

# 317G Compact Track Loader

(PIN: 1T0317G \_ \_ \_ J288093— )



## OPERATOR'S MANUAL Compact Track Loader 317G (PIN: 1T0317G \_ \_ \_ J288093— ) OMT312539X19 ISSUE K8 (ENGLISH)

### CALIFORNIA

#### Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

If this product contains a gasoline engine:

### **⚠ WARNING**

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The State of California requires the above two warnings.

Additional Proposition 65 Warnings can be found in this manual.

**Worldwide Construction  
And Forestry Division**

PRINTED IN U.S.A.

# Introduction

## Foreword

READ THIS MANUAL carefully to learn how to operate and service machine correctly. Personal injury or equipment damage can result if manual is not read. This manual and safety signs on the machine may also be available in other languages; see an authorized John Deere dealer to order.

THIS MANUAL SHOULD BE CONSIDERED a permanent part of the machine and should remain with machine when machine is sold.

MEASUREMENTS in this manual are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by facing in the direction of forward travel.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I.N.) in the Machine Numbers section. Accurately record all the numbers to help in tracing the machine if machine is ever stolen. A dealer also needs these numbers when parts are ordered. File the identification numbers in a secure place off machine.

WARRANTY is provided as part of John Deere's support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate or statement which should have been received from the dealer.

This warranty provides the assurance that John Deere backs the products where defects appear within the warranty period. In some circumstances, John Deere also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied. Setting fuel delivery above specifications or otherwise overpowering machines results in such action.

If current owner is not the original owner of this machine, contact an authorized John Deere dealer to inform them of this unit's serial number. This will help John Deere notify current owner of any issues or product improvements.

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## Manual Identification—READ THIS FIRST!

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

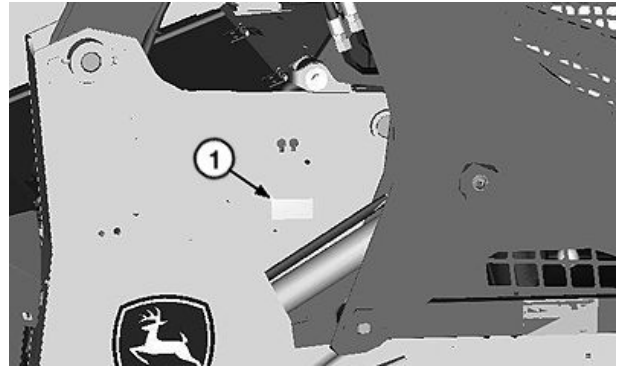
### Choosing the Correct Supporting Manuals

John Deere compact track 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 are listed on the front covers of compact track loader manuals. These numbers are used to identify the correct supporting manual for the machine.

### Product Identification Number

The product identification number (PIN) plate (1) is located on the right side of machine. Each machine has a 17-character PIN (2) shown on PIN plate.



*PIN Plate Location*



*Example of PIN Plate*

1— PIN Plate

2— 17-Character PIN

## Introduction

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 machine that meets Final Tier 4 and Stage IV emission levels:

17-Character PIN Examples																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	T	0	3	1	7	G	-	-	-	J	2	8	8	0	9	3

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

**1T0** ..... **World Code** (manufacturing location)

1DW ..... Davenport Works

1T8 ..... Thibodaux Works

1T0 ..... Dubuque Works

1FF ..... Deere—Hitachi (Kernersville, NC, USA)

1F9 ..... Deere—Hitachi (Indaiatuba, São Paulo, Brazil)

• **(4—8) Machine Model and Series Identifier:** Identifies model number and series.

**317G** ..... **Machine Model and Series Identifier**

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

- ..... **Machine Option Code**

A ..... Single Speed

B ..... 2-Speed

E ..... Single Speed High Flow

F ..... 2-Speed High Flow

J ..... Single Speed Electrohydraulic (EH)

K ..... 2-Speed Electrohydraulic (EH)

L ..... Single Speed High Flow Electrohydraulic (EH)

M ..... 2-Speed High Flow Electrohydraulic (EH)

• **(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)

D ..... 2013

E ..... 2014

F ..... 2015

G ..... 2016

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

**J** ..... **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 ..... Final Tier 4 and Stage IV

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 B (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.

**288093** ..... **Machine Serial Number**

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### IMPORTANT

Warranty will not apply to engine and drivetrain failures resulting from unauthorized adjustments to this engine.

Unauthorized adjustments are in violation of the emissions regulations applicable to this engine and may result in substantial fines and penalties.

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## Introduction

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Deere Open Source Compliance Team  
P.O. Box 1202  
Moline, IL 61266-1202  
USA

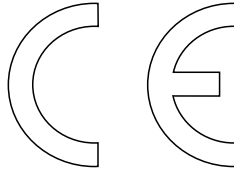
Please include name of the product and the version number of the software in the request letter. This offer is valid to anyone in receipt of this information.

## Conformity Marking for European Union (EU) and Eurasian Economic Union (EAEU)

*NOTE: Some or all machine models listed on the front cover of this manual are available in optional factory configurations that meet or exceed European Union (EU) or Eurasian Economic Union (EAEU) conformity requirements.*

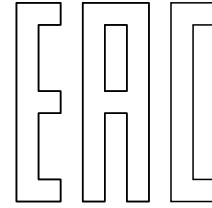
To validate conformance of a particular machine for sale into the EU or EAEU markets, check for the applicable marking on the machine, or see an authorized John Deere dealer.

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European Union (EU)

TX1219405 —UN—18JUL16



Eurasian Economic Union (EAEU)

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**Emissions Control Warranty Statement**

**YANMAR CO., LTD. EMISSION CONTROL SYSTEM WARRANTY—USA ONLY**

**Your Warranty Rights and Obligations:**

The California Air Resources Board (CARB), the United State Environmental Protection Agency (EPA) and YANMAR CO., LTD. hereafter referred to as YANMAR, are pleased to explain the **emission control system warranty** on your 2015, 2016, or 2017 model year industrial compression-ignition engine. California-certified, new off-road compression-ignition engines must be designed, built and equipped to meet the State’s stringent anti-smog standards. In the remaining forty nine (49) states, new non-road compression-ignition engines must be designed, built and equipped to meet the United States EPA emissions standards. YANMAR must warrant the emission control system on your engine for the periods

of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the fuel injection system, the air induction system, the electronic control system, EGR (Exhaust Gas Recirculation) system and the diesel particulate filter system. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, YANMAR will repair your off-road compression-ignition engine at no charge to you including diagnosis, parts and labor.

**Manufacturer’s Warranty Period:**

2015, 2016, or 2017 model year off-road compression-ignition engines are warranted for the periods listed below. If any emission-related part on your engine is found to be defective during the applicable warranty period, the part will be repaired or replaced by YANMAR.

If your engine is certified as	And its maximum power is	And its rated speed is	Then its warranty period is
Variable speed or constant speed	kW < 19	Any speed	1,500 hours or two (2) years whichever comes first. In the absence of a device to measure the hours of use, the engine has a warranty period of two (2) years.
Constant speed	19 ≤ kW < 37	3,000 rpm or higher	1,500 hours or two (2) years whichever comes first. In the absence of a device to measure the hours of use, the engine has a warranty period of two (2) years.
Constant speed	19 ≤ kW < 37	Less than 3,000 rpm	3,000 hours or five (5) years whichever comes first. In the absence of a device to measure the hours of use, the engine has a warranty period of five (5) years.
Variable speed	19 ≤ kW < 37	Any speed	3,000 hours or five (5) years whichever comes first. In the absence of a device to measure the hours of use, the engine has a warranty period of five (5) years.
Variable speed or constant speed	kW ≥ 37	Any speed	3,000 hours or five (5) years whichever comes first. In the absence of a device to measure the hours of use, the engine has a warranty period of five (5) years.

**Warranty Coverage:**

This warranty is transferable to each subsequent purchaser for the duration of the warranty period. Repair or replacement of any warranted part will be performed at an authorized YANMAR dealer.

Warranted parts not scheduled for replacement as required maintenance in the owner’s manual shall be warranted for the warranty period. Warranted parts scheduled for replacement as required maintenance in the owner’s manual are warranted for the period of time prior to the first scheduled replacement. Any warranted parts scheduled for replacement as required maintenance that are repaired or replaced under warranty shall be warranted for the remaining period of time prior to the first scheduled replacement. Any part not scheduled for

replacement that is repaired or replaced under warranty shall be warranted for the remaining warranty period.

During the warranty period, YANMAR is liable for damages to other engine components caused by the failure of any warranted part during the warranty period.

Any replacement part which is functionally identical to the original equipment part in all respects may be used in the maintenance or repair of your engine, and shall not reduce YANMAR’s warranty obligations. Add-on or modified parts that are not exempted may not be used. The use of any non-exempted add-on or modified parts shall be grounds for disallowing a warranty.

**Warranted Parts:**

This warranty covers engine components that are a part of the emission control system of the engine as delivered by YANMAR to the original retail purchaser. Such components may include the following:

- (A) Fuel injection system (including Altitude compensation system)
- (B) Cold start enrichment system
- (C) Intake manifold and Air intake throttle valve
- (D) Turbocharger systems
- (E) Exhaust manifold
- (F) Positive crankcase ventilation system
- (G) Charge Air Cooling systems
- (H) Exhaust Gas Recirculation (EGR) systems
- (I) Exhaust gas after treatment (diesel particulate filter system)
- (J) Electronic Control units, sensors, solenoids and wiring harnesses used in above systems
- (K) Hoses, belts, connectors and assemblies used in above systems
- (L) Emission Control Information Labels

Since emissions related parts may vary slightly between models, certain models may not contain all of these parts and other models may contain the functional equivalents.

**Exclusions:**

Failures other than those arising from defects in material or workmanship are not covered by this warranty. The warranty does not extend to the following: malfunctions caused by abuse, misuse, improper adjustment, modification, alteration, tampering,

disconnection, improper or inadequate maintenance, or use of non-recommended fuels and lubricating oils; accident-caused damage and replacement of expendable items made in connection with scheduled maintenance. YANMAR disclaims any responsibility for incidental or consequential such as loss of time, inconvenience, loss of use of equipment/engine or commercial loss.

**Owner's Warranty Responsibilities:**

**As the off-road compression-ignition engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual.**

YANMAR recommends that you retain all documentation, including receipts, covering maintenance on your off-road compression-ignition engine, but YANMAR cannot deny warranty solely for the lack of receipts, or for your failure to ensure the performance of all scheduled maintenance.

YANMAR may deny your warranty coverage if your off-road compression-ignition engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

Your engine is designed to operate on diesel fuel only. Use of any other fuel may result in your engine no longer operating in compliance with CARB and EPA emissions requirements.

You are responsible for initiating the warranty process. You must present your engine to a YANMAR dealer as soon as a problem exists. The warranty repairs should be completed by the dealer as expeditiously as possible. If you have any questions regarding your warranty rights and responsibilities, or would like information on the nearest YANMAR dealer or authorized service center, you should contact YANMAR America Corporation.

Website: [www.yanmar.com](http://www.yanmar.com)  
E-mail: [CS\\_support@yanmar.com](mailto:CS_support@yanmar.com)  
Toll free telephone number: 1-800-872-2867, 1-855-416-7091

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**Emissions Performance and Tampering**

**Operation and Maintenance**

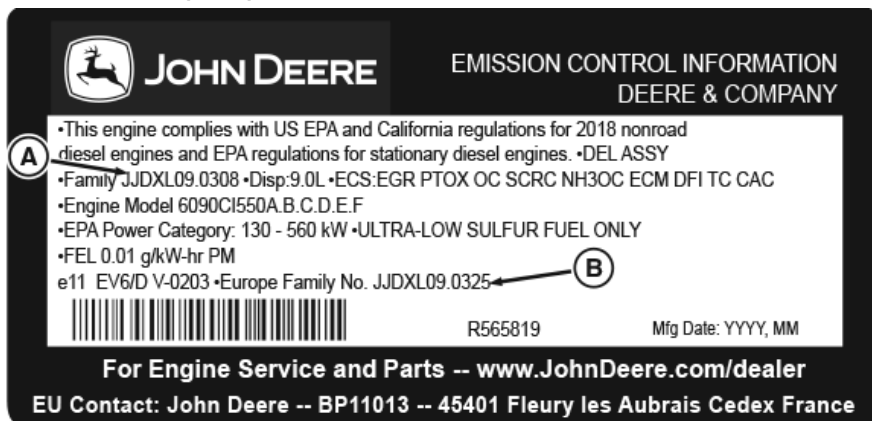
The engine, including the emissions control system, shall be operated, used, and maintained in accordance with the instructions provided in this manual to maintain the emissions performance of the engine within the requirements applicable to the engine's category/certification.

**Tampering**

No deliberate tampering with or misuse of the engine emissions control system shall take place; in particular with regard to deactivating or not maintaining an exhaust gas recirculation (EGR) or a DEF dosing system. Tampering with an engine's emissions control system will void the European Union (EU) type approval and applicable emissions-related warranties.

DX,EMISSIONS,PERFORM -19-12JAN18-1/1

### Carbon Dioxide Emissions (CO<sub>2</sub>)



Engine Emissions Label

A—Family

B—Europe Family

*NOTE: If your engine emissions label lists both a family number (A) and a Europe family number (B), reference the Europe family number using the chart.*

*NOTE: The first letter of the family number is not utilized for family identification on the chart.*

To identify the carbon dioxide (CO<sub>2</sub>) output, locate the engine emissions label. Find the appropriate family on the emissions label and reference the chart.

Family	CO <sub>2</sub> Output
_JDXL02.9323	668 g/kWh
_JDXL06.8324	683 g/kWh
_JDXL09.0325	646 g/kWh
_JDXL13.5326	661 g/kWh

This CO<sub>2</sub> measurement results from testing over a fixed test cycle under laboratory conditions a(n) (parent) engine representative of the engine type (engine family) and shall not imply or express any guarantee of the performance of a particular engine.

DX,EMISSIONS,CO2 -19-12JAN18-1/1

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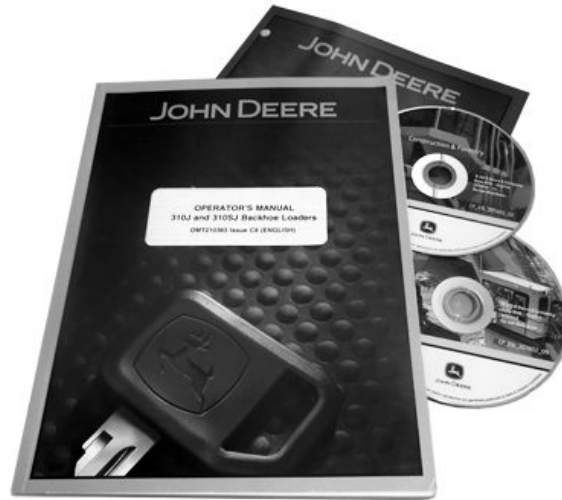
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- John Deere Technical Information Store:  
<http://www.johndeeretechno.com/>
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Available information includes:

- PARTS CATALOGS listing service parts available for machines with exploded view illustrations to help identify the correct parts. It is also useful in assembling and disassembling.
- OPERATOR'S MANUALS providing safety, operating, maintenance, and service information.
- TECHNICAL MANUALS outlining service information for machines. Included are specifications, illustrated assembly and disassembly procedures, hydraulic oil flow diagrams, and wiring diagrams. Some products have separate manuals for repair and diagnostic information. Some components, such as engines, are available in a separate component technical manual.



*John Deere Online Bookstore*

- TRAINING GUIDES AND VIDEOS covering components, preventative maintenance, operation safety, and demonstration tips.

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MB60223,0005117 -19-17MAR17-1/1



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**THANK YOU!**



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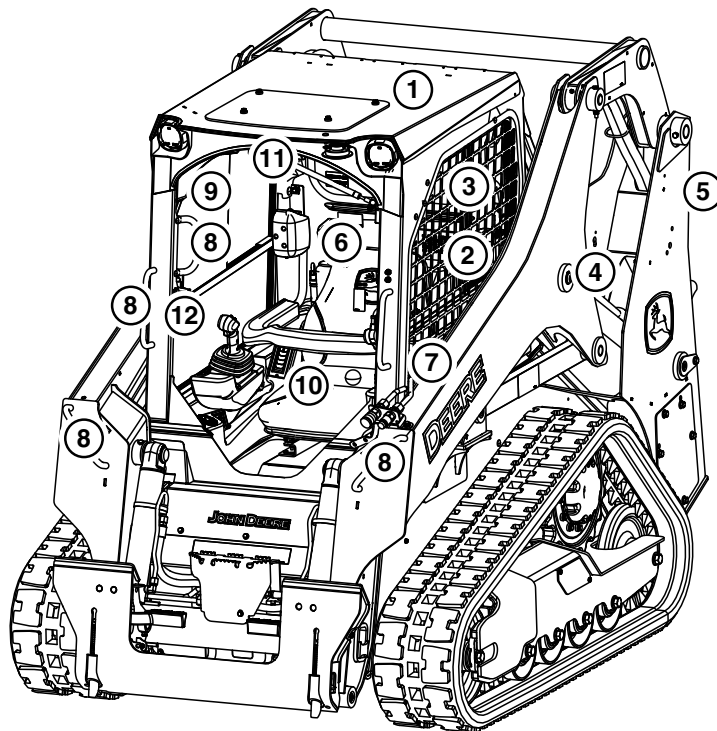
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# Safety—Safety and Operator Conveniences

## Safety and Operator Convenience Features



TX1204744

*Safety and Operator Convenience Features*

**Please remember that the operator is the key to preventing accidents.**

**1. ROPS/FOPS Protection.** Structures designed to help protect the operator are certified to ISO and OSHA. Enclosure also deflects sun and rain.

**2. Window Guarding.** Side screens prevent contact with a moving boom.

**3. Alternative Exit.** The rear window provides an exit path if the front door is blocked.

**4. Bypass Start Protection.** Shielding over the starter terminals helps prevent dangerous bypass starting.

**5. Engine Fan Guard.** Enclosing the fan fully inside the cooling package helps prevent contact with rotating fan blades.

**6. Loader Boom Service Lock.** A mechanical lock is provided for working on or around this machine with the boom raised.

**7. Seat Belt With Automatic Retractor.** Retractor helps protect the operator and keeps the belt and operator's station clean. A convenient integrated seat and shoulder belt system is also provided.

**8. Handholds.** Conveniently placed handholds make it easy to enter or exit the operator's station.

**9. Independent Parking Brake:** Electrically controlled parking brake engages whenever the engine is stopped.

**10. Cab With Air Conditioner, Heater, and Defroster (if equipped).** Options are available.

**11. Rearview Mirror.** For operator convenience, a rearview mirror is available.

**12. Swing Out Front Door (if equipped).** A sealed swing out front door is available. Swing out front door allows the cab to be pressurized. Also provides easy access into cab and more headroom inside cab.

CN93077,0000656 -19-09DEC15-1/1

TX1204744 —UN—30OCT15

# Safety—General Precautions

## 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.



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

T133555 —UN—15APR13

T133588 —19—28AUG00

## 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.



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

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

TS201 —UN—15APR13

## 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



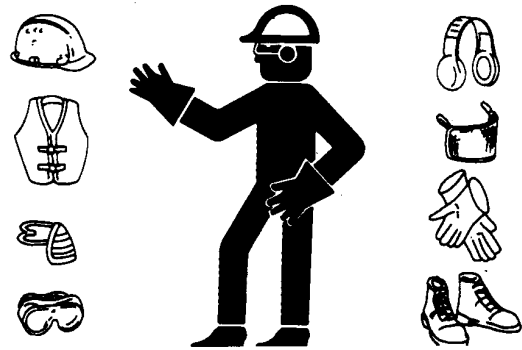
### Wear Protective Equipment

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.



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

TS206 —UN—15APR13

### Protect Against Noise

There are many variables that affect the sound level range, including machine configuration, condition and maintenance level of the machine, ground surface, operating environmental, duty cycles, ambient noise, and attachments.

Exposure to loud noise can cause impairment or loss of hearing.

**Always wear hearing protection.** Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



DX,NOISE -19-03OCT17-1/1

TS207 —UN—23AUG88

### 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.

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### Inspect Machine

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

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



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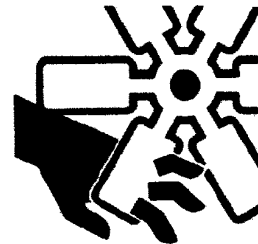
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### Stay Clear of Moving Parts

Entanglements in moving parts can cause serious injury.

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

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



T133592 —UN—15APR13

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

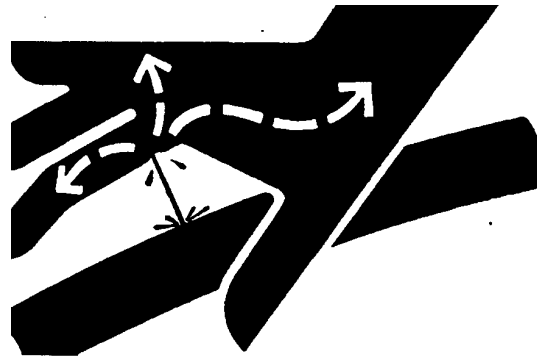
### Avoid High-Pressure Fluids

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

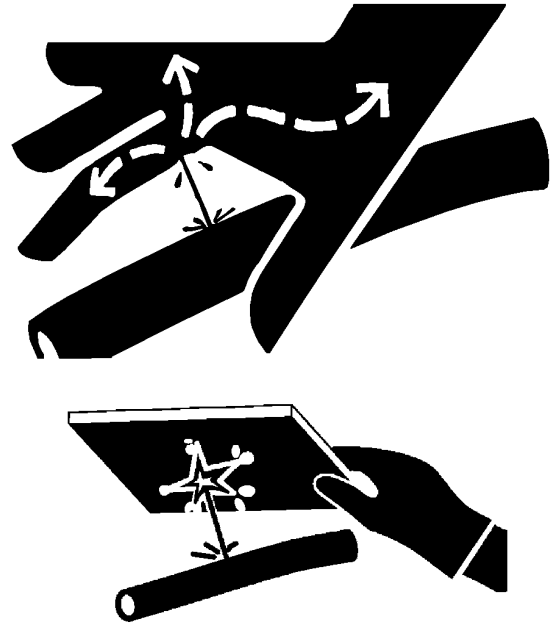
DX,FLUID -19-03MAR93-1/1

### 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.



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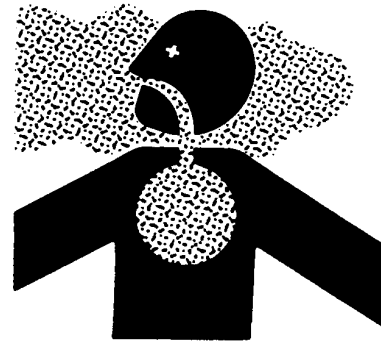
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TX,HPOILS -19-20JAN11-1/1

### 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

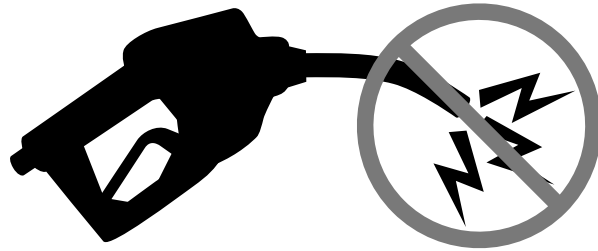
### Avoid Static Electricity Risk When Refueling

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.



T133553 —UN—07SEP00



T133554 —UN—07SEP00



T133552 —UN—15APR13

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.



*In Case of Machine Fire*

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

TS227—UN—15APR13

### 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 volt-meter or hydrometer.

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

Keep Battery Electrolyte levels properly maintained.



MB60223,0000081 -19-03MAR15-1/1

TS204—UN—15APR13

### 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.)



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

TS1132—UN—15APR13

### 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.



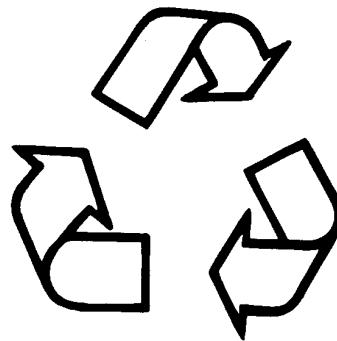
TS1356 —UN—18MAR92

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.**

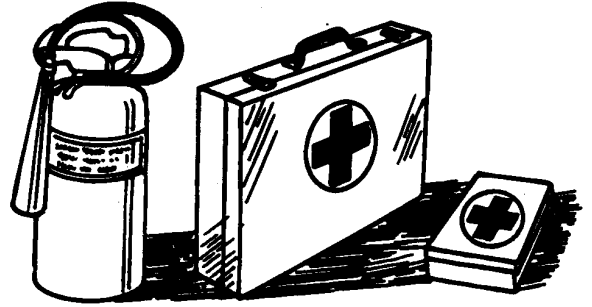
TX,ASH,DISP -19-20JAN11-1/1

### 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

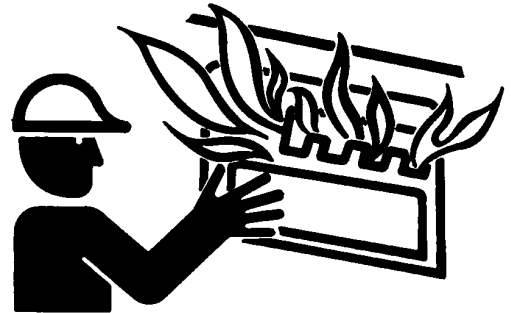
### Clean Debris from Machine

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

### 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.

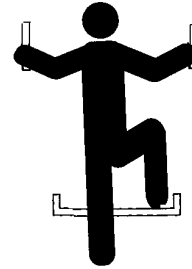
TX,CABGUARD -19-12FEB13-1/1

# Safety—Operating Precautions

## Use Steps and Handholds Correctly

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

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



TX,STEPS -19-09FEB11-1/1

T133468 —UN—15APR13

## Start Only From Operator's Seat

Avoid unexpected machine movement. Start engine only while sitting in operator's seat. Ensure that 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.



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

T133715 —UN—15APR13

## 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 that webbing is not cut or torn. Replace seat belt immediately if any part is damaged or does not function properly.

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



**USE  
SEAT  
BELT**

TX,SEAT,BELT -19-20JAN11-1/1

T133716 —19—17APR13



### Prevent Unintended Machine Movement

Be careful not to accidentally actuate controls. Follow these steps during work interruptions before allowing coworkers to approach the machine, before standing up, leaving the operator's seat, or exiting the machine:

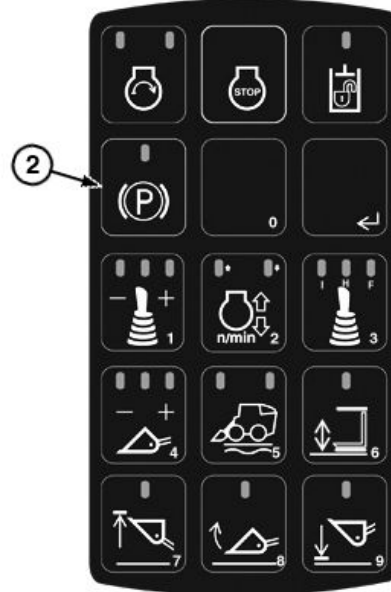
- Lower equipment to the ground.
- If equipped with key start, press park brake switch (1) to engage park brake.
- If equipped with keyless start, press park brake switch (2) to engage park brake.
- Stop the engine.
- Raise interlocking seat bar.

1— Park Brake Switch (key start control panel)

2— Park Brake Switch (keyless start control panel)



Key Start Control Panel



Sealed Switch Module (SSM)

TX1125062 —UN—31OCT12

TX1204670 —UN—30OCT15

CN93077,00006B8 -19-08DEC15-1/1

## Avoid Work Site Hazards

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

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

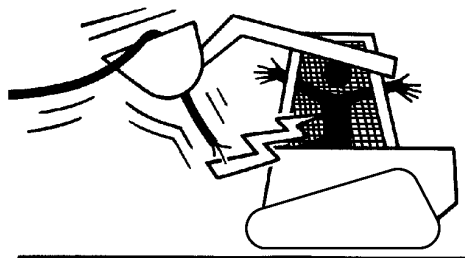
**Avoid boom or attachment contact with overhead obstacles or overhead electrical lines.** Never move machine closer than 3 m (10 ft) plus twice the line insulator length to overhead wires.

**Keep bystanders clear at all times.** Keep bystanders away from raised booms, attachments, and unsupported loads. Avoid swinging or raising booms, attachments, or loads over or near personnel. Use barricades or a signal person to keep vehicles and pedestrians away. Use a signal person if moving machine in congested areas or where visibility is restricted. Always keep signal person in view. Coordinate hand signals before starting machine.

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

**Avoid working under overhanging embankments or stockpiles** that could collapse under or on machine.

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



Contact With Electrical Lines



Operate on Solid Footing

units equipped with shoulder belts always wear both the seat and shoulder belt and **do not lean forward** while operating.

**Do not stand on track.**

JK47244,00002C5 -19-10MAY18-1/1

T211519 —UN—02JUN05

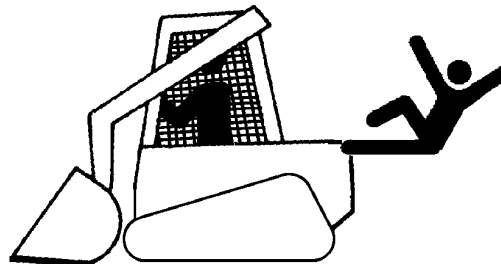
TX1064890 —UN—02OCT09

## Keep Riders Off Machine

Only allow operator on machine.

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

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



Keep Riders Off Machine

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

T211522 —UN—02JUN05

### Avoid Backover Accidents

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

**Be certain reverse warning alarm is working properly.**

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



Avoid Backover Accidents

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

T211523 —UN—02JUN05

### Avoid Machine Tip Over

**Use seat belt at all times.**

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

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

**Be careful on slopes.** Avoid sharp turns. Balance loads so weight is evenly distributed and load is stable. Carry tools and loads close to the ground to aid in visibility and lower center of gravity. Use extra care on wet, soft, rocky, or frozen ground.

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

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



Use Seat Belt

**USE  
SEAT  
BELT**



Avoid Machine Tip Over

VD76477,0000046 -19-25MAY18-1/1

T1133716 —19—17APR13

T211525 —UN—02JUN05

### Operating on Slopes

Avoid side slope travel whenever possible. When working on steep slopes, travel as straight up and down as possible and keep the heavy end of the vehicle uphill to prevent machine tip over.

Carry the load as low as possible for maximum stability and visibility.

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

Be alert to wind direction and velocity.



Operating On Slopes-Tracked

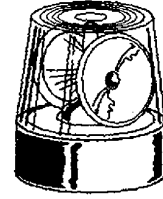
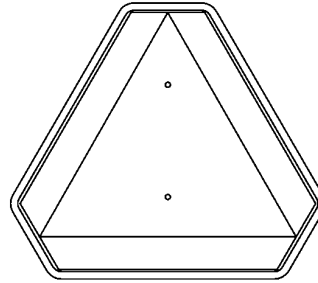
OUT4001,0000471 -19-25MAY18-1/1

TX1063678 —UN—01SEP09

### Operating or Traveling On Public Roads

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

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



T141891 —UN—15APR13

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

### Inspect and Maintain ROPS

A damaged rollover protective structure (ROPS) should be replaced, not reused.

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

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

To maintain the ROPS:

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

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

### Travel Safely

*NOTE: When working on steep slopes, travel as straight up and down as possible to prevent roll-over.*

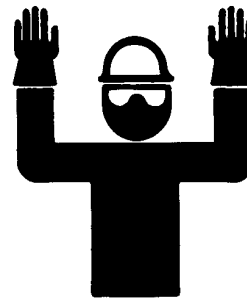
**DO NOT PARK ON A HILLSIDE OR AN INCLINE.**

*Always park the machine on level ground.*

Know the location of bystanders before moving the machine.

Always keep the reverse warning alarm in working condition. The alarm warns bystanders when the machine starts to move in reverse.

Use a signal person when moving the machine in congested areas. Coordinate hand signals before starting the machine.



Travel Safely

T6964AD —UN—20DEC08

CN93077,00000B3 -19-14FEB13-1/1

### Prevent Acid Burns

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

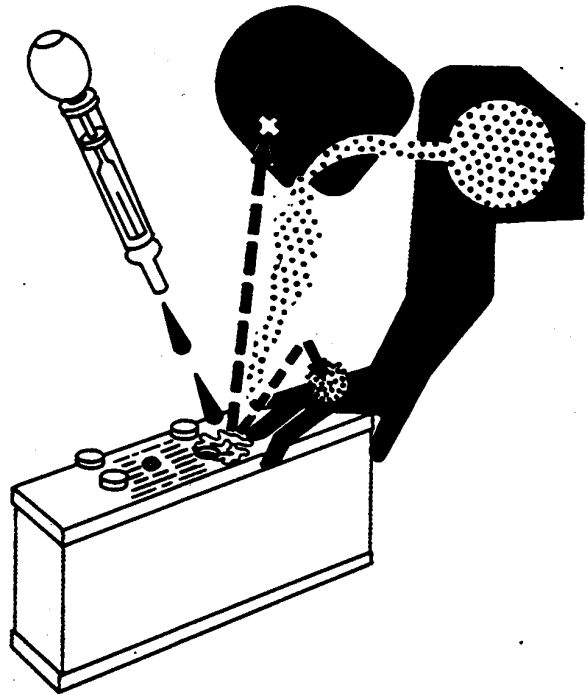
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 15—30 minutes. Get medical attention immediately.

If acid is swallowed:

1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 2 L (2 quarts).
3. Get medical attention immediately.



TS203—UN—23AUG88

DX,POISON -19-21APR93-1/1

### Add and Operate Attachments Safely

Always verify compatibility of attachments by contacting your authorized dealer. Adding unapproved attachments could affect machine stability or reliability and could 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.

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

# Safety—Maintenance Precautions

## Park and Prepare for Service Safely

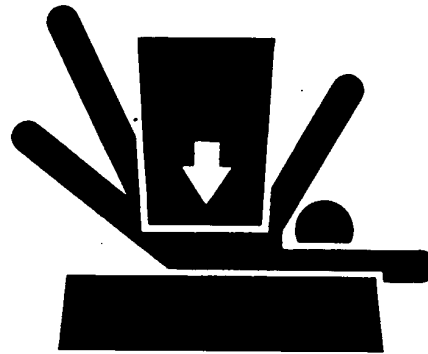
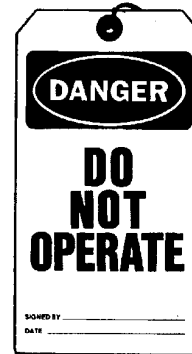
**Warn others of service work.** Always park and prepare machine for service or repair properly.

- Park machine on a level surface and lower equipment to the ground.
- Engage park brake.
- Stop engine and remove key.
- Attach a “DO NOT OPERATE” tag in an obvious place in the operator’s station.

Securely support machine or attachment before working under it.

- Do not support machine with any hydraulically actuated tools or attachments.
- Do not support machine with cinder blocks or wooden pieces that may crumble or crush.
- Do not support machine with a single jack or other devices that may slip out of place.
- Always install boom lock before working on or around this machine with the loader boom raised.

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

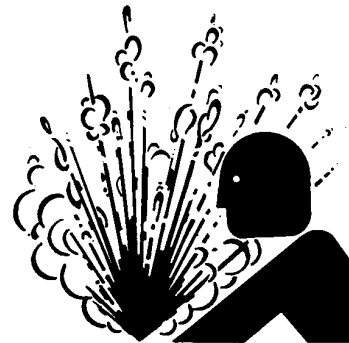
TS229—UN—23AUG88

TX,PARK,SSL -19-28JUN10-1/1

## 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

### 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.



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

TS220—UN—15APR13

### 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.



Heating Near Pressurized Fluid Lines

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

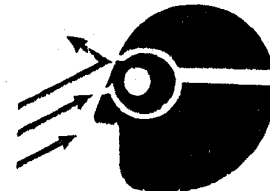
MB60223.0000212 -19-02JUL15-1/1

T133547—UN—15APR13

### 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.



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

T133738—UN—15APR13

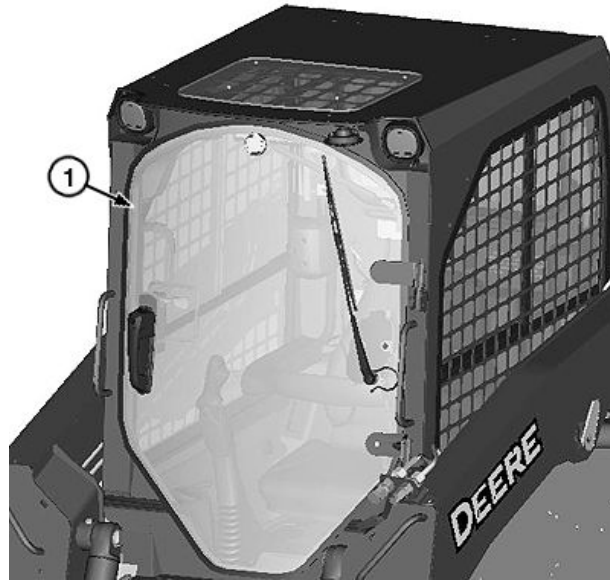
### Handle Cab Door Safely—If Equipped

When servicing machine, be aware that cab door (1) is breakable.

Keep door closed if cab needs to be raised for service. Be aware of surroundings so that door does not come in contact with any objects.

Use care if cab door needs to be removed. To prevent damage to the door, handle with care and store in a secure location.

1— Cab Door



Cab Door

TX1204690 —UN—28OCT15

CN93077,00006B6 -19-28OCT15-1/1



### 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.

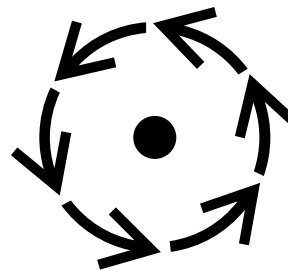
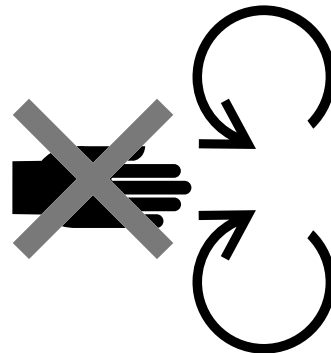
If service procedure requires engine to be running:

- 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.



**STOP**

TS227 —UN—15APR13

TS271 —UN—23AUG88

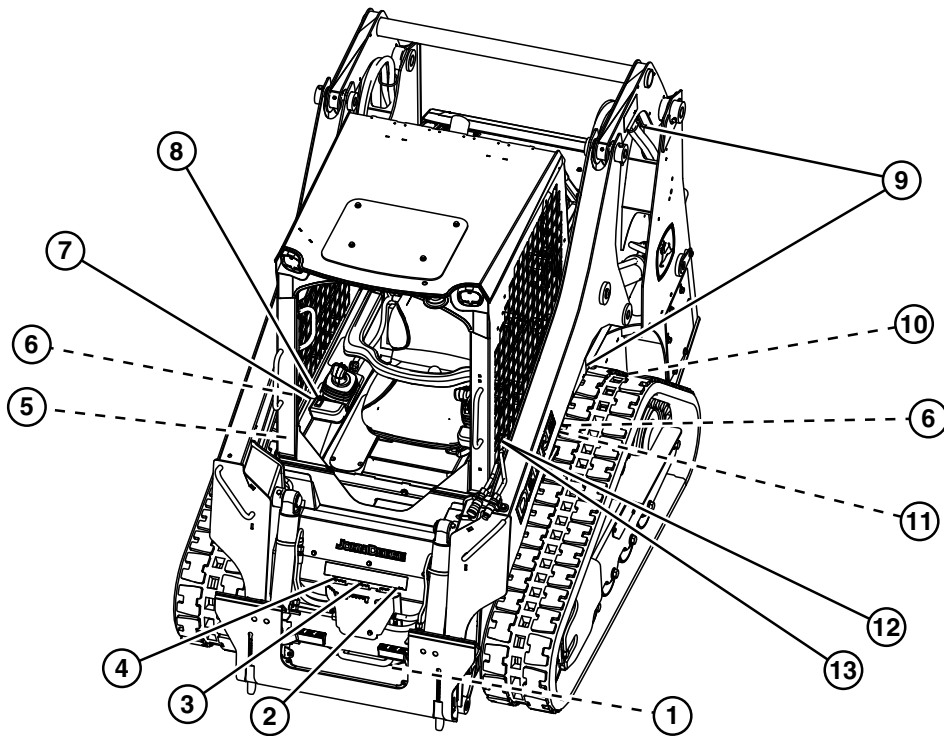
TS1693 —UN—08DEC09

TS1695 —UN—07DEC09

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

# Safety—Safety Signs and Other Instructions

## Safety Signs and Other Instructions



TX1204594

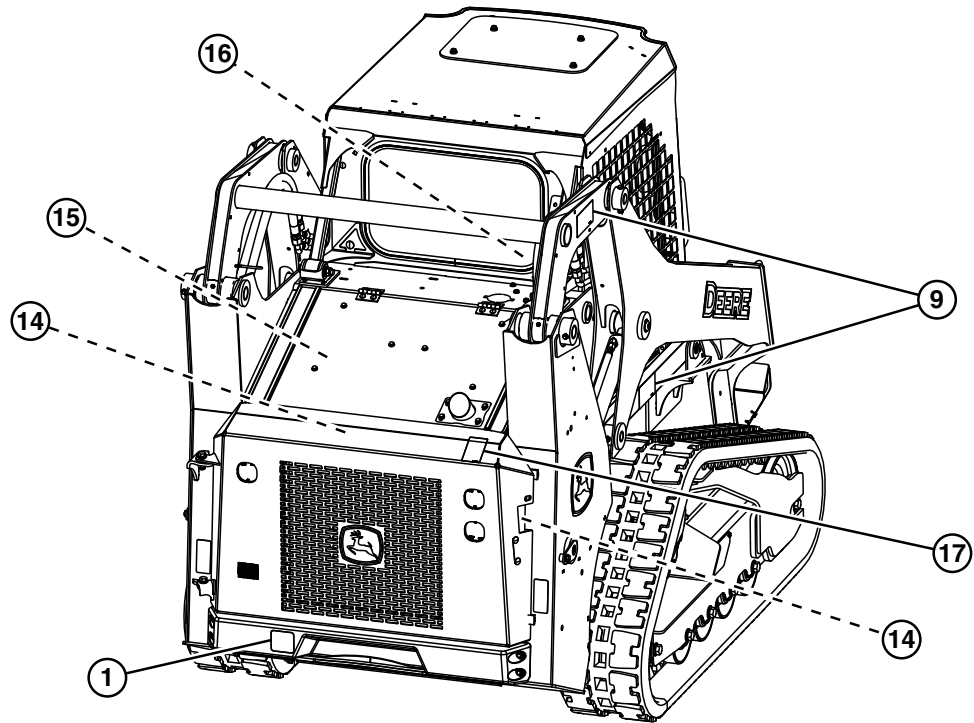
Safety Signs, Left Side Shown

- |                                              |                                           |                                               |                                                    |
|----------------------------------------------|-------------------------------------------|-----------------------------------------------|----------------------------------------------------|
| 1—Tiedown Point                              | 5— CAUTION, Before Raising ROPS           | 9— WARNING, Pinch Area Keep Away              | 12— CAUTION, Avoid Overturn                        |
| 2—WARNING, Prevent Injury                    | 6— WARNING, Always Install Boom Lock      | 10— WARNING, Avoid Injury From Escaping Fluid | 13— WARNING, Seat Belt Should Be Worn at All Times |
| 3—WARNING, Avoid Crushing Injury             | 7— DANGER, Avoid Serious Injury or Death  | 11— WARNING, Avoid Injury From Escaping Fluid |                                                    |
| 4—WARNING, No Riders/Keep Riders Off Machine | 8— CAUTION, Before Operating This Machine |                                               |                                                    |

Continued on next page

CN93077,00006B2 -19-26MAY16-1/19

TX1204594 —UN—30OCT15



TX1204595

Safety Signs, Right Side Shown

- |                                  |                                 |                                    |
|----------------------------------|---------------------------------|------------------------------------|
| 1— Tiedown Point                 | 14— WARNING, Avoid Rotating Fan | 16— Alternative Exit               |
| 9— WARNING, Pinch Area Keep Away | 15— WARNING, Pressurized System | 17— WARNING, Avoid Crushing Injury |

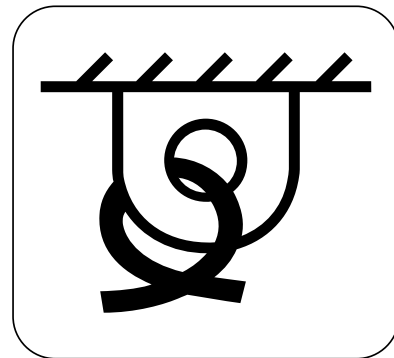
CN93077.00006B2 -19-26MAY16-2/19

TX1204595 —UN—10NOV15

1. Tiedown Point

Route appropriate tiedown device through tiedown points.

This label is positioned strategically around the machine.



Tiedown Point

Continued on next page

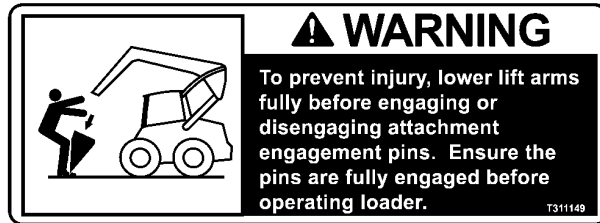
CN93077.00006B2 -19-26MAY16-3/19

TX1171987 —UN—19SEP14

2. **WARNING, Prevent Injury**

To prevent injury, lower lift arms fully before engaging or disengaging attachment engagement pins. Ensure the pins are fully engaged before operating loader.

This label is located on the front of the machine near the bucket cylinder.



TX1125728 —19—03JAN13

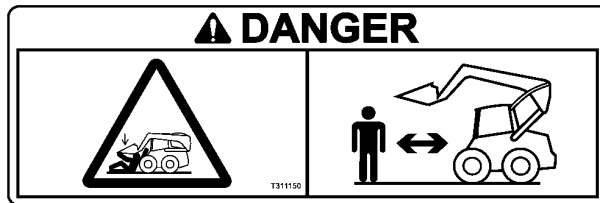
*WARNING, Prevent Injury*

CN93077.00006B2 -19-26MAY16-4/19

3. **DANGER, Avoid Crushing Injury**

Always install boom lock before entering this area.

This label is located on the front of the machine near the bucket cylinder.



TX1125726 —19—17DEC12

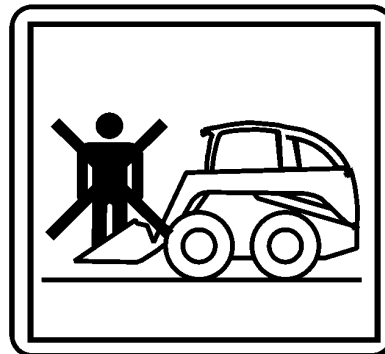
*DANGER, Avoid Crushing Injury*

CN93077.00006B2 -19-26MAY16-5/19

4. **WARNING, No Riders/Keep Riders Off Machine**

Only allow the operator on the machine. Keep riders off. Riders on machine are subject to injury such as being struck by foreign objects and being thrown off the machine. Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.

