repair or replace harness. See Load Center Harness (W3) Wiring Diagram and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.) **NO:** Go to Harness Check.

Continued on next page

JZ81662,000150A -19-21APR16-6/7

5 Harness Check	Turn battery disconnect switch OFF. Disconnect analog throttle position sensor (B14) connector. See Load Center Harness (W3) Component Location. (Group 9015-10.) Disconnect engine control unit (ECU) connector (X5503). See Engine Harness (W6) Component Location. (Group 9015-10.) Check circuit E012 WHT for continuity between pin 10 on ECU connector (X5503) and remaining pins on ECU connector (X5503). See Engine Harness (W6) Wiring Diagram. (Group 9015-10.) Is continuity indicated?	**YES:** Circuit E012 WHT is short to circuit with continuity indicated. Repair or replace harness. See Load Center Harness (W3) Wiring Diagram and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.) **NO:** Program controller.

JZ81662,000150A -19-21APR16-7/7

000091.14 — Engine Throttle Sensor Invalid

Analog throttle position sensor (B14) circuit voltage is above or below the specification.

This code is an informative code that tells that the primary analog throttle is either above or below the out of range specification.

To get the engine to change speed, either:

- Set the throttle to the minimum position, then increase it.
- Cycle the ignition key to OFF, then back to ON.

This is a safety feature used to keep the engine from running away after a throttle problem.

JZ81662,000150B -19-21APR16-1/1

000111.01 — Engine Coolant Level Extremely Low

Engine Coolant Level Alarm Switch (B5009) is open. Coolant level is below the alarm switch level while coolant temperature is greater than 95°C (203°F). Low coolant, open circuit.

Alarm Level:

- Stop Lamp

JZ81662,000150C -19-21APR16-1/6

Engine Coolant Level Extremely Low Diagnostic Procedure

JZ81662,000150C -19-21APR16-2/6

1 Intermittent Check	Does diagnostic trouble code (DTC) periodically “go away”?	**YES:** DTC is intermittent. See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.) **NO:** Go to Engine Coolant Level Check.

JZ81662,000150C -19-21APR16-3/6

2 Engine Coolant Level Check	Is coolant level low? See Check Coolant Level at Surge Tank. (Operator’s Manual.)	**YES:** Add engine coolant. See Diesel Engine Coolant (engine with wet sleeve cylinder liners). (Operator’s Manual.) **NO:** Go to Component Check.

Continued on next page

JZ81662,000150C -19-21APR16-4/6

3 Component Check	Disconnect engine coolant level alarm switch (B5009) connector. See Diesel Exhaust Fluid (DEF) Dosing Unit Harness (W46) Component Location. (Group 9015-10.) Check for continuity on pins 1 and 2 of engine coolant level alarm switch (B5009). See Diesel Exhaust Fluid (DEF) Dosing Unit Harness (W46) Wiring Diagram. (Group 9015-10.) Is continuity indicated?	**YES:** Replace engine coolant level alarm switch (B5009). **NO:** Go to Open Circuit Check.

JZ81662,000150C -19-21APR16-5/6

4 Open Circuit Check	Ignition OFF. Disconnect engine coolant level alarm switch (B5009) connector. See Diesel Exhaust Fluid (DEF) Dosing Unit Harness (W46) Component Location. (Group 9015-10.) Disconnect engine control unit (ECU) connector (X5502). See Engine Harness (W6) Component Location. (Group 9015-10.) Check circuit 5125 GRN for continuity between pin 1 on engine coolant level alarm switch (B5009) and pin 17 on ECU connector (X5502). See Engine Harness (W6) Wiring Diagram and see Diesel Exhaust Fluid (DEF) Dosing Unit Harness (W46) Wiring Diagram. (Group 9015-10.) Check circuit 5628 GRY for continuity between pin 2 on engine coolant level alarm switch (B5009) and pin 14 on ECU connector (X5502). Is continuity indicated?	**YES:** Program controller. **NO:** Repair circuit without continuity indicated or replace harness.

JZ81662,000150C -19-21APR16-6/6

000111.18 — Engine Coolant Very Low Level

Alarm Level:

- Warning Lamp

Engine coolant level alarm switch (B5009) is below low engine coolant level.

JZ81662,000150D -19-21APR16-1/6

Engine Coolant Very Low Level Diagnostic Procedure

JZ81662,000150D -19-21APR16-2/6

1 Intermittent Check	Does diagnostic trouble code (DTC) periodically “go away”?	**YES:** DTC is intermittent. See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.) **NO:** Go to Engine Coolant Level Check.

JZ81662,000150D -19-21APR16-3/6

2 Engine Coolant Level Check	Is engine coolant level low? See Check Coolant Level at Surge Tank. (Operator’s Manual.)	**YES:** Add engine coolant. See Diesel Engine Coolant (engine with wet sleeve cylinder liners). (Operator's Manual.) **NO:** Go to Component Check.

Continued on next page

JZ81662,000150D -19-21APR16-4/6

3 Component Check	Disconnect engine coolant level information switch (B5009) connector. See Diesel Exhaust Fluid (DEF) Dosing Unit Harness (W46) Component Location. (Group 9015-10.)	
	Check for continuity on pins 1 and 2 of engine coolant level information switch (B5009). See Diesel Exhaust Fluid (DEF) Dosing Unit Harness (W46) Wiring Diagram. (Group 9015-10.)	**YES:** Go to Open Circuit Check.
	Is continuity indicated?	**NO:** Replace surge tank.

JZ81662,000150D -19-21APR16-5/6

4 Open Circuit Check	Ignition OFF.	
	Disconnect engine coolant level alarm switch (B5009) connector. See Diesel Exhaust Fluid (DEF) Dosing Unit Harness (W46) Component Location. (Group 9015-10.)	
	Disconnect engine control unit (ECU) connector (X5502). See Engine Harness (W6) Component Location. (Group 9015-10.)	
	Check circuit 5125 GRN for continuity between pin 1 on engine coolant level information switch (B5009) connector and pin 17 on ECU connector (X5502). See Engine Harness (W6) Wiring Diagram. (Group 9015-10.)	**YES:** Program controller.
	Is continuity indicated?	**NO:** Repair circuit without continuity indicated or replace harness. See Diesel Exhaust Fluid (DEF) Dosing Unit Harness (W46) Component Location and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.)

JZ81662,000150D -19-21APR16-6/6

000168.01 — Engine Control Unit (ECU) Battery Voltage Low

Alarm Level:

- Warning Lamp

ECU detects unswitched battery power below 10 volts.

JZ81662,0001510 -19-21APR16-1/6

Engine Control Unit (ECU) Battery Voltage Low Diagnostic Procedure

JZ81662,0001510 -19-21APR16-2/6

1 Intermittent Check	Does diagnostic trouble code (DTC) periodically “go away”?	**YES:** DTC is intermittent. See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
		NO: Go to Fuse Check.

JZ81662,0001510 -19-21APR16-3/6

2 Fuse Check	Ignition OFF.	
	Remove fuse (F3). See Fuse and Relay Specifications. (Group 9015-10.)	
	Check fuse (F3) for continuity.	**YES:** Go to Circuit Check.
	Is continuity indicated?	**NO:** Replace fuse.

Continued on next page

JZ81662,0001510 -19-21APR16-4/6

3 Circuit Check	Turn battery disconnect switch OFF.	
	Disconnect engine control unit (ECU) connector (X5503). See Engine Harness (W6) Component Location. (Group 9015-10.)	
	Check circuit 5122 RED for ground at pins 13 and 14 on ECU connector (X5503). See Engine Harness (W6) Wiring Diagram. (Group 9015-10.)	**YES:** Repair circuit(s) with ground present or replace harness. See Engine Harness (W6) Wiring Diagram. (Group 9015-10.)
	Is ground present?	**NO:** Go to Harness Check.

JZ81662,0001510 -19-21APR16-5/6

4 Harness Check	Ignition OFF.	
	Disconnect engine control unit (ECU) connectors (X5501, X5502, and X5503). See Engine Harness (W6) Component Location. (Group 9015-10.)	
	Check continuity between pins 13 and 14 (circuit 5122 RED) on connector (X5503) and all remaining pins on connectors (X5501, X5502, and X5503).	**YES:** Circuit 5122 RED is short to circuit with continuity indicated. Repair circuit or replace harness. See Engine Harness (W6) Wiring Diagram. (Group 9015-10.)
	Is continuity indicated?	**NO:** Program controller.

JZ81662,0001510 -19-21APR16-6/6

000237.31 — Invalid Vehicle Identification Number (VIN)

VIN sent by vehicle control unit (VCU) does not match the VIN stored in engine control unit (ECU).