This label is located on the front of the machine near the bucket cylinder.



TX1128864 —UN—04JAN13

*WARNING, No Riders/Keep Riders Off Machine*

Continued on next page

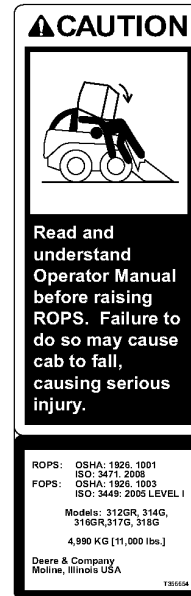
CN93077.00006B2 -19-26MAY16-6/19

5. **CAUTION, Before Raising ROPS**

Read and understand Operator Manual before raising ROPS.

Failure to do so may cause cab to fall, causing serious injury.

This label is located inside the cab behind the right joystick.



CAUTION, Before Raising ROPS

CN93077.00006B2 -19-26MAY16-7/19

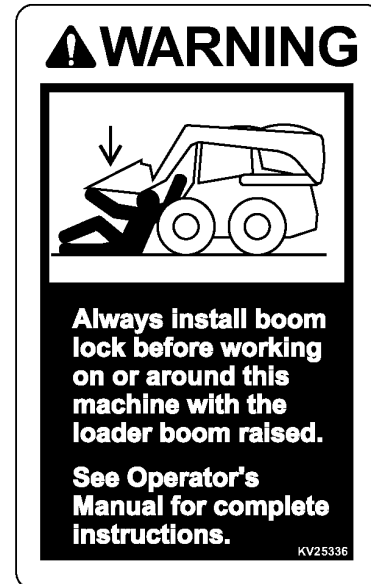
TX1204309 —19—12NOV15

6. **WARNING, Always Install Boom Lock**

Always install boom lock before working on or around this machine with the loader boom raised.

See Operator's Manual for complete instructions.

This label is located inside the cab near the right joystick.



WARNING, Always Install Boom Lock

Continued on next page

CN93077.00006B2 -19-26MAY16-8/19

TX1204313 —19—12NOV15

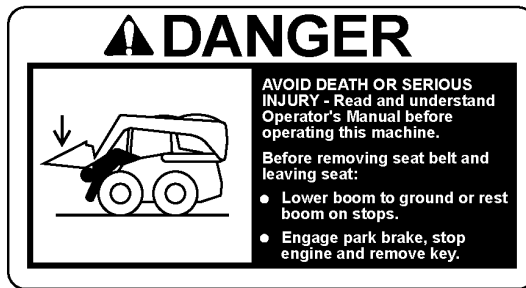
**7. DANGER, Avoid Death or Serious Injury**

Read and understand Operator's Manual before operating this machine.

Before removing seat belt and leaving seat:

- Lower boom to ground or rest boom on stops.
- Engage park brake, stop engine and remove key.

This label is located inside the cab near the right joystick.



*DANGER, Avoid Death or Serious Injury*

CN93077,00006B2 -19-26MAY16-9/19

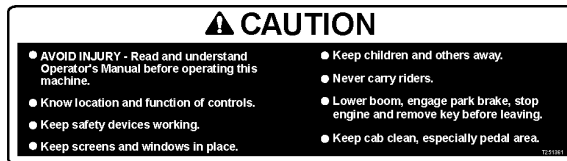
TX1125800 —19—14NOV12

**8. CAUTION, Before Operating This Machine**

AVOID INJURY - Read and understand Operator's Manual before operating this machine.

- Know location and function of controls.
- Keep safety devices working.
- Keep screens and windows in place.
- Keep children and others away.
- Never carry riders.
- Lower boom, engage park brake, stop engine and remove key before leaving.
- Keep cab clean, especially pedal area.

This label is located inside the cab near the right joystick.



*CAUTION, Before Operating This Machine*

CN93077,00006B2 -19-26MAY16-10/19

TX1125787 —19—14NOV12

**9. WARNING, Pinch Area Keep Away**

Pinch area keep away.

This label is located in four places on the loader linkage.



*WARNING, Pinch Area Keep Away*

Continued on next page

CN93077,00006B2 -19-26MAY16-11/19

TX1125566 —19—17DEC12

**10. WARNING, Avoid Injury From Escaping Fluid**

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

1. Refer to proper Machine Model Technical Manual for disassembly or charging instructions and equipment required.
2. Charge with DRY NITROGEN only.

This label is located near the accumulator.



*WARNING, Avoid Injury From Escaping Fluid*

CN93077,00006B2 -19-26MAY16-12/19

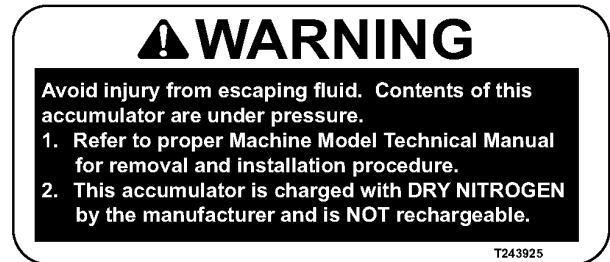
TX1196412 —19—23JUN15

**11. WARNING, Avoid Injury From Escaping Fluid**

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

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

This label is located near the brake change relief.



*WARNING, Avoid Injury From Escaping Fluid*

CN93077,00006B2 -19-26MAY16-13/19

TX1204365 —19—25NOV15

**12. CAUTION, Avoid Overturn**

- Carry load low.
- Avoid steep slopes and high speed turns.
- Do not operate over rated capacity.

This label is located inside the cab near the left joystick.



*CAUTION, Avoid Overturn*

Continued on next page

CN93077,00006B2 -19-26MAY16-14/19

TX1125788 —19—13NOV12

**13. WARNING, Seat Belt Should Be Worn at All Times**

A seat belt should be worn at all times during machine operation to prevent serious injury or death in the event of an accident or machine overturn. Failure to wear a seat belt during machine operation may result in serious injury or death.

This label is located inside the cab near the left joystick.



WARNING, Seat Belt Should Be Worn at All Times

CN93077,00006B2 -19-26MAY16-15/19

TX1125804 —19—13NOV12

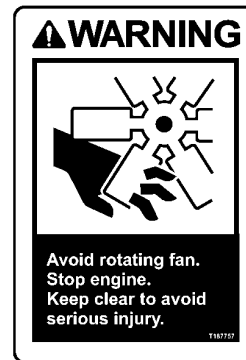
**14. WARNING, Avoid Rotating Fan**

Avoid rotating fan.

Stop engine.

Keep clear to avoid serious injury.

This label is located on the rear of the machine behind rear service door.



WARNING, Avoid Rotating Fan

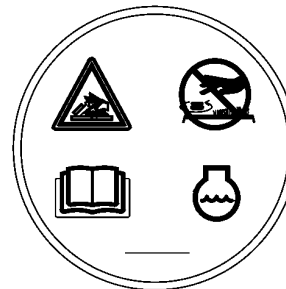
CN93077,00006B2 -19-26MAY16-16/19

TX1125730 —19—17DEC12

**15. WARNING, Pressurized System**

Pressurized system. Hot coolant can cause serious burns, injury, or death. To open the cooling system filler cap, stop the engine and wait until the cooling system components are cool. Loosen the cooling system pressure cap slowly in order to relieve the pressure.

This label is located on the surge tank cap.



WARNING, Pressurized System

Continued on next page

CN93077,00006B2 -19-26MAY16-17/19

TX1099924 —UN—24OCT11



**16. Alternative Exit**

The rear window provides a large exit path if the cab door is blocked in an emergency situation. The rear window is an alternate exit.

This label is located on inside of the right-rear window.



*Alternative Exit*

CN93077,00006B2 -19-26MAY16-18/19

TX1125732 —UN—12NOV12

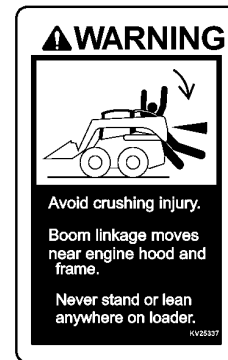
**17. WARNING, Avoid Crushing Injury**

Avoid crushing injury.

Boom linkage moves near engine hood and frame.

Never stand or lean anywhere on loader.

This label is located on rear service door.



*WARNING, Avoid Crushing Injury*

CN93077,00006B2 -19-26MAY16-19/19

TX1125731 —19—17DEC12

# Operation—Operator's Station

## Machine Control

Loader and steering control methods will vary on machine depending on what is ordered directly from factory. There are four machine configurations available:

- Electrohydraulic (EH) Hands Only (ISO pattern) Controls
- Electrohydraulic (EH) Hands Only (ISO and H pattern with performance package) Controls

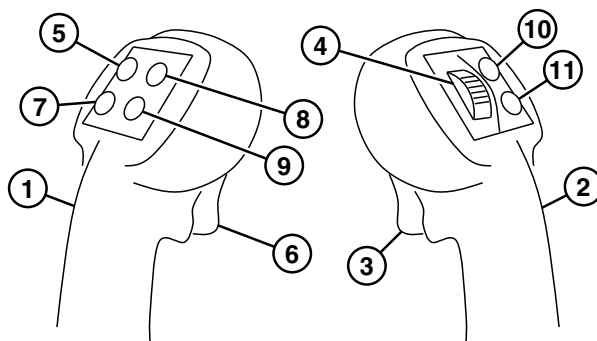
For more detailed information, see Operation—Operating the Machine. (Section 2-2.)

### EH Controls:

**NOTE:** The switchable controls option allows machine control to be easily switched between EH hands only (ISO pattern) controls, or EH hands only (H pattern) controls.

**EH Hands Only (ISO pattern) Controls**—Joysticks (1 and 2) operate loader boom, bucket, and auxiliary hydraulic functions. Joysticks also steer machine using an ISO pattern. Engine speed is controlled by either engine speed control dial (12) or the engine speed control pedal (15).

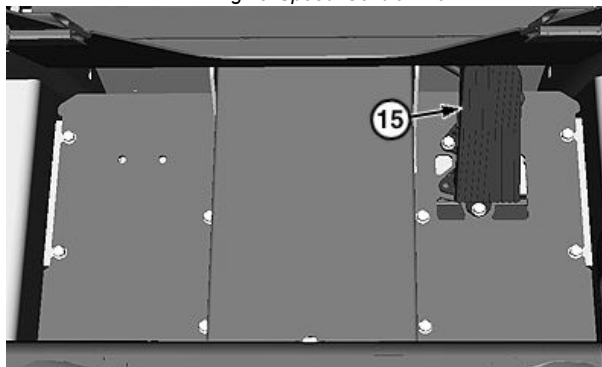
**EH Hands Only (ISO and H pattern with performance package) Controls**—Joysticks (1 and 2) operate loader boom, bucket, and auxiliary hydraulic functions. Joysticks also steer machine using an ISO and H pattern with performance package. Engine speed is controlled by either engine speed control dial (12) or the engine speed control pedal (15).



Left and Right Joysticks



Engine Speed Control Dial



Engine Speed Control Pedal

- |                                         |                                        |
|-----------------------------------------|----------------------------------------|
| 1— Left Joystick                        | 8— Auxiliary Third Function A Switch   |
| 2— Right Joystick                       | 9— Auxiliary Third Function B Switch   |
| 3— Float Switch/Ride Control (activate) | 10— Auxiliary Second Function A Switch |
| 4— Auxiliary Proportional Switch        | 11— Auxiliary Second Function B Switch |
| 5— Horn (if equipped)                   | 12— Engine Speed Control Dial          |
| 6— Two-Speed Switch (if equipped)       | 15— Engine Speed Control Pedal         |
| 7— Auxiliary Flow Set Switch            |                                        |

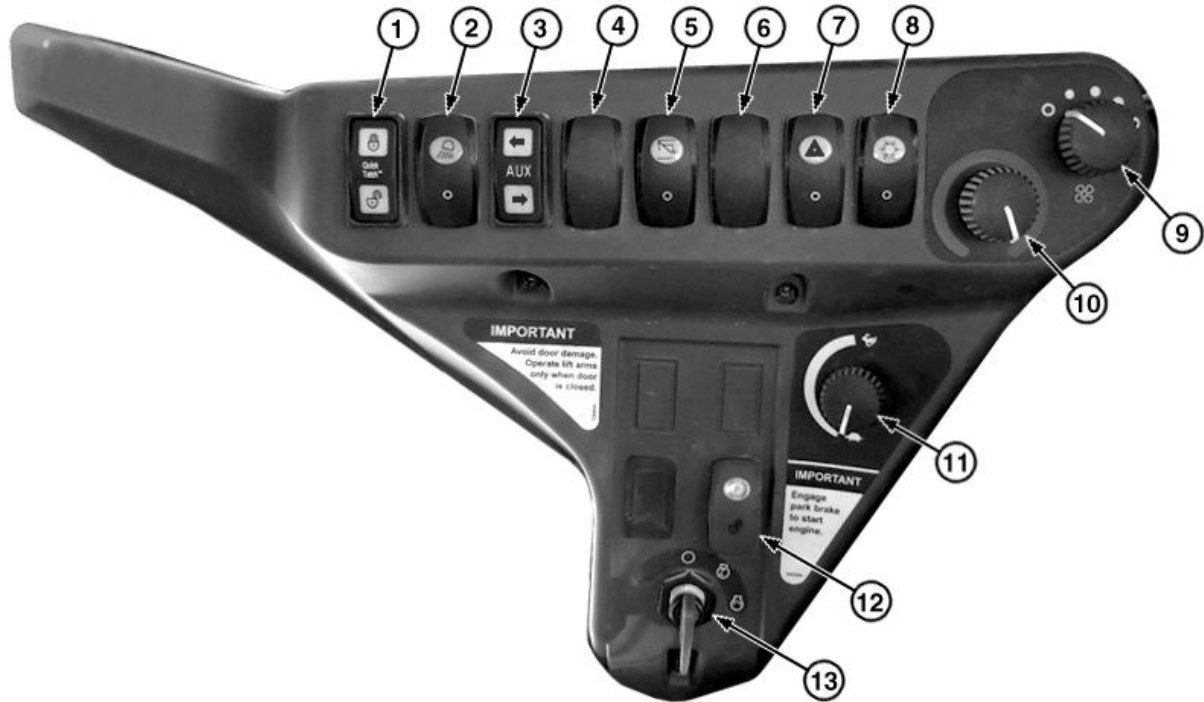
TX106656 —UN—22OCT09

TX1205017 —UN—03NOV15

TX1205026 —UN—03NOV15

CN93077,00006CD -19-29MAR16-1/1

## Control Panel—Key Start



Control Panel—Key Start

- |                                                  |                                                        |                                               |                              |
|--------------------------------------------------|--------------------------------------------------------|-----------------------------------------------|------------------------------|
| 1—Quik-Tatch™ Switch (if equipped)               | 4—Not Used                                             | 8—Air Conditioner Switch (if equipped)        | 11—Engine Speed Control Dial |
| 2—Work Lights Switch                             | 5a—Self Leveling Switch (if equipped)                  | 9—Blower Speed Control Dial (if equipped)     | 12—Park Brake Switch         |
| 3—Auxiliary Fourth Function Switch (if equipped) | 5b—Self Leveling and Ride Control Switch (if equipped) | 10—Cab Temperature Control Dial (if equipped) | 13—Key Switch                |
|                                                  | 6—Not Used                                             |                                               |                              |
|                                                  | 7—Dual Flasher Switch (if equipped)                    |                                               |                              |

### 1—Quik-Tatch™ Switch (if equipped):

*NOTE: The switch will automatically return to center position when released. The lock pins will stop at the position they are in at the time the switch is released.*

Press and hold upper half of switch until lock pins are engaged. Press and hold lower half of switch until lock pins are retracted. For more information, see Attachment Mounting System—Quik-Tatch™. (Section 2-2.)

### 2—Work Lights Switch: This switch has three positions:

- Push upper half of switch to turn on front work lights, side deluxe lights, red taillights, and rear work light.
- Push to middle position to turn on front work lights and red taillights.

*Quik-Tatch is a trademark of Deere & Company*

- Push lower half of switch to turn off lights.

### 3—Auxiliary Fourth Function Switch (if equipped):

Electric control of an auxiliary function.

### 4—Not Used

### 5a—Self Leveling Switch (if equipped):

*NOTE: Self leveling is only operational during boom raise function.*

Press upper half of switch to allow the attachment to remain in same relative position as the boom is raised. Push lower half of switch to turn off this feature. For more information, see Self Leveling Hydraulics—If Equipped. (Section 2-2.)

Continued on next page

CN93077,00006D1 -19-04APR18-1/2

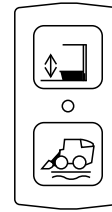
TX1209483—UN—22JAN16

TX1209486 —UN—25JAN16

**5b—Self Leveling and Ride Control Switch (if equipped):**

*NOTE: Self leveling is only operational during boom raise function.*

Push upper half of switch to allow the attachment to remain in same relative position as the boom is raised. Press lower half of switch to activate ride control. For more information, see Ride Control—If Equipped. (Section 2-2.)



Self Leveling and Ride Control Switch (if equipped)

**6—Not Used**

**7—Dual Flasher Switch (if equipped):** Push upper half of switch to turn warning lights on. Push lower half of switch to turn off warning lights.

**8—Air Conditioner Switch (if equipped):** Push upper half of switch to turn on air conditioner. Push lower half of switch to turn off air conditioner.

**9—Blower Speed Control Dial (if equipped):** Turn dial clockwise to increase blower speed. Blower has four speed settings and an OFF position.

**10—Cab Temperature Control Dial (if equipped):** Turn dial clockwise towards red zone for warmer air. Turn dial counterclockwise towards blue zone for cooler air.

**11—Engine Speed Control Dial:**

The engine control unit (ECU) defaults engine speed to slow idle on engine start-up regardless of engine speed control dial position. Move engine speed control dial to slow idle position and then increase the setting to the desired speed to get the engine speed to increase.

Turn dial clockwise towards the rabbit to increase engine speed. Turn dial counterclockwise towards the turtle to decrease engine speed.

**12—Park Brake Switch:** This switch has three positions:

- Push upper half of switch to engage park brake. This position also hydraulically locks the boom and bucket.
- Push to middle position to hydraulically enable boom and bucket while park brake is engaged.

*NOTE: Operator must be in seat with seat belt fastened, interlocking seat bar lowered, and engine running to disengage park brake.*

- Push lower half of switch to momentary position and release to middle position to disengage park brake.

**13—Key Switch:** This switch has three positions:

- Position where ignition key can be inserted or removed is the OFF position. No circuits are active in this position.
- Turn key **clockwise** from the OFF position. This is the RUN position for the engine.
- Turn key **clockwise** from the RUN position. This is the START position for the engine. After starting engine, release key. Key returns to RUN position.

CN93077,00006D1 -19-04APR18-2/2

## Control Panel—Keyless Start



Control Panel—Keyless Start

- |                                                  |                                        |                                               |
|--------------------------------------------------|----------------------------------------|-----------------------------------------------|
| 1—Quik-Tatch™ Switch (if equipped)               | 4—Not Used                             | 9—Blower Speed Control Dial (if equipped)     |
| 2—Work Lights Switch                             | 5—Not Used                             | 12—Sealed Switch Module (SSM)                 |
| 3—Auxiliary Fourth Function Switch (if equipped) | 6—Not Used                             | 10—Cab Temperature Control Dial (if equipped) |
|                                                  | 7—Dual Flasher Switch (if equipped)    | 11—Engine Speed Control Dial                  |
|                                                  | 8—Air Conditioner Switch (if equipped) |                                               |

### 1—Quik-Tatch™ Switch (if equipped):

*NOTE: The switch will automatically return to center position when released. The lock pins will stop at the position they are in at the time the switch is released.*

Press and hold upper half of switch until lock pins are engaged. Press and hold lower half of switch until lock pins are retracted. For more information, see Attachment Mounting System—Quik-Tatch™. (Section 2-2.)

### 2—Work Lights Switch: This switch has three positions:

- Push upper half of switch to turn on front work lights, side deluxe lights, red taillights, and rear work light.
- Push to middle position to turn on front work lights and red taillights.
- Push lower half of switch to turn lights off.

### 3—Auxiliary Fourth Function Switch (if equipped):

Electric control of an auxiliary function.

4—Not Used

5—Not Used

6—Not Used

### 7—Dual Flasher Switch (if equipped):

Push upper half of switch to turn warning lights on. Push lower half of switch to turn warning lights off.

### 8—Air Conditioner Switch (if equipped):

Push upper half of switch to turn on air conditioning. Push lower half of switch to turn off air conditioning.

### 9—Blower Speed Control Dial (if equipped):

Turn dial clockwise to increase blower speed. Blower has four speed settings and an OFF position.

### 10—Cab Temperature Control Dial (if equipped):

Turn dial clockwise towards red zone for warmer air. Turn dial counterclockwise towards blue zone for cooler air.

### 11—Engine Speed Control Dial:

The engine control unit (ECU) will default engine speed to slow idle on engine start-up regardless of engine speed control dial position. Move engine speed control dial to slow idle position and then increase the setting to the desired speed to get the engine speed to increase.

Turn dial clockwise towards the rabbit to increase engine speed. Turn dial counterclockwise towards the turtle to decrease engine speed.

Continued on next page

CN93077,00006D2 -19-04APR18-1/2

TX1209446—UN—22JAN16

**12—Sealed Switch Module (SSM):** See Sealed Switch Module (SSM) in this section.

*Quik-Tatch is a trademark of Deere & Company*

CN93077,00006D2 -19-04APR18-2/2

## Sealed Switch Module (SSM)

**1—Engine Start Switch:** This switch has three settings:

- Press and release switch (left light-emitting diode [LED] is illuminated) to energize ignition and apply power to control units and engagement and monitor unit (EMU).

*NOTE: If kept in this state for more than 10 minutes, machine shuts down automatically.*

- After EMU has initialized, press and hold switch to start engine. Both LEDs are illuminated while engine is starting. Only left LED is illuminated when engine is running.
- When engine stop switch is pressed, engine stops and both LEDs are off.

**2—Engine Stop Switch:** Press switch to shut off engine.

**3—Hydraulic Enable Switch:**

*NOTE: Park brake is engaged when hydraulic functions are disabled.*

Press switch (LED is illuminated) to enable boom and bucket hydraulic functions. Press switch again (LED is off) to disable boom and bucket hydraulic functions.

**4—Park Brake Switch:**

*NOTE: Hydraulic functions are enabled when park brake is released.*

Press switch to release park brake (LED and indicator on display unit go off). Press switch again (LED and indicator on display unit are illuminated) to engage park brake.

**5—Not Used**

**6—Not Used**

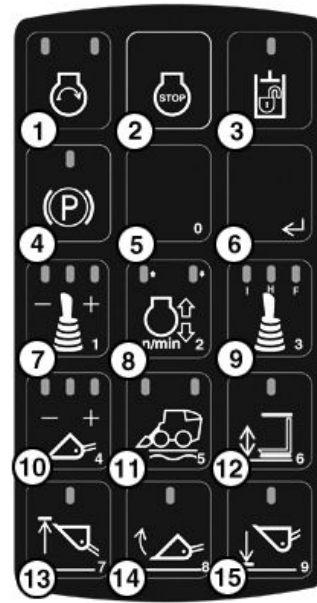
**7—Transmission Response Switch (Electrohydraulic [EH] machines only):** If machine is equipped with joystick performance package, this switch controls movement rate of travel and steer functions. This switch has three positions:

- Press switch (left LED illuminated) to enable precision rate.
- Press switch again (left and middle LED illuminated) to enable utility rate.
- Press switch again (all LEDs illuminated) to enable production rate.

For more information, see Transmission Response Rate (Travel and Steer)—If Equipped. (Section 2-2.)

**8—Accelerator/Decelerator Mode Switch:** This switch allows the engine speed control pedal to increase or decrease engine speed. This switch has two settings.

- Press switch (left LED illuminated) to enable acceleration mode.
- Press switch (right LED illuminated) to enable deceleration mode.



Sealed Switch Module (SSM)

- |                                                    |                                                  |
|----------------------------------------------------|--------------------------------------------------|
| 1— Engine Start Switch                             | 9— Pattern Select Switch (EH machines only)      |
| 2— Engine Stop Switch                              | 10— Hydraulic Response Switch (EH machines only) |
| 3— Hydraulic Enable Switch                         | 11— Ride Control Switch (if equipped)            |
| 4— Park Brake Switch                               | 12— Self Leveling Switch (if equipped)           |
| 5— Not Used                                        | 13— Not Used                                     |
| 6— Not Used                                        | 14— Not Used                                     |
| 7— Transmission Response Switch (EH machines only) | 15— Not Used                                     |
| 8— Accelerator/Decelerator Mode Switch             |                                                  |

**9—Pattern Select Switch (EH machines only):** If machine is equipped with joystick performance package or switchable controls, this switch allows for quick change of joystick functions between electrohydraulic (EH) hands only (ISO pattern) controls, EH hands only (H pattern) controls, or EH hand controls.

- Press and release switch until left LED is illuminated to enable EH hands only (ISO pattern) controls.
- Press and release switch until middle LED is illuminated to enable EH hands only (H pattern) controls.
- Press and release switch until middle and right LEDs are illuminated to enable EH hand controls.

**10—Hydraulic Response Switch (EH machines only):** If machine is equipped with joystick performance package, this switch controls movement rate of boom and bucket functions. This switch has three positions:

- Press switch (left LED illuminated) to enable precision rate.
- Press switch again (left and middle LED illuminated) to enable utility rate.
- Press switch again (all LEDs illuminated) to enable production rate.

For more information, see Hydraulic Response Rate (Boom and Bucket)—If Equipped. (Section 2-2.)

**11—Ride Control Switch (if equipped):** Press switch (LED is illuminated) to activate ride control. Press switch again to deactivate ride control (LED is off). For more information, see Ride Control—If Equipped. (Section 2-2.)

**12—Self Leveling Switch (if equipped):** Press switch (LED is illuminated) to active self leveling. This

deactivates ride control. Press switch again to deactivate self leveling (LED is off). For more information, see Self Leveling Hydraulics—If Equipped. (Section 2-2.)

**13—Not Used**

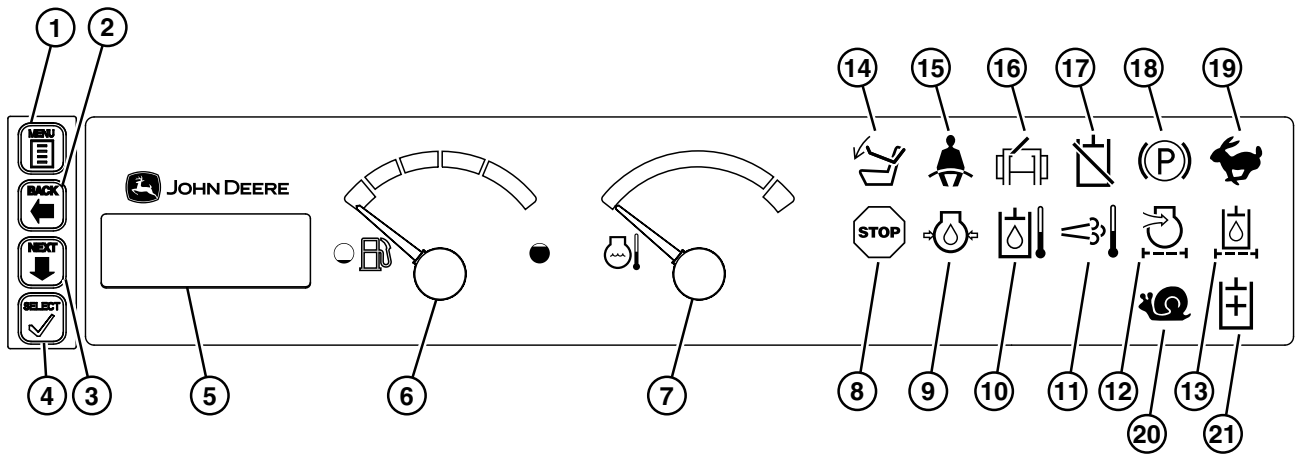
**14—Not Used**

**15—Not Used**

CN93077,00006D0 -19-20JAN16-2/2



## Gauges and Indicators



TX1125651

### Gauges and Indicators

- |                                              |                                                          |                                                |                                             |
|----------------------------------------------|----------------------------------------------------------|------------------------------------------------|---------------------------------------------|
| 1— MENU Button                               | 9— Engine Low Oil Pressure Indicator                     | 13— Hydraulic Oil Filter Restriction Indicator | 18— Park Brake Indicator                    |
| 2— BACK Button                               | 10— Hydraulic Oil Temperature Indicator                  | 14— Interlocking Seat Bar Switch Indicator     | 19— Two-Speed Indicator                     |
| 3— NEXT Button                               | 11— Exhaust Filter Cleaning Indicator (FT4 engines only) | 15— Seat Belt Switch Indicator                 | 20— Creep Mode Indicator (EH machines only) |
| 4— SELECT Button                             | 12— Engine Air Filter Restriction Indicator              | 16— Cab Door Switch Indicator                  | 21— Hydraulic High Flow Indicator           |
| 5— Engagement and Monitor Unit (EMU) Display |                                                          | 17— Hydraulics OFF Indicator                   |                                             |
| 6— Fuel Gauge                                |                                                          |                                                |                                             |
| 7— Engine Coolant Temperature Gauge          |                                                          |                                                |                                             |
| 8— STOP Indicator                            |                                                          |                                                |                                             |

**1—MENU Button:** Press button to scroll through menu options on the engagement and monitor unit (EMU).

**2—BACK Button:** Press button to return to previous menu options.

**3—NEXT Button:** Press button to move forward through menu options.

**4—SELECT Button:** Press button to select a menu or an item under a menu.

**5—Engagement and Monitor Unit (EMU) Display:** Displays vital operating information, hours, diagnostic trouble codes (DTCs), diagnostics, and used to configure units of measure.

**6—Fuel Gauge:** Indicates amount of fuel in fuel tank.

**7—Engine Coolant Temperature Gauge:** Indicates engine coolant temperature.

**8—STOP Indicator:** Red indicator will light when machine should be shutdown.

**9—Engine Low Oil Pressure Indicator:** Red indicator will light when engine oil pressure is too low.

**10—Hydraulic Oil Temperature Indicator:** Red indicator will light when hydraulic oil temperature is too high.

**IMPORTANT: Avoid machine damage. Do not stop engine when exhaust filter cleaning indicator illuminates.**

**11—Exhaust Filter Cleaning Indicator (FT4 engines only):** White indicator will illuminate when elevated idle is active or exhaust filter cleaning is in process.

Machine can be operated as normal if auto cleaning is being performed. Indicator will turn off when exhaust filter auto cleaning is complete and exhaust temperatures return to normal.

Indicator also illuminates during parked cleaning. For more information, see Exhaust Filter. (Section 2-2.)

**12—Engine Air Filter Restriction Indicator:** Amber indicator will light when air filter elements are restricted.

**13—Hydraulic Oil Filter Restriction Indicator:** Amber indicator will light when hydraulic filter element is restricted.

**14—Interlocking Seat Bar Switch Indicator:** Red indicator will light when interlocking seat bar is in the raised position.

**15—Seat Belt Switch Indicator:** Red indicator will light when interlocking seat bar is in the raised position and for 5 seconds after the interlocking seat bar is lowered to remind operator that seat belt is not fastened.

Continued on next page

CN93077,00006BF -19-01DEC15-1/2

**16—Cab Door Switch Indicator:** Red indicator will light when cab door is open.

**17—Hydraulics OFF Indicator:** Red indicator will light when hydraulics are disabled.

**18—Park Brake Indicator:** Red indicator will light when park brake is engaged.

**19—Two-Speed Indicator:** Amber indicator will light when two-speed shift is in high range.

**20—Creep Mode Indicator (EH machines only):** Amber indicator will light when machine is in creep mode.

**21—Hydraulic High Flow Indicator:** Amber indicator will light when hydraulic high flow is activated.

CN93077,00006BF -19-01DEC15-2/2

## Interlocking Seat Bar

Interlocking seat bar (1) must be lowered after sitting in the operator's seat in order for hydraulic and travel functions to operate.

### Adjusting the Interlocking Seat Bar

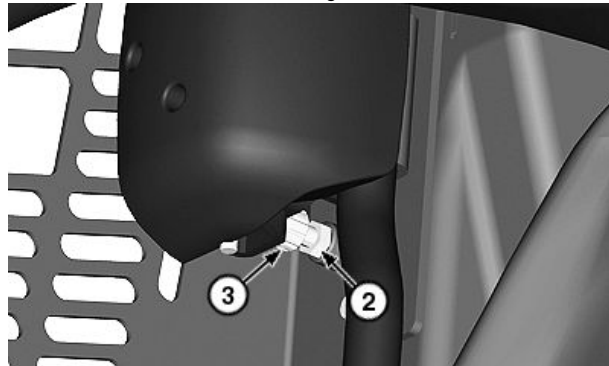
1. Loosen lock nut (2) on right side of the interlocking seat bar.
2. Turn adjustable stop (3) clockwise to adjust seat bar lower. Turn adjustable stop counterclockwise to adjust seat bar higher.
3. Tighten lock nut when finished with adjustment.
4. Repeat procedure on left side of the interlocking seat bar to match.

1— Interlocking Seat Bar  
2— Lock Nut

3— Adjustable Stop



Interlocking Seat Bar



Locking Seat Bar Adjustment

CN93077,00006D7 -19-04NOV15-1/1

TX1205147 —UN—04NOV15

TX1119802 —UN—07AUG12

### Cab Door—If Equipped

If machine is equipped with a cab door, the cab door must be closed in order to enable boom and bucket functions.

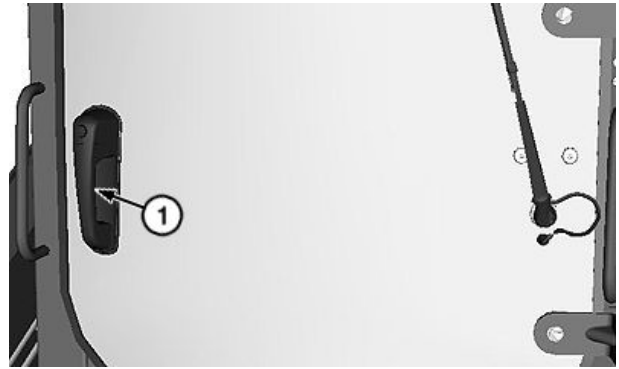
#### Entering and Exiting the Cab

When entering the cab, pull handle (1) outward and open the door. Use handholds for assistance.

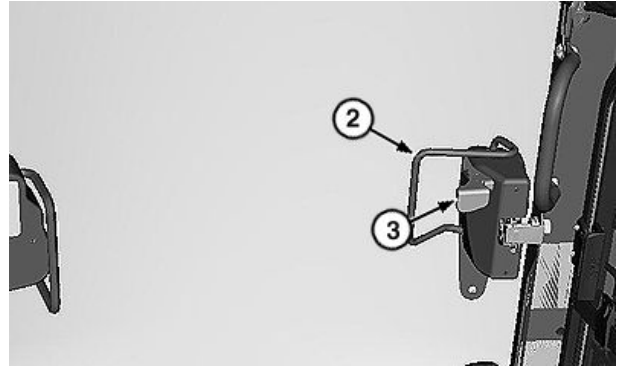
When exiting the cab, ensure engine is off and park brake is engaged. Raise interlocking seat bar (2) and push button (3) forward with thumb or palm of hand. Swing door open and exit the cab safely using handholds.

1— Handle  
2— Bar

3— Button



*Cab Door (shown from outside cab)*



*Cab Door (shown from inside cab)*

Continued on next page

CN93077,00006D8 -19-01DEC15-1/5

TX1205197 —UN—05NOV15

TX1205202 —UN—05NOV15

### Removing and Installing Door

**IMPORTANT: Handle door safely. When removing door, be aware door is breakable.**

#### To remove door:

1. Park machine on level surface.
2. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
3. Engage park brake and turn engine OFF.
4. Remove the wire retainer (4) on gas shock rod (5) by rotating the wire retainer off the shaft and pulling out. Remove gas shock rod from ball joint. Install wire retainer into shaft for storage.
5. Disconnect wiper motor harness connector (6).
6. Disconnect washer fluid line (7). Make sure to leave the check valve (8) connected to the fluid line inside the cab.
7. On outside of machine, remove cotter pin (9) and washer from top hinge pin. Store appropriately.

**CAUTION: Prevent possible crushing injury from heavy component. Use appropriate lifting device.**

8. Using appropriate lifting device, carefully lift the door until the stop clears the door frame.

#### Specification

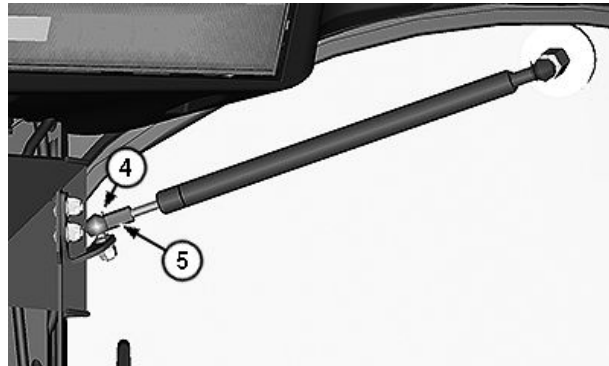
Door—Approximate	
Weight.....	23 kg 50 lb

9. Rotate door until the hinge and handhold do not contact.
10. Carefully lift door the rest of the way off and store in a protected area.

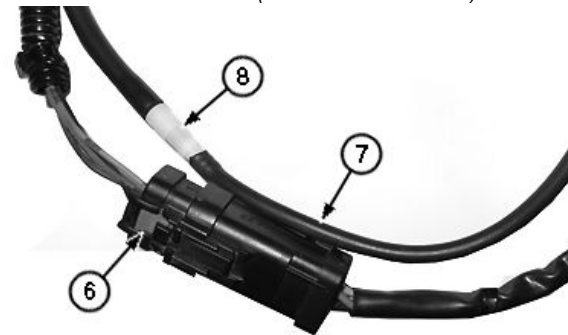
#### To install door:

1. Park machine on level surface.
2. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
3. Engage park brake and turn engine OFF.
4. Carefully lift door. Start by having the door in the 180° open position from the front of the machine. Line up hinges with hinge pins and partially install. Slowly rotate door 90°, making sure to stay clear of handhold. Fully slide hinges down onto hinge pins.
5. Install cotter pin and washer.

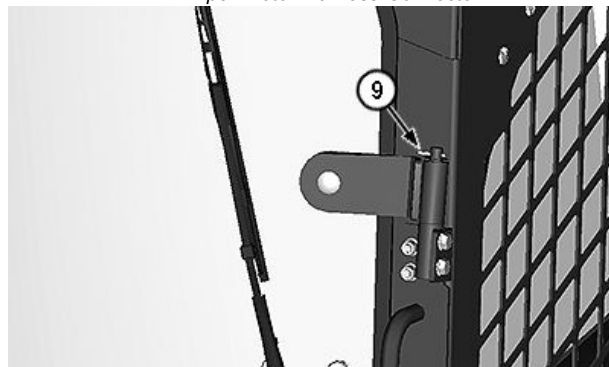
**IMPORTANT: Wiper assembly must be connected so machine knows that a door is present. If the wiper assembly is not connected when a door is present, machine will allow the boom to function with the door in the open position which may result in damage to the door.**



Gas Shock Rod (shown from inside cab)



Wiper Motor Harness Connector



Cab Door (shown from outside cab)

- |                                  |                      |
|----------------------------------|----------------------|
| 4— Wire Retainer                 | 7— Washer Fluid Line |
| 5— Gas Shock Rod                 | 8— Check Valve       |
| 6— Wiper Motor Harness Connector | 9— Cotter Pin        |

6. Connect washer fluid line and wiper motor harness connector.
7. Remove wire retainer from gas shock rod.
8. Install gas shock rod on ball joint. Install wire retainer.
9. Verify door seals and closes properly. If adjustment is needed, see Door Adjustment in this section.

TX116664A—UN—23JUL14

TX1067684A—UN—12NOV09

TX1166670A—UN—23JUL14

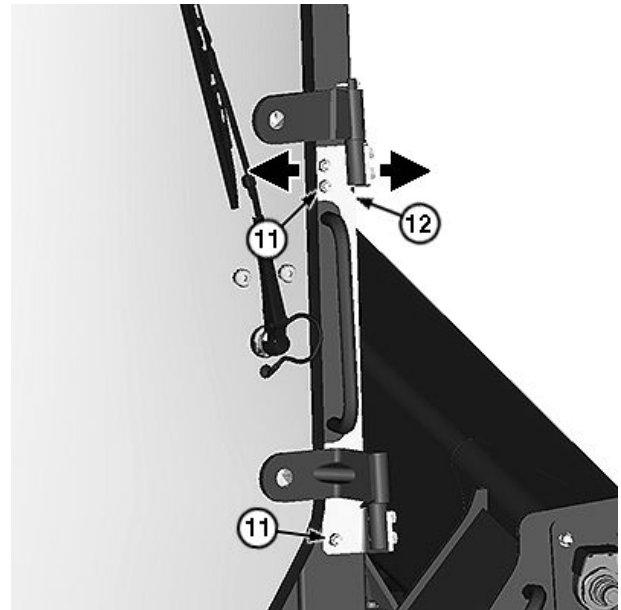
### Door Adjustment

If door needs adjusting to seal properly, proceed with the following steps:

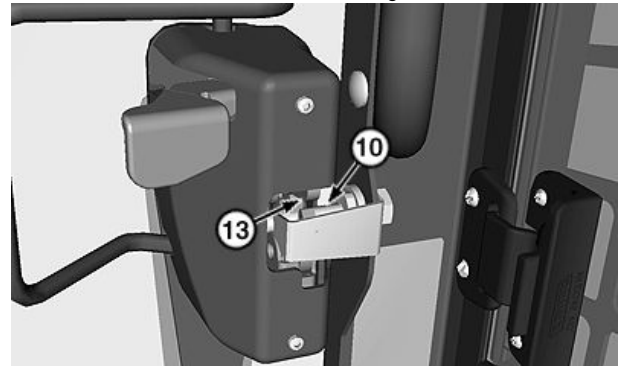
1. Position the striker bolt (10) toward the front, bottom of the mounting hole, and lightly tighten the nut. More adjustment may be required later.
2. Loosen the three hinge fasteners (11). Cycle the door open and close several times.

*NOTE: Hinge fasteners are slotted so door can move slightly to get the proper fit.*

3. Slide the upper part of hinge (12) to the left or right so there is approximately 3 mm (1/8 in) gap between striker bolt and upper jaw of latch (13).
4. Tighten the three hinge fasteners.
5. Latch door and verify that there is approximately 1 mm (1/32—1/16 in) of compression on door seal near the upper, latch-side corner of the door. If there is too much compression and door latches with difficulty (door is harder to close when the side windows are closed), adjust the striker forward. If there is not enough compression, adjust the striker rearward. Try to keep the striker at a constant height to avoid needing to adjust the hinge to maintain striker bolt/latch jaw clearance.
6. After a positive seal is achieved and the effort to close the door is acceptable, verify that the striker bolt/latch jaw clearance is still good. If not, adjust the hinge and/or striker bolt to correct the position of the striker bolt in the latch jaw.
7. Once all adjustments are complete, fully tighten the striker bolt and the three hinge fasteners.



Cab Door Hinge



Cab Door Latch

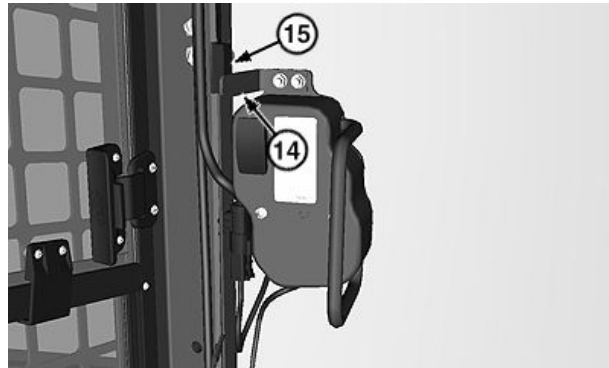
- |                             |                         |
|-----------------------------|-------------------------|
| 10— Striker Bolt            | 12— Upper Part of Hinge |
| 11— Hinge Fastener (3 used) | 13— Upper Jaw of Latch  |

Continued on next page

- From inside the cab with door closed and latched, adjust the door sensor bracket (14) so there is approximately 2 mm (1/16 in) of space between the bracket and sensor (15). Less space is allowable, but the bracket should not touch the sensor. Fully tighten the bracket nuts when adjustment is complete.

14— Door Sensor Bracket

15— Sensor



*Cab Door Sensor Bracket and Sensor*

TX1205209 —UN—05NOV15

CN93077,00006D8 -19-01DEC15-5/5

### Side Windows—If Equipped

To open side window, squeeze latch (3) and slide window rearward.

To close side window, slide window forward until latch clicks into place.

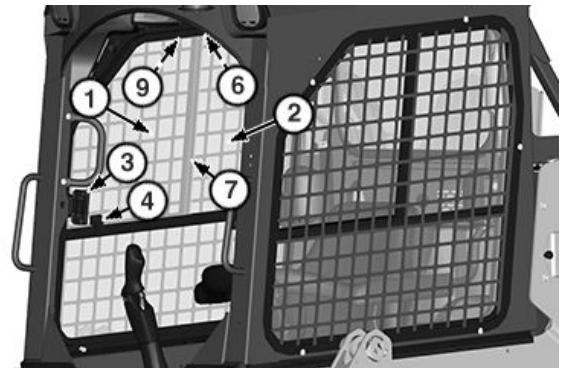
### Removing and Installing Side Windows

#### To remove side windows:

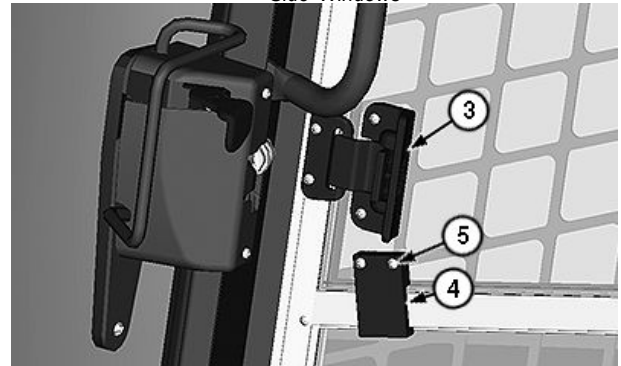
1. Remove glass retainer screws (5).
2. Remove glass retainer (4).
3. Remove rubber seal (6).
4. Slide front window section (1) back to center of frame. Lift up into top channel and pull bottom edge out towards operator. Remove front window section.
5. Remove center post screws (8).
6. Remove center post (7).
7. Remove vinyl filler (9).
8. Slide back window section (2) forward to center of frame.
9. Remove rubber seal (6).
10. Lift back window into top channel and pull bottom edge out towards operator. Remove back window section and place in a safe area.
11. Store both sections in a protected area.

#### To install side windows:

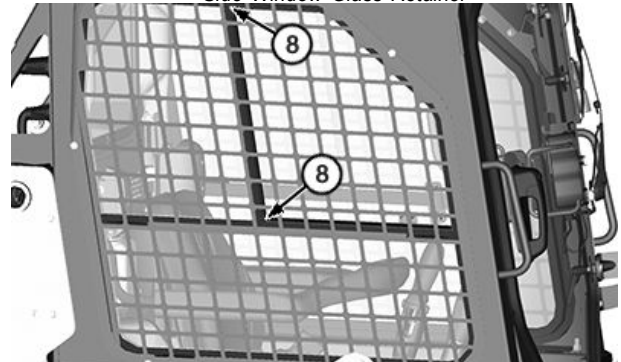
1. Install back window section first, lining up groove on bottom of window with the outer track in frame.
2. Install rubber seal.
3. Slide rearward into stationary position.
4. Install center post.
5. Install front window section, lining up groove on bottom of window with the inner track in frame.
6. Install rubber seal.
7. Slide forward into stationary position.
8. Install glass retainer.



Side Windows



Side Window Glass Retainer



Side Window Center Post

- |                                  |                               |
|----------------------------------|-------------------------------|
| 1— Front Window Section          | 6— Rubber Seal (2 used)       |
| 2— Back Window Section           | 7— Center Post                |
| 3— Latch                         | 8— Center Post Screw (2 used) |
| 4— Glass Retainer                | 9— Vinyl Filler               |
| 5— Glass Retainer Screw (2 used) |                               |

CN93077,00006DA -19-23MAR16-1/1

TX1213234 —UN—23MAR16

TX1166696A —UN—21AUG14

TX1213235 —UN—23MAR16

### Top Window

Top window (1) is standard on canopy or cab.

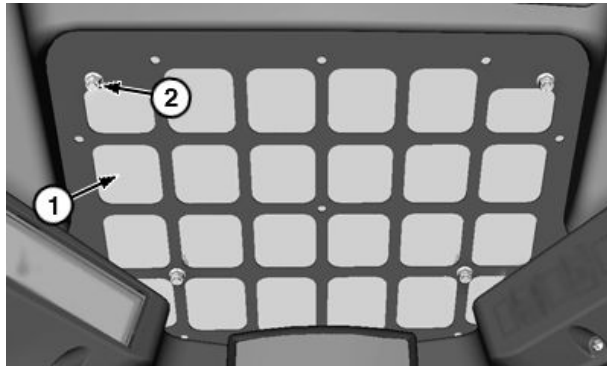
Top window in canopy is permanently installed.

Top window in cab is bolted in place and can be removed for cleaning. To remove top window:

- Remove cap screws (2) from inside the cab.
- Lift off window from outside the cab.
- Store window and hardware in a protected area.

1— Top Window

2— Cap Screw (4 used)



Top Window

TX1205230 —UN—05NOV15

CN93077,00006DD -19-05NOV15-1/1

### Rear Window (Alternative Exit)

Push on bottom corner (1) of window near the instruction label to force window out from molding.

1— Bottom Corner



Alternative Exit

TX1205239 —UN—05NOV15

CN93077,00006DE -19-23JUN17-1/1

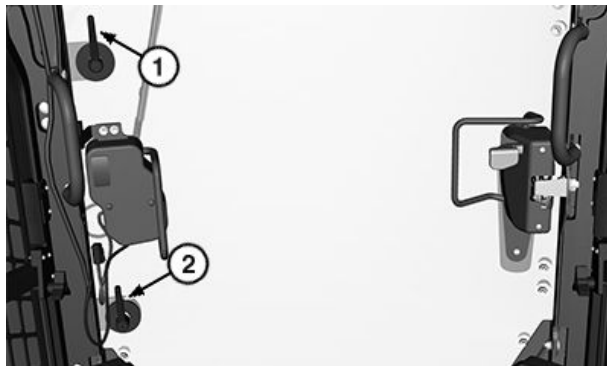
### Secondary Alternative Exit

#### Open Secondary Alternative Exit (Ratchet Style)

The door may serve as an alternate exit.

To remove door:

1. Turn upper ratchet handle (1) counterclockwise until contact is made with the ROPS.
2. Pull ratchet handle to disengage and rotate clockwise 180 degrees.
3. Release ratchet handle and repeat process until ratchet handle is free of hinge.
4. Repeat process for lower ratchet handle (2).
5. Carefully remove door from hinges.



Secondary Alternative Exit

1— Upper Ratchet Handle

2— Lower Ratchet Handle

TX1217612 —UN—17JUN16

Continued on next page

DH10862,00001EB -19-08NOV18-1/3



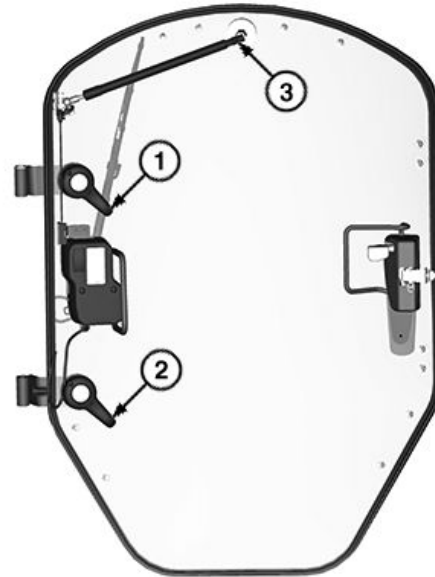
### Open Secondary Alternative Exit (1/4 Turn Style)

The door may serve as an alternate exit.

1. Turn upper handle (1) counterclockwise 1/4 turn until released.
2. Turn lower handle (2) counterclockwise 1/4 turn until released.
3. Disconnect gas shock by pulling collar (3) downward from center mount. Once collar is pulled downward, pull gas shock towards the operator's seat to release.
4. Carefully push out on door and remove door from hinges.

1— Upper Handle  
2— Lower Handle

3— Collar



Secondary Alternative Exit

Continued on next page

DH10862,00001EB -19-08NOV18-2/3

TX1252376A —UN—13FEB18

**Assemble Secondary Alternative Exit Handle (1/4 Turn Style)**

1. Inspect upper handle (1) and lower handle (2) for damage. If handle is damaged, see an authorized John Deere dealer.
2. Remove spacers (5) and bushing (6).
3. Remove cap screw (8) from hinge (7) and latch stud (4).
4. Clean and apply Triton® 460 Grease to pins inside handle.
5. Insert latch stud into the handle, aligning the raised part of the latch stud with the groove inside the handle. Turn the latch stud and metal collar clockwise to engage pins into latch stud. Ensure that the latch stud is secure.

**IMPORTANT: Avoid possible machine damage. Align spacers and bushing properly before tightening cap screw.**

*NOTE: The spacers must be installed with the protruding collar facing towards the glass.*

6. Install spacers and bushing onto door.
7. Install handle and latch stud through the door, spacers, and square opening in the hinge.
8. Apply Loctite® 242® Threadlocker (medium strength) to the threads of the cap screw.

**IMPORTANT: Avoid possible machine damage. Over tightening the cap screw could cause the handle not to function properly. Always tighten cap screws to the proper specification.**

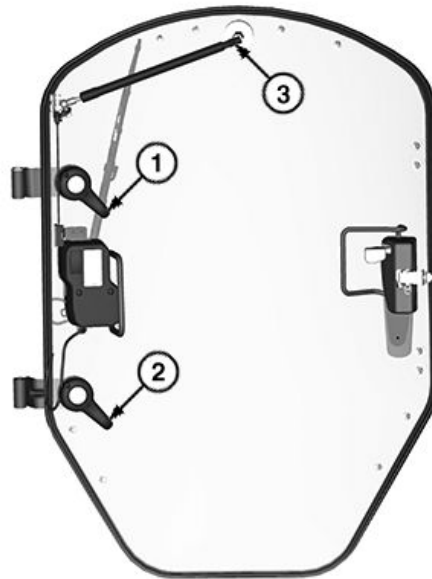
9. Install cap screw into latch stud. Tighten to specification.

**Specification**

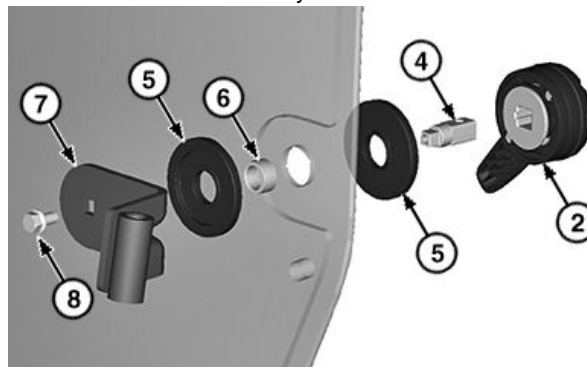
Cap Screw—Torque.....6 N·m  
53 lb·in

10. Inspect door and hardware to ensure proper fit and function. See Door Adjustment. (Section 2-1.)

*Triton is a trademark of Phillips 66 Company Corporation  
Loctite and its related brand marks are trademarks of Henkel Corporation*



Secondary Alternative Exit



Lower Handle Assembly

- |                 |                    |
|-----------------|--------------------|
| 1— Upper Handle | 5— Spacer (2 used) |
| 2— Lower Handle | 6— Bushing         |
| 3— Collar       | 7— Hinge           |
| 4— Latch Stud   | 8— Cap Screw       |

TX1252376A —UN—13FEB18

TX1262533A —UN—13SEP18

DH10862,00001EB -19-08NOV18-3/3

## Fire Extinguisher Location

### MOUNTING LOCATION:

The designated fire extinguisher mounting location (1) is inside the top right of the cab.

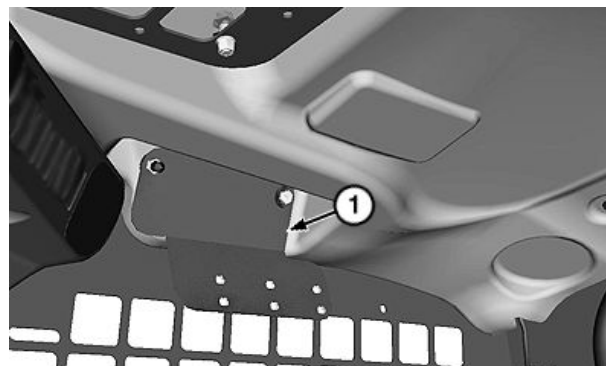
### USE:

**NOTE:** All fire extinguishers do not operate the same. Operating instructions on canister should be read before use.

The portable fire extinguisher is used to aid in the extinguishing of small fires. Refer to individual manufacturer's instructions and proper fire fighting procedures before the need to use the fire extinguisher arises. See Prevent Fires. (Section 1-2.)

### MAINTENANCE:

**IMPORTANT:** Avoid possible machine damage. Check gauge (if equipped) on fire extinguisher. If fire extinguisher is not fully charged, recharge or replace fire extinguisher according to the manufacturer's instructions.



Fire Extinguisher Mounting Location

1— Fire Extinguisher Mounting Location

Inspect and maintain the fire extinguisher following the manufacturer's recommendations and all local, regional, and national regulations.

CN93077,00006DF -19-05NOV15-1/1

TX1205246 —UN—05NOV15

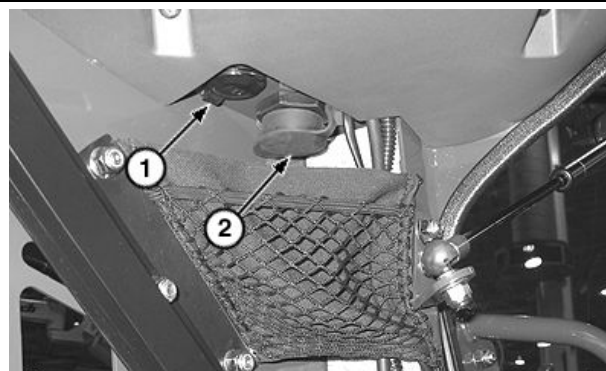
## 12-Volt Power Outlet

**NOTE:** Machine switched power must be on for operation.

A 12-volt power outlet (1) is located in the upper left corner of the cab. Keep outlet free of dirt and moisture for uninterrupted operation.

1— 12-Volt Power Outlet

2— Service ADVISOR™ Connector



Power Outlet

Service ADVISOR is a trademark of Deere & Company

OUT4001,0000510 -19-27MAR13-1/1

TX106674A —UN—11NOV09

### Windshield Wiper and Washer

Push windshield wiper switch (1) to middle position to turn windshield wiper on.

Push and hold upper half of windshield wiper switch to operate windshield washer.

Fill the washer fluid reservoir through washer fluid fill port (2), located behind the operator's seat inside the cab.

- 1— Windshield Wiper Switch      2— Windshield Washer Fluid Fill Port



Windshield Wiper and Washer Switch



Windshield Washer Fluid Fill Port

CN93077,00006E0 -19-01DEC15-1/1

TX1168915A —UN—12AUG14

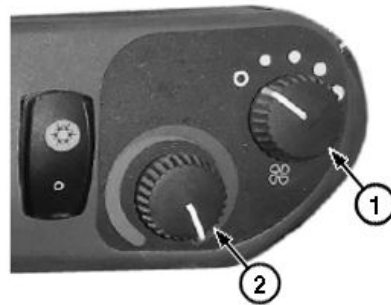
TX1205256 —UN—01DEC15

### Heating/Defrosting Controls—If Equipped

Turn blower speed control dial (1) clockwise to turn heater/defroster on and to increase blower speed. Blower has four speed settings plus an OFF position.

Turn cab temperature control dial (2) clockwise towards red zone for warmer air.

- 1— Blower Speed Control Dial      2— Cab Temperature Control Dial



Heating/Defrosting Controls

JK47244,00001BD -19-11DEC12-1/1

TX1126147A —UN—16NOV12

### Air Conditioner Controls—If Equipped

Push upper half of air conditioner switch (3) to turn air conditioner on.

Turn cab temperature control dial (2) counterclockwise towards blue zone for cooler air.

Turn blower speed control dial (1) clockwise to increase blower speed. Blower has four speed settings plus an OFF position.

- 1—Blower Speed Control Dial
- 2—Cab Temperature Control Dial
- 3—Air Conditioner Switch



Air Conditioner Controls

JK47244,00001BE -19-01DEC15-1/1

TX1126149A —UN—16NOV12

### Operator Seat

#### Standard Seat—If Equipped

1. Pull fore-and-aft adjustment lever (1) up.
2. Slide seat forward or backward to desired position.
3. Release fore-and-aft adjustment lever to lock in place.

- 1—Fore-and-Aft Adjustment Lever



Vinyl Standard Seat

Continued on next page

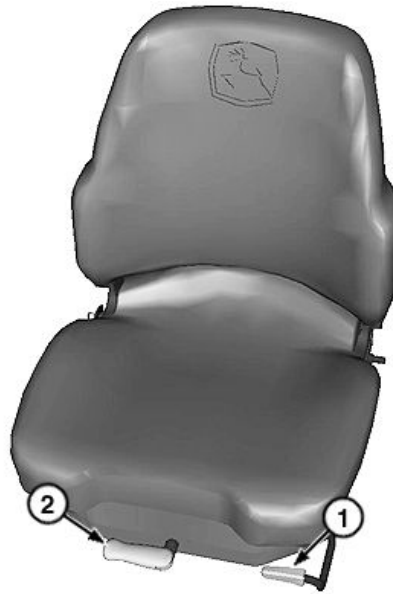
CN93077,00006E1 -19-06NOV15-1/4

TX1205302 —UN—06NOV15

### Mechanical Suspension Seat—If Equipped

1. Rotate fore-and-aft adjustment lever (1).
2. Slide seat forward or backward to desired position.
3. Release fore-and-aft adjustment lever to lock in place.
4. Fold out weight adjustment knob (2) to adjust seat to weight of operator.
5. Turn weight adjustment knob clockwise for a heavier operator. Turn weight adjustment knob counterclockwise for a lighter operator.
6. Return weight adjustment knob to original position.

1— Fore-and-Aft Adjustment Lever      2— Weight Adjustment Knob



Vinyl Mechanical Suspension Seat

CN93077,00006E1 -19-06NOV15-2/4

TX1205303 —UN—06NOV15

### Air Suspension Seat—If Equipped

1. Pull up on fore-and-aft adjustment lever (1).
2. Slide seat forward or backward to desired position.
3. Release fore-and-aft adjustment lever to lock in place.

*NOTE: Switch power must be on for raising operator seat. Engine does not have to be started.*

4. Pull up or push down on weight adjustment knob (2) to adjust seat to weight of operator.
5. Pull up on backrest adjustment lever (3) to recline back of seat to desired comfort.
6. While sitting in seat, turn lumbar support adjustment knob (4) to increase or decrease support to lower back.

1— Fore-and-Aft Adjustment Lever      3— Backrest Adjustment Lever  
2— Weight Adjustment Knob            4— Lumbar Support Adjustment Knob



Cloth Air Suspension Seat

Continued on next page

CN93077,00006E1 -19-06NOV15-3/4

TX1205304 —UN—06NOV15

### Air Suspension Seat With Heat—If Equipped

1. Pull up on fore-and-aft adjustment lever (1).
2. Slide seat forward or backward to desired position.
3. Release fore-and-aft adjustment lever to lock in place.

*NOTE: Switch power must be on for raising operator seat. Engine does not have to be started.*

4. Pull up or push down on weight adjustment knob (2) to adjust seat to weight of operator.
5. Pull up on backrest adjustment lever (3) to recline back of seat to desired comfort.
6. While sitting in seat, turn lumbar support adjustment knob (4) to increase or decrease support to lower back.
7. Push seat heater switch (5) up to activate seat heater. Push seat heater switch to downward position to turn seat heater off.

- |                                 |                                  |
|---------------------------------|----------------------------------|
| 1—Fore-and-Aft Adjustment Lever | 4—Lumbar Support Adjustment Knob |
| 2—Weight Adjustment Knob        | 5—Seat Heater Switch             |
| 3—Backrest Adjustment Lever     |                                  |



Vinyl Air Suspension Seat With Heat

TX1205309 —UN—06NOV15

CN93077,00006E1 -19-06NOV15-4/4

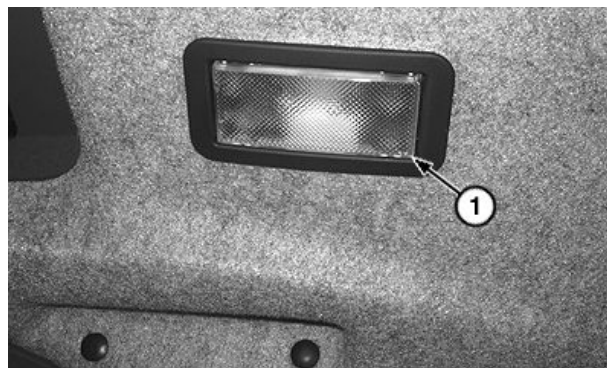
### Dome Light

*NOTE: If equipped with keyless start, dome light (1) will turn on when operator sits in seat. Dome light will remain illuminated until engine is started or until 5 minute time-out is reached.*

The dome light (1) is located on the right side of the cab ceiling.

Dome light can be turned on by pushing on right or left side of lens. Return dome light to middle position to turn off.

- 1—Dome Light



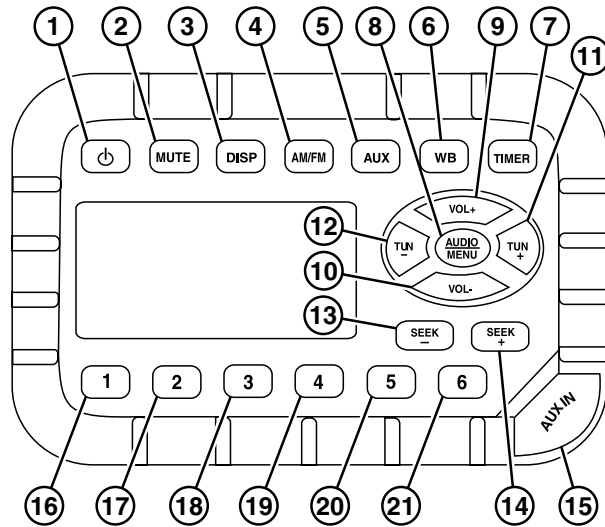
Dome Light

TX1066805A —UN—24OCT09

JK47244,00001BA -19-25MAR14-1/1

### Radio—If Equipped

1. Power—Press power button (1) to turn radio on or off.
2. Mute—Press mute button (2) to silence radio audio. MUTE message will appear on display. If mute feature is activated when radio is off, volume will return to programmed turn-on level when radio is turned on.
3. Display—Press display button (3) to switch between tuner, auxiliary input, or weather band function modes and clock mode. Frequency, time, and activated functions will appear on display.
4. AM/FM—Press AM/FM button (4) to change between AM bands (AM1 and AM2) and FM bands (FM1, FM2, and FM3). Press AM/FM button to access tuner mode from any other function mode.
5. Auxiliary Input Function—Press auxiliary button (5) to select auxiliary input mode. To connect a portable device to radio, connect device to the auxiliary input jack (15).
6. Press weather band button (6) to access the weather band mode from any other function mode.
7. Timer—Press timer button (7) to access timer mode. Press timer button to start timer function; TIMER message will flash in the display. Press timer button again to stop timer (TIMER icon will remain in the display without flashing). Press and hold timer button for 3 seconds to reset timer to zero and to remove icon from display.
8. Auxiliary Audio Input—Use auxiliary audio input jack (15) to connect portable audio devices.
9. Preset Stations—Six numbered preset buttons (16–21) store and recall stations for each AM and FM band. To store a station, select a band and then select a station. Press and hold preset button for 3 seconds. Current station will be stored and corresponding preset number will appear in display. To recall a station, select a band and then press preset button. Radio will automatically tune to stored station.



Radio

- |                                           |                                              |
|-------------------------------------------|----------------------------------------------|
| 1— Power Button                           | 12— Decrease Manual Tune Frequency Button    |
| 2— Mute Button                            | 13— Decrease Automatic Tune Frequency Button |
| 3— Display Button                         | 14— Increase Automatic Tune Frequency Button |
| 4— AM/FM Button                           | 15— Auxiliary Audio Input Jack               |
| 5— Auxiliary Button                       | 16— Preset Button 1                          |
| 6— Weather Band Button                    | 17— Preset Button 2                          |
| 7— Timer Button                           | 18— Preset Button 3                          |
| 8— Audio and Menu Adjustment Button       | 19— Preset Button 4                          |
| 9— Increase Volume Button                 | 20— Preset Button 5                          |
| 10— Decrease Volume Button                | 21— Preset Button 6                          |
| 11— Increase Manual Tune Frequency Button |                                              |

#### Audio and Menu Adjustment:

**Audio Adjustment**—Press audio and menu adjustment button (8) to step through the following audio adjustment options: Bass, Treble, and Balance (left to right). When desired option appears on display, press increase volume button or decrease volume button to adjust audio feature. When no adjustments have been made for 3 seconds, radio will resume normal operation.

**Menu Adjustment**—Press and hold audio and menu adjustment button for more than 3 seconds to enter menu adjustment mode and adjust any of the menu options.

When desired option appears on display, press increase volume button or decrease volume button to adjust that option. When no adjustments have been made for 3 seconds, the radio will resume normal operation.

The following menu options may be adjusted using this feature:

1. Beep Confirm (on and off)—Determines if a beep will be heard each time a button is pressed.

2. Operation Region (USA or Euro)—Selects appropriate operating region.
3. Clock Display (12 or 24)—Selects a 12-hour or 24-hour clock display.
4. Display Brightness (low, mid, or high)—Determines brightness level of display.
5. Backlight Color (Amber or Green)—Determines backlight color of radio.
6. Turn On Volume (0–40)—Selects desired volume level for radio to assume when turned on.
7. WB Alert (on or off)—Determines if weather band alert feature is activated.

#### Volume Adjustment:

**Increase Volume**—Press increase volume button (9) to increase volume setting.

**Decrease Volume**—Press decrease volume button (10) to decrease volume setting.

TX1128038—UN—12DEC12



### Tuning Radio:

**Increase Manual Tune Frequency**—Press increase manual tune frequency button (11) to tune the frequency one notch higher. Press and hold increase manual tune frequency button for more than 1 second to tune continuously in selected direction.

**Decrease Manual Tune Frequency**—Press decrease manual tune frequency button (12) to tune the frequency one notch lower. Press and hold decrease manual tune frequency button for more than 1 second to tune continuously in selected direction.

**Decrease Automatic Tune Frequency**—Press decrease automatic tune frequency button (13) to automatically tune the frequency down to next strong station.

**Increase Automatic Tune Frequency**—Press increase automatic tune frequency button (14) to automatically tune the frequency up to next strong station.

### Setting the Clock:

To set the clock to display current time, press and hold display button for more than 3 seconds to enter clock setting mode (time will flash on display). Press decrease manual tune frequency button to adjust hours or increase manual tune frequency button to adjust minutes. When no adjustment is made for 10 seconds, time will be set and normal operation will resume.

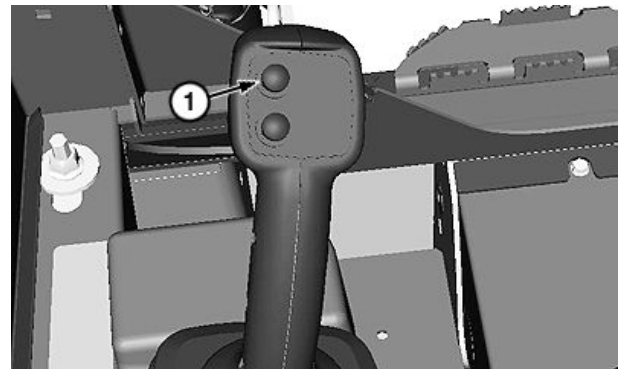
DB84312,0000020 -19-01DEC15-2/2

### Horn

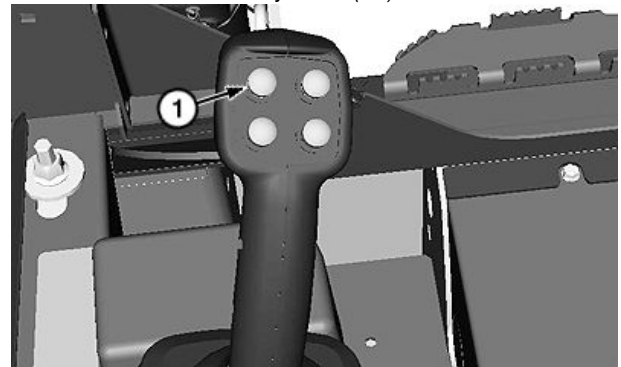
Sound the horn momentarily to warn bystanders before starting the engine or commencing operation.

The horn switch (1) is located on the left joystick.

1—Horn Switch



Electrohydraulic (EH) Control



EH Control With Performance Package (if equipped)

CN93077,00006E4 -19-01DEC15-1/1

TX1205318 —UN—06NOV15

TX1205319 —UN—06NOV15

# Operation—Operating the Machine

## Before Starting Work

Review the operating precautions. See **Safety—Operating Precautions**. (Section 1-3.)

Use seat belt when operating machine. Remember to fasten seat belt even during brief periods of use.



Reading Operator's Manual

T133556 —UN—24AUG00

TX03679,0001780 -19-23APR15-1/1

## Inspect Machine Daily Before Starting

Perform daily maintenance checks. See **Maintenance—Every 10 Hours or Daily**. (Section 3-4.)

- Inspect rear grille (3) for obstructions.
- Clean engine shield (2).
- Clean operator's station (1), check pedals for freedom of movement, and check fire extinguisher charge (if equipped).
- Inspect exhaust stack (4). Check for any clogs or damage to exhaust stack.
- Check fuel level. Remove fuel tank cap (5) and fill with proper fuel if necessary.

Inspect the following before starting:

**ELECTRICAL SYSTEM:** Check for worn or frayed wires and loose or corroded connections.

**HYDRAULIC SYSTEM:** Check for leaks, missing or loose clamps, kinked hoses, and lines or hoses that are making contact with each other or other machine parts.

**FUEL SYSTEM:** Check for leaks, missing or loose clamps, kinked hoses, drain water and sediment from primary and auxiliary fuel filters, and check lines or hoses that are making contact with each other or other machine parts.

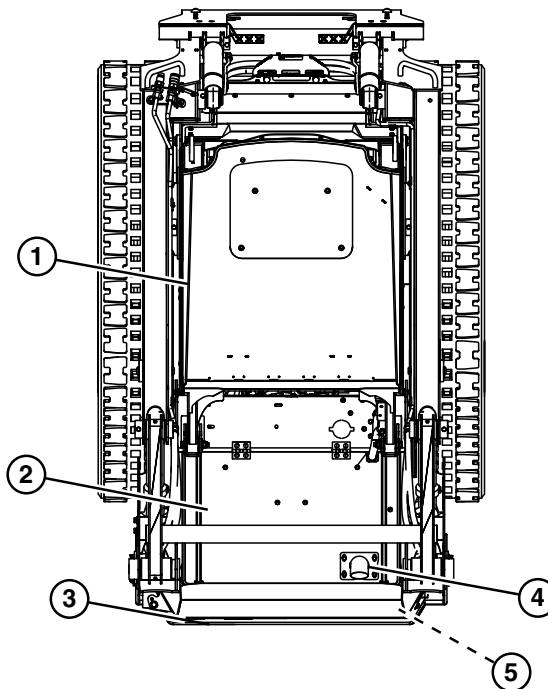
**HARDWARE:** Check for loose or missing parts.

**LUBRICATION:** Check lubrication points on periodic maintenance chart. See **Service Machine at Specified Intervals**. (Section 3-2.)

**SHEET METAL AND TRACKS:** Check for bent, broken, loose, or missing parts.

**PROTECTIVE DEVICES:** Inspect guards, shields, roll-over protective structure (ROPS), and seat belt.

**SAFETY:** Walk around machine to be sure all bystanders are away from machine area.



Machine Inspection

1— Operator's Station  
2— Engine Shield  
3— Rear Grille

4— Exhaust Stack  
5— Fuel Tank Cap

TX1205400 —UN—11NOV15

CN93077,00006E5 -19-08DEC15-1/1

## Entering and Exiting Compact Track Loader

**⚠ CAUTION:** Prevent possible injury when entering and exiting machine. Maintain three points of contact at all times. Do not use controls as handholds.

### Entering Machine With a Cab Door

**From the side or the front without a bucket attached:** Use the boom step (5), right boom handhold (2), and door handle (if equipped) (4) for first step. Use right cab handhold (3) and door handle to enter machine.

**From the front with a bucket attached:** Use bucket step (1), right boom handhold, and door handle for first step. Continue holding right boom handhold and door handle, then step onto boom step. Use right cab handhold and door handle to enter machine.

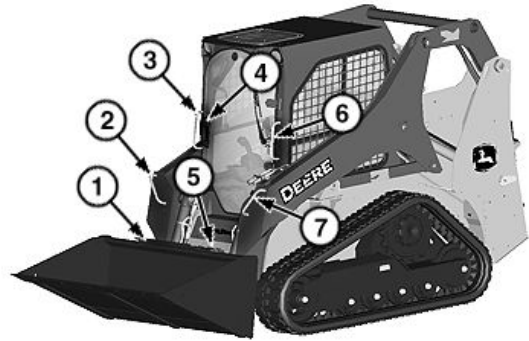
**When the boom is raised on the boom lock:** Enter from the front. Use right cab handhold and door handle.

### Entering Machine Without a Cab Door

**From the side or the front without a bucket attached:** Use the boom step and right and left boom handholds for first step. Use right and left cab handholds to enter machine.

**From the front with a bucket attached:** Use bucket step and right and left boom handholds for first step. Continue holding right and left boom handholds and step onto boom step. Use right and left cab handholds to enter machine.

**When the boom is raised on the boom lock:** Enter from the front. Use right and left cab handholds to enter machine.



Compact Track Loader (with cab door)

- |                              |                       |
|------------------------------|-----------------------|
| 1— Bucket Step               | 5— Boom Step          |
| 2— Right Boom Handhold       | 6— Left Cab Handhold  |
| 3— Right Cab Handhold        | 7— Left Boom Handhold |
| 4— Door Handle (if equipped) |                       |

### Exiting the Machine

**⚠ CAUTION:** Avoid possible injury from unexpected boom movement. Always lower boom to the ground or onto boom lock. Always engage the park brake and stop the engine before exiting the machine.

1. Engage park brake and switch power to OFF position.
2. Use handholds on inside and outside the cab for support. Step onto the boom step first, then bucket step (if equipped), and then onto the ground.

CN93077,00006E6 -19-14DEC15-1/1

## Engine Break-In Period

**IMPORTANT:** To avoid engine damage, it is critical to observe the engine break-in period. Extra care during the first 500 hours of operation will result in more satisfactory long-term engine performance and life.

1. Operate the machine at heavy or normal loads with minimal idling during the break-in period. During the first 20 hours, avoid prolonged periods of engine idling or sustained maximum load operation. If engine will idle longer than 5 minutes, stop engine.
2. Check engine oil level more frequently during the engine break-in period.
3. Change oil and oil filter after first 500 hours of operation (maximum). Fill crankcase with the normal seasonal viscosity grade oil. See Diesel Engine Oil. (Section 3-1.)
4. Watch coolant temperature gauge closely. If coolant temperature rises above specified limits on the gauge, reduce load on engine. Unless temperature drops quickly, stop the engine and determine the cause before resuming operation. See Miscellaneous—Troubleshooting.
5. Watch for low oil pressure warning during operation.
6. Check belt for proper alignment and seating in pulley grooves.

CN93077,000073B -19-10DEC15-1/1

## Starting the Engine

### Key Start

The engine control unit (ECU) will default engine speed to slow idle on engine start-up regardless of engine speed control dial position. Move engine speed control dial to slow idle position and then increase the setting to the desired speed to get the engine speed to increase.

1. Fasten seat belt.
2. Lower interlocking seat bar.
3. Be sure all joysticks/control levers and pedals are in neutral position.
4. Engage park brake.
5. Turn engine speed control dial (1) to slow idle position.
6. Turn switch power to RUN position, but do not crank engine.
7. Check engagement and monitor unit (EMU). Engine low oil pressure indicator will be lit until engine starts.

**IMPORTANT: Avoid possible machine damage. Do not crank starter continuously for more than 30 seconds or damage to starter may occur.**

**If engine does not start within 30 seconds, turn key switch to OFF position and allow starter to cool for 65 seconds before trying again.**

**Do not use ether or any other type of starting fluid on engines.**

**Do not tow the machine to start. Damage to hydrostatic system will occur.**

8. Turn key switch (2) to START position.



Control Panel—Key Start

1— Engine Speed Control Dial    2— Key Switch

9. Release key when engine starts.
  - a. A monitor indicator check is performed each time machine is started.
- IMPORTANT: To prevent damage of hydraulics and engine in temperatures below 0°C (32°F), run engine at slow idle for 10 minutes before operating controls.**
  - b. Always allow engine to warm-up before applying a load.
10. Run at 1/3 speed for 30 seconds. Do not run at fast or slow idle. Do not accelerate rapidly during warm up.
11. Operate machine at less-than-normal loads and speeds until engine is at normal operating temperature.

TX1126173A—JUN—16NOV12

Continued on next page

CN93077,00006E8 -19-02DEC15-1/2

### Keyless Start

The engine control unit (ECU) will default engine speed to slow idle on engine start-up regardless of engine speed control dial position. Move engine speed control dial to slow idle position and then increase the setting to the desired speed to get the engine speed to increase.

1. Fasten seat belt.
2. Lower interlocking seat bar.
3. Be sure all joysticks/control levers and pedals are in neutral position.
4. Turn engine speed control dial (1) to slow idle position.
5. Press engine start switch (2) to turn switched power ON, but do not crank engine.
6. Check engagement and monitor unit (EMU). Engine low oil pressure indicator will be lit until engine starts.

**IMPORTANT: Avoid possible machine damage. Do not crank starter continuously for more than 30 seconds or damage to starter may occur.**

**If engine does not start within 30 seconds, press engine stop switch and allow starter to cool for 65 seconds before trying again.**

**Do not use ether or any other type of starting fluid on engines.**

**Do not tow the machine to start. Damage to hydrostatic system will occur.**

7. Press engine start switch.
8. Release switch when engine starts.



Control Panel—Keyless Start

- 1— Engine Speed Control Dial    2— Engine Start Switch

- a. A monitor indicator check is performed each time machine is started.

**IMPORTANT: To prevent damage of hydraulics and engine in temperatures below 0°C (32°F), run engine at slow idle for 10 minutes before operating controls.**

- b. Always allow engine to warm-up before applying a load.
9. Run at 1/3 speed for 30 seconds. Do not run at fast or slow idle. Do not accelerate rapidly during warm up.
10. Operate machine at less-than-normal loads and speeds until engine is at normal operating temperature.

CN93077,00006E8 -19-02DEC15-2/2

TX1205430 —UN—10NOV15

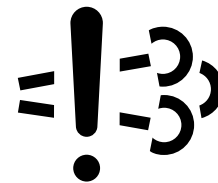
### Required Machine Stop Warning

#### Machine Stop Mandate Occurs

**IMPORTANT: In some situations, machine engine power may be reduced as described. On notification, immediately place the machine in a safe state and move it to a safe location. A mandated machine stop can only be removed by a service technician.**

Engine emissions system malfunction indicator illuminates when an emission-related fault occurs.

RG22491 —UN—21AUG13



Engine Emissions System Malfunction Indicator

Continued on next page

DB84312,00001BC -19-21NOV17-1/6

Warning indicator illuminates when a condition exists which requires operator action.

RG22492 —UN—21AUG13

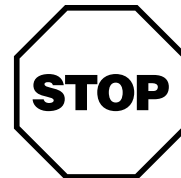


Warning Indicator

DB84312,00001BC -19-21NOV17-2/6

Engine stop indicator illuminates when a condition exists which requires immediate operator action and service.

RG22493 —UN—21AUG13



Engine Stop Indicator

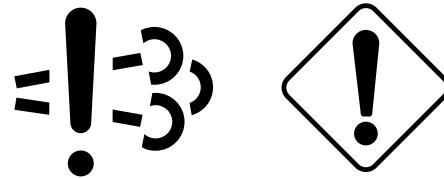
DB84312,00001BC -19-21NOV17-3/6

### Emission System Fault Has Occurred

RG26361 —UN—04SEP14

Four hours or less remaining, engine emissions system malfunction and warning indicators are illuminated to warn operator of emissions-related fault. Two hours or less when pop-up is displayed.

- Engine power is normal.
- Machine operation is normal.
- Place machine in a safe state.
- Contact service provider.



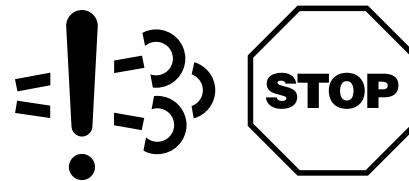
Engine Emissions System Malfunction and Warning Indicators

DB84312,00001BC -19-21NOV17-4/6

Sixty minutes remaining, engine emissions system malfunction and engine stop indicators are illuminated and alarm sounds to warn operator of emissions-related fault. Sixty minutes or less from when pop-up is displayed until final power restriction.

RG26972 —UN—26MAR15

- Engine power and torque will be reduced.
- Key Off—Key On will temporarily provide full power.
- Place machine in a safe state.
- Contact service provider.

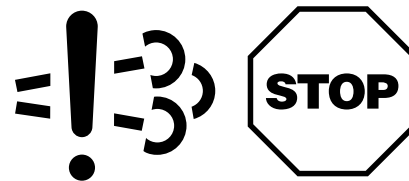


Engine Emissions System Malfunction and Engine Stop Indicators

DB84312,00001BC -19-21NOV17-5/6

Two minutes or less remaining, engine emissions system malfunction and engine stop indicators are illuminated and alarm sounds to warn operator of emissions-related fault which has not been corrected. "DEF System Fault-Engine Power and Speed Limited" is displayed on machines with monitors.

RG26972 —UN—26MAR15



Engine Emissions System Malfunction and Engine Stop Indicators

- Engine power is idle only.
- Place machine in a safe state.
- Contact service provider.

DB84312,00001BC -19-21NOV17-6/6

## Cold Weather Starting

### Key Start

*NOTE: It is normal for battery voltage indicator to light when glow plugs are active.*

*NOTE: For recommended oils for improving starting performance, see Operating in Cold Temperature Climates. (Section 3-1.)*

**IMPORTANT: Avoid possible machine damage. Do not crank starter continuously for more than 60 seconds or the starter may be damaged.**

**If engine does not start within 60 seconds, turn key switch to OFF position and allow starter to cool for 65 seconds before trying again.**

**Do not use ether or any other type of starting fluid on engines.**

**Do not tow the machine to start or damage to hydrostatic system will occur.**

**IMPORTANT: To prevent damage to hydraulics and engine in temperatures below 0°C (32°F), run engine at slow idle for 10 minutes before operating controls.**

The engine control unit (ECU) will default engine speed to slow idle on engine start-up regardless of engine speed control dial position. Move engine speed control dial to slow idle position and then increase the setting to the desired speed to get the engine speed to increase.

1. Turn key switch to RUN position. If engine coolant temperature is low, the engagement and monitor unit (EMU) will display a glow plug icon, text stating WAIT TO START, and the countdown of the seconds remaining before the engine should be started.
2. Once countdown is completed, the EMU will display text stating READY TO START ENGINE for 2 seconds and then return to the normal runtime screen.
3. Turn key switch to the START position and release key when engine starts.

### Keyless Start

*NOTE: It is normal for battery voltage indicator to light when glow plugs are active.*

*NOTE: For recommended oils for improving starting performance, see Operating in Cold Temperature Climates. (Section 3-1.)*

**IMPORTANT: Avoid possible machine damage. Do not crank starter continuously for more than 60 seconds or the starter may be damaged.**

**If engine does not start within 60 seconds, press engine stop switch and allow starter to cool for 65 seconds before trying again.**

**Do not use ether or any other type of starting fluid on engines.**

**Do not tow the machine to start or damage to hydrostatic system will occur.**

**IMPORTANT: To prevent damage to hydraulics and engine in temperatures below 0°C (32°F), run engine at slow idle for 10 minutes before operating controls.**

The engine control unit (ECU) will default engine speed to slow idle on engine start-up regardless of engine speed control dial position. Move engine speed control dial to slow idle position and then increase the setting to the desired speed to get the engine speed to increase.

1. Press engine start switch to turn switched power ON. If engine coolant temperature is low, the engagement and monitor unit (EMU) will display a glow plug icon, text stating WAIT TO START, and the countdown of the seconds remaining before the engine should be started.
2. Once countdown is completed, the EMU will display text stating READY TO START ENGINE for 2 seconds and then return to the normal runtime screen.
3. Press engine start switch and release switch when engine starts.

JK47244,000032E -19-13FEB18-1/1

## Engine Block Heater—If Equipped

**⚠ CAUTION:** Prevent possible injury from electrical shock. Use grounded cord and inspect for damage before connecting to power source.

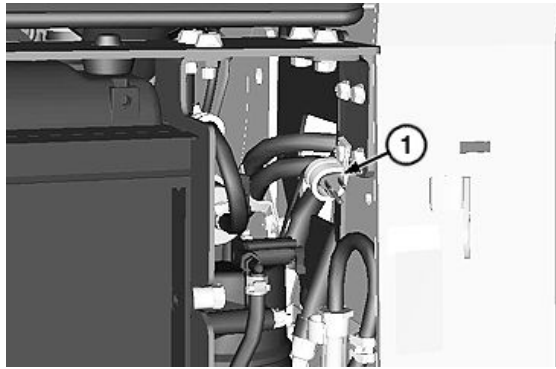
**IMPORTANT:** Prevent property damage as a result of possible fire from an overheated electrical cord. Use a heavy-duty, grounded cord to connect heater to electrical power.

Supply voltage for engine block heater can be 220 V or 110 V. Ensure the correct engine block heater is used for the correct supply voltage.

*NOTE: Engine block heater is recommended when ambient temperature is below -15°C (5°F) or at altitudes above 1820 m (6000 ft).*

The engine block heater allows for quicker start and warm-up during cold weather temperatures.

Before starting engine, connect engine block heater cord (1) to electrical power for a minimum of 4 hours



Engine Block Heater Cord

1— Engine Block Heater Cord

when ambient temperature is between -15°C (5°F) and -25°C (-13°F). Connect engine block heater cord to electrical power for a minimum of 10 hours when ambient temperature is below -25°C (-13°F).

TX1205447 —UN—11NOV15

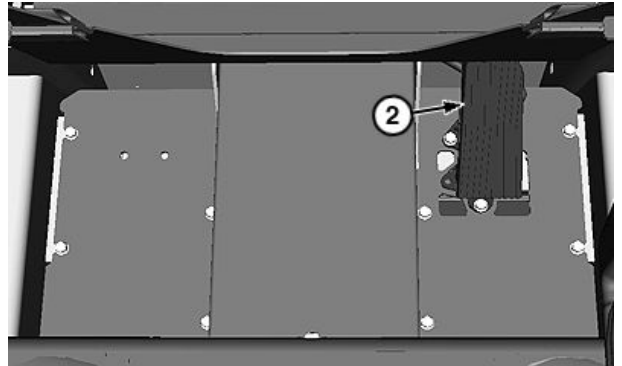
CN93077,00006EA -19-09DEC15-1/1



## Engine Speed Control



Engine Speed Control Dial



Engine Speed Control Pedal

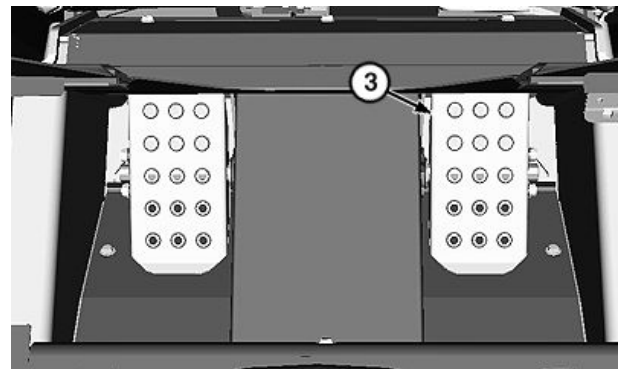
### Electrohydraulic (EH) Control Machine

The engine control unit (ECU) will default engine speed to slow idle on engine start-up regardless of engine speed control dial position. Move engine speed control dial to slow idle position and then increase the setting to the desired speed to get the engine speed to increase.

There are two ways to control engine speed:

- Engine speed control dial (1)
- Engine speed control pedal (2) or right pedal (3)

On machines equipped with both EH hand controls and switchable controls option, pressing right pedal forward can control engine speed if using EH hands only (ISO pattern) controls.

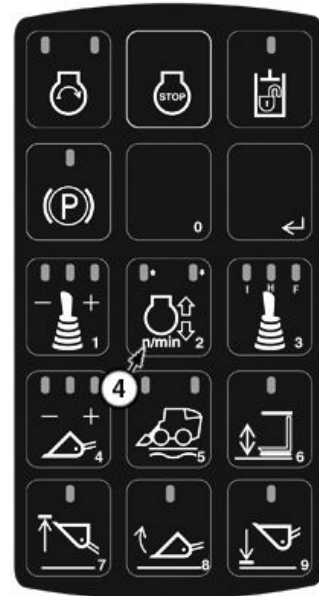


Right Pedal

Press accelerator/decelerator mode switch (4) to activate acceleration mode (left light-emitting diode [LED] illuminated). In acceleration mode, engine speed will increase when the engine speed control pedal is pressed.

Press accelerator/decelerator mode switch to activate deceleration mode (right LED illuminated). In deceleration mode, engine speed will decrease when the engine speed control pedal is pressed.