Alarm Level:

- Warning Lamp

JZ81662,0001511 -19-21APR16-1/4

Invalid Vehicle Identification Number (VIN) Diagnostic Procedure

JZ81662,0001511 -19-21APR16-2/4

1 Intermittent Check	Does diagnostic trouble code (DTC) periodically “go away”?	**YES:** DTC is intermittent. See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.) **NO:** Go to Program Controller.

JZ81662,0001511 -19-21APR16-3/4

2 Program Controller	Program vehicle control unit (VCU).	
	Check for active codes.	**YES:** Replace VCU.
	Is ECU code 000237.31 present?	**NO:** Check complete.

JZ81662,0001511 -19-21APR16-4/4

001321.05 — Starter Relay Open Circuit

Alarm Level:

Start relay (K3) control circuit is open.

- Protect Lamp

JZ81662,0001512 -19-21APR16-1/5

Starter Relay Open Circuit Diagnostic Procedure

JZ81662,0001512 -19-21APR16-2/5

1 Intermittent Check	Does diagnostic trouble code (DTC) periodically “go away”?	**YES:** DTC is intermittent. See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.) **NO:** Go to Start Relay Check.

JZ81662,0001512 -19-21APR16-3/5

2 Start Relay Check	Ignition OFF. Disconnect start relay (K3). See Load Center Harness (W3) Component Location. (Group 9015-10.) Apply 24 volts and ground to coil of ignition relay (K4). Check for continuity between remaining pins on ignition relay (K4). Is continuity indicated?	**YES:** Go to Open Circuit Check. **NO:** Replace start relay (K3).

JZ81662,0001512 -19-21APR16-4/5

3 Open Circuit Check	Ignition OFF. Disconnect circuits E002 WHT and R093 BLK from start relay (K3). See Load Center Harness (W3) Component Location. (Group 9015-10.) Disconnect engine control unit (ECU) connector (X5503). See Engine Harness (W6) Component Location. (Group 9015-10.) Check circuit E002 WHT at pin 30 on ECU connector (X5503) and start relay (K3) for continuity. See Engine Harness (W6) Wiring Diagram and see Load Center Harness (W3) Wiring Diagram. (Group 9015-10.) Check circuit R093 BLK at pin 26 on ECU connector (X5503) and start relay (K3) for continuity. Is continuity indicated?	**YES:** Program controller. **NO:** Open wire in harness. Repair or replace harness. See Load Center Harness (W3) Wiring Diagram and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.)

JZ81662,0001512 -19-21APR16-5/5

001321.06 — Starter Relay High Current

Alarm Level:

Start relay (K3) control circuit is reading high current.

- Protect Lamp

Continued on next page

JZ81662,0001513 -19-21APR16-1/6

Starter Relay High Current Diagnostic Procedure

JZ81662,0001513 -19-21APR16-2/6

1 Intermittent Check	Does diagnostic trouble code (DTC) periodically “go away”?	**YES:** DTC is intermittent. See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.) **NO:** Go to Start Relay Check.

JZ81662,0001513 -19-21APR16-3/6

2 Start Relay Check	Ignition OFF. Disconnect start relay (K3). See Load Center Harness (W3) Component Location. (Group 9015-10.) Apply 24 volts and ground to coil of ignition relay (K4). Check for continuity between remaining pins on ignition relay (K4). Is continuity indicated?	**YES:** Go to Short Circuit Check. **NO:** Replace start relay (K3).

JZ81662,0001513 -19-21APR16-4/6

3 Short Circuit Check	Ignition OFF. Disconnect circuits E002 WHT and R093 BLK from start relay (K3). See Load Center Harness (W3) Component Location. (Group 9015-10.) Disconnect engine control unit (ECU) connector (X5503). See Engine Harness (W6) Component Location. (Group 9015-10.) Check circuits E002 WHT and R093 BLK for ground on pins 26 and 30 of ECU connector (X5503). See Engine Harness (W6) Wiring Diagram. (Group 9015-10.) Is ground present?	**YES:** Circuit is grounded. Repair or replace harness. See Load Center Harness (W3) Wiring Diagram and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.) **NO:** Go to Harness Check.

Continued on next page

JZ81662,0001513 -19-21APR16-5/6

4 Harness Check	Ignition OFF. Disconnect circuits E002 WHT and R093 BLK from start relay (K3). See Load Center Harness (W3) Component Location. (Group 9015-10.) Disconnect engine control unit (ECU) connectors (X5501, X5502, and X5503). See Engine Harness (W6) Component Location. (Group 9015-10.) Check for continuity between pin 26 (circuit R093 BLK) and all other pins on ECU connectors (X5501, X5502, and X5503). Check for continuity between pin 30 (circuit E002 WHT) and all other pins on ECU connectors (X5501, X5502, and X5503). Is continuity indicated?	**YES:** Repair circuit with continuity or replace harness. See Load Center Harness (W3) Wiring Diagram and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.) **NO:** Program controller.

JZ81662,0001513 -19-21APR16-6/6

001321.09 — Starter Signal Invalid

Start relay (K3) circuit is receiving an invalid start signal from engine control unit (ECU).

Alarm Level:

- Warning Lamp

JZ81662,0001514 -19-21APR16-1/6

Starter Signal Invalid Diagnostic Procedure

JZ81662,0001514 -19-21APR16-2/6

1 Intermittent Check	Does diagnostic trouble code (DTC) periodically “go away”?	**YES:** DTC is intermittent. See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.) **NO:** Go to Start Relay Check.

JZ81662,0001514 -19-21APR16-3/6

2 Start Relay Check	Ignition OFF. Disconnect start relay (K3). See Load Center Harness (W3) Component Location. (Group 9015-10.) Apply 24 volts and ground to coil of ignition relay (K4). Check for continuity between remaining pins on ignition relay (K4). Is continuity indicated?	**YES:** Go to Short Circuit Check. **NO:** Replace start relay (K3).

Continued on next page

JZ81662,0001514 -19-21APR16-4/6

3 Short Circuit Check	Ignition OFF. Disconnect circuits E002 WHT and R093 BLK from start relay (K3). See Load Center Harness (W3) Component Location. (Group 9015-10.) Disconnect engine control unit (ECU) connector (X5503). See Engine Harness (W6) Component Location. (Group 9015-10.) Check circuits E002 WHT at pin 30 and R093 BLK at pin 26 for ground on ECU connector (X5503). See Engine Harness (W6) Wiring Diagram. (Group 9015-10.) Is ground present?	**YES:** Circuit is grounded. Repair or replace harness. See Load Center Harness (W3) Wiring Diagram and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.) **NO:** Go to Harness Check.

JZ81662,0001514 -19-21APR16-5/6

4 Harness Check	Ignition OFF. Disconnect circuits E002 WHT and R093 BLK from start relay (K3). See Load Center Harness (W3) Component Location. (Group 9015-10.) Disconnect engine control unit (ECU) connectors (X5501, X5502, and X5503). See Engine Harness (W6) Component Location. (Group 9015-10.) Check for continuity between pin 26 (circuit R093 BLK) and all other pins on ECU connectors (X5501, X5502, and X5503). See Engine Harness (W6) Wiring Diagram. (Group 9015-10.) Check for continuity between pin 30 (circuit E002 WHT) and all other pins on ECU connectors (X5501, X5502, and X5503). Is continuity indicated?	**YES:** Repair or replace harness on circuit with continuity. See Load Center Harness (W3) Wiring Diagram and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.) **NO:** Program controller.

JZ81662,0001514 -19-21APR16-6/6

001321.16 — Too Long to Start

Starter motor (M1) was engaged for 30 or more seconds. Starter motor must be disengaged for 60 seconds to reset engine control unit (ECU) timer.

Alarm Level:

- Warning Lamp

JZ81662,0001515 -19-21APR16-1/4

Too Long to Start Diagnostic Procedure

JZ81662,0001515 -19-21APR16-2/4

1 Intermittent Check	Does diagnostic trouble code (DTC) periodically “go away”?	**YES:** DTC is intermittent. See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.) **NO:** Go to Starter Motor Check.

Continued on next page

JZ81662,0001515 -19-21APR16-3/4

2 Starter Motor Check	Has starter motor been operated for 30 or more seconds?	**YES:** Do not attempt to start for 60 seconds. Starter motor must be disengaged for 60 seconds to reset engine control unit (ECU) timer. **NO:** Program controller.

JZ81662,0001515 -19-21APR16-4/4

001321.31 — Starter Solenoid Open Circuit

Starter is commanded to start with no engine speed detected.

Alarm Level:

- Warning Lamp

JZ81662,0001516 -19-21APR16-1/4

Starter Solenoid Open Circuit Diagnostic Procedure

JZ81662,0001516 -19-21APR16-2/4

1 Intermittent Check	Does diagnostic trouble code (DTC) periodically “go away”?	**YES:** DTC is intermittent. See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.) **NO:** Go to Start Relay Check.