- |                               |                                      |
|-------------------------------|--------------------------------------|
| 1— Engine Speed Control Dial  | 3— Right Pedal                       |
| 2— Engine Speed Control Pedal | 4— Accelerator/Decelator Mode Switch |



Sealed Switch Module (SSM)

CN93077,00006ED -19-25JAN16-1/1

## Stopping the Engine

1. For electrohydraulic (EH) control machines, move joysticks to neutral position.
2. Move auxiliary hydraulic controls to neutral position.

**⚠ CAUTION: Prevent possible injury from unexpected boom movement. Never exit machine with boom raised unless boom is resting on boom lock.**

3. Lower boom completely to ground. If boom is to remain in raised position, use boom lock. See Boom Lock in this section.

4. Engage park brake.
5. Turn engine speed control dial to slow idle position.
6. If equipped with key start, turn key switch to OFF position.  
If equipped with keyless start, press engine stop switch.
7. Raise interlocking seat bar.
8. Release seat belt.

JB92884,0000143 -19-07JUN16-1/1

## Exhaust Filter

The exhaust filter is a critical component of the engine's emissions control system, which is required to meet governmental emissions regulations. The exhaust filter captures soot and ash to prevent its release into the atmosphere. The soot and ash must be eliminated from the exhaust filter to keep it functioning properly. The process of eliminating collected soot is called exhaust filter cleaning. There are four types of exhaust filter cleaning available to the operator:

- **PASSIVE CLEANING**
- **ENHANCED PASSIVE CLEANING**
- **ACTIVE CLEANING**
- **PARKED CLEANING**

There are three soot levels to describe the amount of restriction in the exhaust filter. These levels determine the type of cleaning that is required:

- **LOW**
- **MODERATE**
- **HIGH**

*NOTE: If exhaust filter restriction reaches HIGH soot level, a diagnostic trouble code (DTC) will appear, and an authorized John Deere dealer should be contacted.*

For more information, see Exhaust Filter (EMU). (Section 2-3.)

### AUTO CLEANING

Auto cleaning is set from the factory in the monitor menu to be enabled. Different settings can be chosen for the default state after a power cycle. These settings are:

- ENABLE AUTO CLEAN**
- DISABLE AUTO CLEAN**

*NOTE: If auto cleaning is set to disabled, machine will not revert back to enabled after a power cycle.*

Passive, enhanced passive, and active cleaning are automatically performed as needed with auto cleaning enabled and no interaction required from the operator. An exhaust filter cleaning indicator may illuminate on the gauge and indicator display when the system is actively performing a cleaning. Machine can be operated as normal. Exhaust filter cleaning indicator will turn off when exhaust filter cleaning is complete and exhaust temperatures return to normal.

If operating in conditions where it may be unsafe for elevated exhaust temperatures, auto cleaning can be disabled using the engagement and monitor unit (EMU) menu. If the filter restriction reaches the MODERATE soot level with auto cleaning disabled, a pop-up will appear on the display monitor stating that auto cleaning needs to be enabled. For more information, see Exhaust Filter Auto Cleaning (EMU). (Section 2-3.)

*NOTE: Disabling exhaust filter auto cleaning is not preferred. Whenever possible, auto cleaning should*

*be enabled to keep soot buildup to a minimum and to increase overall machine uptime.*

In addition to the cleaning procedures, the exhaust filter also requires maintenance to remove accumulated ash, which is a noncombustible result of additives used in crankcase lubrication oils and the fuel. Ash removal CANNOT be performed by the operator. For more information on exhaust filter ash removal, see Service Exhaust Filter. (Section 3-3.)

### PASSIVE CLEANING

During normal machine operation, the exhaust heat will naturally clean the soot buildup in the exhaust filter.

*NOTE: Unnecessary idling can cause exhaust filter soot to accumulate. For the best possible exhaust filter operation, which requires the least amount of operator interaction, idling should be kept to a minimum.*

### ENHANCED PASSIVE CLEANING

**IMPORTANT: Avoid machine damage. Do not stop engine when exhaust filter cleaning indicator illuminates.**

Enhanced passive cleaning will initiate during normal machine operation when soot levels are above passive cleaning. The air throttle closes and injection timing changes to increase exhaust gas temperature. The exhaust filter cleaning indicator may illuminate.

Machine requirements:

- Auto cleaning must be enabled. See Exhaust Filter (EMU). (Section 2-3.)
- Engine must remain running.

### ACTIVE CLEANING

**IMPORTANT: Avoid machine damage. Do not stop engine when exhaust filter cleaning indicator illuminates.**

Active cleaning will initiate during normal machine operation when soot levels are above passive and enhanced passive cleaning levels or every 100 hours.

- Air throttle closes.
- Injection timing changes.
- In-cylinder fuel dosing occurs.
- Engine speed increases to an elevated slow idle and stays above elevated slow idle until active cleaning has completed.
- EMU may display elevated idle.
- Exhaust filter cleaning indicator may illuminate.

Machine requirements:

- Auto cleaning must be enabled. See Exhaust Filter (EMU). (Section 2-3.)
- Engine must remain running.

## PARKED CLEANING

**IMPORTANT: Avoid machine damage. Do not stop engine when exhaust filter cleaning indicator illuminates.**

**⚠ CAUTION: Servicing machine during exhaust filter parked cleaning can result in serious personal injury. Avoid exposure and skin contact with hot gases and components.**

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

Parked cleaning can be initiated when the exhaust filter restriction reaches either LOW or MODERATE soot levels.

When parked cleaning is required, the engine may derate and the operator may be prompted to perform a parked cleaning. EMU displays exhaust filter restricted indicator for 5 seconds every 10 minutes until parked cleaning is performed.

**IMPORTANT: Initiating a parked cleaning is not advised if the filter restriction is at LOW and a parked cleaning has occurred within 50 hours of runtime.**

Parked cleaning is prompted by the EMU and initiated by the operator. Parked cleaning is most commonly initiated after extended operation with exhaust filter auto cleaning disabled, frequent engine shutdowns have occurred while the auto cleaning process was active, or if machine has been running at lower engine idles for extended periods of time.

The initial parked cleaning menu allows operator to automatically shutdown or not to shutdown after a parked cleaning. See Exhaust Filter Parked Cleaning (EMU). (Section 2-3.)

During the cleaning process, the engine speed will be controlled automatically and the machine must remain parked to complete the procedure. Complete cleaning time takes approximately 1 hour, but will vary on several criteria including fuel type, oil type, duty cycle, and the number of previously aborted exhaust filter cleaning requests.

Move machine to a well ventilated and safe location along with the following requirements:

- Auto cleaning must be enabled. See Exhaust Filter (EMU). (Section 2-3.)

- Park brake applied and machine remains parked.
- Engine must remain running.
- Set engine speed to slow idle.
- Coolant temperature must be at 60°C (140°F) or higher.

The following occurs during parked cleaning:

- Air throttle closes.
- Injection timing changes.
- In-cylinder fuel dosing occurs.
- Engine speed increases to an elevated slow idle and stays above elevated slow idle until active cleaning has completed.
- EMU may display elevated idle.
- EMU will display exhaust filter cleaning progress bar.
- Exhaust filter cleaning indicator may illuminate.

The cleaning process will continue until one of the following conditions exist:

- Auto cleaning is disabled in the EMU.
- Engine speed control dial is moved above the lowest position.
- Engine is shut off by operator (not recommended).
- Until there is no soot restriction in the exhaust filter.
- Park brake released.
- Parked cleaning is aborted due to a malfunction.
- Engine runs out of fuel.

When parked cleaning procedure is complete, engine will automatically return to slow idle and EMU displays parked cleaning is complete. Machine is ready to return to operation.

**IMPORTANT: Avoid engine damage. If machine will NOT be returning to operation immediately after a parked cleaning procedure, allow the engine and exhaust filter to return to normal operating temperatures BEFORE stopping engine.**

Avoid disabling the auto cleaning process unless absolutely necessary. Repeated disabling of the auto cleaning process or ignoring prompts to perform a parked cleaning procedure will cause engine power limitations and can eventually lead to dealer required service cleaning.

### Ash Removal

The exhaust filter cleaning procedures described previously, clean the soot from the machine's exhaust filter. The exhaust filter also traps ash deposits over time which are not removed during an exhaust filter cleaning. When the exhaust filter has been run for several thousand hours, these ash deposits can restrict engine performance and must be removed. For more information on ash removal, see Service Exhaust Filter. (Section 3-3.)

CN93077,00006F1 -19-14DEC15-2/2

## Boom Lock

Use boom lock (2) when it is necessary to leave machine with boom in a raised position.

### Locking boom in raised position

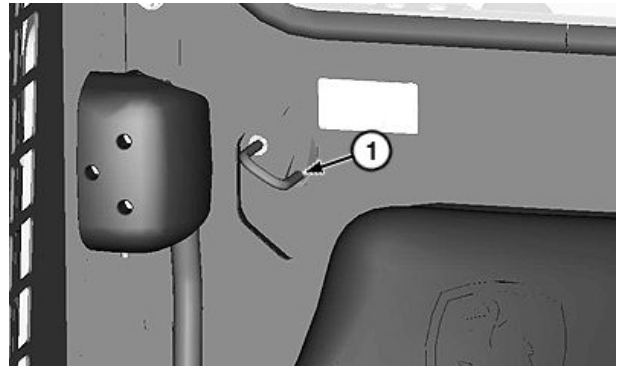
1. Remove any attachment.
2. Park machine on level surface.
3. Raise boom a short distance above boom lock.
4. Pull out on boom lock lever (1), rotate up to extend boom lock to locked position.
5. Slowly lower boom onto boom lock.

### Disengaging boom lock

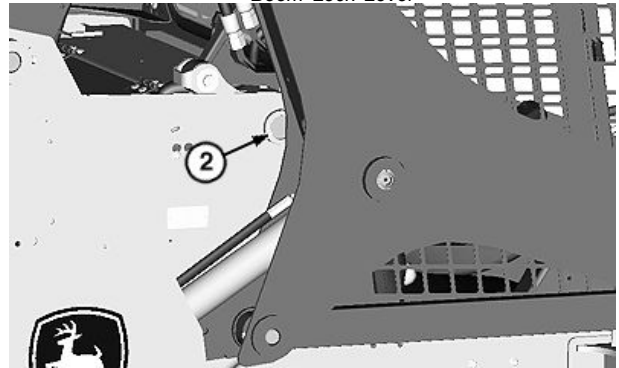
1. Raise boom a short distance off boom lock.
2. Rotate boom lock lever down to retract the boom lock to the unlocked position.
3. Slowly lower boom to the ground.

1— Boom Lock Lever

2— Boom Lock



Boom Lock Lever



Boom Lock

CN93077,00006F3 -19-11NOV15-1/1

TX1205479 —UN—11NOV15

TX1205478 —UN—11NOV15

## Boom Release

**⚠ CAUTION: Prevent possible injury from unexpected boom movement. Never exit machine with boom raised unless boom is resting on boom lock.**

Boom release is to be used when boom is in a partially raised position and engine is stopped and will not start.

1. Close cab door, if equipped.
2. Fasten seat belt.
3. Lower interlocking seat bar.
4. Remove knob (1) from boom release cover in lower left side of cab. Remove cover.
5. Pull boom release valve (2) and hold.

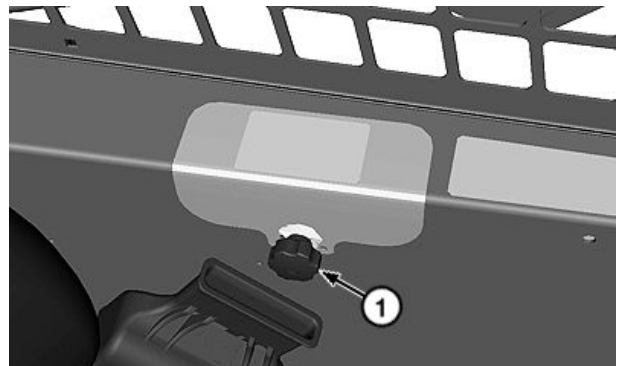
*NOTE: Boom lower function will vary based on machine control pattern.*

6. Lower boom.

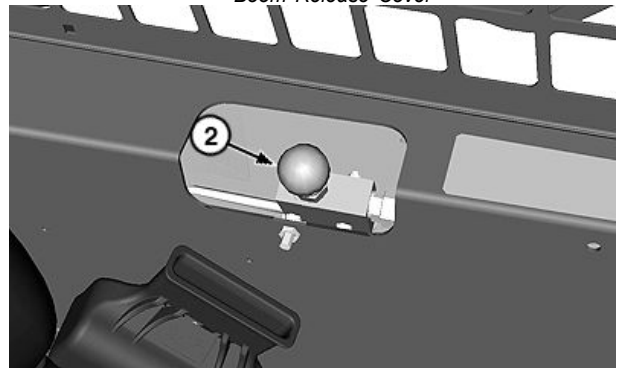
If boom does not lower, see an authorized John Deere dealer.

1— Knob

2— Boom Release Valve



Boom Release Cover



Boom Release Valve

CN93077,00006F4 -19-16DEC15-1/1

TX1205503 —UN—12NOV15

TX1205505 —UN—12NOV15

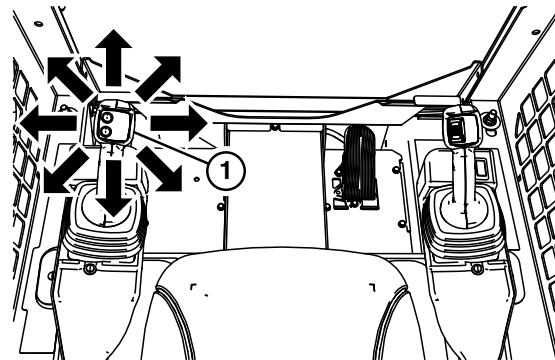
## Steering—EH Controls

**CAUTION:** Avoid possible injury from unexpected machine movement. If machine is equipped with joystick performance package, be aware that there are two control patterns available. Always verify control response before operating machine.

### Electrohydraulic (EH) Hands Only (ISO pattern) Controls

**NOTE:** The left joystick (1) controls left and right drive.

- Move left joystick (1) in the direction of desired travel.
- Slowly return left joystick to neutral position to stop.



Electrohydraulic (EH) Hands Only (ISO pattern) Controls

1— Left Joystick

CN93077,00006FA -19-08DEC15-1/1

TX1205636 —UN—16NOV15

## Operating Boom—EH Controls

Depending on machine configuration, there are three possible control patterns: electrohydraulic (EH) hands only (ISO pattern) controls or EH hands only (H pattern) controls.

### EH Hands Only (ISO pattern) Controls

The right joystick (1) controls the boom:

- Move joystick forward to lower boom.
- Move joystick backward to raise boom.
- Boom will move faster the farther the joystick is moved.

### Float Position

Relieves down pressure on boom cylinders and allows boom and attachment to float with contour of the ground.

**NOTE:** Float function will not activate if ride control is on.

**NOTE:** Do not press and hold float switch (2). Holding float switch can result in a diagnostic trouble code (DTC).

To activate float:

1. Activate boom down motion.
2. Press and release float switch (2).
3. Allow joystick to move to neutral position.

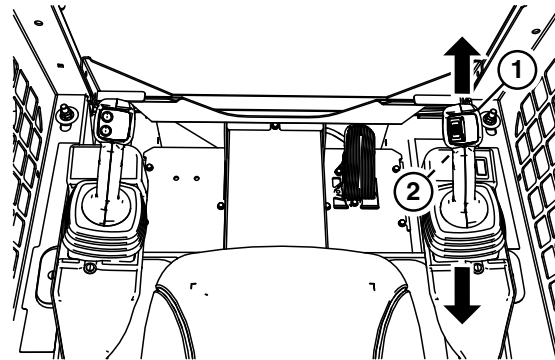
**NOTE:** Pressing float switch again will not deactivate float.

To deactivate float:

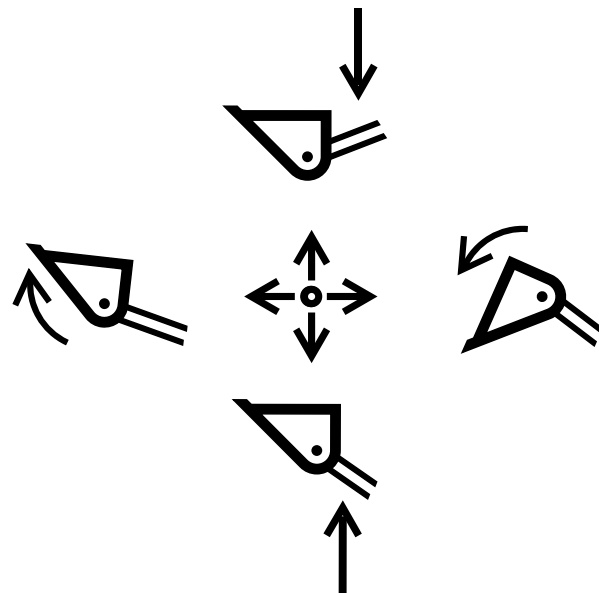
1. Move right joystick a minimum of 10% either forward or backward.

1— Right Joystick

2— Float Switch



Right Joystick



Right Joystick Operation—ISO Pattern

Continued on next page

CN93077,00006FC -19-08DEC15-1/2

TX1205592 —UN—16NOV15

TX1067123 —UN—04NOV09

**EH Hands Only (H pattern) Controls**

The left joystick (1) controls the boom:

- Pivot joystick to the left to raise boom.
- Pivot joystick to the right to lower boom.
- Boom will move faster the farther the joystick is moved.

**Float Position**

Relieves down pressure on boom cylinders and allows boom and attachment to float with contour of the ground.

*NOTE: Float function will not activate if ride control is on.*

*NOTE: Do not press and hold float switch (2). Holding float switch can result in a diagnostic trouble code (DTC).*

To activate float:

1. Activate boom down motion.
2. Press and release float switch (2).
3. Allow joystick to move to neutral position.

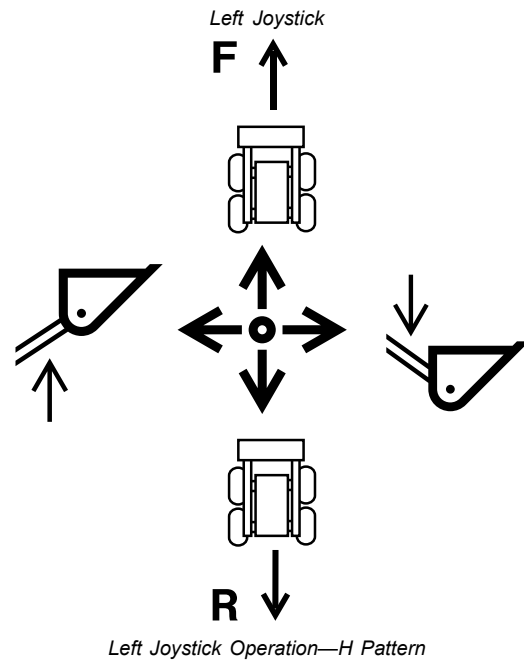
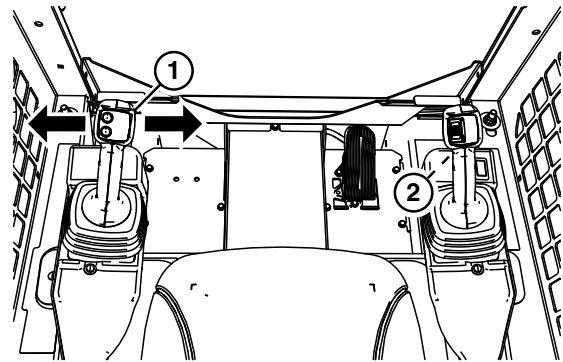
*NOTE: Pressing float switch again will not deactivate float.*

To deactivate float:

1. Move left joystick a minimum of 10% either left or right.

1— Left Joystick

2— Float Switch



TX1205593 —UN—16NOV15

TX1067122 —UN—04NOV09

CN93077,00006FC -19-08DEC15-2/2

### Operating Bucket—EH Controls

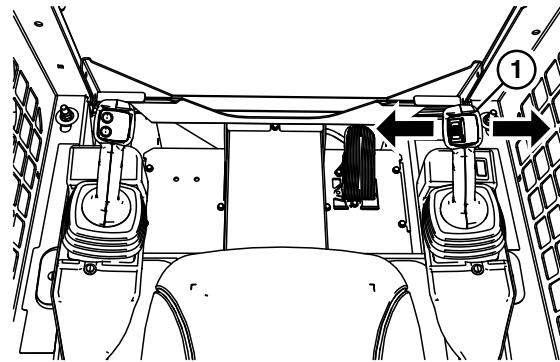
Depending on machine configuration, there are three possible control patterns: electrohydraulic (EH) hands only (ISO pattern) controls or EH hands only (H pattern) controls.

### EH Hands Only (ISO pattern) Controls

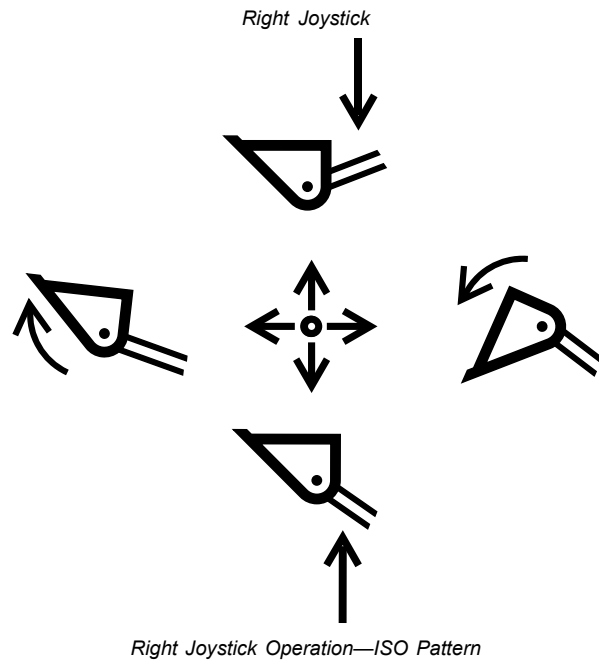
The right joystick (1) controls the bucket:

- Pivot joystick left to roll back bucket.
- Pivot joystick right to dump bucket.
- Bucket will move faster the farther the joystick is moved.

1—Right Joystick



TX1205595 —UN—16NOV15



TX1067123 —UN—04NOV09

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CN93077,00006FD -19-08DEC15-1/2

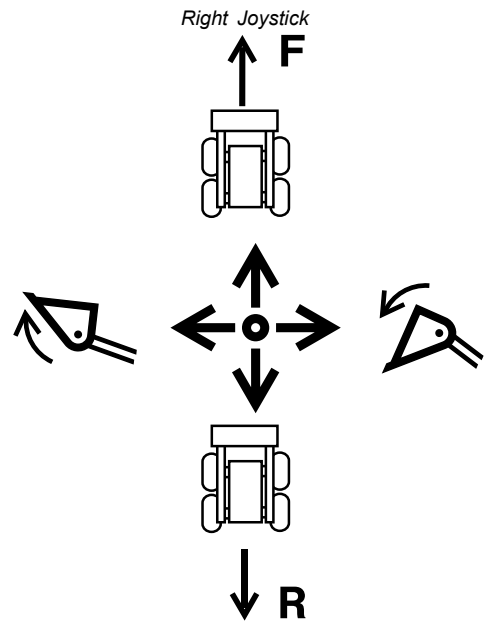
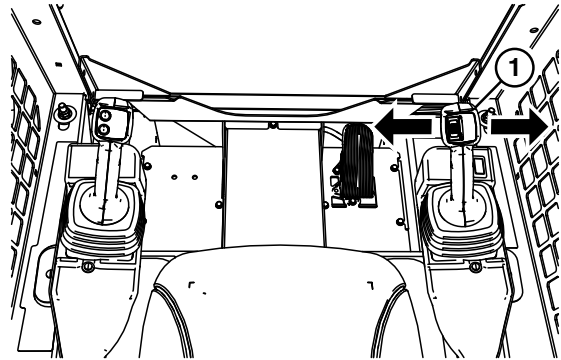


### EH Hands Only (H pattern) Controls

The right joystick (1) controls the bucket:

- Pivot joystick left to roll back bucket.
- Pivot joystick right to dump bucket.
- Bucket will move faster the farther the joystick is moved.

1— Right Joystick



Right Joystick Operation—H Pattern

CN93077,00006FD -19-08DEC15-2/2

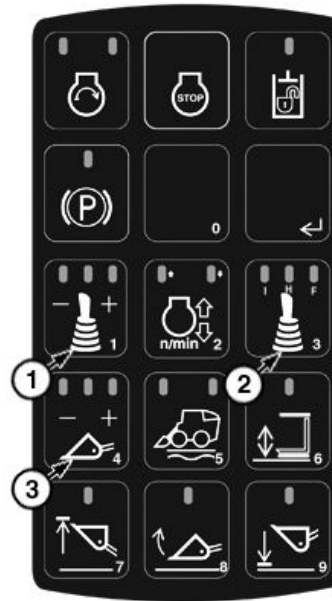
TX1205595 —UN—16NOV15

TX1067124 —UN—04NOV09

### Joystick Performance Package—If Equipped

Joystick performance package includes the following:

- **Transmission response rate (travel and steer)**—Setting can be selected for increased performance and to suit desired operator preference. For more information, see **Transmission Response Rate (Travel and Steer)—If Equipped** in this section.
- **Switchable controls**—Machine control can be switched between electrohydraulic (EH) hands only (ISO pattern) controls, EH hands only (H pattern) controls, or EH hand controls. For more information, see **Switchable Controls—If Equipped** in this section.
- **Hydraulic response rate (boom and bucket)**—Setting can be selected for increased performance and to suit desired operator preference. For more information, see **Hydraulic Response Rate (Boom and Bucket)—If Equipped** in this section.
- **Creep mode**—Travel speed can be limited when joysticks are at full travel. Creep mode switch is located by right joystick. For more information, see **Creep Mode—If Equipped** in this section.



Sealed Switch Module (SSM)

- 1— Transmission Response Switch
- 2— Pattern Select Switch
- 3— Hydraulic Response Switch

TX1205597 —UN—13NOV15

CN93077,00006FE -19-15DEC15-1/1

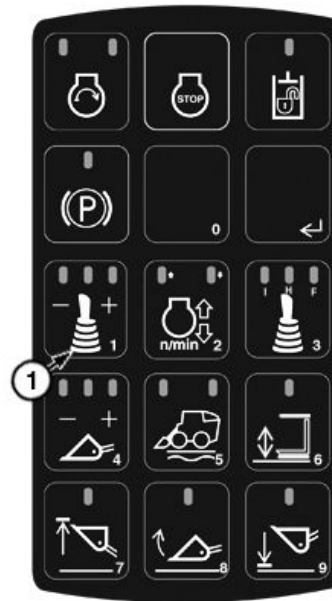
### Transmission Response Rate (Travel and Steer)—If Equipped

For electrohydraulic (EH) machines with joystick performance package only, one of three travel and steer speed rate settings can be selected for increased performance and to suit desired operator preference.

Press transmission response switch (1) on sealed switch module (SSM) to select desired rate.

- **Precision Rate (left light-emitting diode [LED] illuminated)**—Provides reduced response to the joystick command. Speed is limited to no less than 80%.
- **Utility Rate (left and middle LEDs illuminated)**—Provides increased response to the joystick command. All functions attain 100% maximum speed at the end of joystick travel. This setting is the default setting from the factory.
- **Production Rate (all LEDs illuminated)**—Provides quickest response to the joystick command. All functions attain 100% maximum speed for each function.

- 1— Transmission Response Switch



Sealed Switch Module (SSM)

TX1205598 —UN—13NOV15

CN93077,00006FF -19-11APR17-1/1

### Switchable Controls—If Equipped

**CAUTION:** Avoid machine damage or personal injury from unexpected machine movement. Verify machine control functions prior to operation.

The switchable controls option allows machine control to be switched between electrohydraulic (EH) hands only (ISO pattern) controls, EH hands only (H pattern) controls, or EH hand controls for operator preference.

*NOTE: The active pattern will be displayed on engagement and monitor unit (EMU) at machine start-up and anytime the pattern is changed.*

*The pattern used prior to shutdown will be enabled upon next start-up.*

Press and release pattern select switch (1) until left light-emitting diode (LED) is illuminated to activate EH hands only (ISO pattern) controls.

Press and release pattern select switch until middle LED is illuminated to activate EH hands only (H pattern) controls.

Press and release pattern select switch until both middle and right LEDs are illuminated to activate EH hand controls.



Sealed Switch Module (SSM)

1— Pattern Select Switch

CN93077,0000700 -19-15DEC15-1/1

TX1205599 —UN—13NOV15

### Hydraulic Response Rate (Boom and Bucket)—If Equipped

For electrohydraulic (EH) machines with joystick performance package only, one of three boom and bucket speed rate settings can be selected for increased performance and to suit desired operator preference.

Press hydraulic response switch (1) on sealed switch module (SSM) to select desired rate.

- **Precision Rate (left light-emitting diode [LED] illuminated)**—Provides reduced response to the joystick command.
- **Utility Rate (left and middle LEDs illuminated)**—Provides increased response to the joystick command. This setting is the default setting from the factory.
- **Production Rate (all LEDs illuminated)**—Provides quickest response to the joystick command.

1— Hydraulic Response Switch



Sealed Switch Module (SSM)

CN93077,0000701 -19-11APR17-1/1

TX1205600 —UN—13NOV15

## Creep Mode—If Equipped

**NOTE:** When creep mode is active, machine control pattern cannot be changed.

**NOTE:** Do not press and hold creep mode switch (1). Holding creep mode switch can result in a diagnostic trouble code (DTC).

Creep mode is only available with electrohydraulic (EH) controls and is included as part of the optional joystick performance package.

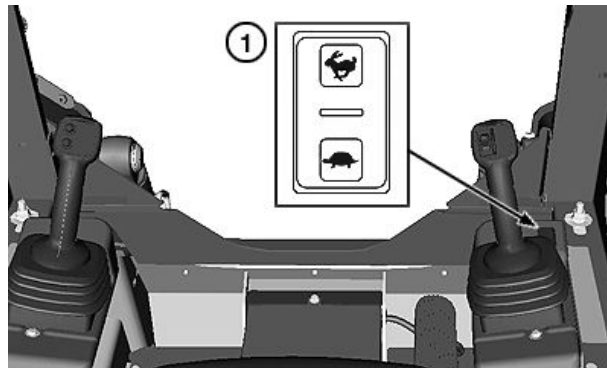
Creep mode is used to limit the travel speed of the machine when the joystick is at full travel.

**NOTE:** For wheeled machines, shifting to high speed is allowed regardless of hydraulic oil temperature. Shifting to low speed is allowed during normal operation if hydraulic oil temperature is 40°C (105°F) or greater. If hydraulic oil temperature is less than 40°C (105°F), then shifting to low speed requires machine to be stopped and park brake applied. If hydraulic oil is too cold for down shift without park brake applied, **HYD TEMP TOO LOW FOR SHIFT** pop-up will display on engagement and monitor unit (EMU).

To activate creep mode, press creep mode speed switch (1) located by right joystick and move the joystick to neutral. For two-speed machines, if machine is in high range prior to actuation of the switch, the machine will also shift to low range when the joystick is in neutral.

Once creep mode is activated, the engagement and monitor unit (EMU) will display the speed limit setting screen. The creep mode limit will display the last saved setting.

Change the speed limit setting by pressing upper or lower portion of creep mode speed switch.



Creep Mode Speed Switch

### 1—Creep Mode Speed Switch

Speed limit can be adjusted while the machine is moving. The setting selected will become active immediately. The display will show the percentage of allowed maximum speed in increments of 10% above 20%, and in increments of 1% below 20%. If the MENU or SELECT button is pressed, the display will return to the previous menu display and the operator is allowed to again navigate the display as normal. The operator can return to the speed limit setting screen by either cycling creep mode off and then on again or by navigating the menus and selecting creep mode.

When machine is in creep mode, the creep mode indicator (snail) will illuminate on EMU.

To deactivate creep mode and return to travel speed, press the left joystick trigger switch.

TX1205729 —UN—17NOV15

CN93077,0000702 -19-04JUN18-1/1

## Attachment Mounting System—Quik-Tatch™

### Manual Quik-Tatch™

**⚠ CAUTION:** Prevent possible injury from unexpected machine movement. Be careful not to pinch hands between latch handle and step or latch handle and attachment. **DO NOT** try to latch or unlatch handles from operator's station.

#### Installing an attachment:

1. Park machine on level surface.
2. Exit machine.
3. Lift latch handles (1) up to unlatched position. Be sure latch handles are all the way up so lock pins are fully retracted.
4. Enter machine, fasten seat belt, and lower interlocking seat bar. Start engine. Disengage park brake.
5. Tilt mounting plates (2) forward.
6. Drive forward. Raise boom and guide top of mounting plates under attachment mounting brackets (3).
7. Raise and roll back mounting plates. The back of attachment should rest against front of mounting plates.
8. When attachment is fully supported, lower boom until boom is resting on boom stops.
9. Roll attachment out, stopping with bottom edge of attachment about 50 mm (2 in) from ground.
10. Engage park brake, stop engine, raise interlocking seat bar, unfasten seat belt, and exit machine.
11. Push the two latch handles down to lock attachment to Quik-Tatch™.
12. Enter machine, fasten seat belt, and lower interlocking seat bar.
13. Start engine and disengage park brake.
14. Activate boom cylinders to raise attachment and extend bucket cylinders to tilt attachment at a slight downward angle so that bottom of Quik-Tatch™ is visible.

**⚠ CAUTION:** Prevent possible crushing injury from falling attachment. Be sure pins and latch handles are secure before operating boom and bucket.

**If attachment is not securely latched, follow the removal procedure, and then repeat installation procedure.**

*Quik-Tatch is a trademark of Deere & Company*



Manual Quik-Tatch™

1— Latch Handle (2 used)  
2— Mounting Plate (2 used)

3— Mounting Bracket (2 used)

15. Visually inspect attachment mechanism to verify that pins are fully engaged in slots on back of attachment.

**IMPORTANT:** Avoid excessive pin wear. Keep the pin area clear of dirt and debris. If the pin will not fully engage or if wear is detected, see an authorized John Deere dealer.

16. Connect attachment hydraulic hoses and electrical connections to machine if equipped. See Connecting and Disconnecting Auxiliary Hydraulics in this section.

#### Removing the attachment:

1. Park machine on level surface.

**⚠ CAUTION:** Prevent possible crushing injury from falling attachment. Be sure attachment is on the ground before continuing.

2. Lower boom until attachment is securely resting on ground.
3. Disconnect hydraulic hoses from couplers if needed.
4. Pull latch handles up to unlatched position to release pins from lower attachment tabs. Be sure latch handles are fully raised.
5. Enter machine, fasten seat belt, and lower interlocking seat bar.
6. Start engine and disengage park brake.
7. Tilt mounting plate forward and back machine away from attachment at the same time.

TX1205743 —UN—17NOV15

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CN93077,0000705 -19-01MAY17-1/3

## Power Quik-Tatch™

### Installing an attachment:

1. Park machine on level surface.
2. Lower boom until boom is resting on boom stops.
3. Disengage park brake.

**NOTE:** The switch will automatically return to center position when released. The lock pins will stop at the position they are in at the time the switch is released.

4. Press and hold lower half of Quik-Tatch™ switch (1) to retract lock pins. Red indicator should be visible in indicator windows (2).
5. Tilt mounting plates (3) forward.
6. Drive forward and raise boom. Guide top of mounting plates under attachment mounting brackets.
7. Raise and rollback mounting plates. Back of attachment should rest against front of mounting plates.
8. Lower boom until boom is resting on boom stops when attachment is fully supported.
9. Roll attachment out. Stop with bottom edge of attachment 50 mm (2 in) from ground.
10. Press and hold upper half of Quik-Tatch™ switch to engage lock pins. Red indicator should not be visible in indicator window.
11. Activate lift cylinders to raise attachment and extend bucket cylinders to tilt attachment at a slight downward angle so that the bottom of the Quik-Tatch™ is visible.

**CAUTION:** Prevent possible crushing injury from falling attachment. Be sure pins are engaged before operating boom and bucket. Red indicator should not be visible in the indicator window.

**If attachment is not securely latched, follow the removal procedure and then repeat installation procedure.**

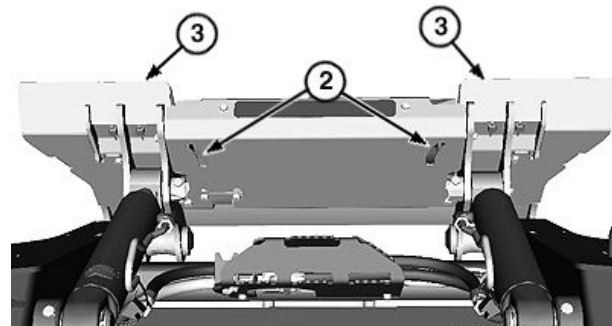
12. Visually inspect attachment mechanism to verify that pins are fully engaged in slots on back of attachment.
13. Connect hydraulic hoses to couplers if needed. See Connecting and Disconnecting Auxiliary Hydraulics in this section.

### Removing the attachment:

1. Park machine on level surface.



Control Panel



Power Quik-Tatch™

- 1— Quik-Tatch™ Switch      3— Mounting Plate (2 used)  
2— Indicator Window (2 used)

**CAUTION:** Prevent possible crushing injury from falling attachment. Be sure attachment is on the ground before continuing.

2. Lower boom until attachment is securely resting on ground.
3. If attachment does not have hydraulic hoses connected to couplers, proceed to next step.

If attachment does have hydraulic hoses connected to couplers:

- Engage park brake and stop engine.
- Raise interlocking seat bar and unfasten seat belt.
- Disconnect hydraulic hoses from couplers.
- Enter machine, fasten seat belt, and lower interlocking seat bar.
- Start engine and disengage park brake.

4. Press and hold lower half of Quik-Tatch™ switch to retract lock pins. Red indicator should be visible in indicator window.
5. Tilt mounting plates forward and back machine away from attachment at the same time.

Quik-Tatch is a trademark of Deere & Company

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TX1205751 —UN—17NOV15

## Auto-Idle

Auto-idle can be enabled or disabled based on a selection in the engagement and monitor unit (EMU) operator menus. See Auto-Idle (EMU). (Section 2-3.)

### Auto-Idle—Electrohydraulic (EH) Controls

Auto-idle automatically commands the engine to idle speed if the engine is left running at a speed greater than slow idle with no activation of travel, hydraulic, or auxiliary hydraulic functions for more than 5 seconds.

*NOTE: AUTO-IDLE will be displayed on the EMU when machine is in auto-idle mode.*

Auto-idle will become **active** if ALL of the following are true:

1. Engine is running.
2. When more than 30 seconds have passed since engine was started.
3. Auto-idle is enabled in the EMU.
4. Operator present in seat with interlocking seat bar down.
5. Park brake is released.
6. Engine speed control dial or engine speed control dial is more than 5% above slow idle.
7. Engine speed control pedal (if equipped) is not depressed.
8. Engine coolant temperature is greater than 25°C (77°F).
9. Auxiliary hydraulics are not enabled.
10. Left and right joysticks are in center position.
11. Foot pedals (if equipped) are in center position.
12. No travel, boom, or bucket functions have been activated.
13. Creep mode is not enabled.
14. Cab door (if equipped) is closed.
15. Transmission response switch is not enabled.
16. Calibration mode is not enabled (see an authorized John Deere dealer).
17. Items 1—16 have been true for longer than 5 seconds.

*NOTE: Auto-idle is also deactivated if engine is shut off.*

To deactivate auto-idle, do one of the following:

- Adjust engine speed control dial by more than 5%.

- If engine speed control dial is not at maximum, depress engine speed control pedal by more than 5%.
- Move either left or right joystick out of neutral position.
- Move foot pedals (if equipped) out of neutral position.
- Actuate auxiliary proportional switch.
- Enable creep mode.
- Disable Auto-idle in the EMU.

### Limited Auto-Idle—Electrohydraulic (EH) and Manual Controls

Limited auto-idle automatically commands the engine to idle speed if the engine is left running at a speed greater than slow idle with no activation of travel, hydraulic, or auxiliary hydraulic functions for more than 60 seconds.

*NOTE: AUTO-IDLE will be displayed on the EMU when machine is in limited auto-idle mode.*

Limited auto-idle will become **active** if ALL of the following are true:

1. Engine is running.
2. When more than 30 seconds have passed since engine was started.
3. Operator is out of the seat.
4. Engine speed control dial is more than 5% above idle.
5. Engine speed control pedal (if equipped) is not depressed.
6. Engine coolant temperature is greater than 25°C (77°F).
7. Auxiliary hydraulics are not enabled.
8. Left and right joysticks are in center position.
9. Foot pedals (if equipped) are in center position.
10. Items 1—9 have been true for longer than 60 seconds.

*NOTE: Limited auto-idle is also deactivated if engine is shut off.*

To deactivate limited auto-idle, do one of the following:

- Move either left or right joystick out of neutral position.
- Move foot pedals (if equipped) out of neutral position.
- Actuate auxiliary proportional switch.
- Adjust engine speed control dial by more than 5%.
- If engine speed control dial is not at maximum, depress engine speed control pedal by more than 5%.

CN93077,000073D -19-09JUN16-1/1

## Connecting and Disconnecting Auxiliary Hydraulics

**CAUTION:** To avoid injury from escaping fluid under pressure, stop engine and relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

### Standard Auxiliary Hydraulic

If auxiliary hydraulic connection or disconnection cannot be made, relieve hydraulic system pressure. See Hydraulic System Pressure Release—EH Controls.

### Connecting Auxiliary Hydraulics

For electrohydraulic (EH) machines with joystick performance package only, machine comes equipped with connect under pressure (CUP) couplers to allow for easier attachment connection.

Connect attachment to male and female auxiliary port couplers (2 and 1).

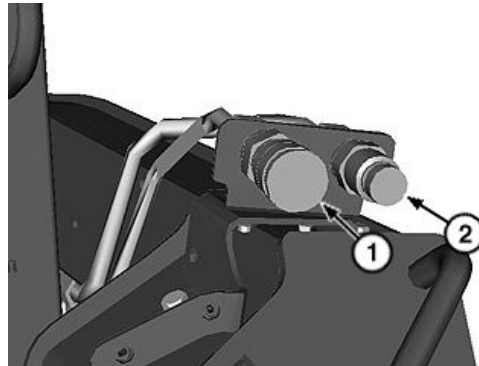
See attachment operator's manual for additional connection information.

### Disconnecting Auxiliary Hydraulics

Disconnect male and female auxiliary port couplers.

### EH Auxiliary Hydraulic

**CAUTION:** To avoid injury from escaping fluid under pressure, stop engine and relieve the



Standard Flow Auxiliary Hydraulics

1— Female Auxiliary Port Coupler (standard flow)

2— Male Auxiliary Port Coupler (standard flow)

**pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.**

If auxiliary hydraulic connection or disconnection cannot be made, relieve hydraulic system pressure. See Hydraulic System Pressure Release—EH Controls.

### Connecting Auxiliary Hydraulics

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CN93077,0000709 -19-08DEC15-1/2

TX1205754 —UN—17NOV15



For electrohydraulic (EH) machines with joystick performance package only, machine comes equipped with connect under pressure (CUP) couplers to allow for easier attachment connection.

**NOTE:** Male and female auxiliary port couplers (2 and 1) move in and out of housing (4), allowing system pressure to bleed back to hydraulic tank through auxiliary case drain port (3).

Press and hold male and female auxiliary port couplers up to 10 seconds to relieve system pressure.

Connect attachment to male and female auxiliary port couplers.

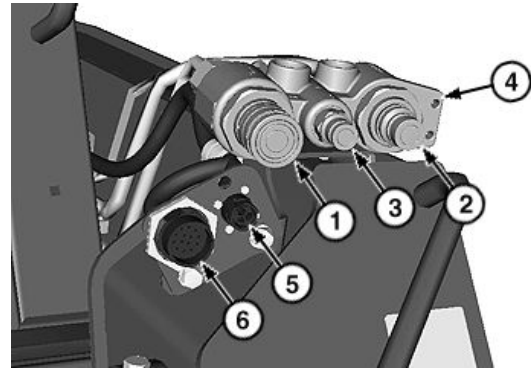
Attachment auxiliary case drain port is only used when required by attachment.

If attachment is equipped with an electrical connector, attach electrical connector to 3-pin electrical connector (5) or 14-pin electrical connector (6).

See attachment operator's manual for additional connection information.

#### Disconnecting Auxiliary Hydraulics

**NOTE:** Male and female auxiliary port couplers move in and out of housing, allowing system pressure to bleed back to hydraulic tank through auxiliary case drain port.



EH Auxiliary Hydraulic (performance package)

- |                                  |                                              |
|----------------------------------|----------------------------------------------|
| 1— Female Auxiliary Port Coupler | 4— Housing                                   |
| 2— Male Auxiliary Port Coupler   | 5— 3-Pin Electrical Connector (if equipped)  |
| 3— Auxiliary Case Drain Port     | 6— 14-Pin Electrical Connector (if equipped) |

Press and hold male and female auxiliary port couplers up to 10 seconds to relieve system pressure.

Disconnect male and female auxiliary port couplers.

Disconnect electrical connector if equipped.

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TX1205761 —UN—17NOV15

## Operating Auxiliary Hydraulics

The auxiliary hydraulic interlock function ensures operator is present in machine and cab door is closed before operating auxiliary hydraulics.

*NOTE: Depending on machine configuration, some joystick/control lever switches may not be present.*

Use switches on left and right joysticks/control levers (1 and 2) to operate auxiliary hydraulic functions.

Roll auxiliary proportional switch (4) forward or backward to vary hydraulic flow rate and direction depending on desired attachment function. Releasing the auxiliary proportional switch stops all auxiliary hydraulic flow.

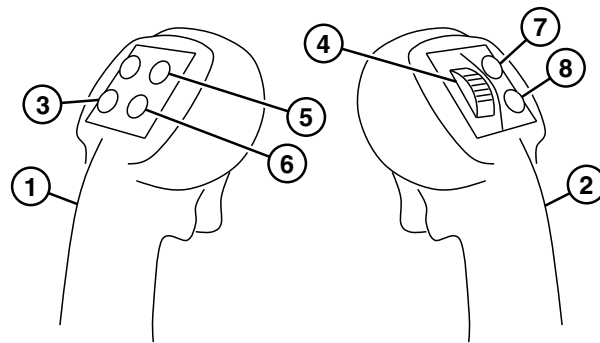
To set continuous auxiliary flow, press and release the auxiliary flow set switch (3) while the proportional switch is actuated in the desired direction. This will set the auxiliary hydraulics to run at full flow in the direction selected. Continuous auxiliary hydraulic flow will continue without pressing the auxiliary proportional switch.

If attachment is equipped with 3-pin connector, switches (5 and 6) are used to operate attachment. If attachment is equipped with 14-pin connector, switches (5, 6, 7, 8, and 9) are used to operate attachment. Consult attachment operator's manual for attachment functions controlled by these switches.

If continuous flow is active and the auxiliary proportional switch is moved in either direction or the flow set switch is pressed, continuous flow is cancelled and proportional auxiliary hydraulic flow resumes.

### Auxiliary Hydraulic Override

If operator needs to exit machine, auxiliary hydraulic functions can be enabled through engagement and monitor unit (EMU) allowing auxiliary hydraulic functions to be run without being in the seat. See Auxiliary Hydraulic Override (EMU). (Section 2-3.)



Auxiliary Hydraulic Controls (EH controls)



Control Panel

- |                                      |                                       |
|--------------------------------------|---------------------------------------|
| 1— Left Joystick/Control Lever       | 6— Auxiliary Third Function B Switch  |
| 2— Right Joystick/Control Lever      | 7— Auxiliary Second Function A Switch |
| 3— Auxiliary Flow Set Switch         | 8— Auxiliary Second Function B Switch |
| 4— Auxiliary Proportional Switch     | 9— Auxiliary Fourth Function Switch   |
| 5— Auxiliary Third Function A Switch |                                       |

TX1067175 —UN—04NOV09

TX1209550 —UN—22JAN16

CN93077.0000708 -19-22JAN16-1/1

## Hydraulic System Pressure Release—EH Controls

**⚠ CAUTION:** Prevent possible injury from unexpected boom or bucket movement when equipped with ride control. Ride control accumulator energy must be discharged when working on hydraulic components. Turn switched power on. Press ride control switch ON and move joystick or pedal to float position.

To avoid injury from escaping fluid under pressure, stop engine and relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

Use electrohydraulic (EH) controls for this procedure to relieve trapped hydraulic system pressure before performing hydraulic system repairs or tests.

### Key Start

1. Sit in seat. Close cab door, if equipped.
2. Lower interlocking seat bar.
3. Turn key to RUN position. Do not start engine.
4. Press park brake switch to middle position to engage hydraulic functions.

**⚠ CAUTION:** To prevent crushing injury, only perform hydraulic system pressure release with boom down or boom up with boom lock engaged. To lower boom manually, see Boom Release in this section.

5. Cycle both the boom and bucket functions.
6. Stop cycling functions once pressure has been released.
7. Cycle auxiliary hydraulic functions.
8. Stop cycling auxiliary hydraulic functions once pressure has been released.
9. Engage park brake and turn key switch to OFF.

### Keyless Start

1. Sit in seat. Close cab door, if equipped.
2. Lower interlocking seat bar.
3. Press engine start switch to turn switched power ON. Do not start engine.
4. Press hydraulic enable switch.

**⚠ CAUTION:** To prevent crushing injury, only perform hydraulic system pressure release with boom down or boom up with boom lock engaged. To lower boom manually, see Boom Release in this section.

5. Cycle both the boom and bucket functions.
6. Stop cycling functions once pressure has been released.
7. Cycle auxiliary hydraulic functions.
8. Stop cycling auxiliary hydraulic functions once pressure has been released.
9. Press park brake switch and engine stop switch.

CN93077,000073F -19-15DEC15-1/1

### Self Leveling Hydraulics—If Equipped

If machine is equipped with self leveling option, the attachment remains in same relative position as the boom is raised.

*NOTE: Self leveling is only operational during boom raise function.*

*Self leveling will not operate if ride control is active.*

#### Key Start

#### Self Leveling Switch (If Equipped)

Press upper half of self leveling switch (1) to activate self leveling feature. Press lower half of self leveling switch to deactivate.

#### Self Leveling and Ride Control Switch (If Equipped)

Push upper half of switch to activate self leveling feature. Press lower half of switch to activate ride control. For more information, see Ride Control—If Equipped in this section.

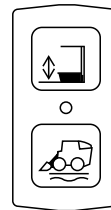
1— Self Leveling Switch



1

Self Leveling Switch (if equipped)

TX1209486 —UN—25JAN16



Self Leveling and Ride Control Switch (if equipped)

CN93077,000070D -19-26JUL17-1/2

TX1209531 —UN—22JAN16

#### Keyless Start

Press self leveling switch (1) on sealed switch module (SSM) (light-emitting diode [LED] illuminated ) to turn on self leveling.

1— Self Leveling Switch



Sealed Switch Module (SSM)

CN93077,000070D -19-26JUL17-2/2

TX1209594 —UN—25JAN16

## Ride Control—If Equipped

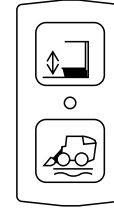
TX1209486 —UN—25JAN16

**⚠ CAUTION:** Prevent possible injury from unexpected boom or bucket movement when equipped with ride control. Ride control accumulator energy must be discharged when working on hydraulic components. Turn switched power on. Press ride control switch ON and move joystick/control lever or pedal to float position.

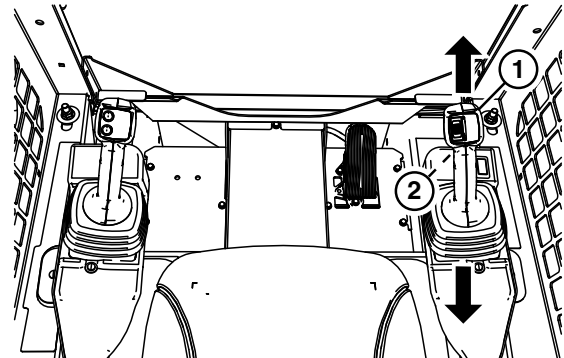
### Key Start

Ride control improves machine ride when traveling over rough terrain. Ride control also reduces material spillage from the bucket by cushioning boom movement.

1. Press lower half of self leveling and ride control switch to turn on ride control.
2. The ride control feature will be in standby mode and can be toggled on and off as desired.
3. Press and release the right joystick/control lever trigger (2) on the right joystick (1) to activate ride control.
4. Press right joystick/control lever trigger again to deactivate ride control.
5. To turn off ride control, return the switch to the center position.



Self Leveling and Ride Control Switch (if equipped)



Right Joystick (if equipped)

1— Right Joystick

2— Right Joystick/Control Lever Trigger

TX1205592 —UN—16NOV15

CN93077,000070E -19-20MAR18-1/2

### Keyless Start

1. Press ride control switch (1) on sealed switch module (SSM) (left light-emitting diode [LED] illuminated) to turn on ride control.
2. Activate ride control by pressing right joystick/control lever trigger (both LEDs illuminated).
3. Press right joystick/control lever trigger again (left LED illuminated) to deactivate ride control.
4. Press ride control switch on SSM (no LEDs illuminated) to turn off ride control.

1— Ride Control Switch



Sealed Switch Module (SSM)

TX1205838 —UN—18NOV15

CN93077,000070E -19-20MAR18-2/2

## Loading Machine on a Trailer

Understand and follow all local regulations when transporting machine on public roads.

**IMPORTANT: Avoid damage. Never put chains across bucket cylinders. Damage to cylinders may occur.**

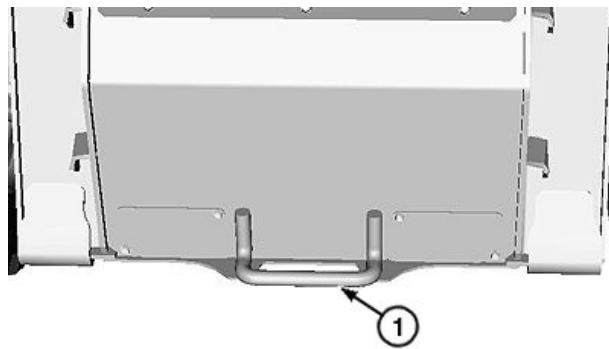
**Do not tow machine or hydrostatic system damage may occur.**

**Use extra caution in wet or muddy conditions.**

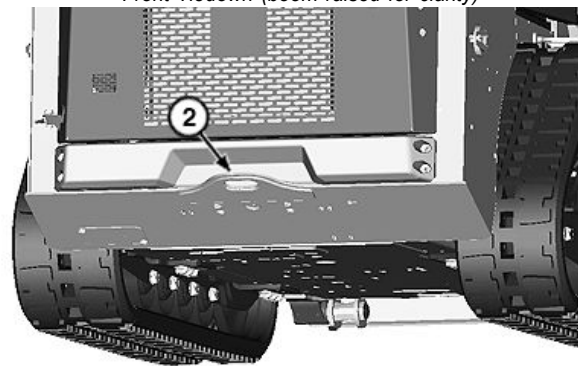
1. Use a heavy-duty trailer to transport machine.
2. Park trailer on level ground.
3. Keep trailer bed clean.
4. Place chock blocks against the trailer wheels.
5. Back machine onto trailer keeping boom and attachment low.
6. Centerline of machine should be over centerline of trailer.
7. Before exiting machine, lower attachment to trailer bed, engage park brake, and shut engine off.
8. Fasten machine securely to trailer with heavy-duty straps, chains, or cables using front, rear, and boom tiedowns (1, 2, and 3). Both front and rear straps must be directed down and outward from machine.
9. Trailer must have signs and lights required by law.

1— Front Tiedown  
2— Rear Tiedown

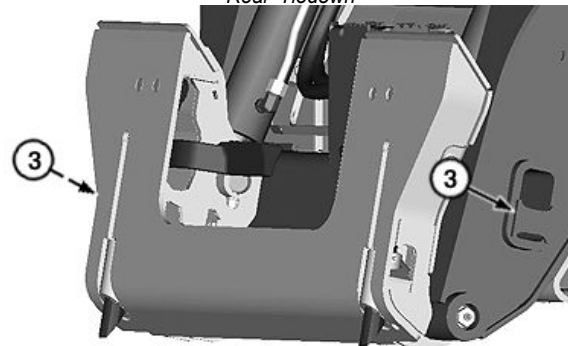
3— Boom Tiedown (2 used)



Front Tiedown (boom raised for clarity)



Rear Tiedown



Boom Tiedowns

TX1205870 —UN—18NOV15

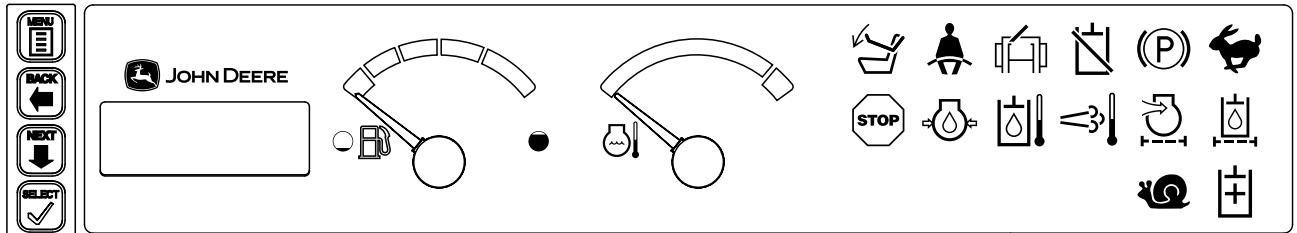
TX1205872 —UN—14DEC15

TX1207778 —UN—14DEC15

CN93077.0000710 -19-14DEC15-1/1

# Operation—Monitor Operation

## Engagement and Monitor Unit (EMU)



### TX1204328

#### Engagement and Monitor Unit (EMU)

##### Wake-Up Mode

Engagement and monitor unit (EMU) wake-up mode occurs when SELECT button is pressed and held when switch power is OFF and seat switch is not activated.

Display unit performs as follows:

1. Backlight remains on.
2. All icons remain off and display window will be cleared.
3. Upper line of display will show battery voltage with lower line showing machine hours.

##### Normal Switch Power On

Display unit performs a display check sequence as follows:

1. Alarm sounds for approximately 2 seconds.
2. Display initially reads TMC by John Deere momentarily before showing the machine model and speeds momentarily.
3. Backlight will turn on.
4. Display monitor goes into bulb check mode. All lights on display monitor will illuminate.
5. All gauges position gauge needle to center position before returning to normal runtime position.
6. If security system has been enabled by owner, operator logon screen will appear on display unit. Operator must enter valid personal identification number (PIN).

CN93077,00006BC -19-26APR17-1/1

TX1204328 —UN—30OCT15

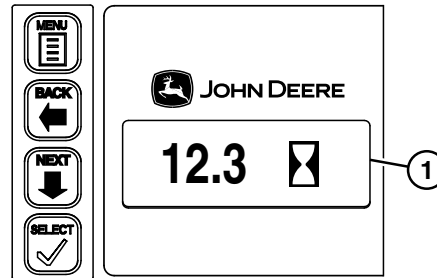
## Main Menu (EMU)

The MAIN MENU displays submenus that can be selected to view diagnostic information or change various operating characteristics of machine or display unit.

*NOTE: Translations shown on display may be abbreviated.*

Press MENU button to access MAIN MENU.

Navigate menu using BACK, NEXT, and SELECT buttons on engagement and monitor unit (EMU).



1— Display Window

Engagement and Monitor Unit (EMU)

TX1144063—UN—16SEP13

MAIN MENU Items	
Menu Items	Description
AUX HYD OVRRD	If equipped, allows operator to exit machine with auxiliary hydraulic functions engaged.
EXHAUST FILTER	Allows operator to view exhaust filter restriction level, enable or disable auto cleaning, and activate parked cleaning.
COURTESY LIGHTING	Allows operator to set amount of time front cab lights and the taillights remain illuminated after machine is turned off.
CODES	Allows operator to view active and stored diagnostic trouble codes (DTCs).
MONITOR	Allows operator to select language and units format for the monitor.
JOB TIMER	Allows operator to record time for a specific job.
AUTO IDLE	Allows operator to enable or disable auto-idle feature.
ANTITHEFT	<i>NOTE: ANTITHEFT menu is initially programmed as inactive (disabled). To program the ANTITHEFT menu as active (enabled), contact an authorized John Deere dealer.</i> If equipped, provides a basic level of machine theft protection.
MANUAL TRACKING	If equipped, allows operator to adjust higher speed tracking so machine will go in straighter path when joystick is not commanding a steer.

CN93077,00006B9 -19-23JUL18-1/1

## Auxiliary Hydraulic Override—If Equipped (EH Only) (EMU)

The AUXILIARY HYDRAULIC OVERRIDE menu (EH machines only) allows operator to exit machine with auxiliary hydraulic functions engaged.

Navigate through menu: **MAIN MENU >> AUX HYD OVRRD.**

- SELECT button enables or disables auxiliary hydraulic function.
- BACK button returns to previous menu.

GS11409,0000378 -19-12NOV18-1/1



### Exhaust Filter (EMU)

EXHAUST FILTER menu displays the current filter soot level and provides options for filter cleaning.

Navigate through menu: **MAIN MENU >> EXHAUST FILTER.**

There are three soot levels that determine the type of filter cleaning required.

- AUTO CLEANING (if enabled) may initiate a filter cleaning automatically when soot levels are LOW or MODERATE.
- PARKED CLEANING can only be initiated when soot levels are LOW or MODERATE.

For more information on the exhaust filter, see Exhaust Filter. (Section 2-2.)

EXHAUST FILTER Menu Items				
Menu Items		Submenu Items	Value	Description
1: SOOT LEVEL			<ul style="list-style-type: none"> <li>• LOW</li> <li>• MODERATE</li> <li>• HIGH</li> </ul>	Describes soot restriction level of exhaust filter which determines type of cleaning required.
2: AUTO CLEANING	>>	1: ENABLE AUTO CLEAN 2: DISABLE AUTO CLEAN		For more information, see Exhaust Filter Auto Cleaning (EMU) in this section.
3: PARKED CLEANING	>>	<ul style="list-style-type: none"> <li>• ENG MUST BE RUN</li> <li>• CLEAN NOT NEEDED</li> <li>• SERVICE REQUIRED</li> </ul>		For more information, see Exhaust Filter Parked Cleaning (EMU) in this section.

CN93077,00006C0 -19-26APR17-1/1

### Exhaust Filter Auto Cleaning (EMU)

**⚠ CAUTION: Servicing machine during exhaust filter auto cleaning can result in serious personal injury. Avoid exposure and skin contact with hot gases and components.**

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

*NOTE: Disabling exhaust filter auto cleaning is not preferred. Whenever possible, auto cleaning should be enabled to keep soot buildup to a minimum and to increase overall machine uptime.*

If enabled, an exhaust filter cleaning is capable of initiating automatically when filter soot levels are LOW or MODERATE.

Auto cleaning is set to ENABLED from the factory. If operating in conditions where elevated exhaust temperatures may be unsafe, auto cleaning can be disabled. See Exhaust Filter (EMU) in this section.

For more information on exhaust filter cleaning, see Exhaust Filter. (Section 2-2.)

#### Set AUTO CLEANING Mode:

1. Navigate through menu: **MAIN MENU >> EXHAUST FILTER >> AUTO CLEANING.**
2. Highlight desired option and press SELECT button to activate.

CN93077,00006C1 -19-10DEC15-1/1

## Exhaust Filter Parked Cleaning (EMU)

**CAUTION:** Servicing machine during exhaust filter parked cleaning can result in serious personal injury. Avoid exposure and skin contact with hot gases and components.

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

**IMPORTANT:** Avoid machine damage. Always park machine in a safe location and check for adequate fuel level before beginning exhaust filter parked cleaning.

PARKED CLEANING allows operator to manually initiate an exhaust filter cleaning. Certain conditions must be met before a parked cleaning will proceed, display monitor will warn operator of these conditions if not met. Once a filter cleaning cycle is started a status bar and percentage complete is displayed.

For more information on exhaust filter cleaning, see Exhaust Filter. (Section 2-2.)

### Initiate PARKED CLEANING:

1. Navigate through menu: **MAIN MENU >> EXHAUST FILTER >> PARKED CLEANING.**

*NOTE: PARKED CLEANING can only be performed when filter soot levels are LOW or MODERATE.*

2. View FILTER SOOT LEVEL in menu to verify filter soot levels are appropriate for filter cleaning.
3. Select PARKED CLEANING from menu.
4. Display monitor prompts operator if machine shutdown is desired after cleaning.
5. The following conditions must be met before exhaust filter cleaning proceeds:
  - Park brake engaged.
  - Engine speed at slow idle.
6. Machine will prepare exhaust filter for cleaning then proceed with cleaning cycle.

If necessary, an in process exhaust filter cleaning may be canceled by releasing park brake, shifting to forward or reverse, or increasing engine speed but is not suggested.

If machine detects any of the following, exhaust filter cleaning will abort:

- LOW FUEL SELECT GO.
  - LOW FUEL BACK STOP.
- SELECT requests parked cleaning.  
BACK cancels parked cleaning.

CN93077,00006C2 -19-10DEC15-1/1

## Courtesy Lighting (EMU)

The COURTESY LIGHTING menu allows operator to set amount of time front cab lights and the taillights remain illuminated when the machine is turned off and the engine is not running.

Navigate through menu: **MAIN MENU >> COURTESY LIGHTING.**

COURTESY LIGHTING Menu Items		
Menu Items	Value	Description
COURTESY LIGHTING	>> <ul style="list-style-type: none"> <li>• OFF</li> <li>• 30 SEC</li> <li>• 45 SEC</li> <li>• 60 SEC</li> <li>• 90 SEC</li> </ul>	Current courtesy lighting delay off time displays. Pressing NEXT scrolls through the list. As the operator scrolls through the list, the monitor sets the delay time when the menu is exited.

Press SELECT or MENU button to return to MAIN MENU.

CN93077,00006C3 -19-20NOV15-1/1

### Codes (EMU)

Navigate through menu: **MAIN MENU >> CODES.**

The CODES menu provides the capability to select and display active and stored diagnostics trouble codes (DTCs) and information about the DTC.

CODES Menu Items			
Menu Items		Submenu Items	Description
ACTIVE CODES	>>	<ul style="list-style-type: none"> <li>Source control unit detecting fault (example: EMU, ECU, VCU)</li> <li>Suspect parameter number (SPN)</li> <li>Failure mode indicator (FMI)</li> <li>Text description of DTC</li> </ul>	Provides the capability to display the latest DTCs that are currently active and stored on the machine. As each active DTC is resolved or fixed, the code is removed from the active code list and added to the stored code list. Each DTC is saved in order it occurred. The listed information is displayed for each code.
STORED CODES			

CN93077,00006C5 -19-04NOV15-1/1

### Monitor (EMU)

Navigate through menu: **MAIN MENU >> MONITOR.**

The MONITOR menu allows operator to choose language and units format for their monitor.

MONITOR Menu Items			
Menu Items		Submenu Items	
UNITS	>>	ENGLISH METRIC	
LANGUAGE		ENGLISH SPANISH FRENCH RUSSIAN PORTUGUESE	

CN93077,00006C6 -19-04NOV15-1/1

### Job Timer (EMU)

Navigate through menu: **MAIN MENU >> JOB TIMER.**

The JOB TIMER menu allows operator to record time for a specific job.

JOB TIMER Menu Items			
Menu Items		Submenu Items	
RESET TIMER	>>	Resets the timer. Timer rolls over to 0.1 after 999.9 operating hours have been reached. Job timer shall continue to run even if the job display is hidden.	

CN93077,00006C7 -19-04NOV15-1/1

### Auto-Idle (EMU)

The AUTO IDLE menu allows operator to enable or disable auto-idle functions.

Navigate through menu: **MAIN MENU >> AUTO IDLE.**

- SELECT button enables or disables auto-idle.
- BACK button returns to previous menu.

CN93077,00006C8 -19-20NOV15-1/1

### Anti-Theft—If Equipped (EMU)

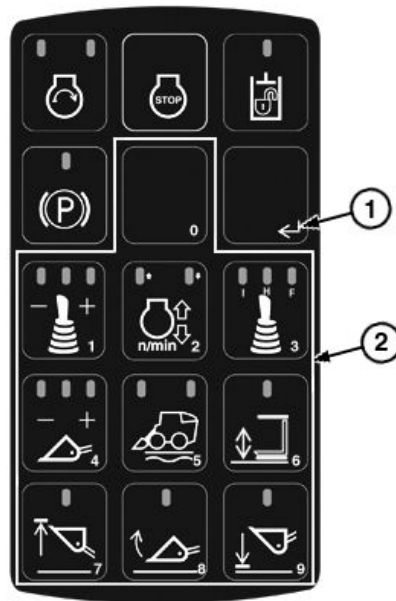
The ANTITHEFT menu allows owner to enable/disable security as well as remove, add, and modify operator PINs and security levels. Owner can also set the time interval allowed for lock mode after the machine is shut off. When enabled, the security feature is designed to impede theft or unauthorized use of the machine by preventing the engine from starting until the operator correctly enters a valid security code.

*NOTE: ANTITHEFT menu is initially programmed as inactive (disabled). To program the ANTITHEFT menu as active (enabled), contact an authorized John Deere dealer.*

Navigate through menu: **MAIN MENU >> ANTITHEFT.**

Enter OWNER PIN using one of the following methods:

- Using numeric keypad (2) on sealed switch module (SSM), then press enter key (1).
- Using engagement and monitor unit (EMU) buttons:
  - a. Press UP or DOWN button to start process of entering PIN.
  - b. Press UP button to increment number shown. If pressed when “9” is shown, display will wrap around to “0”.
  - c. Press DOWN button to decrement number shown. If pressed when “0” is shown, display will wrap around to “9”.
  - d. Press SELECT button to store current digit.



Key Pad

1— Enter Key

2— Numeric Keypad

- e. Continue entering remaining digits of PIN.
- f. When PIN is correctly displayed, press BACK button to enter PIN and activate ANTITHEFT menu.

#### ANTI-THEFT Menu Items

Menu Items		Submenu Items		Submenu Items	Description
CHANGE CODES	>>	<ul style="list-style-type: none"> <li>• OPERATOR 1 CODE</li> <li>• OPERATOR 2 CODE</li> <li>• OPERATOR 3 CODE</li> <li>• OPERATOR 4 CODE</li> <li>• OPERATOR 5 CODE</li> <li>• OWNER CODE</li> <li>• RESET ALL CODES</li> </ul>			Operator codes can be from 3 or 5 numeric characters in length. Leading zeros are recognized. For example, 001 or 002 are each valid and unique operator codes. Operator codes can only be added or deleted by the owner.
LOCK MODE	>>	Enter owner code.	>>	<ul style="list-style-type: none"> <li>• TURN ATS OFF</li> <li>• PROMPT TO LOCK</li> <li>• LOCK IN 5 MIN</li> <li>• LOCK IN 60 MIN</li> </ul>	Allows owner to turn anti-theft system off, set a prompt to lock or auto lock anti-theft, or set anti-theft to lock in 5 min or 60 min.
NUMBER OF DIGITS	>>	Enter owner code.	>>	<ul style="list-style-type: none"> <li>• INVALID OWNER CODE</li> <li>• SELECT TO ENABLE 3-DIGIT CODES</li> <li>• SELECT TO ENABLE 5-DIGIT CODES</li> </ul>	Allows owner to set number of characters for operator codes.

CN93077,00006C9 -19-20JUN18-1/1

TX1204884 —UN—03NOV15

### Manual Tracking—If Equipped (EH Only) (EMU)

The MANUAL TRACKING menu (EH machines only) allows for the fine adjustment of higher speed tracking so the machine travels in a straighter path when the travel function is not commanding a steer.

Using MTA can help compensate for machine variations, such as differences in tire size from side-to-side or uneven tire inflation, beyond what can be done using hydrostatic system calibration.

Stored MTA setting is applied to both forward and reverse travel.

Navigate through menu: **MAIN MENU >> MANUAL TRACKING.**

1. Change MTA setting as needed. Press NEXT button to increment MTA setting to right. Press BACK button to increment the MTA setting to the left.  
  
Possible MTA setting values are 0—100 for both right and left.
2. Press SELECT button to save the MTA setting and return to the normal runtime display.
3. Drive machine to verify manual tracking adjustment. Repeat procedure as necessary. If maximum right or left MTA setting is reached and machine still mistracks, see an authorized John Deere dealer.

MANUAL TRACKING Menu Items		
Menu Items		Description
BACK TO GO LEFT NEXT TO GO RIGHT	>>	Engagement monitor unit (EMU) shall display whatever is broadcast for manual tracking adjustment (MTA) value from the hydraulic control unit (HCU). The HCU will respond to BACK and NEXT buttons of the EMU and update the MTA value accordingly. Each time NEXT or BACK is pressed, the HCU shall increment the MTA by one to the right or left, respectively. Maximum value of 100, right or left. When MTA value is to the right, an arrow pointing right shall be displayed above the MTA value. When MTA value is to the left, an arrow pointing left shall be displayed above the MTA value.

CN93077,00006D6 -19-15JUN16-1/1

### Software Delivery (EMU)

This menu allows for software updates to be downloaded remotely via JDLINK™ cellular connection. Software updates are sent to machine using Service ADVISOR™ Remote (SAR). Downloads can take place with engine running and machine operating. However, software installation can only process if engine is not running. If conditions exist that will not allow the download or installation to happen, screens will appear on the monitor advising what needs to be done in order to continue. For more information, contact an authorized John Deere dealer.

1. Read Service ADVISOR™ Remote (SAR)—Software Terms and Conditions found at the beginning of this manual.

*NOTE: SOFTWARE DELIVERY menu must be enabled by dealer.*

2. Navigate through menu: **MAIN MENU >> SOFTWARE DELIVERY.**
3. Operator is notified of one of the following conditions:
  - Download complete. Ready to install.

*JDLINK is a trademark of Deere & Company  
Service ADVISOR is a trademark of Deere & Company*

- Download completed. Stop engine.
- Downloading.
- Download not available.
- Status unknown. Please check later.

*NOTE: If operator chooses to reject download, dealer interaction is necessary to have rejected software downloaded at another time.*

4. If new software is available, select APPROVE.
5. When download is complete, press SELECT to accept the software license agreement.
6. To proceed with software installation, the following criteria must be met:
  - Engine must be off.
  - Battery power must be at a sufficient level.
  - Park brake must be engaged.
7. Software installation will commence. Do not press stop button during installation.

CN93077,00006D4 -19-23NOV15-1/1

## Auto-Shutdown With Alarm

Machine is equipped with automatic shutdown to prevent machine damage.

- **Engine coolant temperature gauge:**

- Engine coolant temperature gauge will indicate full hot.
- Alarm will sound.
- STOP indicator will flash.
- Engagement and monitor unit (EMU) will shut the engine down after 5 seconds when engine coolant temperature is too high.

Engine can be restarted and will run for 30 seconds before it will shutdown again.

- **Oil pressure indicator:**

- Oil pressure indicator will light.
- Alarm will sound.

- STOP indicator will flash.
- EMU will shut the engine down after 5 seconds when engine oil pressure is too low.

Engine can be started and will run for 30 seconds before it will shutdown again.

- **Hydraulic oil temperature indicator:**

- Hydraulic oil temperature indicator will light.
- Alarm will sound.
- STOP indicator will flash.

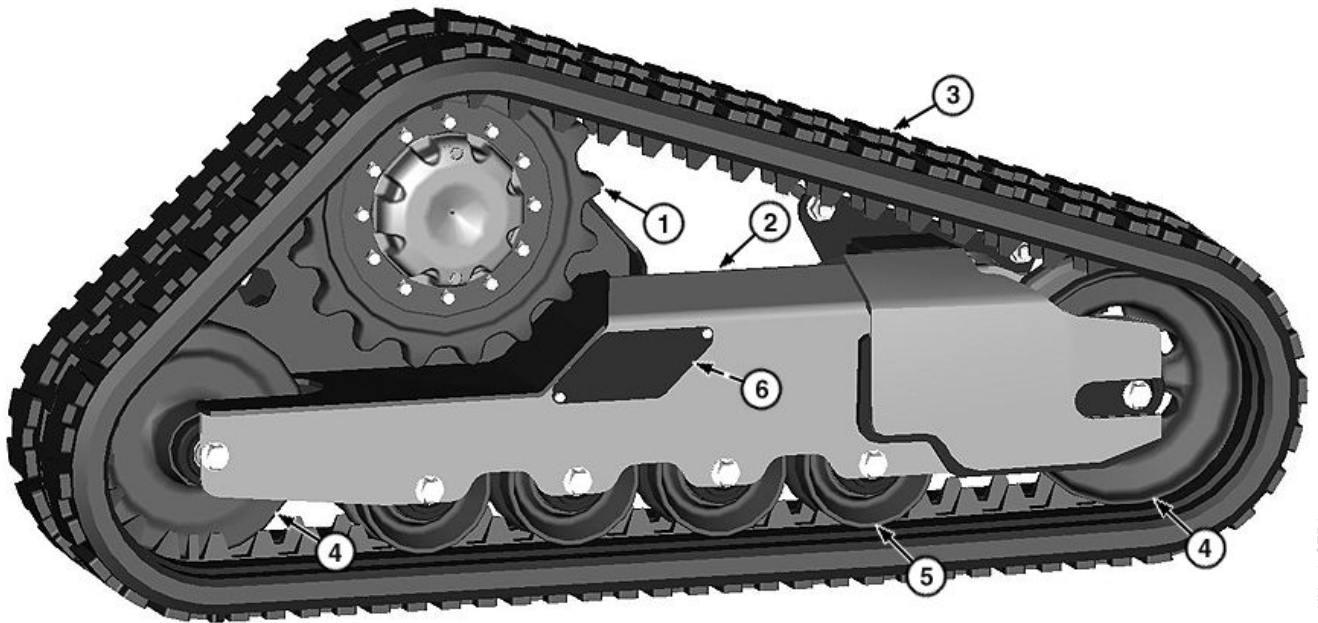
- EMU will shut the engine down after 5 minutes when hydraulic oil temperature is too high.

Engine can be started and will run for 30 seconds before it will shutdown again.

CN93077,00006D5 -19-13JUN16-1/1

# Operation—Track Information

## Undercarriage Component Identification



*Undercarriage (right side shown)*

1— Drive Sprocket  
2— Undercarriage Frame

3— Track  
4— Idler (2 per side)  
5— Roller (4 per side)

6— Track Adjuster Grease Fitting

Proper machine setup and operation are important to extend the life of the track system components. By following the recommendations in this section, the

operator can reduce unplanned downtime, maximize operator efficiency, and minimize operating costs.

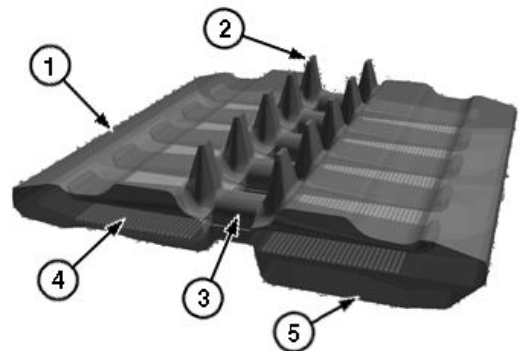
CN93077,0000666 -19-14SEP15-1/1

TX1201460 —UN—14SEP15

## Rubber Track Structure

1— Rubber Casing  
2— Guide Lug  
3— Embedded Metal Insert

4— Steel Cord  
5— Tread Lug



*Rubber Track Structure*

OUT4001,000049A -19-22SEP09-1/1

TX1021372 —UN—03MAY07

## Rubber Track Usage

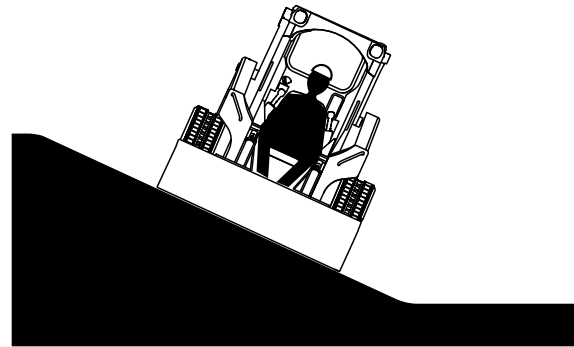
Damage to rubber tracks caused from operating the machine in unsuitable environments (such as rocky terrain, asphalt, concrete, metal debris, etc.) may cause premature wear of the rubber tracks and is not covered under warranty. The more care an operator takes when using rubber-tracked equipment, the longer the track will perform as expected.

### AVOID:

1. Constant operation across a slope or side hill. Excessive operation across a slope or side hill will cause accelerated, uneven wear of undercarriage components. Unless the job requires otherwise, climb slopes straight up and down.
2. Making spin turns or pivot turns. Spin and pivot turns will cause accelerated wear and increase the potential for de-tracking. Operators should be trained to make wider, less aggressive turns especially on hard surfaces.
3. Traveling with one track on a slope, and the other on a flat surface. Travel with both tracks on level surfaces when possible.
4. Running over curbs or along curbs and other structures allowing tracks to rub against the structure.
5. Traveling or operating rubber track units on broken stone, jagged base stone, iron rods, scrap iron, or other recycling-type materials.
6. Continuous transporting and aggressive turning on hard surfaces such as asphalt and concrete.
7. Operating in corrosive materials (fuel, oil, salt, fertilizer, etc.). Clean the tracks and undercarriage with clear water if any substances get on the tracks.

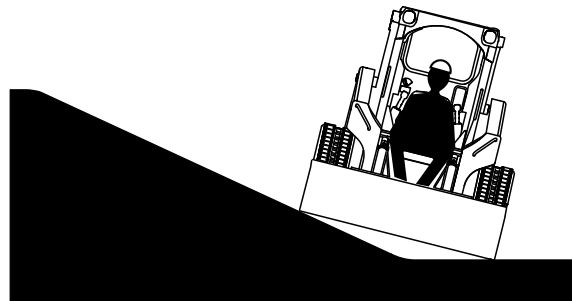
### DO:

1. Monitor track sag on a weekly basis or as needed. Certain soil conditions may require additional adjustments. Loose tracks can wander and de-track; however, be careful not to overtighten. Overtightening may cause power loss and excessive wear of undercarriage components. See Check Track Tension. (Section 3-5.)
2. Clean out the undercarriage, especially at the end of the work day in cold temperatures to prevent material from freezing and putting excessive loads on the operating systems.
3. Minimize the spinning of tracks when possible.



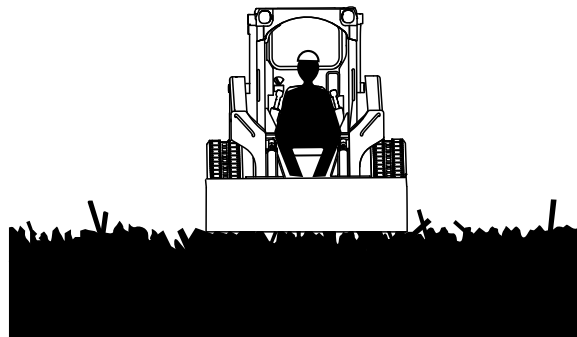
Constant Operation Across a Slope

TX1064891 —UN—02OCT09



One Track on Slope

TX1064892 —UN—02OCT09



Jagged Surface

TX1064893 —UN—02OCT09

4. Alternate turning direction. Continuous turning in the same direction can create an accelerated wear pattern on undercarriage components.

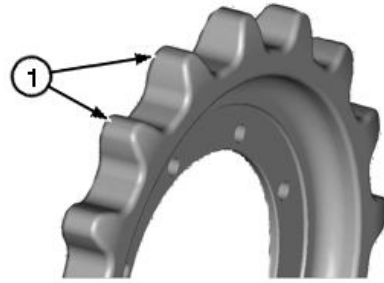
CN93077,0000662 -19-08OCT15-1/1



### Sprocket Teeth Wear

Under sandy conditions, teeth can wear faster. The embedded metal inserts will wear a pocket into the sprocket. Check for wear on the top of sprocket teeth (1).

1— Top of Sprocket Teeth



*Sprocket Teeth Wear*



*Sprocket Tooth Profile Wear*

OUT4001,00004A0 -19-06DEC12-1/1

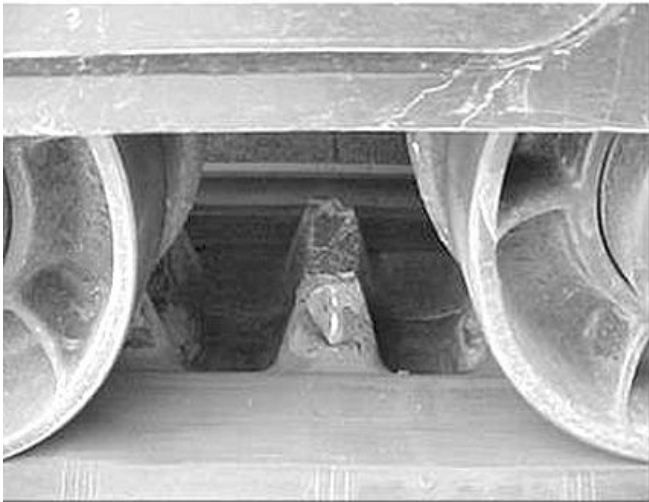
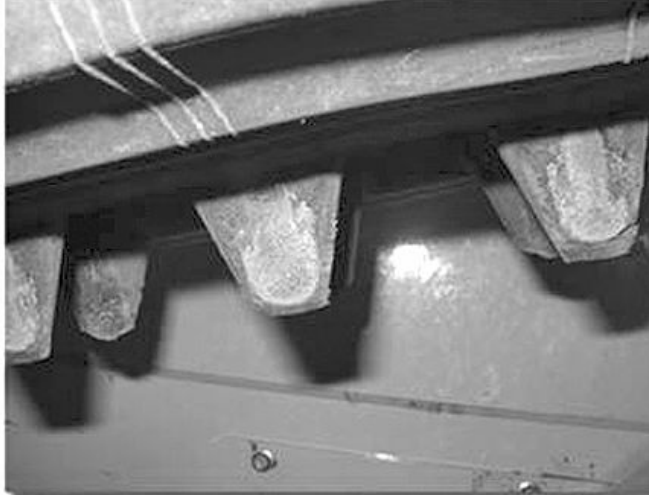
TX1021373 —UN—01MAY07

TX1021390A —UN—30MAR07

### Normal Break-In

In these examples of normal wear, the rubber has been removed by friction to expose the metal on the guide lugs.

The guide lugs have a very light coating of rubber over them that will wear off quickly.



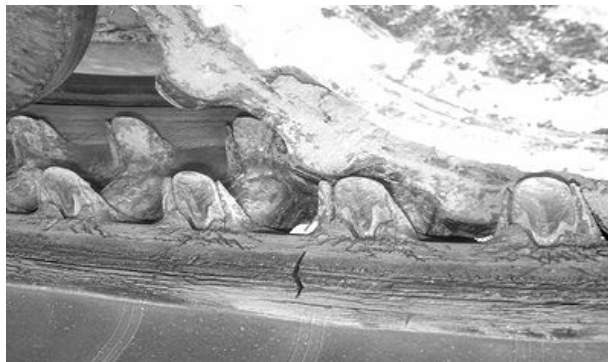
Examples of Normal Break-In

TX1021391A —UN—30MAR07

OUT4001,000049E -19-21SEP09-1/1

### Normal Track Wear in Dirt Conditions

In dirt conditions, tracks will show wear lines (small cracks) but will not have rubber chunks being removed.



Normal Track Wear in Dirt Conditions

TX1021570A —UN—04APR07

OUT4001,00004A2 -19-22OCT12-1/1

## Rubber Track—Types of Damage

### Cut on Tread Lug Side Rubber

Cut on tread lug side rubber often occurs as one of the most typical malfunctions. A cut on the tread lug side is most likely caused by counter rotating on hard, sharp material or by driving over a hard sharp object.

When a cut on the lug side rubber reaches the embedded steel cord, cords can rapidly corrode due to foreign material entry and can cause premature malfunction of the track.



*Counter Rotating Damage*



*Driving Over Sharp Object*

OUT4001,00004A1 -19-08OCT15-1/7

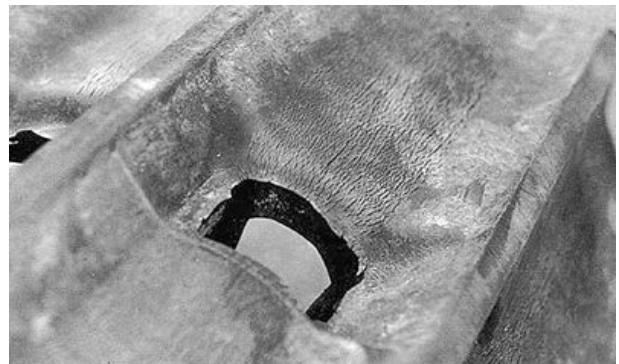
TX1021393A —UN—30MAR07

TX1021394A —UN—30MAR07

### Crack on Tread Lug Side Rubber—Fatigue

Small cracks occur as a result of operation fatigue or long-term environmental damage such as sun or chemicals.

When the cracks reach so deep that they expose the steel cords, premature malfunction can occur.



*Fatigue*

Continued on next page

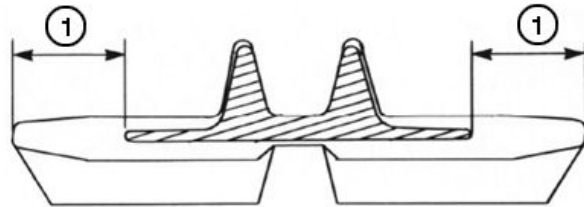
OUT4001,00004A1 -19-08OCT15-2/7

TX1021403A —UN—30MAR07

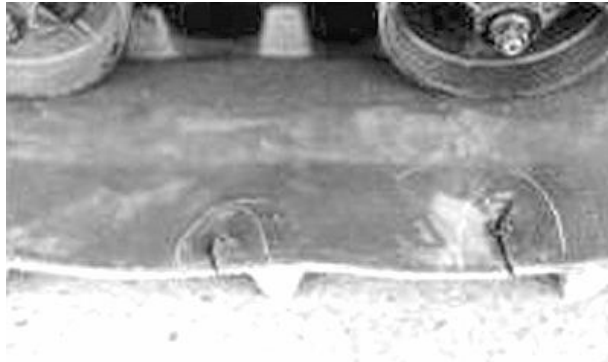
### Cuts on the Edges of the Track Roller Side Rubber

Edge (1) cuts indicate normal wear, which can be caused by hitting rocks, sticks, or other sharp objects. This type of damage does not usually occur on soft ground or small gravel. As long as the cut does not enter the cords or metal, no action is necessary.

1— Edge



Edge of Track Roller



Cuts on the Edges of the Track Roller Side Rubber

OUT4001,00004A1 -19-08OCT15-3/7

TX1021375 —UN—01MAY07

TX1021407A —UN—30MAR07

### Tread Lug Abrasion

Lug abrasion is normal and the track can be replaced when the lug height becomes less than 5 mm (0.2 in). Running machine on hard surfaces such as pavement can decrease track life significantly. Owner can run the track until smooth if necessary.



Tread Lug Abrasion

Continued on next page

OUT4001,00004A1 -19-08OCT15-4/7

TX1021408A —UN—30MAR07

### Deterioration of the Track Roller Side Rubber Surface

In normal applications with gravel, the rubber surface wears down until the metal is exposed. Replacing the rubber track is recommended when more than half of the embedded metals are exposed.

In normal soil conditions, the inside rubber wears but will not come out in chunks. The ride becomes rough as the rubber wears down.

When running machine in rocky conditions, cuts in the rubber can cause the rubber to come out in chunks. The embedded metal becomes exposed.



Track Roller



Results of Running in Heavy Rock Condition

OUT4001,00004A1 -19-08OCT15-5/7

TX1021415A —UN—30MAR07

TX1021563A —UN—04APR07

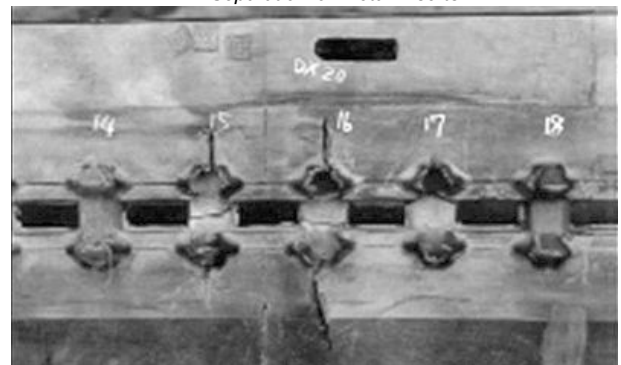
### Separation of Metal Inserts—External Forces and Corrosion

Metal inserts should not separate from the track unless there is abuse of the track or machine is operated in a corrosive environment. The metal insert separates at the end of the track's life span. Replacing the complete track is suggested when even partial separation or corrosion occurs.

Foreign material entering the track system, such as reinforcing rod from concrete or sharp rock, can cause this type of damage.



Separation of Metal Inserts



Separation of Metal Inserts

Continued on next page

OUT4001,00004A1 -19-08OCT15-6/7

TX1021566A —UN—04APR07

TX1021567A —UN—04APR07

### Cut Steel Cord

If embedded steel cords are cut off, replacement is required. Heavy damage may be the result of a sharp edge and possibly counter rotating on the sharp edge.



*Cut Steel Cord*

TX1021568A —JUN—04APR07

OUT4001,00004A1 -19-08OCT15-77

# Maintenance—Machine

## Required Emission-Related Information

### Service Provider

A qualified repair shop or person of the owner's choosing may maintain, replace, or repair emission control devices and systems with original or equivalent replacement parts. However, warranty, recall, and all other services paid for by John Deere must be performed at an authorized John Deere service center.

DX,EMISSIONS,REQINFO -19-12JUN15-1/1

## Diesel Fuel

Consult a local fuel distributor for properties of the diesel fuel available in the area.

In general, diesel fuels are blended to satisfy the low temperature requirements of the geographical area in which they are marketed.

Diesel fuels specified to EN 590 or ASTM D975 are recommended. Renewable diesel fuel produced by hydrotreating animal fats and vegetable oils is basically identical to petroleum diesel fuel. Renewable diesel fuel that meets EN 590 or ASTM D975 is acceptable for use at all percentage mixture levels.