JZ81662,0001516 -19-21APR16-3/4

2 Open Circuit Check	Ignition OFF. Disconnect circuits E002 WHT and R093 BLK from start relay (K3). See Load Center Harness (W3) Component Location. (Group 9015-10.) Disconnect engine control unit (ECU) connector (X5503). See Engine Harness (W6) Component Location. (Group 9015-10.) Check circuit E002 WHT at pin 30 on ECU connector (X5503) and start relay (K3) for continuity. See Engine Harness (W6) Wiring Diagram and see Load Center Harness (W3) Wiring Diagram. (Group 9015-10.) Check circuit R093 BLK at pin 26 on ECU connector (X5503) and start relay (K3) for continuity. Is continuity indicated?	**YES:** Program controller. **NO:** Open wire in harness. Repair or replace harness. See Load Center Harness (W3) Wiring Diagram and see Engine Harness (W6) Wiring Diagram. (Group 9015-10.)

JZ81662,0001516 -19-21APR16-4/4

001761.01 — Diesel Exhaust Fluid is Extremely Low

Diesel exhaust fluid (DEF) tank fluid level sensor is indicating the DEF tank is empty.

Alarm Level:

- Amber Warning Light

Machine Response:

- Engine power and speed derated.

Circuit Information:

- See Exhaust Aftertreatment Circuit Theory of Operation. (Group 9015-05.)
- See Controller Area Network (CAN) Circuit Theory of Operation. (Group 9015-05.)
- See CAN Circuit Test. (Group 9015-25.)

Component Location:

- See Engine Frame Harness (W5) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- See Refilling Diesel Exhaust Fluid (DEF) Tank. (Operator's Manual.)

Possible Causes:

1. DEF tank is empty.
2. Problem with DEF header assembly.

PM10405,0001062 -19-25APR16-1/1

001761.18 — Diesel Exhaust Fluid is Very Low

Diesel exhaust fluid (DEF) tank fluid level sensor is indicating the DEF tank is almost empty.

Alarm Level:

- Amber Warning Light

Machine Response:

- Engine power derated.

Circuit Information:

- See Exhaust Aftertreatment Circuit Theory of Operation. (Group 9015-05.)
- See Controller Area Network (CAN) Circuit Theory of Operation. (Group 9015-05.)
- See CAN Circuit Test. (Group 9015-25.)

Component Location:

- See Engine Frame Harness (W5) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- See Refilling Diesel Exhaust Fluid (DEF) Tank. (Operator's Manual.)

Possible Causes:

1. DEF tank fluid level is very low.
2. Problem with DEF header assembly.

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002003.09 — Controller Area Network (CAN) Communication Lost for Transmission Control Unit (TCU)

CAN communication error; engine control unit (ECU) has lost communication with TCU.

Alarm Level:

- Warning Lamp

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Controller Area Network (CAN) Communication Lost for Transmission Control Unit (TCU) Diagnostic Procedure

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1 Intermittent Check	Does DTC periodically “go away”?	**YES:** DTC is intermittent. See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.) **NO:** Go to Controller Sensors Check.

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2 Controller Sensors Check	View TCU monitored sensor outputs by accessing the DIAGNOSTICS/TRANSMISSION SENSORS submenu on the advanced display unit (ADU). See Display Unit—Main Menu—Diagnostics—Transmission/Axle. (Operator's Manual.) Are all transmission sensor values displayed on the ADU?	**YES:** Go to CAN Circuit Check. **NO:** Go to Fuse Check.

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3 Fuse Check	Ignition OFF. Remove fuses (F18) and (F28). See Fuse and Relay Specifications. (Group 9015-10.) Check fuses (F18) and (F28) for continuity. Is continuity indicated in both fuses?	 **YES:** Go to Voltage Check. **NO:** Replace fuse(s) without continuity indicated.

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4 Voltage Check	Ignition OFF. Disconnect transmission control unit (TCU) connector (X23). See Load Center Harness (W3) Component Location. (Group 9015-10.) Ignition ON. Check for voltage at the following pins on TCU connector (X23): See Load Center Harness (W3) Wiring Diagram. (Group 9015-10.) • 23 (circuit P018) RED • 45 (circuit P028) RED • 68 (circuit P018) RED Is voltage present at all pins?	 **YES:** Go to Ground Circuit Check. **NO:** Circuit(s) without voltage is open. Repair circuit or replace harness. See Load Center Harness (W3) Wiring Diagram. (Group 9015-10.)

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