### Required Fuel Properties

In all cases, the fuel shall meet the following properties:

**Cetane number of 43 minimum.** Cetane number greater than 47 is preferred, especially for temperatures below -20°C (-4°F) or elevations above 1500 m (5000 ft).

**Cold filter plugging point (CFPP)** should be at least 5°C (9°F) below the expected lowest temperature or **Cloud Point** below the expected lowest ambient temperature.

**Fuel lubricity** should pass a maximum scar diameter of 0.52 mm as measured by ASTM D6079 or ISO 12156-1. A maximum scar diameter of 0.45 mm is preferred.

**Diesel fuel quality and sulfur content** must comply with all existing emissions regulations for the area in which the engine operates. DO NOT use diesel fuel with sulfur content greater than 10 000 mg/kg (10 000 ppm).

### Sulfur Content for Engines That Meet Interim Tier 4, Final Tier 4, Stage III B, and Stage IV Engines

- Use ONLY ultra low sulfur diesel (ULSD) fuel with a maximum of 15 mg/kg (15 ppm) sulfur content.

### Sulfur Content for Engines That Meet Tier 3 and Stage III A Engines

- Use of diesel fuel with sulfur content less than 2000 mg/kg (2000 ppm) is RECOMMENDED.
- Use of diesel fuel with sulfur content 2000—5000 mg/kg (2000—5000 ppm) REDUCES the oil and filter change interval.
- BEFORE using diesel fuel with sulfur content greater than 5000 mg/kg (5000 ppm), contact an authorized John Deere dealer.

### Sulfur Content for Engines That Meet Tier 2 and Stage II Engines

- Use of diesel fuel with sulfur content less than 2000 mg/kg (2000 ppm) is RECOMMENDED.
- Use of diesel fuel with sulfur content 2000—5000 mg/kg (2000—5000 ppm) REDUCES the oil and filter change interval.
- BEFORE using diesel fuel with sulfur content greater than 5000 mg/kg (5000 ppm), contact an authorized John Deere dealer.

### Sulfur Content for Other Engines

- Use of diesel fuel with sulfur content less than 5000 mg/kg (5000 ppm) is RECOMMENDED.
- Use of diesel fuel with sulfur content greater than 5000 mg/kg (5000 ppm) REDUCES the oil and filter change interval.

**IMPORTANT: Do not mix used diesel engine oil or any other type of lubricating oil with diesel fuel.**

**Improper fuel additive usage may cause damage on fuel injection equipment of diesel engines.**

MB60223,0000029 -19-05JUL16-1/1

## Diesel Fuel Specifications

The engine in this machine is designed to operate only with ultra low sulfur diesel (ULSD) fuel. Use of fuel other than ULSD will reduce the efficiency and durability of the engine, will harm and permanently damage the

engine's advanced emissions control systems, reduce fuel economy, and possibly prevent the engine from running at all. Emission-related warranties are likely to be rendered void by the use of fuel that does not meet these specifications.

OUT4001,000060A -19-10JAN12-1/1

## Lubricity of Diesel Fuel

Most diesel fuels manufactured in the United States, Canada, and the European Union have adequate lubricity to ensure proper operation and durability of fuel injection system components. However, diesel fuels manufactured in some areas of the world may lack the necessary lubricity.

**IMPORTANT: Make sure the diesel fuel used in your machine demonstrates good lubricity characteristics.**

Fuel lubricity should pass a maximum scar diameter of 0.52 mm as measured by ASTM D6079 or ISO 12156-1. A maximum scar diameter of 0.45 mm is preferred.

If fuel of low or unknown lubricity is used, add John Deere Fuel-Protect Diesel Fuel Conditioner (or equivalent) at the specified concentration.

### Lubricity of BioDiesel Fuel

Fuel lubricity can improve significantly with BioDiesel blends up to B20 (20% BioDiesel). Further increase in lubricity is limited for BioDiesel blends greater than B20.

DX,FUEL5 -19-07FEB14-1/1

## Handling and Storing Diesel Fuel

**⚠ CAUTION: Reduce the risk of fire. Handle fuel carefully. DO NOT fill the fuel tank when engine is running. DO NOT smoke while you fill the fuel tank or service the fuel system.**

Fill the fuel tank at the end of each day's operation to prevent water condensation and freezing during cold weather.

Keep all storage tanks as full as practical to minimize condensation.

Ensure that all fuel tank caps and covers are installed properly to prevent moisture from entering. Monitor water content of the fuel regularly.

When using biodiesel fuel, the fuel filter may require more frequent replacement due to premature plugging.

Check engine oil level daily prior to starting engine. A rising oil level may indicate fuel dilution of the engine oil.

**IMPORTANT: The fuel tank is vented through the filler cap. If a new filler cap is required, always replace it with an original vented cap.**

When fuel is stored for an extended period or if there is a slow turnover of fuel, add a fuel conditioner to stabilize the fuel. Keeping the free water drained and treating the bulk fuel storage tank quarterly with a maintenance dose of a biocide will prevent microbial growth. Contact your fuel supplier or John Deere dealer for recommendations.

DX,FUEL4 -19-13JAN18-1/1



## Biodiesel Fuel

Biodiesel fuel is comprised of monoalkyl esters of long chain fatty acids derived from vegetable oils or animal fats. Biodiesel blends are biodiesel mixed with petroleum diesel fuel on a volume basis.

Before using fuel containing biodiesel, review the Biodiesel Use Requirements and Recommendations in this Operator's Manual.

Environmental laws and regulations can encourage or prohibit the use of biofuels. Operators should consult with appropriate governmental authorities prior to using biofuels.

### John Deere Stage V Engines Operating in the European Union

Where the engine is to be operated within the Union on diesel or non-road gas-oil, a fuel with a FAME content not greater than 8% volume/volume (B8) shall be used.

### John Deere Engines with Exhaust Filter Except Stage V Engines Operating in the European Union

Biodiesel blends up to B20 can be used ONLY if the biodiesel (100% biodiesel or B100) meets ASTM D6751, EN 14214, or equivalent specification. Expect a 2% reduction in power and a 3% reduction in fuel economy when using B20.

Biodiesel concentrations above B20 can harm the engine's emission control systems and should not be used. Risks include, but are not limited to, more frequent stationary regeneration, soot accumulation, and increased intervals for ash removal.

John Deere Fuel conditioners or equivalent, which contain detergent and dispersant additives, are required when using biodiesel blends from B10 to B20, and are recommended when using lower biodiesel blends.

### John Deere Engines Without Exhaust Filter

Biodiesel blends up to B20 can be used ONLY if the biodiesel (100% biodiesel or B100) meets ASTM D6751, EN 14214, or equivalent specification. Expect a 2% reduction in power and a 3% reduction in fuel economy when using B20.

These John Deere engines can operate on biodiesel blends above B20 (up to 100% biodiesel). Operate at levels above B20 ONLY if the biodiesel is permitted by law and meets the EN 14214 specification (primarily available in Europe). Engines operating on biodiesel blends above B20 might not fully comply with or be permitted by all applicable emissions regulations. Expect up to a 12% reduction in power and an 18% reduction in fuel economy when using 100% biodiesel.

John Deere fuel conditioners or equivalent, which contain detergent and dispersant additives, are required when using biodiesel blends from B10 to B100, and are recommended when using lower biodiesel blends.

## Biodiesel Use Requirements and Recommendations

The petroleum diesel portion of all biodiesel blends must meet the requirements of ASTM D975 (US) or EN 590 (EU) commercial standard.

Biodiesel users in the U.S. are strongly encouraged to purchase biodiesel blends from a BQ-9000 Certified Marketer and sourced from a BQ-9000 Accredited Producer (as certified by the National Biodiesel Board). Certified Marketers and Accredited Producers can be found at the following website: <http://www.bq9000.org>.

Biodiesel contains residual ash. Ash levels exceeding the maximums allowed in either ASTM D6751 or EN14214 can result in more rapid ash loading and require more frequent cleaning of the Exhaust Filter (if present).

The fuel filter can require more frequent replacement when using biodiesel fuel, particularly if switching from diesel. Check engine oil level daily prior to starting engine. A rising oil level can indicate fuel dilution of the engine oil. Biodiesel blends up to B20 must be used within 90 days of the date of biodiesel manufacture. Biodiesel blends above B20 must be used within 45 days from the date of biodiesel manufacture.

When using biodiesel blends up to B20, the following must be considered:

- Cold-weather flow degradation
- Stability and storage issues (moisture absorption, microbial growth)
- Possible filter restriction and plugging (usually a problem when first switching to biodiesel on used engines)
- Possible fuel leakage through seals and hoses (primarily an issue with older engines)
- Possible reduction of service life of engine components

Request a certificate of analysis from your fuel distributor to ensure that the fuel is compliant with the specifications provided in this Operator's Manual.

Consult your John Deere dealer for John Deere fuel products to improve storage and performance with biodiesel fuels.

The following must also be considered if using biodiesel blends above B20:

- Possible coking or blocked injector nozzles, resulting in power loss and engine misfire if John Deere fuel additives and conditioners or equivalent containing detergent/dispersants are not used
- Possible crankcase oil dilution (requiring more frequent oil changes)
- Possible lacquering or seizure of internal components
- Possible formation of sludge and sediments
- Possible thermal oxidation of fuel at elevated temperatures

- Possible compatibility issues with other materials (including copper, lead, zinc, tin, brass, and bronze) used in fuel handling, distribution, and storage equipment
- Possible reduction in water separator efficiency
- Possible damage to paint if exposed to biodiesel
- Possible corrosion of fuel injection equipment
- Possible elastomeric seal and gasket material degradation (primarily an issue with older engines)
- Possible high acid levels within fuel system

- Because biodiesel blends above B20 contain more ash, using blends above B20 can result in more rapid ash loading and require more frequent cleaning of the Exhaust Filter (if present)

**IMPORTANT: Raw pressed vegetable oils are NOT acceptable for use as fuel in any concentration in John Deere engines. Their use could cause engine failure.**

DX,FUEL7 -19-13JAN18-2/2

## Supplemental Diesel Fuel Additives

Diesel fuel can be the source of performance or other operational problems for many reasons. Some causes include poor lubricity, contaminants, low cetane number, and a variety of properties that cause fuel system deposits. These and others are referenced in other sections of this Operator's Manual.

To optimize engine performance and reliability, closely follow recommendations on fuel quality, storage, and handling, which are found elsewhere in this Operator's Manual.

To further aid in maintaining performance and reliability of the engine's fuel system, John Deere has developed a family of fuel additive products for most global markets. The primary products include Fuel-Protect Diesel Fuel Conditioner (full feature conditioner in winter and summer formulas) and Fuel-Protect Keep Clean (fuel injector deposit removal and prevention). Availability of these and other products varies by market. See your local John Deere dealer for availability and additional information about fuel additives that might be right for your needs.

DX,FUEL13 -19-07FEB14-1/1

## Testing Diesel Fuel

A fuel analysis program can help to monitor the quality of diesel fuel. The fuel analysis can provide critical data such as calculated cetane index, fuel type, sulfur content, water content, appearance, suitability for cold weather

operations, bacteria, cloud point, acid number, particulate contamination, and whether the fuel meets ASTM D975 or equivalent specification.

Contact your John Deere dealer for more information on diesel fuel analysis.

DX,FUEL6 -19-13JAN18-1/1

## Fuel Filters

The importance of fuel filtration cannot be overemphasized with modern fuel systems. The combination of increasingly restrictive emission regulations and more efficient engines requires fuel system to operate at much higher pressures. Higher pressures can only be achieved using fuel injection components with very close tolerances. These close

manufacturing tolerances have significantly reduced capacities for debris and water.

John Deere brand fuel filters have been designed and produced specifically for John Deere engines.

To protect the engine from debris and water, always change engine fuel filters as specified in this manual.

DX,FILT2 -19-14APR11-1/1

## Minimizing the Effect of Cold Weather on Diesel Engines

The engine in this machine is designed to operate effectively in cold weather.

However, for effective starting and cold-weather operation, a little extra care is necessary. The following information outlines steps that can minimize the effect that cold weather may have on starting and operation of an engine. See an authorized John Deere dealer for additional information and local availability of cold-weather aids.

### Use Winter Grade Fuel

When temperatures fall below 0°C (32°F), winter grade fuel (No. 1-D in North America) is best suited for cold-weather operation. Winter grade fuel has a lower cloud point and a lower pour point.

**Cloud point** is the temperature at which wax begins to form in the fuel. This wax causes fuel filters to plug. **Pour point** is the lowest temperature at which movement of the fuel is observed.

*NOTE: On average, winter grade diesel fuel has a lower Btu (heat content) rating. Using winter grade fuel may reduce power and fuel efficiency, but should not cause any other engine performance effects. Check the grade of fuel being used before troubleshooting for low-power complaints in cold-weather operation.*

**⚠ CAUTION: Ether is highly flammable. Do not use ether when starting an engine equipped with glow plugs.**

### Coolant Heater

An engine block heater (coolant heater) is an available option to aid cold-weather starting.

### Seasonal Viscosity Oil and Proper Coolant Concentration

Use seasonal grade viscosity engine oil based on the expected air temperature range between oil changes and a proper concentration of low silicate antifreeze as

recommended. (See DIESEL ENGINE OIL and ENGINE COOLANT requirements in this section.)

### Diesel Fuel Flow Additive

Use John Deere fuel-protect diesel fuel conditioner (winter formula), which contains anti-gel chemistry, or equivalent fuel conditioner to treat non-winter grade fuel (No. 2-D in North America) during the cold-weather season. This generally extends operability to about 10°C (18°F) below the fuel cloud point. For operability at even lower temperatures, use winter grade fuel.

**IMPORTANT: Treat fuel when outside temperature drops below 0°C (32°F). For best results, use with untreated fuel. Follow all recommended instructions on label.**

### BioDiesel

When operating with biodiesel blends, wax formation can occur at warmer temperatures. Use John Deere fuel-protect diesel fuel conditioner (winter formula), at 5°C (41°F) to treat biodiesel fuels during the cold-weather season. Use B7 or lower blends at temperatures below 0°C (32°F). Use only winter grade petroleum diesel fuel at temperatures below -10°C (14°F).

### Winterfronts

Use of fabric, cardboard, or solid winterfronts is not recommended with this engine. Their use can result in excessive engine coolant, oil, and charge air temperatures. This can lead to reduced engine life, loss of power, and poor fuel economy. Winterfronts may also put abnormal stress on fan and fan drive components potentially causing premature failures.

If winterfronts are used, they should never totally close off the grill frontal area. Approximately 25% area in the center of the grill should remain open at all times. At no time should the air blockage device be applied directly to the radiator core.

CN93077,00006AF -19-22MAR16-1/1

## Operating in Cold Temperature Climates

See Engine Block Heater—If Equipped. (Section 2-2.)

See Cold Weather Starting. (Section 2-2.)

The following oils are recommended for optimum starting performance:

### Diesel Engine Oil

- John Deere Plus-50™ II

### Hydraulic and Hydrostatic Oil

- John Deere Hydrau™XR

*Plus-50 is a trademark of Deere & Company*

*Hydrau is a trademark of Deere & Company*

CN93077,000065D -19-10SEP15-1/1

## Diesel Engine Oil — Interim Tier 4, Final Tier 4, Stage IIIB, Stage IV, and Stage V

Failure to follow applicable oil standards and drain intervals can result in severe engine damage that might not be covered under warranty. Warranties, including the emissions warranty, are not conditioned on the use of John Deere oils, parts, or service.

Use oil viscosity based on the expected air temperature range during the period between oil changes.

### John Deere Plus-50™ II is the recommended engine oil.

Extended service intervals may apply when John Deere Plus-50™ II engine oil is used. Refer to the engine oil drain interval table and consult your John Deere dealer for more information.

If John Deere Plus-50™ II engine oil is not available, engine oil meeting one or more of the following may be used:

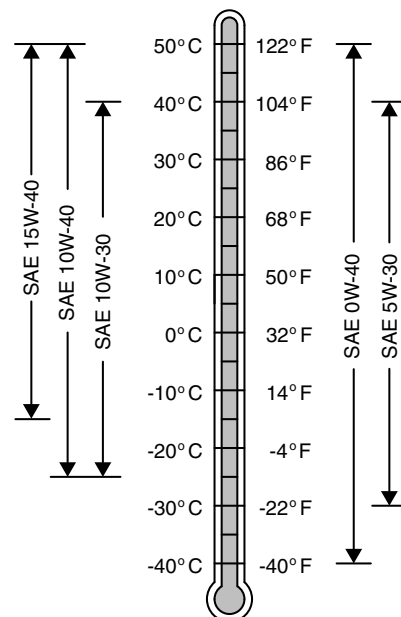
- API Service Category CK-4
- API Service Category CJ-4
- ACEA Oil Sequence E9
- ACEA Oil Sequence E6

DO NOT use engine oil containing more than 1.0% sulfated ash, 0.12% phosphorus, or 0.4% sulfur.

### Multi-viscosity diesel engine oils are preferred.

Diesel fuel quality and fuel sulfur content must comply with all existing emissions regulations for the area in which the engine operates.

*Plus-50 is a trademark of Deere & Company*



Oil Viscosities for Air Temperature Ranges

**IMPORTANT: Use only ultra low sulfur diesel (ULSD) fuel with a maximum sulfur content of 15 mg/kg (15 ppm).**

TS1691 —UN—18JUL07

DX,ENOIL14 -19-14JAN18-1/1

## Engine Oil and Filter Service Intervals — Interim Tier 4, Final Tier 4, Stage IIIB, Stage IV, and Stage V Engines

Failure to follow applicable oil standards and drain intervals can result in severe engine damage that might not be covered under warranty. Warranties, including the emissions warranty, are not conditioned on the use of John Deere oils, parts, or service.

Recommended oil and filter service intervals are based on a combination of oil pan capacity, type of engine oil and filter used, and sulfur content of the diesel fuel. Actual service intervals also depend on operation and maintenance practices.

### Approved Oil Types:

- John Deere Plus-50™ II
- "Other Oils" include API CK-4, API CJ-4, ACEA E9, and ACEA E6

Use oil analysis to evaluate the condition of the oil and to aid in selection of the proper oil and filter service interval. Contact your John Deere dealer or other qualified service provider for more information on engine oil analysis.

Change the oil and oil filter at least once every 12 months even if the hours of operation are fewer than the otherwise recommended service interval.

**Diesel fuel sulfur content** affects engine oil and filter service intervals. Higher fuel sulfur levels reduce oil and filter service intervals.

Use of diesel fuel with sulfur content less than 15 mg/kg (15 ppm) is **REQUIRED**.

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**Engine operation at high altitude** decreases oil change intervals. See Diesel Engine Oil Service Interval for Operation at High Altitude for additional information.

**NOTE:** The 500 hour extended oil and filter change interval is only allowed if all of the following conditions are met:

- Use of diesel fuel with sulfur content less than 15 mg/kg (15 ppm)
- Use of John Deere Plus-50™ II oil
- Use of an approved John Deere oil filter

Engine Oil and Filter Service Intervals	
John Deere Plus-50™ II	500 hours
Other Oils	250 hours
Oil analysis may extend the service interval of "Other Oils" to a maximum not to exceed the interval of Plus-50™ II oils. Oil analysis means taking a series of oil samples at 50-hour increments beyond the normal service interval until either the data indicates the end of useful oil life or the maximum service interval of John Deere Plus-50 II oils is reached.	

### IMPORTANT: To avoid engine damage:

- **Reduce oil and filter service intervals by 50% when using biodiesel blends greater than B20. Oil analysis may allow longer service intervals.**
- **Use only approved oil types.**

DX,ENOIL15,IT4,120toMAX -19-13JAN18-1/1

## Oil Filters

Filtration of oils is critically important for proper operation and lubrication. John Deere brand oil filters have been designed and produced specifically for John Deere applications.

John Deere filters adhere to engineering specifications for quality of the filter media, filter efficiency rating, strength

of the bond between the filter media and the element end cap, fatigue life of the canister (if applicable), and pressure capability of the filter seal. Non-John Deere branded oil filters might not meet these key John Deere specifications.

Always change oil filters regularly as specified in this manual.

DX,FILT1 -19-11APR11-1/1

## Diesel Engine Coolant (engine without wet sleeve cylinder liners)

### Preferred Coolants

Failure to follow applicable coolant standards and drain intervals can result in severe engine damage that may not be covered under warranty. Warranties including the emissions warranty are not conditioned on the use of John Deere coolants, parts, or service.

The following pre-mix engine coolants are preferred:

- John Deere COOL-GARD™ II
- John Deere COOL-GARD II PG

COOL-GARD II pre-mix coolant is available in several concentrations with different freeze protection limits as shown in the following table.

COOL-GARD II pre-mix	Freeze Protection Limit
COOL-GARD II Water-Base	0°C (32°F)
COOL-GARD II 20/80	-9°C (16°F)
COOL-GARD II 30/70	-16°C (3°F)
COOL-GARD II 50/50	-37°C (-34°F)
COOL-GARD II 55/45	-45°C (-49°F)
COOL-GARD II PG 60/40	-49°C (-56°F)
COOL-GARD II 60/40	-52°C (-62°F)

Not all COOL-GARD II pre-mix products are available in all countries.

Use COOL-GARD II PG when a non-toxic coolant formulation is required.

### Additional Recommended Coolants

The following engine coolant is also recommended:

- John Deere COOL-GARD II Concentrate in a 40—60% mixture of concentrate with quality water.

**IMPORTANT: When mixing coolant concentrate with water, do not use less than 40% or greater than 60% concentration of coolant. Less than 40% gives inadequate additives for corrosion protection. Greater than 60% can result in coolant gelation and cooling system problems.**

### Other Coolants

Other ethylene glycol or propylene glycol base coolants may be used if they meet one of the following specifications:

COOL-GARD is a trademark of Deere & Company

<sup>1</sup>Coolant analysis may extend the service interval of other "Coolants" to a maximum not to exceed the interval of Cool-Gard II coolants. Coolant analysis means taking a series of coolant samples at 1000-hour increments beyond the normal service interval until either the data indicate the end of useful coolant life or the maximum service interval of Cool-Gard coolants is reached.

- Pre-mix coolant meeting ASTM D6210 requirements
- Are nitrite-free
- Coolant concentrate meeting ASTM D6210 requirements in a 40—60% mixture of concentrate with quality water
- Pre-mix coolant meeting ASTM D3306 requirements
- Coolant concentrate meeting ASTM D3306 requirements in a 40—60% mixture of concentrate with quality water

If coolant meeting one of these specifications is unavailable, use a coolant concentrate or pre-mix coolant that has a minimum of the following chemical and physical properties:

- Is formulated with a nitrite-free additive package
- Protects the cooling system metals (cast iron, aluminum alloys, and copper alloys such as brass) from corrosion

### Water Quality

Water quality is important to the performance of the cooling system. Deionized or demineralized water is recommended for mixing with ethylene glycol and propylene glycol base engine coolant concentrate.

### Coolant Drain Intervals

Drain and flush the cooling system and refill with fresh coolant at the indicated interval, which varies with the coolant used.

When COOL-GARD II or COOL-GARD II PG is used, the drain interval is 6 years or 6000 hours of operation.

If a coolant other than COOL-GARD II or COOL-GARD II PG is used, reduce the drain interval to 2 years or 2000 hours of operation.<sup>1</sup>

**IMPORTANT: Do not use cooling system sealing additives or antifreeze that contains sealing additives.**

**Do not mix ethylene glycol and propylene glycol base coolants.**

**Do not use coolants that contain nitrites.**

## Water Quality for Mixing with Coolant Concentrate

Engine coolants are a combination of three chemical components: ethylene glycol (EG) or propylene glycol (PG) antifreeze, inhibiting coolant additives, and quality water.

Water quality is important to the performance of the cooling system. Deionized or demineralized water is recommended for mixing with ethylene glycol and propylene glycol base engine coolant concentrate.

All water used in the cooling system should meet the following minimum specifications for quality:

Chlorides	<40 mg/L
Sulfates	<100 mg/L
Total solids	<340 mg/L
Total dissolved I hardness	<170 mg/L
pH	5.5—9.0

**IMPORTANT: Do not use bottled drinking water because it often contains higher concentrations of total dissolved solids.**

## Freeze Protection

The relative concentrations of glycol and water in the engine coolant determine its freeze protection limit.

Ethylene Glycol	Freeze Protection Limit
40%	-24°C (-12°F)
50%	-37°C (-34°F)
60%	-52°C (-62°F)
Propylene Glycol	Freeze Protection Limit
40%	-21°C (-6°F)
50%	-33°C (-27°F)
60%	-49°C (-56°F)

**DO NOT** use a coolant-water mixture greater than 60% ethylene glycol or 60% propylene glycol.

DX,COOL19 -19-13JAN18-1/1

## Operating in Warm Temperature Climates

John Deere engines are designed to operate using recommended engine coolants.

Always use a recommended engine coolant, even when operating in geographical areas where freeze protection is not required.

**IMPORTANT: Water may be used as coolant in emergency situations only.**

**Foaming, hot surface aluminum and iron corrosion, scaling, and cavitation occur when water is used as the coolant, even when coolant conditioners are added.**

**Drain cooling system and refill with recommended engine coolant as soon as possible.**

DX,COOL6 -19-15MAY13-1/1

## Testing Coolant Freeze Point

The use of a handheld coolant refractometer is the quickest, easiest, and most accurate method to determine coolant freeze point. This method is more accurate than a test strip or a float-type hydrometer which can produce poor results.

A coolant refractometer is available through your John Deere dealer under the SERVICEGARD™ tool program. Part number 75240 provides an economical solution to accurate freeze point determination in the field.

To use this tool:

1. Allow cooling system to cool to ambient temperatures.
2. Open radiator cap to expose coolant.
3. With the included dropper, collect a small coolant sample.
4. Open the lid of the refractometer, place one drop of coolant on the window and close the lid.
5. Look through the eyepiece and focus as necessary.
6. Record the listed freeze point for the type of coolant (ethylene glycol coolant or propylene glycol) being tested.



SERVICEGARD™ Part Number 75240

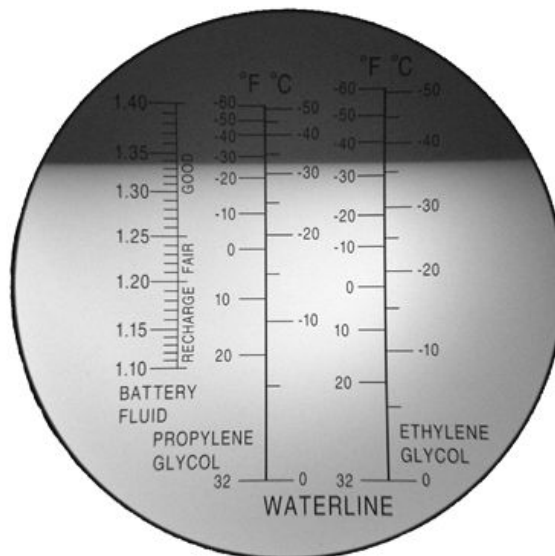


Image with a Drop of 50/50 Coolant Placed on the Refractometer Window

SERVICEGARD is a trademark of Deere & Company

DX.COOL.TEST -19-13JUN13-1/1

TS1732—UN—04SEP13

TS1733—UN—04SEP13

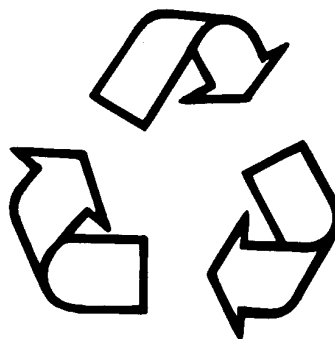
## Disposing of Coolant

Improperly disposing of engine coolant can threaten the environment and ecology.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Inquire on the proper way to recycle or dispose of waste from a local environmental or recycling center, or from an authorized John Deere dealer.



Recycle Waste

OUT4001,0000685 -19-07JUL15-1/1

TS1133—UN—15APR13



### **Alternative and Synthetic Lubricants**

Conditions in certain geographical areas may require lubricant recommendations different from those printed in this manual.

Some John Deere brand coolants and lubricants may not be available in your location.

Consult your John Deere dealer to obtain information and recommendations.

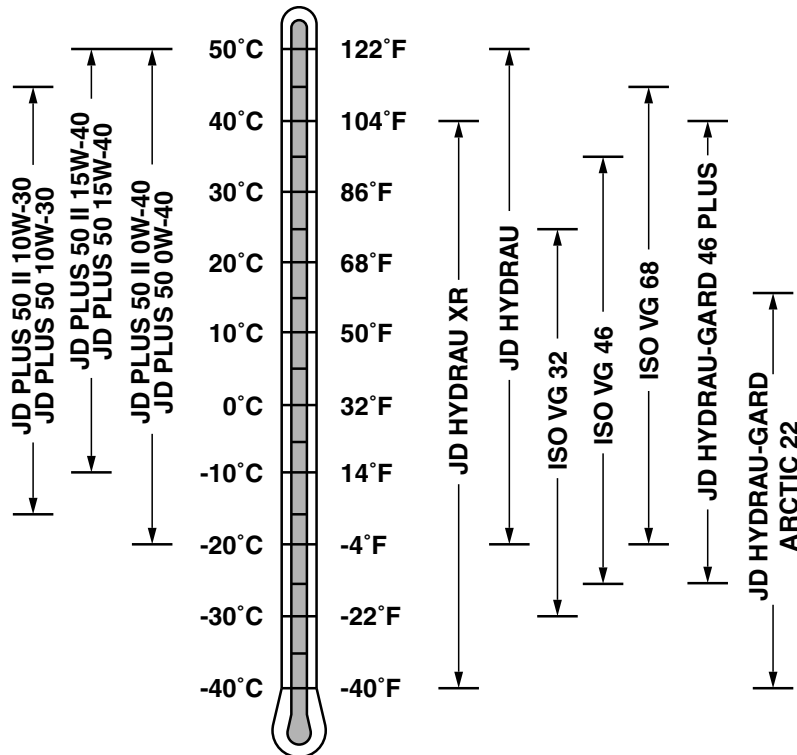
Synthetic lubricants may be used if they meet the performance requirements as shown in this manual.

The temperature limits and service intervals shown in this manual apply to John Deere branded fluids or fluids that have been tested and/or approved for use in John Deere equipment.

Re-refined base stock products may be used if the finished lubricant meets the performance requirements.

DX,ALTER -19-13JAN18-1/1

## Hydraulic and Hydrostatic Oil



TX1201169

Oil Viscosities for Ambient Temperature Ranges

Use oil viscosity based on the expected air temperature range during the period between oil changes.

**IMPORTANT: To avoid machine damage. Do not mix fluids of different type or brand. Do not mix zinc-free and zinc-based. Mixing fluids can result in additive fall-out and lubricant degradation. Zinc-free oils are not approved for use.**

### 1000 Hour Change Interval

The following oils are preferred:

- John Deere Hydrau™
- John Deere Hydrau™XR
- John Deere Plus-50™ II
- John Deere Plus-50™
- John Deere Hydrau-Gard™ 46 Plus<sup>1</sup>

### 500 Hour Change Interval

Other oils may be used if they meet one or more of the following:

- Minimum API classification CI-4
- Anti-Wear Hydraulic Oils (AWHO):
  - ISO 11158 Category HV
  - DIN 51524-3

### Cold weather operation only:

John Deere Hydrau-Gard™ 22 Arctic<sup>1</sup>

<sup>1</sup>Fluid is not available in the United States or Canada.

Hydrau is a trademark of Deere & Company  
 Plus-50 is a trademark of Deere & Company  
 Hydrau-Gard is a trademark of Deere & Company

MB60223,0000074 -19-10SEP15-1/1

TX1201169 —UN—10SEP15

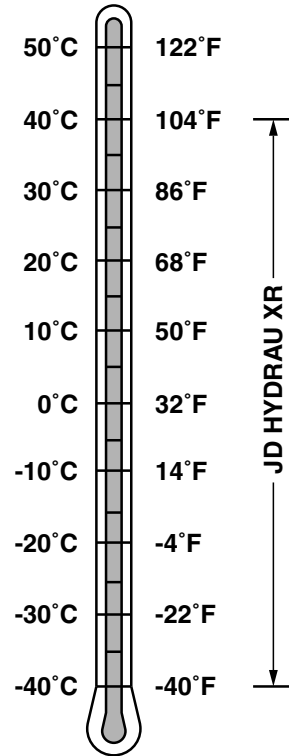
### Hydrostatic Motor Brake Cavity Oil

Use oil viscosity based on the expected air temperature range during the period between oil changes.

**IMPORTANT: To avoid machine damage. Do not mix fluids of different type or brand. Do not mix zinc-free and zinc-based. Mixing fluids can result in additive fall-out and lubricant degradation. Zinc-free oils are not approved for use.**

The following oil is preferred:

- John Deere Hydrau™XR



Oil Viscosities for Ambient Temperature Ranges

Hydrau is a trademark of Deere & Company

MB60223,0005001 -19-13SEP17-1/1

TX1216744 —UN—02JUN16

### Multipurpose Extreme Pressure (EP) Grease

**IMPORTANT: For automated lubrication systems different ambient air temperatures need to be considered.**

Use grease based on NLGI consistency numbers and the expected air temperature range during the service interval.

**John Deere SD Polyurea Grease is preferred.**

The following greases are also recommended:

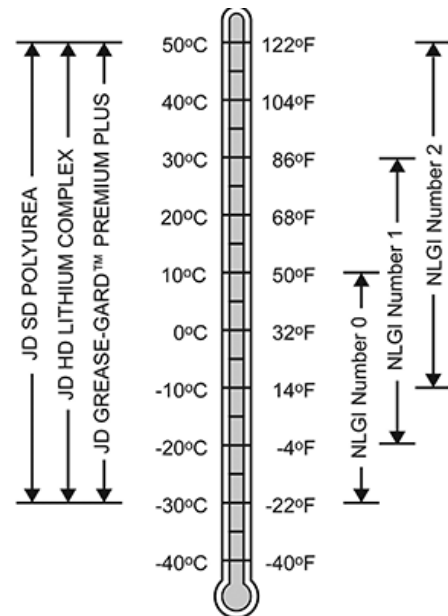
- John Deere HD Lithium Complex Grease
- John Deere Grease-Gard™ Premium Plus

Other greases may be used if they meet the following:

- NLGI Performance Classification GC-LB
- ISO-L-X-BDHB 2 or DIN KP 2 N-10 Lithium Complex, Non-Synthetic Base Oil (100 to 220 mm<sup>2</sup>/s @ 40°C)

**IMPORTANT: Some types of thickeners, base oils, and additives used in greases are not compatible with others. Mixing greases should be avoided. Consult your grease supplier before mixing different types of grease.**

Grease-Gard is a trademark of Deere & Company



Greases for Air Temperature Ranges

DX.GRE1 -19-13JAN18-1/1

RG30199 —UN—08MAR18

### Lubricant Storage

Your equipment can operate at top efficiency only when clean lubricants are used.

Use clean containers to handle all lubricants.

Whenever possible, store lubricants and containers in an area protected from dust, moisture, and other contamination. Store containers on their side to avoid water and dirt accumulation.

Make certain that all containers are properly marked to identify their contents.

Properly dispose of all old containers and any residual lubricant they may contain.

DX,LUBST -19-18MAR96-1/1

### Mixing of Lubricants

In general, avoid mixing different brands or types of oil. Oil manufacturers blend additives in their oils to meet certain specifications and performance requirements.

Mixing different oils can interfere with the proper functioning of these additives and degrade lubricant performance.

Consult your John Deere dealer to obtain specific information and recommendations.

DX,LUBMIX -19-18MAR96-1/1

# Maintenance—Periodic Maintenance

## Engine Identification

Use the following information to identify engine model.

**IMPORTANT: Use only supporting manuals designated for the specific machine. If 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 skid steers are available in different machine configurations based on the various markets into which they are sold. Different supporting manuals exist for different machine configurations.

For more information, see Manual Identification.

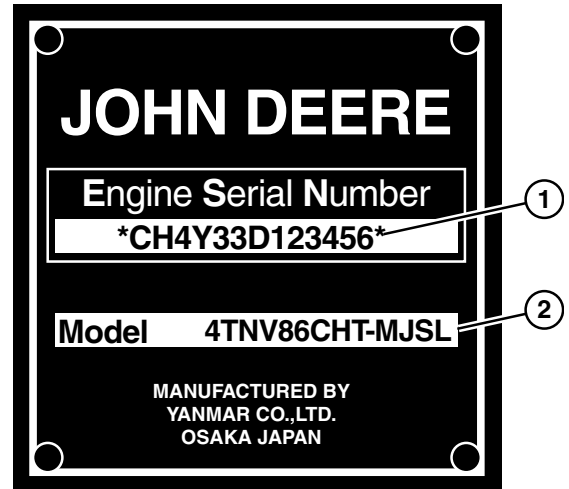
### Engine Serial and Model Number Identification

The engine serial number tag (3) is located on top of engine rocker arm cover.

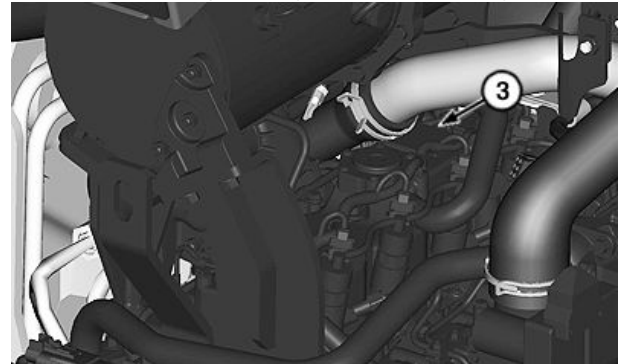
Engine Model Number	
4TNV86CHT	Final Tier 4 and Stage III B turbocharged engine

1— Engine Serial Number  
2— Engine Model Number

3— Engine Serial Number Tag



Example of Engine Serial Number Tag



Engine Serial Number Final Tier 4

CN93077,0000679 -19-01DEC15-1/2

TX1206243 —UN—24NOV15

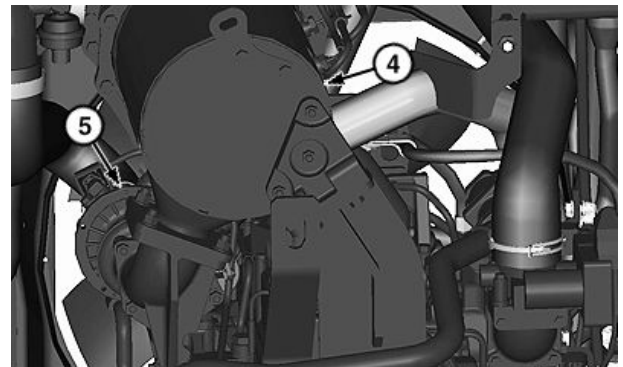
TX1202027 —UN—21SEP15

## Engine Component Identification

Machines equipped with a 4TNV86CHT engine, utilize a turbocharger (5) and diesel exhaust filter (4).

4— Diesel Exhaust Filter

5— Turbocharger



4TNV86CHT Engine

CN93077,0000679 -19-01DEC15-2/2

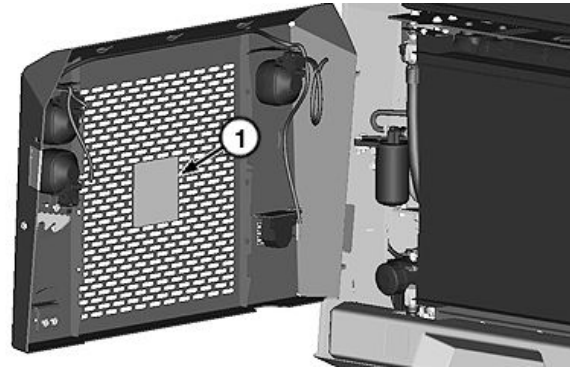
TX1202096 —UN—22SEP15

### Service Machine at Specified Intervals

Lubricate and make service checks and adjustments at intervals shown on the periodic maintenance chart (1) and on the following pages. The periodic maintenance chart is located on the inside rear door.

Perform service on items at multiples of the original requirement. For example, at 500 hours, also service those items, if applicable, listed under 250 hours, 50 hours, and 10 hours or daily.

1— Periodic Maintenance Chart



Periodic Maintenance Chart

CN93077,0000671 -19-18SEP15-1/1

TX1201862—UN—28OCT15

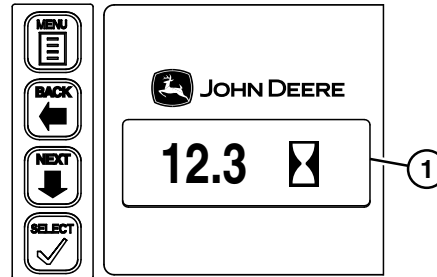
### Check Hour Meter Regularly

**NOTE:** Hour meter (1) display is located in top left corner of the engagement and monitor unit (EMU) window.

Press UP or DOWN arrows to toggle between engine hours, battery voltage, job timer, hydraulic oil temperature, engine coolant temperature, and engine speed indicators.

Use the hour meter (1) to determine when the machine needs periodic maintenance.

Intervals on the periodic maintenance chart are for operating in normal conditions. If operating machine in severe conditions, machine should be serviced at shorter intervals.



Display Window (hour meter shown)

1— Hour Meter

CN93077,00006B5 -19-16NOV15-1/1

TX1144063—UN—16SEP13

### Fuel Tank

**CAUTION:** Fuel is flammable and may ignite if spilled on hot engine. To prevent injury, handle fuel carefully. If engine is hot or running, **DO NOT** fill the fuel tank. **DO NOT** smoke while filling fuel tank or working on fuel system.

**IMPORTANT:** Avoid engine damage. If machine has run out of fuel, engine will not start. Contact an authorized John Deere dealer for instructions.

To avoid condensation, fill the fuel tank at the end of each work day. Shut off engine before filling.

KR46761,0000F5B -19-18AUG15-1/1

### Raising and Blocking Machine

1. Park machine on level surface.
2. Remove any attachment.
3. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
4. Engage park brake and stop engine.

**⚠ CAUTION: To avoid injury from escaping fluid under pressure, stop engine and relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.**

5. Relieve hydraulic system pressure.

**⚠ CAUTION: Prevent possible crushing injury from heavy component. Use appropriate lifting device.**

6. Place appropriate lifting device under front center of machine base and raise machine.

**Specification**

312GR—Operating Weight (approximate).....	2722 kg 6000 lb
314G—Operating Weight (approximate).....	2867 kg 6321 lb
316GR—Operating Weight (approximate).....	2894 kg 6380 lb
317G—Operating Weight (approximate).....	3789 kg 8353 lb
318G—Operating Weight (approximate).....	2939 kg 6479 lb

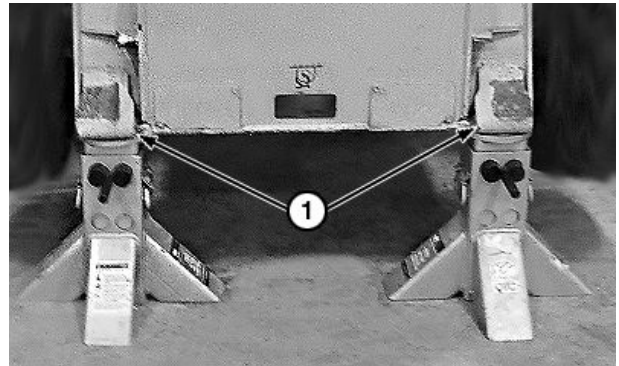
7. Place blocks or stands under front corners (1) of machine base.
8. Lower machine onto blocks or stands.

**⚠ CAUTION: Prevent possible crushing injury from heavy component. Use appropriate lifting device.**

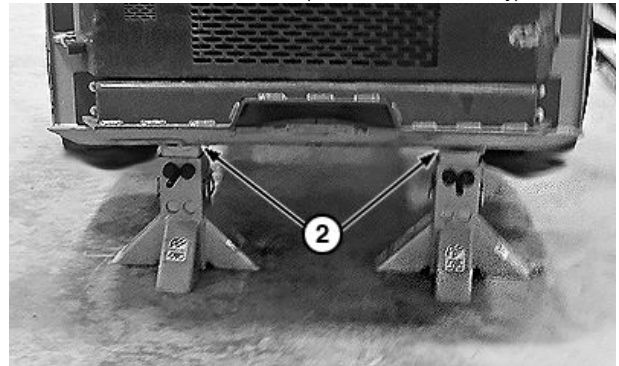
9. Place appropriate lifting device under rear center of machine base and raise machine.

**Specification**

312GR—Operating Weight (approximate).....	2722 kg 6000 lb
-------------------------------------------	--------------------



Front of Machine (boom raised for clarity)



Rear of Machine (blocked)

1— Front Corner

2— Rear Corner

314G—Operating Weight (approximate).....	2867 kg 6321 lb
316GR—Operating Weight (approximate).....	2894 kg 6380 lb
317G—Operating Weight (approximate).....	3789 kg 8353 lb
318G—Operating Weight (approximate).....	2939 kg 6479 lb

10. Place blocks or stands under rear corners (2) of machine base.

**⚠ CAUTION: Prevent possible injury from unexpected machine movement. Make sure that machine is stable after blocking.**

11. Lower machine onto blocks or stands.

CN93077,000066B -19-15JUN18-1/1

TX1201757 —UN—17SEP15

TX1201760 —UN—17SEP15

## Raising Operator's Station

1. Park machine on level surface.
2. Remove any attachments.
3. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
4. Engage park brake and stop engine.
5. Remove nuts (1) and washers (2) from mounting studs on both sides of operator's station.

**⚠ CAUTION: Prevent crushing injury from unexpected cab movement. NEVER attempt to repair a damaged gas spring cylinder. Replace gas spring cylinder if cylinder is cracked, damaged, or if operator's station is hard to lift.**

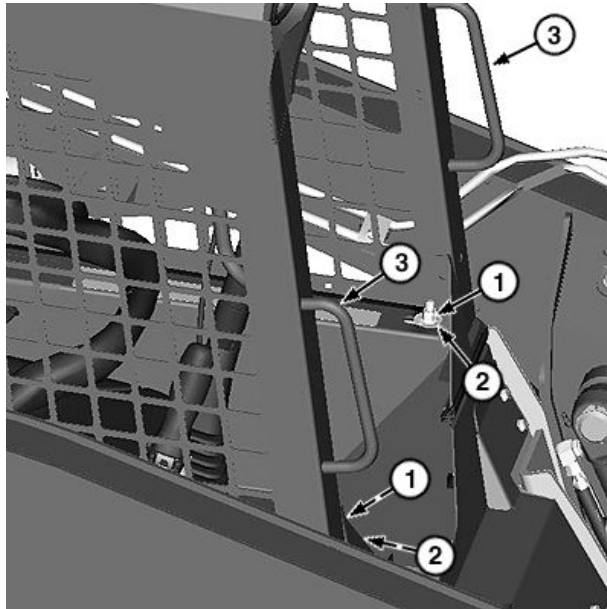
6. Using handholds (3), raise operator's station. Continue raising operator's station until gas spring cylinder locks are in place.
7. Pull forward on red cylinder lock (4) to ensure operator's station is in locked position.

*NOTE: If machine is equipped with a pressurized cab, make sure that seal on back of footwell is in place prior to lowering cab.*

8. To lower operator's station, push red cylinder lock (5) rearward to unlocked position.
9. Pull operator's station down until seated on mounting studs.
10. Install and tighten washers and nuts on mounting studs.

1— Nut (2 used)  
2— Washer (2 used)  
3— Handhold (2 used)

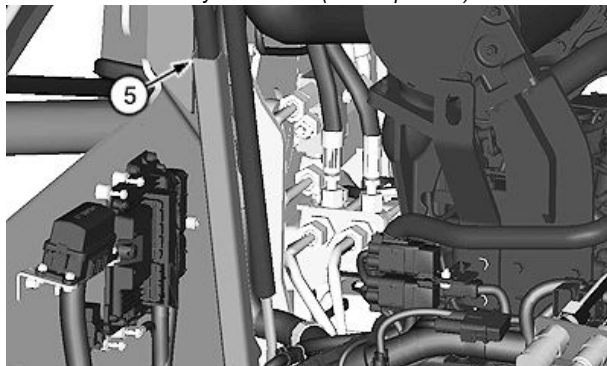
4— Cylinder Lock (locked position)  
5— Cylinder Lock (unlocked position)



Operator's Station Mounting Hardware (canopy cab shown)



Cylinder Lock (locked position)



Cylinder Lock (unlocked position)

TX1201695 —UN—16SEP15

TX1201697 —UN—16SEP15

TX1201698 —UN—16SEP15

NK60711,000027 -19-24MAY18-1/1



## Opening and Closing Engine Cover

### Opening engine cover (1):

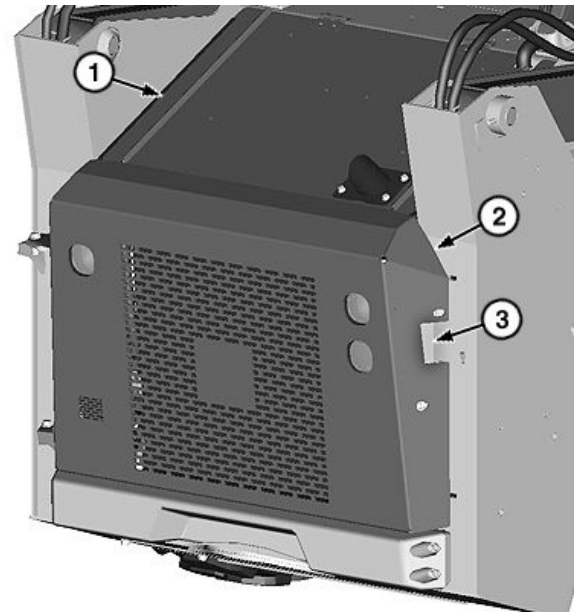
1. Park machine on a level surface.
2. Engage park brake and stop engine.
3. Pull rear service door latch (3) rearward to swing open rear service door (2).
4. Push engine cover (1) until lock stay completely engages lock groove inside engine cover.

### Closing engine cover:

1. Disengage lock stay from lock groove inside engine cover.
2. Pull down on engine cover.
3. Close rear service door and ensure latch is secured.

1— Engine Cover  
2— Rear Service Door

3— Rear Service Door Latch



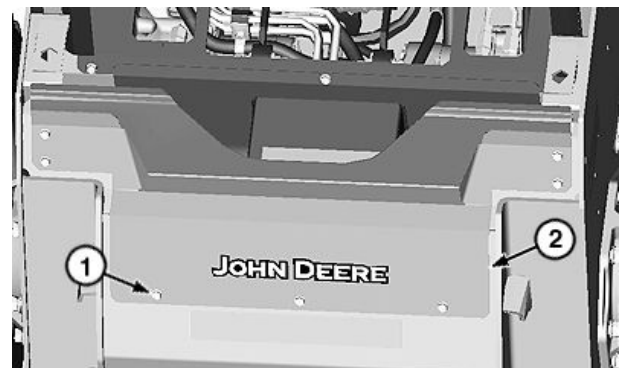
Rear Service Door and Engine Cover

CN93077,000066C -19-24NOV15-1/1

TX1201772 —UN—17SEP15

## Toe Guard Removal

1. Park machine on level surface.
2. Remove any attachment.
3. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
4. Engage park brake and stop engine.
5. Raise and lock operator's station. See Raising Operator's Station in this section.
6. Remove cap screws (1) from toe guard (2).
7. Remove toe guard.



Front of Machine Shown

1— Cap Screw (7 used)

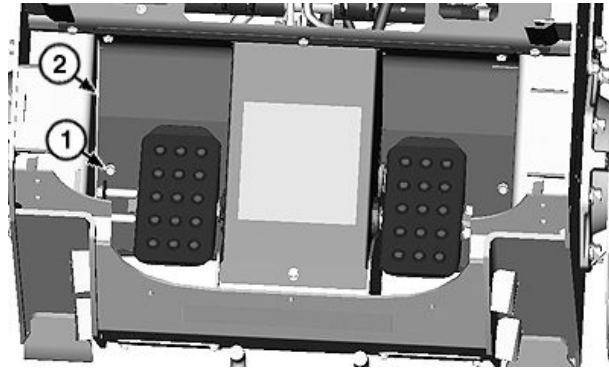
2— Toe Guard

CN93077,000066F -19-23NOV15-1/1

TX1201831 —UN—23NOV15

### Footwell Removal

1. Park machine on level surface.
2. Remove any attachment.
3. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
4. Engage park brake and stop engine.
5. Raise and lock operator's station. See Raising Operator's Station in this section.
6. Remove cap screws (1) from footwell kick plate (2).
7. Lift out footwell kick plate.



Front of Manual Controls Machine Shown

1— Cap Screw (8 used)

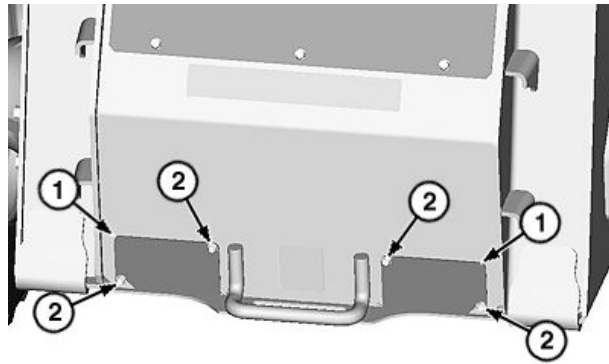
2— Footwell Kick Plate

TX1201833 —UN—23NOV15

CN93077,000066E -19-28MAR16-1/1

### Footwell Cleanout

1. Park machine on level surface.
2. Remove any attachment.
3. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
4. Engage park brake and stop engine.
5. Raise and lock operator's station. See Raising Operator's Station in this section.
6. Loosen cap screws (2) from front cover plates (1).
7. Swing cover plates upward.
8. Clean out footwell area. Replace cover plate and tighten cap screws.



Front of Machine Shown

1— Front Cover Plate (2 used)

2— Cap Screw (4 used)

TX1201855 —UN—18SEP15

CN93077,0000670 -19-16NOV15-1/1

### Fluid Analysis Program Test Kits and 3-Way Coolant Test Kit

Fluid Analysis Program Test Kits and the 3-Way Coolant Test Kit are John Deere fluid sampling products to help you monitor machine maintenance and system condition. The objective of a fluid sampling program is to ensure machine availability when you need it and to reduce repair costs by identifying potential problems before they become critical.

Engine, hydraulic, power train, and coolant samples should be taken from each system on a periodic basis, before a filter or fluid change interval. Certain systems require more frequent sampling. Consult your authorized John Deere dealer on a maintenance program for your specific application. Your authorized John Deere dealer has the sampling products and expertise to assist you in lowering your overall operating costs through fluid sampling.



TX1003513A —UN—20FEB06

TX\_ANALYSIS -19-20JAN11-1/1

## Service Intervals

<b>Model:</b>		<b>PIN/Serial Number:</b>	
<b>Hour Meter Reading:</b>			
<b>SERVICE INTERVALS</b>			
Service machine at intervals shown on this chart. Also, perform service on items at multiples of the original requirement. For example, at 500 hours also service those items (if applicable) listed under 250 hours, 50 hours, and 10 hours or daily.			
<b>FLUID SAMPLING</b>			
Fluid samples should be taken from each system at its recommended change interval prior to actually draining the fluid. Regular oil sampling extends the operational life of machine.			
<b>As Required</b>			
<input type="checkbox"/> Check and clean cooling package	<input type="checkbox"/> Replace primary and secondary engine air filter elements	<input type="checkbox"/> Replace cab fresh air filter element (if equipped)	<input type="checkbox"/> Check and drain primary fuel filter and water separator
<input type="checkbox"/> Replace cab recirculation air filter element (if equipped)	<input type="checkbox"/> Check accessory drive belt	<input type="checkbox"/> Check fuel tank breather	<input type="checkbox"/> Service exhaust filter
<b>Every 10 Hours or Daily</b>			
<input type="checkbox"/> Check engine oil level	<input type="checkbox"/> Check hydraulic oil level	<input type="checkbox"/> Check coolant level	<input type="checkbox"/> Lubricate boom linkage, cylinder, and Quik-Tatch™ pivot points
<b>Every 50 Hours</b>			
<input type="checkbox"/> Check and clean dust unloader valve	<input type="checkbox"/> Check track tension	<input type="checkbox"/> Lubricate Quik-Tatch™ engagement pins	
<b>Every 100 Hours</b>			
<input type="checkbox"/> Check and adjust accessory drive belt tension (machines without air conditioning only)			
<b>Every 250 Hours</b>			
<input type="checkbox"/> Take engine oil sample			
<b>Every 500 Hours</b>			
<input type="checkbox"/> Drain and refill engine oil and replace filter	<input type="checkbox"/> Take hydraulic oil sample	<input type="checkbox"/> Replace primary fuel filter and water separator	<input type="checkbox"/> Take engine coolant sample
<input type="checkbox"/> Replace final fuel filter	<input type="checkbox"/> Take diesel fuel sample	<input type="checkbox"/> Drain water and sediment from fuel tank	
<b>Every 1000 Hours</b>			
<input type="checkbox"/> Drain and refill hydraulic oil and replace filter	<input type="checkbox"/> Check coolant condition	<input type="checkbox"/> Replace hydraulic oil reservoir breather	<input type="checkbox"/> Replace fuel tank breather
<input type="checkbox"/> Drain and refill hydrostatic motor brake cavity oil			
<b>Every 1500 Hours</b>			
<input type="checkbox"/> Check and adjust engine valve lash			
<b>Every 6000 Hours</b>			
<input type="checkbox"/> Drain, flush, and refill cooling system			

Quik-Tatch is a trademark of Deere & Company

CN93077,0000691 -19-07DEC15-1/1

## Required Parts

Description	Every 250 Hours	Every 500 Hours	Every 1000 Hours	Every 1500 Hours	Every 6000 Hours
Engine Oil Filter Element		1	1	1	1
Final Fuel Filter Element		1	1	1	1
Primary Fuel Filter and Water Separator		1	1	1	1
Hydraulic Oil Reservoir Breather <sup>1</sup>			1		1
Hydraulic Oil Filter Element			1		1
Fuel Tank Breather			1		1
Engine Rocker Arm Cover Gasket				1	1
Diesel Particulate Filter (DPF) (component of exhaust filter)	As Required				
Cab Fresh Air Filter Element (if equipped)	As Required				
Cab Recirculation Air Filter Element (if equipped)	As Required				
Engine Air Filter Element—Primary	As Required				
Engine Air Filter Element—Secondary	As Required				
Dust Unloader Valve	As Required				
John Deere Plus-50™ II Engine Oil <sup>2</sup>		7.5 L (2.0 gal)	7.5 L (2.0 gal)	7.5 L (2.0 gal)	7.5 L (2.0 gal)
John Deere Hydrau™ Hydraulic and Hydrostatic Oil <sup>2</sup>			22.7 L (6.0 gal)		22.7 L (6.0 gal)
John Deere Hydrau™ XR Motor Brake (per side) <sup>2</sup>			0.35 L (11.83 fl oz)		0.35 L (11.83 fl oz)
Cool-Gard™ II Pre-Mix Engine Coolant					12.0 L (3.2 gal)
Fluid Analysis Kits <sup>3</sup>					
Diesel Engine Oil	1	1	1	1	1
Hydraulic Oil		1	1	1	1
Diesel Fuel		1	1	1	1
Engine Coolant		1	1	1	1
<sup>1</sup> Hydraulic reservoir breather is an integral part of the hydraulic reservoir fill cap. <sup>2</sup> For recommended oil types and oil viscosities based on operating temperatures, see Maintenance—Machine. (Section 3-1.) <sup>3</sup> Based on fluid analysis results, intervals may need to be adjusted for operating conditions. Consult an authorized John Deere dealer.					

Plus-50 is a trademark of Deere & Company  
 Hydrau is a trademark of Deere & Company  
 Cool-Gard is a trademark of Deere & Company

CN93077,000069D -19-05MAY16-1/1

# Maintenance—As Required

## Check and Clean Cooling Package

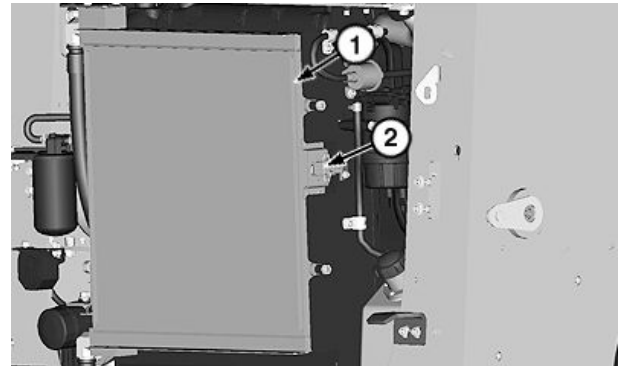
Check radiator (4), hydraulic oil cooler (1), and charge air cooler (3), for dirt, damage, leaks, and loose or broken mounting hardware.

**⚠ CAUTION: Prevent personal injury. Allow engine to cool enough so components can be touched with bare hands.**

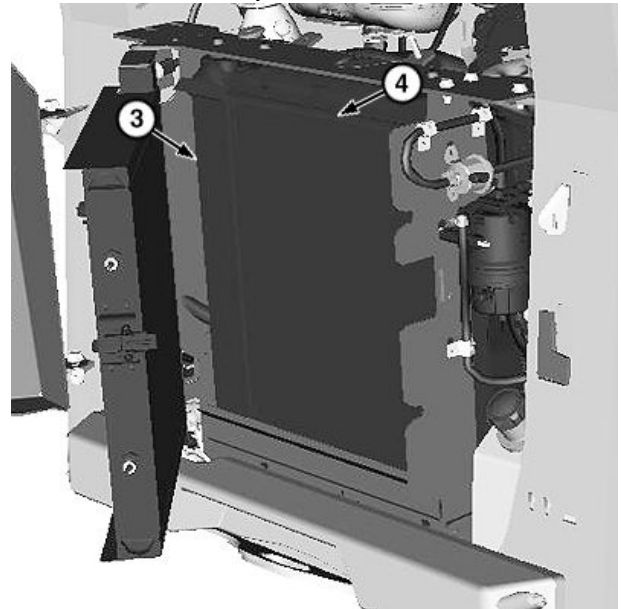
1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Open rear service door.
4. On right side of machine, open latch (2) on hydraulic oil cooler.
5. Swing hydraulic oil cooler away from radiator.
6. Clean charge air cooler, hydraulic oil cooler, and radiator fins using compressed air.
7. Clean any dirt buildup in cooler area.
8. Close hydraulic oil cooler.
9. If any areas require washing after cleaning with air, allow radiator and cooler parts to dry thoroughly before operating machine.
10. Close rear service door.

1— Hydraulic Oil Cooler  
2— Latch

3— Charge Air Cooler  
4— Radiator



*Hydraulic Oil Cooler*



*Radiator and Charge Air Cooler*

TX1201686 —UN—15SEP15

TX1201691 —UN—02DEC15

CN93077,0000667 -19-02DEC15-1/1

## Replace Cab Fresh Air and Recirculation Air Filter Elements—If Equipped

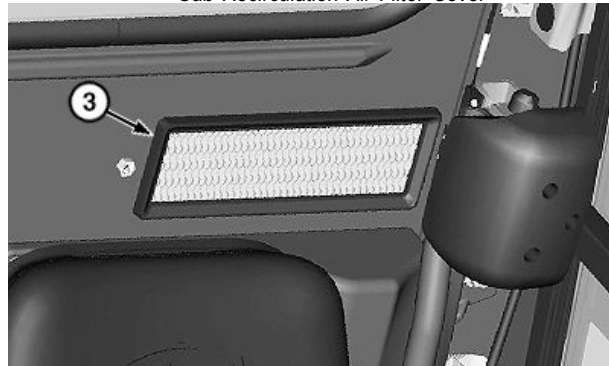
**NOTE:** Air filters require periodic checking when running in dirty environments.

1. Park machine on level surface.
2. Remove any attachment.
3. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
4. Engage park brake and stop engine.
5. Behind operator's seat, remove knob (1) from cover (2).
6. Remove cover.
7. Remove cab fresh air filter element (3).
8. Install new cab fresh air filter element.
9. Install cover and knob.
10. On left side of machine behind cab, remove knobs (4) from cover (5).
11. Remove cover.
12. Remove cab recirculation air filter element (6).
13. Install new cab recirculation air filter element.
14. Install cover and knobs.

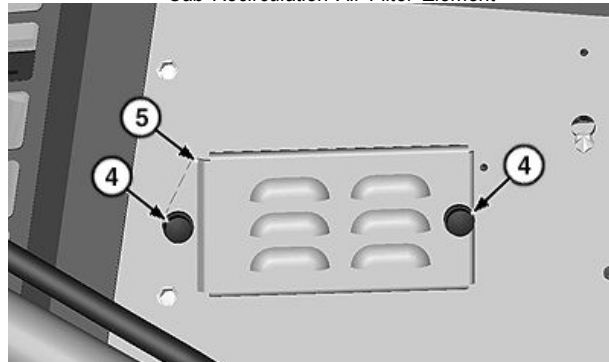
- |                                 |                                         |
|---------------------------------|-----------------------------------------|
| 1— Knob                         | 4— Knob (2 used)                        |
| 2— Cover                        | 5— Cover                                |
| 3— Cab Fresh Air Filter Element | 6— Cab Recirculation Air Filter Element |



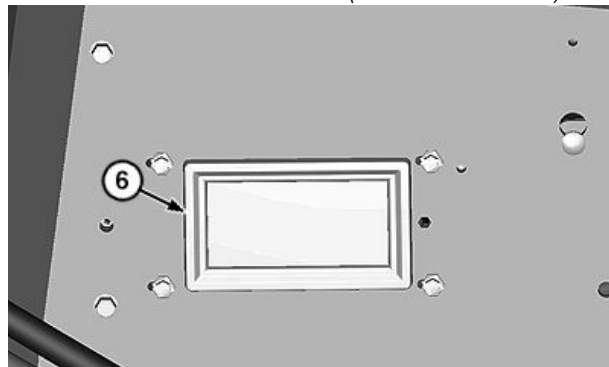
Cab Recirculation Air Filter Cover



Cab Recirculation Air Filter Element



Cab Fresh Air Filter Cover (radial lift boom shown)



Cab Fresh Air Filter Element (radial lift boom shown)

TX1202191 —UN—23SEP15

TX1202192 —UN—23SEP15

TX1202193 —UN—23SEP15

TX1202194 —UN—23SEP15

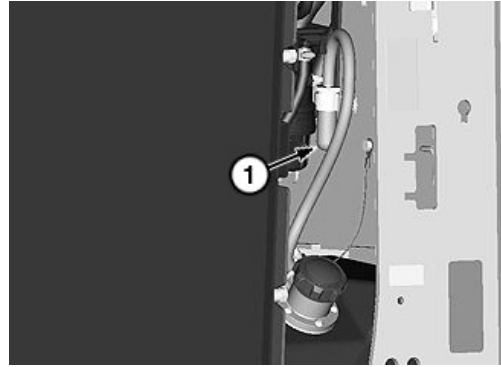
CN93077,0000681 -19-07DEC15-1/1

### Check Fuel Tank Breather

**IMPORTANT: Prevent possible engine damage.  
Replace fuel tank breather if damaged.**

1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Open rear service door.
4. Inspect fuel tank breather filter (1). Replace if damaged. See Replace Fuel Tank Breather. (Section 3-9.)
5. Close rear service door.

1— Fuel Tank Breather Filter



Fuel Tank Breather

TX1202198 —UN—25SEP15

CN93077,0000682 -19-19OCT15-1/1

## Replace Primary and Secondary Engine Air Filter Elements

**IMPORTANT: Damaged or dirty engine air filter elements can cause engine damage. DO NOT clean engine air filter elements; replace engine air filter elements as required.**

**Do not start engine without both primary and secondary filters installed.**

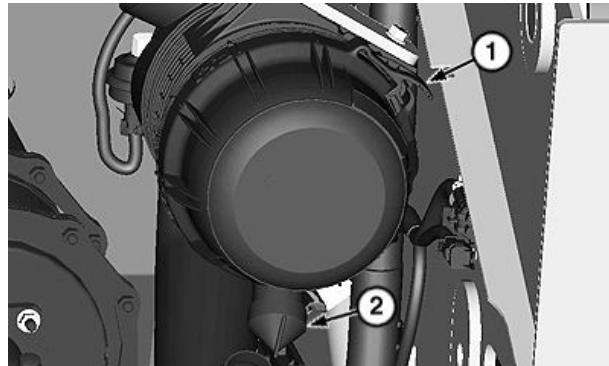
1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Open rear service door and engine cover.
4. Squeeze engine air cleaner dust unloader valve (2) to remove dust from air cleaner.
5. Lift latch (1) and rotate to remove engine air cleaner access cover.

**IMPORTANT: DO NOT use compressed air to clean debris from air cleaner housing. Debris can enter engine, causing internal engine damage.**

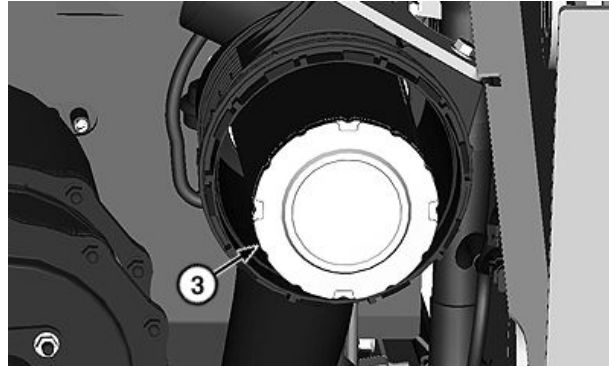
6. Remove primary engine air filter element (3).
7. Using a damp cloth, wipe the inside area of the engine air cleaner compartment.
8. Remove secondary engine air filter element (4).
9. Using a damp cloth, wipe the sealing surfaces of the air cleaner elements.
10. Install secondary engine air filter element. Verify that secondary engine air filter element is centered and securely positioned.

**IMPORTANT: Prevent possible engine damage. If engine air cleaner access cover does not fit flush to air filter housing, primary filter is not properly seated in housing.**

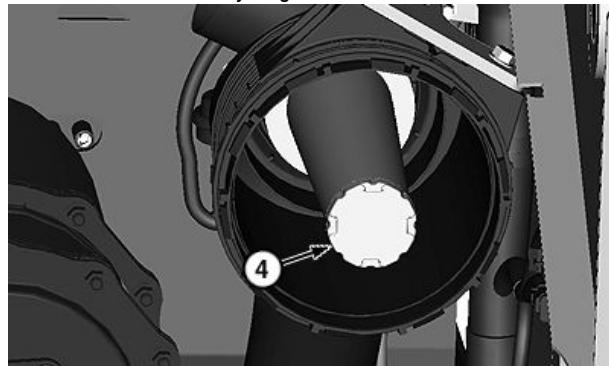
11. Install primary engine air filter element. Press the element against the air cleaner housing for the seal to seat.
12. Install engine air cleaner access cover and secure latch.
13. Inspect and tighten all clamps, cap screws, and connections in the entire air intake system. Check for holes in piping and repair if needed.



Engine Air Cleaner Access Cover and Air Cleaner Dust Unloader Valve



Primary Engine Air Filter Element



Secondary Engine Air Filter Element

1— Latch  
2— Engine Air Cleaner Dust Unloader Valve

3— Primary Engine Air Filter Element  
4— Secondary Engine Air Filter Element

14. Close engine cover and rear service door.

CN93077,0000684 -19-23SEP15-1/1

TX1202247 —UN—23SEP15

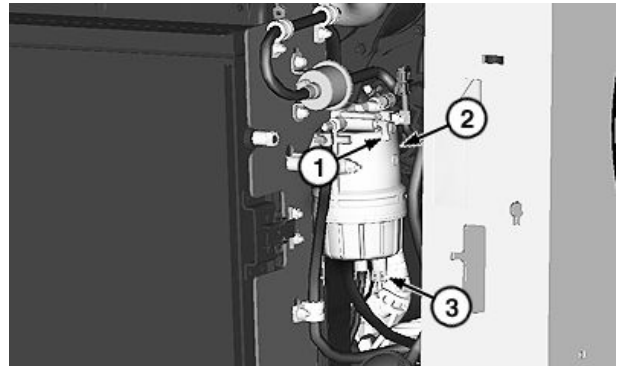
TX1202248 —UN—23SEP15

TX1202249 —UN—23SEP15



### Check and Drain Primary Fuel Filter and Water Separator

1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Open rear service door.
4. Place suitable container under drain valve (1) of primary fuel filter and water separator (2).
5. Turn fuel shutoff valve (3) to OFF position.
6. Loosen drain valve to drain water and sediment into container. Dispose of waste properly.
7. Tighten drain valve.
8. Turn fuel shutoff valve to ON position.
9. Operate engine and check for leaks.
10. Close rear service door.



Primary Fuel Filter and Water Separator

1— Drain Valve  
2— Primary Fuel Filter and Water Separator

3— Fuel Shutoff Valve

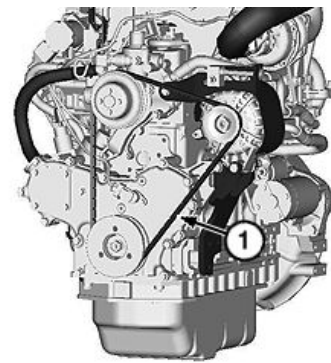
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TX1202305 —UN—24SEP15

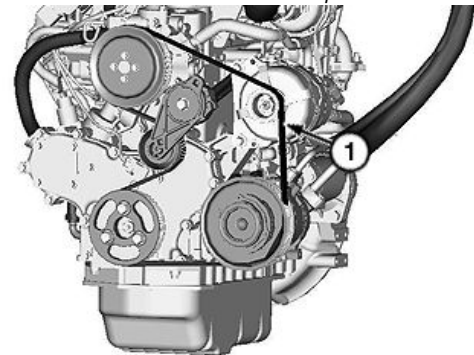
### Check Accessory Drive Belt

Check accessory drive belt (1) regularly for wear, especially for cracks at the bottom of grooves and for frayed edges. If necessary, replace belt. See Replacing Accessory Drive Belt. (Section 4-1.)

1— Accessory Drive Belt



Without Air Conditioner Compressor



With Air Conditioner Compressor

CN93077,000068C -19-24SEP15-1/1

TX1202350 —UN—24SEP15

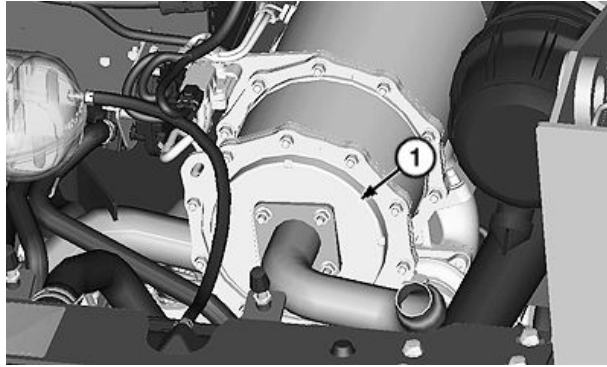
TX1202351 —UN—24SEP15

## Service Exhaust Filter

**⚠ CAUTION:** Under federal, state, and/or local laws or regulations, exhaust filter ash may 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. See an authorized dealer for exhaust filter ash handling and disposal.

The exhaust filter (1) is designed to retain residual ash, which is a noncombustible result of additives used in crankcase lubrication oils and the fuel. As ash levels rise, the capacity for soot storage is reduced. Engine performance can be reduced due to increased exhaust system back pressure. The residual ash must be removed from the filter. Ash removal is performed by removing the exhaust filter from machine and having it cleaned by specialized equipment or replacing the exhaust filter.

Do **NOT** attempt to remove exhaust filter from machine. **Contact an authorized dealer to remove exhaust filter for ash removal or replacement.**



Exhaust Filter

### 1— Exhaust Filter

Failure to follow the approved ash removal methods may violate U.S. federal, state, and local hazardous waste laws, and damage the exhaust filter, resulting in potential denial of the emissions warranty.

TX1202368 —UN—24SEP15

CN93077,000068F -19-20OCT15-1/1

# Maintenance—Every 10 Hours or Daily

## Check Engine Oil Level

**IMPORTANT:** Prevent engine damage. **DO NOT** run engine when oil level is below the **ADD** mark.

*NOTE: Engine oil may appear milky in color due to machine being equipped with closed crankcase ventilation system, which may cause moisture on engine oil dipstick and fill cap.*

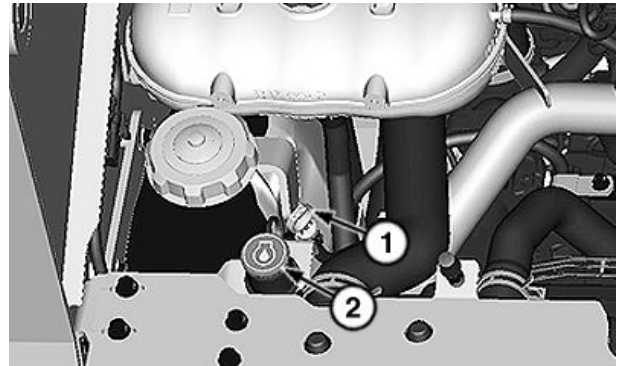
If engine oil appears milky in color, check engine coolant level to verify that engine coolant has not entered the engine oil system. See Check Coolant Level in this section.

If there is still concern after checking engine coolant level, take an engine oil sample for further analysis. See Take Engine Oil Sample. (Section 3-7.)

The most accurate oil level reading is obtained when the engine is cold; before starting the engine for the day's operation.

1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Open rear service door and engine cover.
4. Make sure dipstick (1) is fully seated.
5. Remove dipstick to check oil level.

**BEFORE THE ENGINE IS STARTED:** Engine is full when oil level is in the cross-hatch area. Running the



Engine Oil Dipstick and Fill Tube Cap

1— Dipstick

2— Fill Tube Cap

engine when the oil level is above the **ADD** mark is acceptable.

**AFTER THE ENGINE HAS BEEN RUN:** Allow the oil to drain into the oil pan for 10 minutes before checking the oil level. Ten minutes after shutdown, engine oil level must be above the **ADD** mark.

6. If necessary, remove fill tube cap (2) to add oil. For recommended oil, see Maintenance—Machine. (Section 3-1.)
7. Close engine cover and rear service door.

CN93077,0000694 -19-28SEP15-1/1

TX1202556 —UN—28SEP15

## Check Hydraulic Oil Level

**IMPORTANT:** To ensure an accurate reading, park machine on smooth, level ground. Check level only when hydraulic oil is cold and boom is down with boom and bucket cylinders fully retracted.

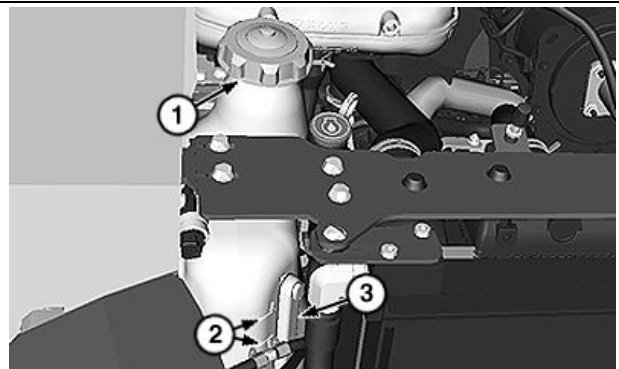
When adding oil to the hydraulic reservoir, be careful not to get dirt into reservoir or oil.

Do not overfill hydraulic oil reservoir. An overfilled hydraulic oil reservoir will not allow for oil expansion, which may result in oil leakage past hydraulic reservoir breather or fill cap.

1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Open rear service door and engine cover.
4. Check oil level at sight glass (3). Hydraulic oil level should be between the arrow marks (2) on site glass.

**If adding oil is necessary:**

1. Remove hydraulic reservoir fill cap (1).



Hydraulic Reservoir

1— Hydraulic Reservoir Fill Cap 3— Sight Glass  
2— Arrow Mark (2 used)

2. Add hydraulic oil. For recommended oil, see Hydraulic and Hydrostatic Oil. (Section 3-1.)
3. Install hydraulic reservoir fill cap.
4. Close engine cover and rear service door.

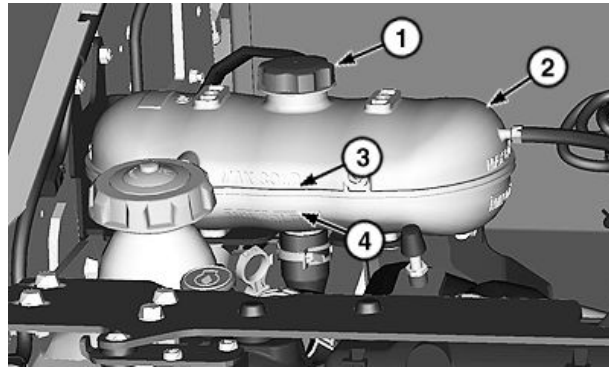
CN93077,00006A4 -19-09OCT15-1/1

TX1203439 —UN—09OCT15

## Check Coolant Level

**⚠ CAUTION:** Prevent possible injury from hot spraying fluids. Shut off engine. Remove surge tank cap (1) only when cool enough to touch with bare hands. Slowly loosen surge tank cap to relieve pressure before removing completely.

1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Allow engine to cool.
4. Open rear service door and engine cover.
5. Check surge tank for coolant level. Coolant should be above the MIN COLD line (4), but below the MAX COLD line (3).
6. If coolant is below the MIN COLD line, add coolant to surge tank. For recommended coolant, see Diesel Engine Coolant (engine without wet sleeve cylinder liners). (Section 3-1.)
7. If surge tank is empty, check for leaks. Repair as required. Add coolant to surge tank.



Surge Tank

1— Surge Tank Cap  
2— Surge Tank

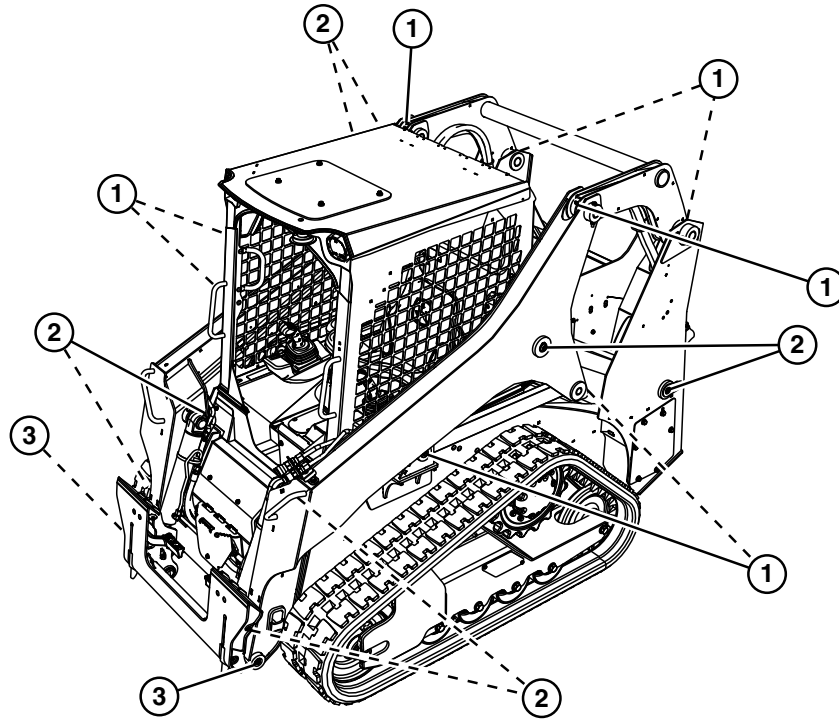
3— MAX COLD Line  
4— MIN COLD Line

8. Close engine cover and rear service door. Run engine.
9. Stop engine. Allow engine to cool and check coolant level again.
10. If level is still low, repeat procedure.

CN93077,00006A5 -19-10NOV15-1/1

TX1203667—UN—13OCT15

### Lubricate Boom Linkage, Cylinder, and Quik-Tatch™ Pivot Points



**TX1203662**

*Boom Linkage, Cylinder, and Quik-Tatch™ Pivot Points*

- 1— Boom Linkage Point (8 used)    3— Quik-Tatch™ Pivot Point (2 used)  
2— Cylinder Pivot Point (8 used)

Lubricate boom linkage points (1), cylinder pivot points (2), and Quik-Tatch™ pivot points (3) on each side of

boom with 1—2 shots of grease. For recommended grease, see Grease. (Section 3-1.)

*Quik-Tatch is a trademark of Deere & Company*

CN93077,00006A7 -19-10NOV15-1/1

TX1203662 —UN—04NOV15

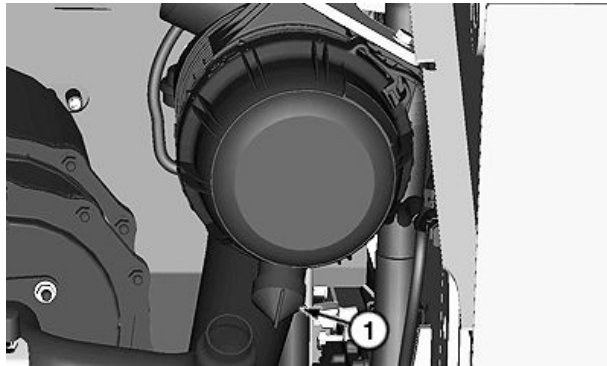
# Maintenance—Every 50 Hours

## Check and Clean Dust Unloader Valve

**IMPORTANT:** Avoid machine damage. A missing, damaged, or hardened dust unloader valve will make the dust cup precleaner ineffective, causing very short element life. Valve should close when engine is running.

**NOTE:** If operating in high dust conditions, squeeze dust unloader valve every 2 hours of operation to release dust.

1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Open rear service door and engine cover to access dust unloader valve (1).
4. Squeeze dust unloader valve to remove dust from air cleaner.
5. Check condition of dust unloader valve. Replace if hardened or damaged.



Dust Unloader Valve

1—Dust Unloader Valve

6. Close engine cover and rear service door.

CN93077,00006A8 -19-13OCT15-1/1

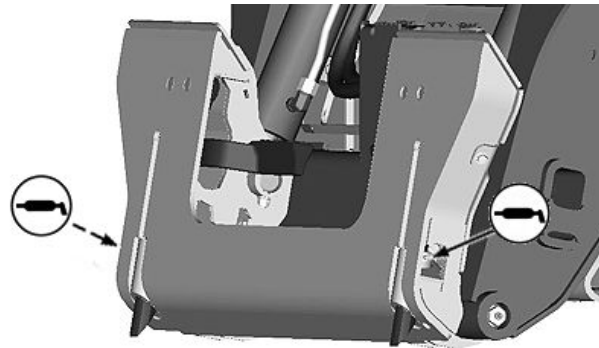
TX1203672—UN—13OCT15

## Lubricate Quik-Tatch™ Engagement Pins

**NOTE:** In severe operating conditions, Quik-Tatch™ linkage points may need more frequent lubrication.

For proper lubrication, ensure Quik-Tatch™ engagement pins are in the raised position while lubricating.

Lubricate Quik-Tatch™ linkage points on each side of boom with 1—2 shots of grease. For recommended grease, see Grease. (Section 3-1.)



Quik-Tatch™ (manual shown)

Quik-Tatch is a trademark of Deere & Company

CN93077,00006A6 -19-27JUL17-1/1

TX1203678—UN—09DEC15

## Check Track Tension

**IMPORTANT: Avoid track damage. Track sag measurement can only be performed safely and accurately by using a bucket to raise machine to proper height. DO NOT use a broken or worn out bucket when checking or adjusting track sag.**

1. Install bucket attachment on machine. Visually check pin engagement with Quik-Tatch™ to ensure locking.
2. Park machine on level surface.
3. Raise boom.
4. Extend bucket cylinders to place bucket in full dump position.
5. Lower boom to lowest position to raise front of machine off the ground by 20 cm (8 in) and allow operator to exit machine if necessary.
6. Engage park brake. If equipped with key start, press park brake switch (1) to position P to engage park brake. If equipped with keyless start, press park brake switch (2) to engage (light-emitting diode [LED] illuminated) park brake.
7. Turn engine off.

**CAUTION:** Prevent injury due to unexpected machine movement during servicing. Be alert to possible machine movement caused by hydraulic leakage. If hydraulics drift, see an authorized John Deere dealer.

8. From seat, verify machine is stable and front end is still raised.

**CAUTION:** Avoid possible injury from falls or slips. Use care when entering and exiting machine with front end raised. Maintain three point contact. DO NOT use bucket as foothold when machine is in raised position.

9. Exit machine using handholds and top of track for assistance.

**NOTE:** If gravel or mud is packed between sprocket and track, gravel and mud must be removed before adjusting track.

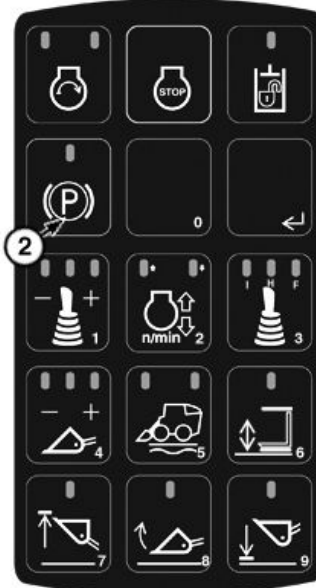
10. Measure distance (3) from bottom of third roller from rear of machine to top of track. The bottom of the rollers should not be touching the track.

	Specification	
Track—Sag.....	25—38 mm	
	1.0—1.5 in	

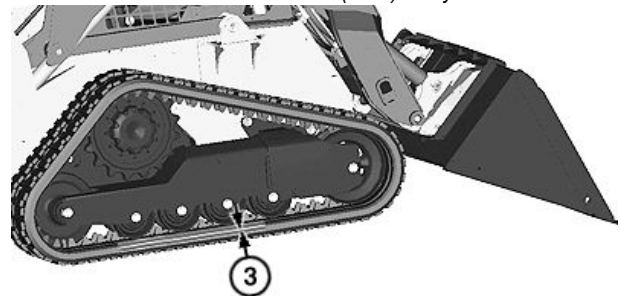
Quik-Tatch is a trademark of Deere & Company



Park Brake Switch—Key Start



Sealed Switch Module (SSM)—Keyless Start



Track Sag Measurement

- 1— Park Brake Switch (control panel—key start)
- 2— Park Brake Switch (control panel—keyless start)
- 3— Distance

Continued on next page

CN93077,00006AB -19-30JUN17-1/2

TX1125062—UN—31OCT12

TX1203876—UN—13NOV15

TX1203766—UN—15OCT15

**CAUTION:** Prevent personal injury. High-pressure grease is in track adjuster cylinder. Do not loosen track adjuster valve (5) quickly or too much. Never loosen grease fitting (4) to release grease.

**IMPORTANT:** Prevent possible damage to track components. Do not use the grease fitting on track adjuster cylinder for lubrication. Use grease fitting only for track sag adjustment.

11. If track sag is not within specification, remove track adjuster cover plate on track frame.
12. To decrease track sag, add grease to track adjuster cylinder through grease fitting (4).

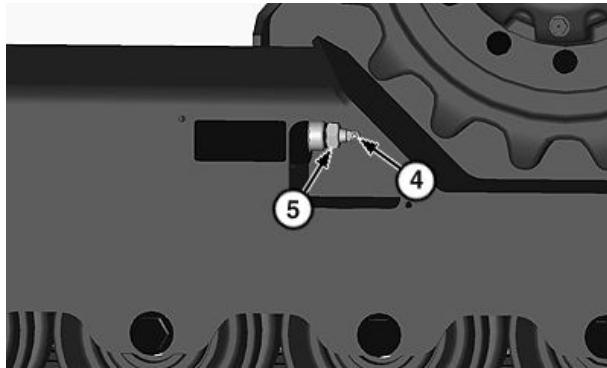
To increase track sag, loosen track adjuster valve (5) 1—2 turns to release grease from track adjuster cylinder.

Tighten track adjuster valve when track sag is correct.

Specification	
Track—Sag.....	25—38 mm 1.0—1.5 in

13. Install track adjuster cover plate on track frame.
14. Repeat procedure for other track.

**CAUTION:** Avoid possible injury from falls or slips. Use care when entering and exiting



Track Adjuster

4— Grease Fitting

5— Adjuster Valve

**machine with front end raised. Maintain three point contact. DO NOT use bucket as foothold when machine is in raised position.**

15. Enter machine using top of track and handholds on machine for assistance.
16. Start machine and rollback bucket to lower front end.

TX1203833—UN—15OCT15

CN93077,00006AB -19-30JUN17-2/2

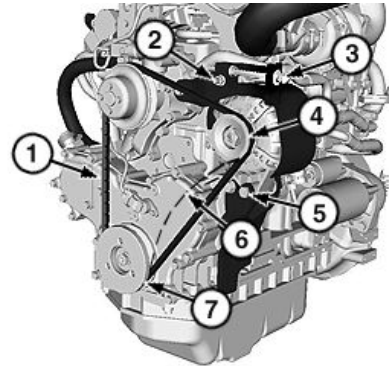


# Maintenance—Every 100 Hours

## Check and Adjust Accessory Drive Belt Tension

*NOTE: Machines with an air conditioner come equipped with an automatic belt tension adjuster. This procedure is only necessary on machines without an air conditioner.*

1. Check accessory drive belt (1) regularly for wear, especially for cracks at the bottom of grooves and for frayed edges. If necessary, replace belt. See Replacing Accessory Drive Belt. (Section 4-1.)
2. Check belt tension by depressing the midpoint between the alternator pulley (4) and crankshaft pulley (7) with thumb. Deflection (6) must be within specification.



Engine Without Air Conditioner

Specification	
Belt—Deflection (6).....	5 mm 0.20 in
Belt—Depressing Force.....	160 N 36.0 lbf

3. If tension is not within specification, loosen top alternator cap screw (2) and bottom alternator cap screw (5).
4. Move alternator forward or backwards by turning belt tension adjusting cap screw (3). Adjust until tension meets specification.
5. Tighten top and bottom alternator cap screws to specification.

- |                                     |                                |
|-------------------------------------|--------------------------------|
| 1— Accessory Drive Belt             | 5— Bottom Alternator Cap Screw |
| 2— Top Alternator Cap Screw         | 6— Deflection                  |
| 3— Belt Tension Adjusting Cap Screw | 7— Crankshaft Pulley           |
| 4— Alternator Pulley                |                                |

	Specification
Top Alternator Cap Screw—Torque.....	.25 N·m 221 lb·in
Bottom Alternator Cap Screw—Torque.....	.70 N·m 52 lb·ft

CN93077,00006AC -19-18NOV15-1/1

TX1204137—UN—21OCT15

## Maintenance—Every 250 Hours

### Take Engine Oil Sample

See an authorized John Deere dealer for procedures and sampling equipment.

JG33441,000012E -19-30MAR17-1/1

# Maintenance—Every 500 Hours

## Drain and Refill Engine Oil and Replace Filter

*NOTE: Engine oil may appear milky in color due to machine being equipped with closed crankcase ventilation system, which may cause moisture on engine oil dipstick and fill cap.*

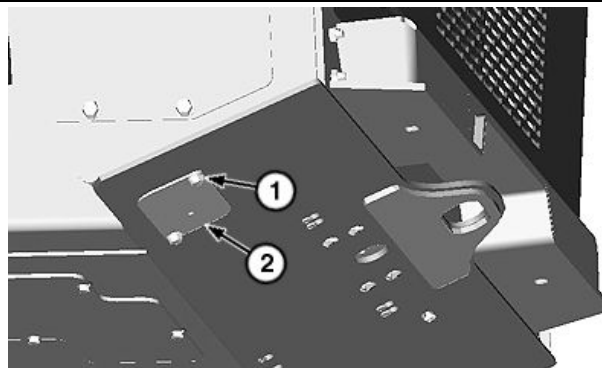
If engine oil appears milky in color, check engine coolant level to verify engine coolant has not entered the engine oil system. See Check Coolant Level. (Section 3-4.)

If there is still concern after checking engine coolant level, take an engine oil sample for further analysis. See Take Engine Oil Sample. (Section 3-7.)

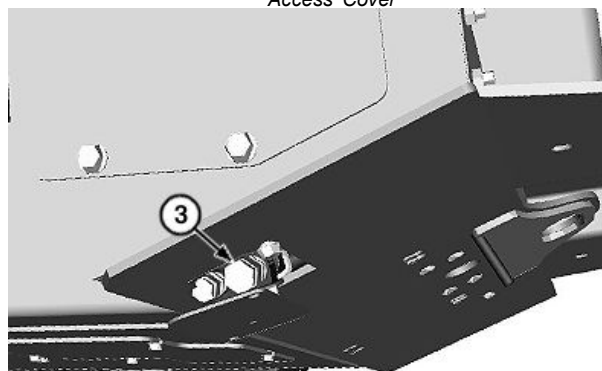
1. Park machine on a level surface.
2. Run engine to warm oil.
3. Engage park brake and stop engine.
4. Under left rear side of machine, remove cap screws (1) from access cover (2) and pull out cover with attached engine oil drain hose.
5. Place suitable container under engine oil drain plug (3). Remove hose plug using two wrenches to avoid twisting hose. Allow oil to drain into suitable container. Dispose of waste oil properly.
6. After oil is drained, install hose plug.
7. Make sure O-ring is still intact when installing hose plug.
8. Open rear service door and engine cover.
9. Clean dirt or debris around engine oil filter (4).
10. Place suitable container under engine oil filter.
11. To remove oil filter, turn filter counterclockwise using a filter wrench. Allow oil to drain from filter.

**IMPORTANT: DO NOT prefill filter. Debris in unfiltered oil may damage engine components.**

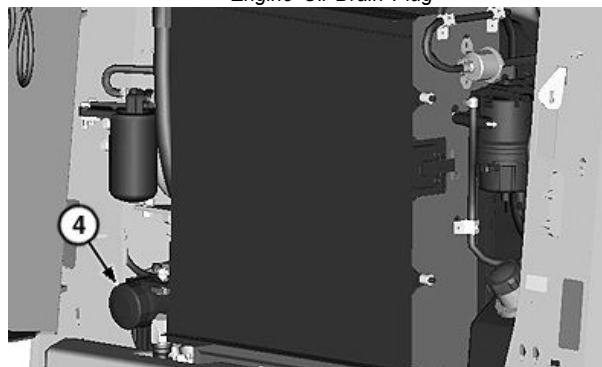
12. Apply a film of clean engine oil on seal of new filter.
13. Install filter. Turn filter until seal contacts mounting surface. Then turn filter by hand 2/3—1 turn more.



Access Cover



Engine Oil Drain Plug



Engine Oil Filter

1— Cap Screw (2 used)  
2— Access Cover

3— Engine Oil Drain Plug  
4— Engine Oil Filter

Continued on next page

CN93077,000071A -19-23NOV15-1/2

TX1202807 —UN—30SEP15

TX1205953 —UN—19NOV15

TX1206168 —UN—23NOV15

14. Remove engine oil fill cap (5).

**IMPORTANT: Avoid engine damage. Do not overfill engine oil.**

15. Add oil. For recommended oil, see Diesel Engine Oil. (Section 3-1.)

**Specification**

Engine—Oil Capacity	
With Filter.....	7.5 L 2.0 gal

16. Check engine oil level on dipstick (6).

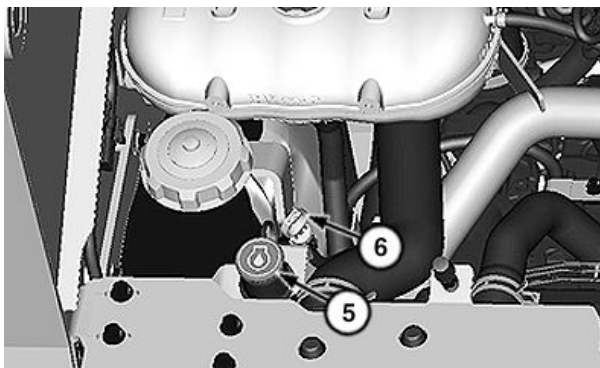
17. Install engine oil fill cap.

18. Start engine and run for 2 minutes. Check for leaks around filter and drain plug.

19. Stop engine.

20. Check engine oil level on dipstick.

21. Install access cover and cap screws.



Engine Oil Fill Cap and Dipstick

5— Engine Oil Fill Cap

6— Dipstick

22. Close engine cover and rear service door.

CN93077,000071A -19-23NOV15-2/2

TX1205965 —UN—19NOV15

**Replace Primary Fuel Filter and Water Separator**

1. Park machine on a level surface.

2. Engage park brake and stop engine.

3. Open rear service door.

4. Turn fuel shutoff valve (1) to OFF position.

5. Thoroughly clean exterior of primary fuel filter and water separator assembly (2) and surrounding area.

6. Place a suitable container under drain valve (3) of primary fuel filter and water separator.

7. Loosen drain valve to drain water, sediment, and fuel into suitable container. Dispose of waste properly.

8. Close drain valve.

9. Disconnect water-in-fuel (WIF) sensor (4) connector.

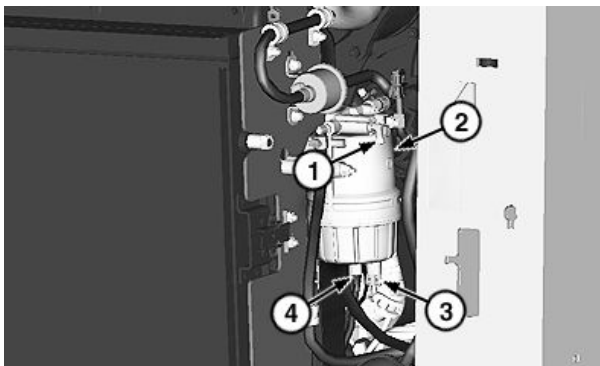
10. Remove water separator bowl from filter element. Clean and dry separator bowl.

11. Inspect bowl. Replace if necessary.

12. Remove filter and discard.

**IMPORTANT: DO NOT prefill fuel filters. Debris in unfiltered fuel will damage fuel system components.**

**Only lubricate filter seal with diesel fuel before installing.**



Primary Fuel Filter and Water Separator

1— Fuel Shutoff Valve  
2— Primary Fuel Filter and Water Separator Assembly

3— Drain Valve  
4— Water-In-Fuel (WIF) Sensor

13. Install new filter element.

14. Install water separator bowl. Tighten 1/2 turn after seal contacts mounting base.

15. Connect WIF sensor connector and turn fuel shutoff valve to ON position.

16. Bleed fuel system. See Bleed Fuel System. (Section 4-1.)

17. Close rear service door.

CN93077,000071B -19-23NOV15-1/1

TX1206169 —UN—23NOV15

## Replace Final Fuel Filter

**NOTE:** Perform this service at required interval when operating in normal conditions. When operating in dry, dusty conditions, it may be necessary to replace final fuel filter more often.

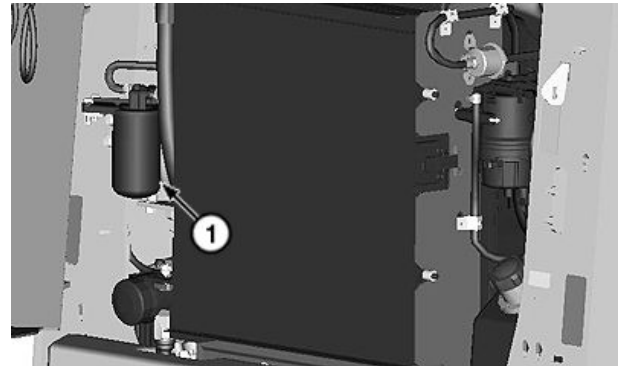
1. Park machine on a level surface.
2. Engage park brake and stop engine.
3. Open rear service door.
4. Clean area around final fuel filter (1).

**NOTE:** Some fuel will be present in final fuel filter housing.

5. Place suitable container under final fuel filter. Rotate final fuel filter counterclockwise and remove from mounting base. Dispose of waste properly.
6. Clean filter mounting base.

**IMPORTANT: DO NOT prefill fuel filters. Debris in unfiltered fuel will damage fuel system components.**

**Only lubricate filter seal with diesel fuel before installing.**



Final Fuel Filter

1— Final Fuel Filter

7. Install new final fuel filter onto mounting base. Rotate filter housing clockwise by hand. Tighten 1 turn after seal contacts mounting base.
8. Bleed fuel system. See Bleed Fuel System. (Section 4-1.)
9. Close rear service door.

CN93077,000071C -19-23NOV15-1/1

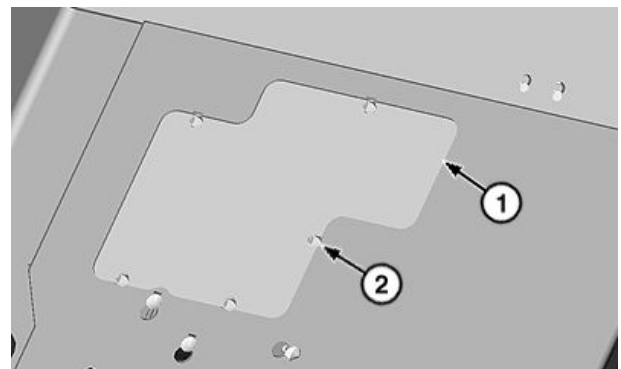
TX1205971 —UN—19NOV15

## Drain Water and Sediment From Fuel Tank

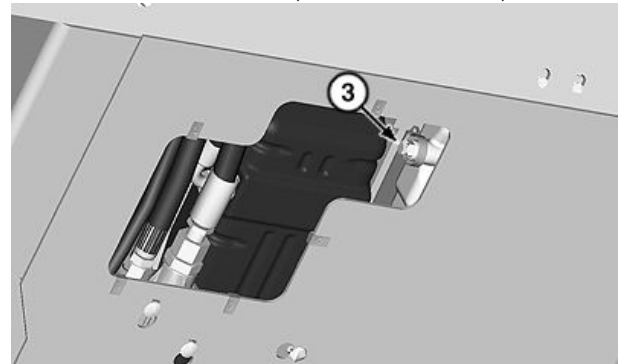
1. Park machine on a level surface.
2. Engage park brake and stop engine.
3. Raise and block machine. See Raising and Blocking Machine. (Section 3-2.)
4. Remove cap screws (2) and service panel (1) from under machine.
5. Place a suitable container under drain valve (3) of fuel tank.
6. Loosen drain valve. Drain water and sediment into a suitable container until clean fuel emerges. Dispose of waste properly.
7. Close drain valve.
8. Install service panel and cap screws.

1— Service Panel  
2— Cap Screw (5 used)

3— Drain Valve



Service Panel (shown under machine)



Fuel Tank Drain Valve

CN93077,000071D -19-23NOV15-1/1

TX1205978 —UN—19NOV15

TX1205980 —UN—19NOV15

**Take Fluid Samples**

See an authorized John Deere dealer for procedures and sampling equipment.

- Hydraulic Oil
- Engine Coolant
- Diesel Fuel

CN93077,0000699 -19-01OCT15-1/1

# Maintenance—Every 1000 Hours

## Check Coolant Condition

**⚠ CAUTION:** Prevent possible injury from hot, spraying fluids. Shut off engine. Remove filler cap only when cool enough to touch with bare hands. Slowly loosen cap to relieve pressure before removing completely.

*NOTE: Check coolant every 1000 hours, yearly, or when replacing 1/3 or more of coolant using SERVICEGARD™ tool program.*

1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Open rear service door.
4. Open engine cover to access surge tank (2).
5. Test engine coolant. See Testing Coolant Freeze Point. (Section 3-1.)
6. Install surge tank cap (1).
7. Close engine cover.
8. Close rear service door.

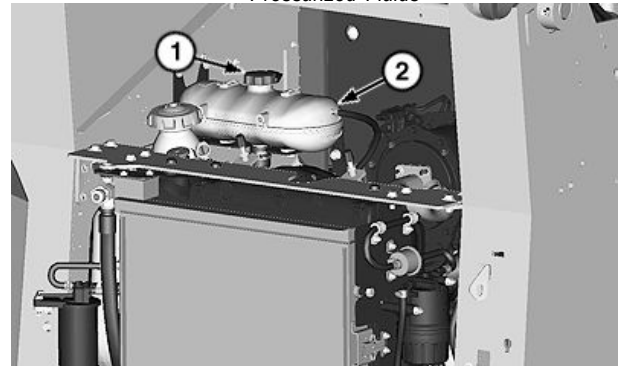
1— Surge Tank Cap

2— Surge Tank

*SERVICEGARD is a trademark of Deere & Company*



Pressurized Fluids



Surge Tank

TS281 —UN—15APR13

TX1201690 —UN—16SEP15

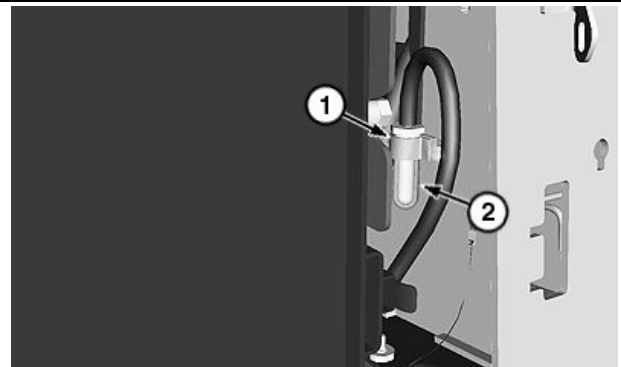
CN93077,000066A -19-19OCT15-1/1

## Replace Fuel Tank Breather

1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Open rear service door.
4. Open hose clamp (1) to access fuel tank breather (2).
5. Rotate fuel tank breather counterclockwise to remove.
6. Discard fuel tank breather.
7. Install new fuel tank breather.
8. Close rear service door.

1— Hose Clamp

2— Fuel Tank Breather



Fuel Tank Breather

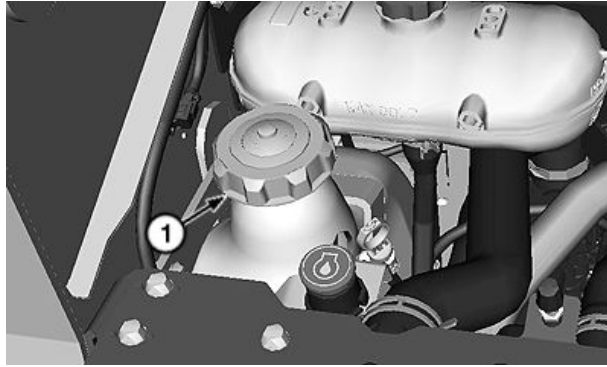
TX1202788 —UN—26OCT15

CN93077,0000696 -19-26OCT15-1/1

## Replace Hydraulic Oil Reservoir Breather

*NOTE: Hydraulic oil reservoir breather is an integral part of the hydraulic reservoir fill cap.*

1. Park machine on a level surface.
2. Engage park brake and stop engine.
3. Open rear service door and engine cover.
4. Remove hydraulic reservoir fill cap (1).
5. Install new hydraulic reservoir fill cap.
6. Close engine cover and rear service door.



Hydraulic Reservoir Fill Cap

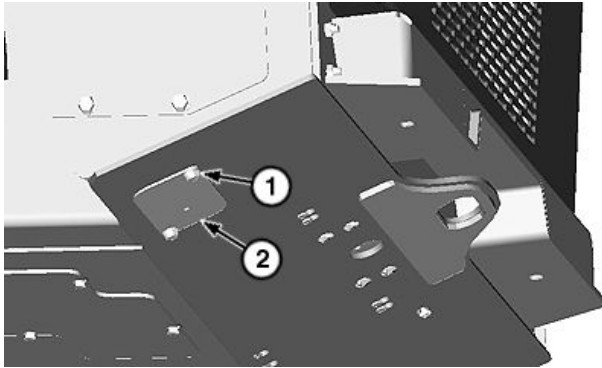
1— Hydraulic Reservoir Fill Cap

TX1202909 —UN—01OCT15

CN93077,000069B -19-01OCT15-1/1

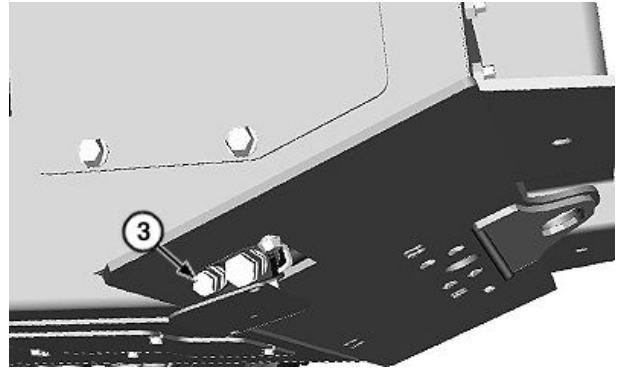


## Drain and Refill Hydraulic Oil and Replace Filter



Drain Cover

TX1202807—UN—30SEP15



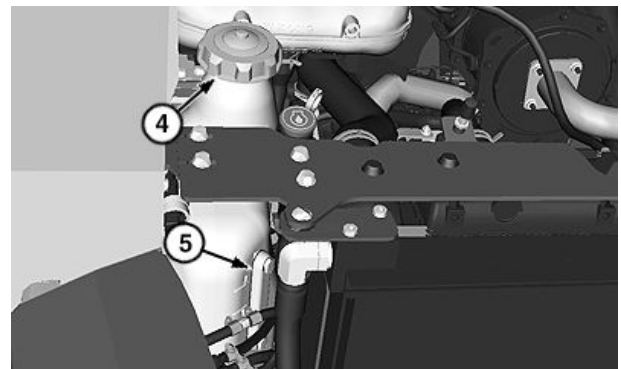
Hydraulic Reservoir Drain Plug

TX1202808—UN—30SEP15

**IMPORTANT:** Avoid hydraulic system component damage. When adding oil to the hydraulic reservoir, be careful not to get dirt into reservoir or oil.

To ensure an accurate reading, park machine on smooth, level ground and check level only when hydraulic oil is cold and boom is down with boom and bucket cylinders fully retracted.

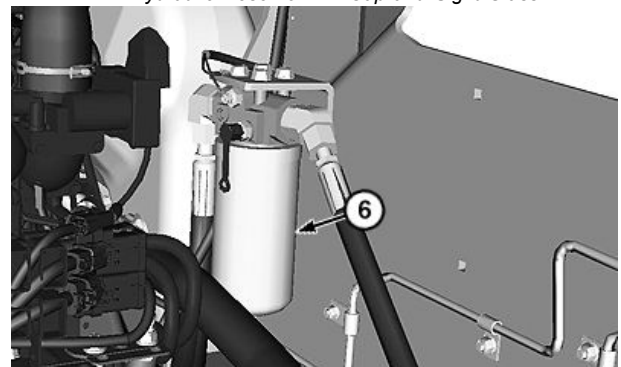
Do not overfill hydraulic oil reservoir. An overfilled hydraulic oil reservoir will not allow for oil expansion, which may result in oil leakage past hydraulic reservoir fill cap (4).



Hydraulic Reservoir Fill Cap and Sight Glass

TX1202866—UN—01OCT15

1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Raise operator's station. See Raising Operator's Station. (Section 3-2.)
4. Raise and block machine. See Raising and Blocking Machine. (Section 3-2.)
5. Open rear service door and engine cover.
6. Remove hydraulic reservoir fill cap (4).
7. Under left rear side of machine, remove cap screws (1) from drain cover (2) and pull out cover with attached hydraulic reservoir drain plug (3).
8. Position a suitable container under hydraulic reservoir drain plug.
9. Remove hydraulic reservoir drain plug and drain hydraulic oil. Dispose of waste properly.
10. Remove hydraulic oil filter element (6) and discard.
11. Install new filter element.
12. Install hydraulic reservoir drain plug.
13. Fill hydraulic oil reservoir. For recommended hydraulic oil, see Hydraulic and Hydrostatic Oil. (Section 3-1.)



Hydraulic Oil Filter Element

TX1202867—UN—01OCT15

- |                                   |                                 |
|-----------------------------------|---------------------------------|
| 1— Cap Screw (2 used)             | 4— Hydraulic Reservoir Fill Cap |
| 2— Drain Cover                    | 5— Sight Glass                  |
| 3— Hydraulic Reservoir Drain Plug | 6— Hydraulic Oil Filter Element |

### Specification

Hydraulic Reservoir Oil—Capacity.....	22.7 L
	6.0 gal

14. Check hydraulic reservoir oil level on sight glass (5). See Check Hydraulic Oil Level. (Section 3-4.)
15. Inspect hydraulic reservoir drain plug for leaks.

Continued on next page

CN93077.0000698 -19-16OCT15-1/2

16. Install drain cover and cap screws.
17. Install hydraulic reservoir fill cap.

18. Close engine cover and rear service door.

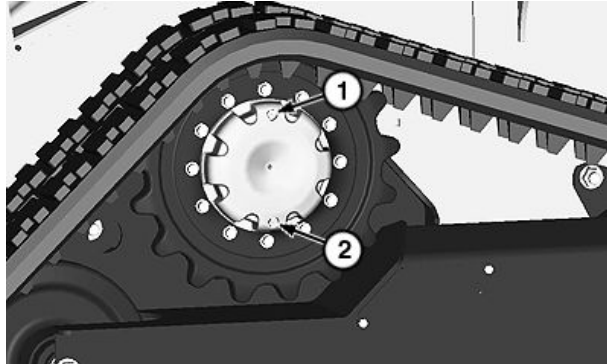
CN93077,0000698 -19-16OCT15-2/2

### Drain and Refill Hydrostatic Motor Brake Cavity Oil

1. Park machine on level surface with drain plug (2) at bottom of hydrostatic motor brake cavity.
2. Engage park brake and stop engine.

**⚠ CAUTION: High-pressure release of fluids from a pressurized system can cause serious burns. Wait for hydrostatic motor brake cavity oil to cool. Keep body and face away from fill plug. Gradually loosen fill plug to release pressure.**

3. Allow machine to cool. Slowly loosen fill plug (1) to release pressure.
4. Remove drain plug. Allow oil to drain into a container. Dispose of waste properly.
5. Install drain plug.
6. Remove fill plug.
7. Add oil to fill plug hole. For recommended oil, see Hydrostatic Motor Brake Cavity Oil. (Section 3-1.)



Hydrostatic Motor Brake Cavity

1— Fill Plug

2— Drain Plug

#### Specification

Hydrostatic Motor Brake Cavity Oil—Capacity (per side).....	0.35 L
	11.83 fl oz

8. Install fill plug.

CN93077,000069E -19-13SEP17-1/1

TX1203358—UN—12OCT15

## Maintenance—Every 1500 Hours

### Check and Adjust Engine Valve Lash

See an authorized John Deere dealer.

JK47244,0000180 -19-09SEP15-1/1

# Maintenance—Every 6000 Hours

## Drain, Flush, and Refill Cooling System

### Drain Cooling System

**⚠ CAUTION:** Prevent possible injury from hot spraying fluids. Shut off engine. Remove filler cap only when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

Drain and flush cooling system using clean water and refill with new coolant.

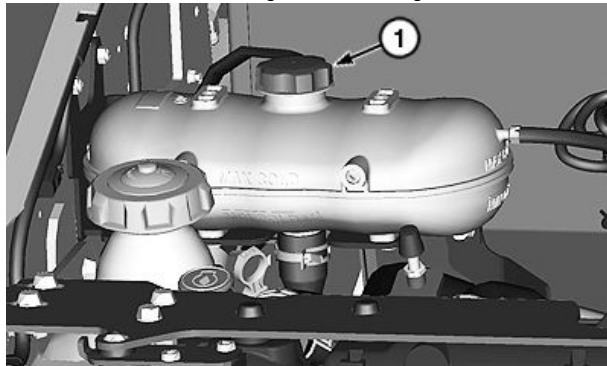
1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Allow engine to cool.
4. Open rear service door and engine cover.
5. Slowly turn surge tank cap (1) to release pressure. Remove cap.
6. Route drain hose (2) through rear service door. Place suitable container under drain hose.
7. Inside right side of engine compartment, behind radiator, open drain valve (3) and allow coolant to drain into suitable container. Dispose of waste properly.
8. Close drain valve.

1— Surge Tank Cap  
2— Drain Hose

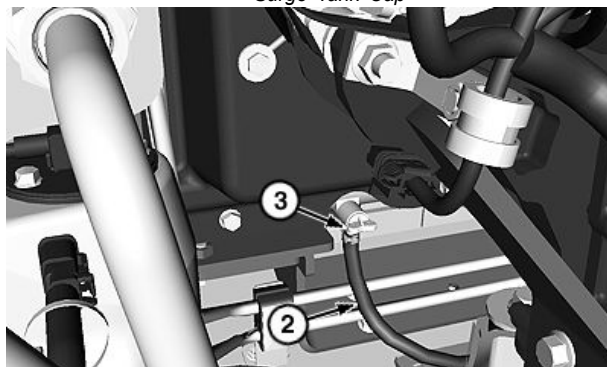
3— Drain Valve



Surge Tank Warning



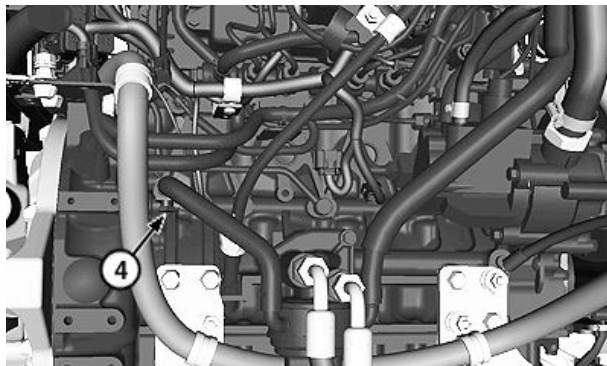
Surge Tank Cap



Drain Valve (shown from inside engine compartment)

9. On left side of machine, open engine block drain valve (4) and allow coolant to drain into suitable container. Dispose of waste properly.
10. Close engine block drain valve.

4— Engine Block Drain Valve



Engine Block Drain Valve (components removed for clarity)

Continued on next page

CN93077,000071F -19-03DEC15-1/4

T6642EK—UN—01NOV88

TX1206257—UN—24NOV15

TX1206256—UN—24NOV15

TX1206259—UN—08DEC15

### Flush Cooling System

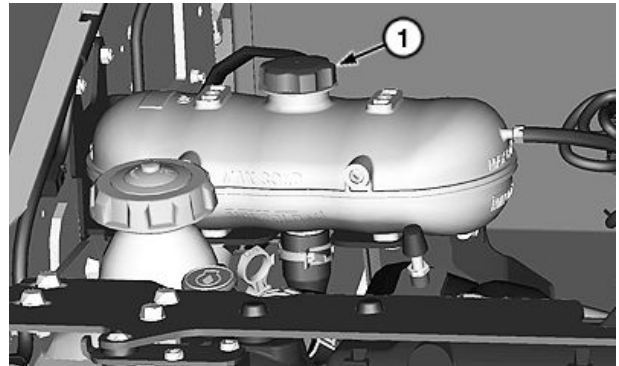
**IMPORTANT: To prevent engine damage:**

- Do not pour coolant into a hot engine.
- Do not operate engine without coolant.

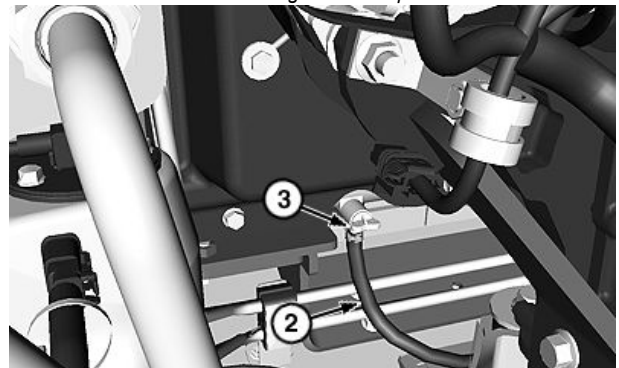
1. Fill cooling system with clean water, John Deere Cooling System Cleaner, and John Deere Cooling System Quick Flush. Follow directions on container.
2. Install surge tank cap (1).
3. Start and run engine until engine reaches operating temperature.
4. Stop engine.
5. Place suitable container under drain hose (2).

**⚠ CAUTION: Prevent burns from hot flushing solution. Avoid skin contact with flushing solution.**

6. Drain cooling system immediately before rust and dirt settle. Slowly remove radiator cap and open drain valve (3). Allow flushing solution to drain into suitable container. Dispose of waste properly.
7. Close drain valve and route drain hose back.
8. Fill cooling system with proper coolant. See Fill Cooling System in this section.



Surge Tank Cap



Drain Valve (shown from inside engine compartment)

1— Surge Tank Cap  
2— Drain Hose

3— Drain Valve

Continued on next page

CN93077,000071F -19-03DEC15-3/4

TX1206257 —UN—24NOV15

TX1206256 —UN—24NOV15

**Fill Cooling System**

**IMPORTANT:** Use only permanent type, low silicate, ethylene glycol base antifreeze in coolant solution. Other types of antifreeze may damage cylinder seals.

If not using premixed coolant, use only distilled water when mixing with ethylene glycol concentrate.

*NOTE: John Deere COOL-GARD™ II Pre-Mix coolant is recommended when adding new coolant to cooling system.*

*Follow directions on container for correct mixture ratio.*

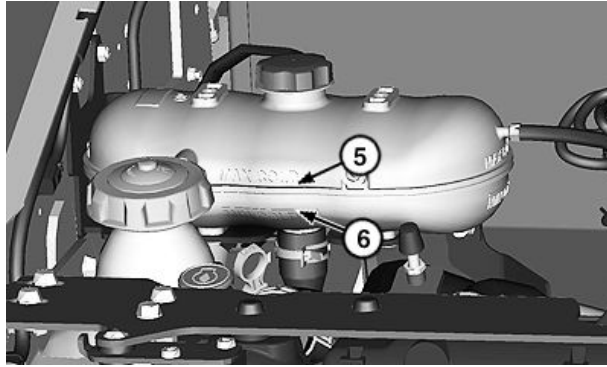
1. Check condition of coolant system hoses. If new hoses are needed, see an authorized John Deere dealer.
2. Fill system with coolant. For recommended coolant, see Diesel Engine Coolant (engine without wet sleeve cylinder liners). (Section 3-1.)

**Specification**

Cooling System—Capacity..... 12.0 L  
3.2 gal

3. Install surge tank cap.

*COOL-GARD is a trademark of Deere & Company*



Surge Tank

5— MAX COLD Mark

6— MIN COLD Mark

4. Start engine and run until engine reaches operating temperature, allowing entire system to be filled with coolant.
5. Stop engine.
6. Allow engine to cool.
7. Check coolant level in surge tank. Coolant should be to the MAX COLD mark (5) on the surge tank.

TX1206262 —UN—24NOV15

CN93077,000071F -19-03DEC15-4/4

## Miscellaneous—Machine

### Bleed Fuel System

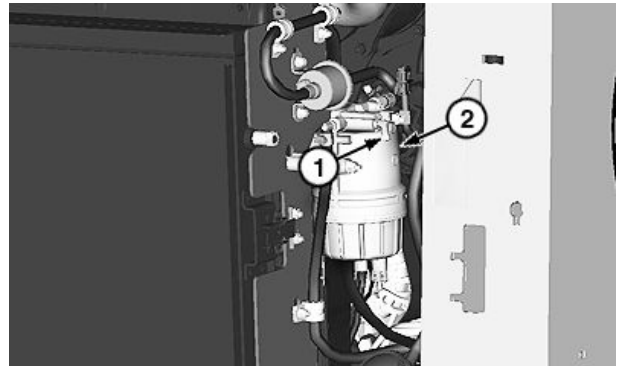
**NOTE:** This procedure should be performed after each fuel filter change or when the engine has run out of fuel.

This machine is equipped with an electric low-pressure fuel pump.

1. Park machine on level surface.
2. Make sure fuel tank is full.
3. Open rear service door.
4. Check that fuel shutoff valve (1) is in the ON position.
5. Turn switched power ON. The electric low-pressure fuel pump will start to bleed air.

If primary fuel filter and water separator (2) was replaced, allow fuel pump to run for 120 seconds before trying to start engine.

If engine has run out of fuel, allow fuel pump to run for 60 seconds before trying to start engine.



Primary Fuel Filter and Water Separator

1— Fuel Shutoff Valve

2— Primary Fuel Filter and Water Separator

6. Start engine. Check fuel supply system for leaks. If engine does not start or starts and stalls, repeat procedure.
7. Close rear service door.

CN93077,000072A -19-03DEC15-1/1

### Do Not Service or Adjust Injection Nozzles or High-Pressure Fuel Pump

If injection nozzles are not working correctly or are dirty, the engine will not run normally. See an authorized John Deere dealer for service.

Changing the high-pressure fuel pump in any way not approved by the manufacturer will end the warranty. See copy of the John Deere warranty on this machine.

Do not service a high-pressure fuel pump that is not operating correctly. See an authorized John Deere dealer.

VD76477,0000366 -19-30MAR17-1/1

### Do Not Service Control Valves, Cylinders, Pumps, or Motors

Special tools and information are needed to service control valves, cylinders, pumps, or motors.

If these parts need service, see an authorized John Deere dealer.

TX,90,DH2537 -19-27JUL15-1/1

### Precautions for Alternator and Regulator

When batteries are connected, follow these rules:

1. Disconnect negative (-) battery cable when working on or near alternator or regulator.
2. DO NOT TRY TO POLARIZE ALTERNATOR OR REGULATOR.
3. Be sure alternator wires are correctly connected BEFORE connecting batteries.
4. Do not ground alternator output terminal.
5. Do not disconnect or connect any alternator or regulator wires while batteries are connected or while alternator is operating.
6. Connect batteries or a booster battery in the correct polarity (positive [+] to positive [+] and negative [-] to negative [-]).
7. Do not disconnect the batteries when engine is running and alternator is charging.
8. Disconnect battery cables before connecting battery charger to the batteries. If machine has more than one battery, each battery must be charged separately.

CED,OUO1021,185 -19-30MAR17-1/1

## Handling, Checking, and Servicing Batteries Carefully

**⚠ CAUTION:** Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

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

Always remove grounded (-) battery clamp first and replace it last.

Sulfuric acid in battery electrolyte is poisonous. Sulfuric acid is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Using proper jump start procedure.

If acid is spilled on a person:

1. Flush contacted skin with water.
2. Apply baking soda or lime to contacted area to help neutralize the acid.
3. Flush eyes with water for 15—30 minutes.
4. Get medical attention immediately.

If acid is swallowed:

1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 1.9 L (2 qt).
3. Get medical attention immediately.

**⚠ CAUTION:** Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling. If electrolyte spills on the floor, use one of the following mixtures to neutralize the acid: 0.5 kg (1 lb) baking soda in 4 L (1 gal) water or 0.47 L (11.0 fl oz) household ammonia in 4 L (1 gal) water.

Do not overfill the battery cells.

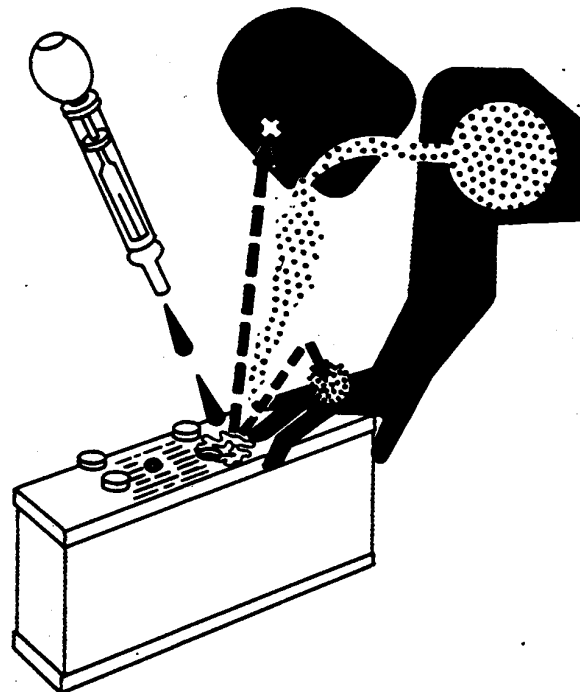
Check the specific gravity of electrolyte in each battery cell.

See an authorized John Deere dealer for SERVICEGARD™ battery and coolant tester. Follow directions included with the tester.

A fully charged battery will have a corrected specific gravity reading of 1.260. If the reading is below 1.200, charge the battery.



Exploding Battery Gas



Battery Electrolyte



Battery and Coolant Tester

TS204 —UN—15APR13

TS203 —UN—23AUG88

T85402 —UN—10NOV88



## Using Battery Charger

**⚠ CAUTION:** Prevent possible injury from exploding battery. Do not charge a battery if the battery is frozen or it may explode. Warm battery to 16°C (60°F) before charging.

Turn off charger before connecting or disconnecting it.

**IMPORTANT:** Do not use battery charger as a booster if a battery has a 1.150 specific gravity reading or lower.

**Disconnect battery ground (-) clamp before charging batteries in the machine to prevent damage to electrical components.**

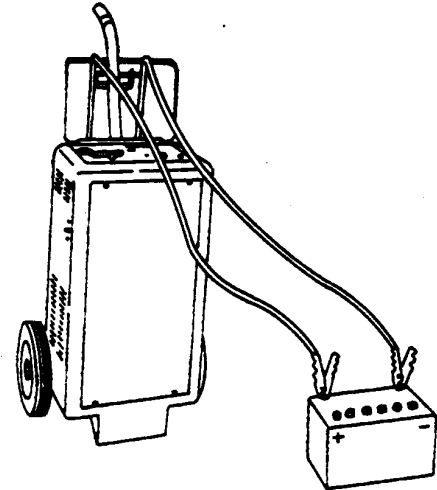
A battery charger may be used as a booster to start engine.

Ventilate the area where batteries are being charged.

Stop or cut back charging rate if battery case feels hot or is venting electrolyte. Battery temperature must not exceed 52°C (125°F).



Prevent Battery Explosions



Charger

TS204—UN—15APR13

N36890—UN—07OCT88

OUT4001,0000239 -19-13JAN16-1/1

### Using Booster Batteries—12-Volt System

Before boost starting, machine must be properly shut down to prevent unexpected machine movement when engine starts.

**⚠ CAUTION:** Prevent possible injury from exploding battery. An explosive gas is produced while batteries are in use or being charged. Keep flames or sparks away from the battery area. Make sure the batteries are charged in a well-ventilated area.

**IMPORTANT:** The machine electrical system is a 12-volt negative (-) ground. Use only 12-volt booster batteries.

1. Connect one end of the positive cable to the positive terminal of the machine batteries and the other end to the positive terminal of the booster batteries.
2. Connect one end of the negative cable to the negative terminal of the booster batteries. Connect other end of the negative cable to the machine as far away from the machine batteries as possible.
3. Start engine.
4. Immediately after starting engine disconnect end of the negative cable from the machine. Then disconnect the other end of the negative cable from the negative terminal of the booster batteries.
5. Disconnect positive cable from booster batteries and machine batteries.



Using Booster Batteries

TS204 —UN—15APR13

OUT4001,00000E1 -19-21JUL17-1/1

## Removing Battery

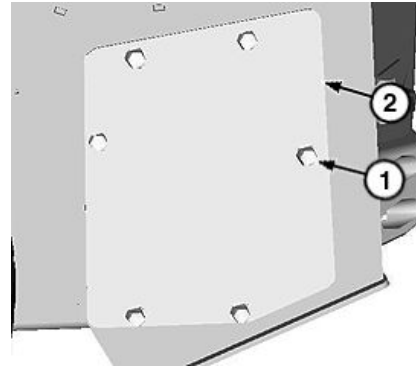
**⚠ CAUTION: Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.**

If equipped with rear counterweight, counterweight needs removed to access batteries. See Adding Rear Counterweights in this section.

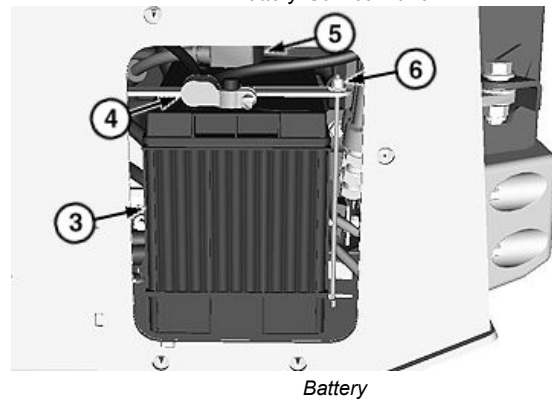
1. Park machine on level surface.
2. Engage park brake and stop engine.
3. Remove cap screws (1) and left rear service panel (2).
4. Disconnect negative (-) terminal (4) cable from battery.
5. Pull back red positive terminal cover (5) and disconnect positive (+) cable from battery.
6. Clean battery (3) with a damp cloth. Keep dirt out of battery cells.
7. Loosen J-bolt (6) on battery hold-down bracket.
8. Lift battery from battery compartment.
9. Clean battery, battery terminals, cable ends, battery compartment, and other parts with a solution of 1 part baking soda to 4 parts water. Keep solution out of battery cells.
10. Rinse all parts with clean water and let dry.

**NOTE:** If a new battery is needed, install a battery of equal specification. See Replacing Battery in this section.

11. Place battery in battery compartment.
12. Install battery hold-down bracket.
13. Install J-bolt and tighten hardware.
14. Connect positive (+) cable to battery positive (+) terminal. Apply petroleum or silicone spray to terminal to prevent corrosion. Make sure connection is tight. Push red positive cover over positive terminal.



Battery Service Panel



Battery

- |                            |                            |
|----------------------------|----------------------------|
| 1— Cap Screw (6 used)      | 4— Negative (-) Terminal   |
| 2— Left Rear Service Panel | 5— Positive Terminal Cover |
| 3— Battery                 | 6— J-Bolt                  |

15. Connect negative (-) cable to battery negative (-) terminal. Apply petroleum or silicone spray to terminal to prevent corrosion. Make sure connection is tight.
16. Install left panel.

CN93077,000072C -19-20JAN16-1/1

## Replacing Battery

This machine has one 12-volt battery with negative (-) ground. Battery must meet one of the specifications below.

Specification	
Battery—Cold Cranking	
Amps.....	750

Battery—Minutes	
Reserve Capacity.....	150

For removal and installation procedure, see Removing Battery in this section.

JK47244,000031F -19-10JUL13-1/1

TX1206346—UN—25NOV15

TX1206360—UN—25NOV15

## Welding on Machine

**⚠ CAUTION:** Avoid potentially toxic fumes and dust. Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch. Do all work outside or in a well-ventilated area. Dispose of paint and solvent properly.

When sanding or grinding painted surfaces, avoid breathing the dust. Wear an approved respirator. When using 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.

**IMPORTANT:** Have only a qualified welder perform this job. Connect welder ground clamp close to each weld area so electrical current does not pass through any bearings, articulation joints, or pivot points. Remove or protect all parts that can be damaged by heat or weld splatter.

1. Remove paint before welding or heating.

- When sanding or grinding paint, avoid breathing the dust.
- Wear an approved respirator. When using 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.

**IMPORTANT:** Electrical current traveling from the welder through the machine electrical system may damage the machine electrical system, including battery and control units. Disconnect battery positive and negative cables before welding on machine.

2. Disconnect the negative (-) battery cables.
3. Disconnect the positive (+) battery cables.
4. Cover, protect, or move any wiring harness sections away from welding area.

For any repairs, see an authorized John Deere dealer.

VD76477,00005A0 -19-21JUL17-1/1

## Keep Electronic Control Unit Connectors Clean

**IMPORTANT:** Do not open control unit and do not clean with a high-pressure spray. Moisture, dirt, and other contaminants may cause permanent damage.

1. Keep terminals clean and free of foreign debris. Moisture, dirt, and other contaminants may cause the terminals to erode over time and not make a good electrical connection.

2. If a connector is not in use, put on the proper dust cap or an appropriate seal to protect it from foreign debris and moisture.
3. Control units are not repairable.
4. Since control units are the components LEAST likely to fail, isolate failure before replacing by completing a diagnostic procedure. (See your John Deere dealer.)
5. The wiring harness terminals and connectors for electronic control units are repairable.

DX,WW,ECU04 -19-11JUN09-1/1

### Remove and Install Halogen Bulbs

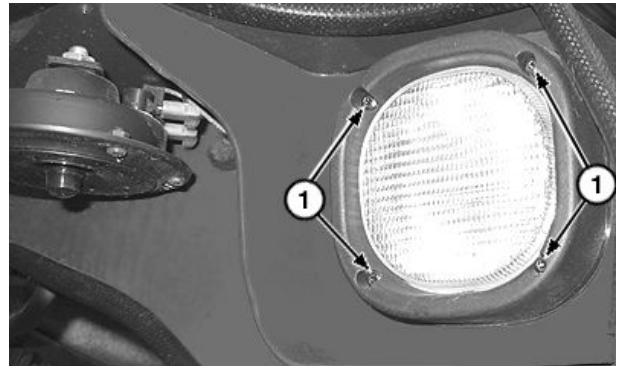
1. Remove TORX® screws (1) and pull out lamp housing (2) from machine.
2. Disconnect harness connector (3).
3. Release retainer clip (4) to remove halogen bulb (5) from lamp.
4. Disconnect halogen bulb from connector (6).

**IMPORTANT: Do not touch the halogen bulb with bare hands. Oil and moisture may cause premature bulb malfunction. If bulb is touched, clean bulb glass using an oil-free cloth with alcohol.**

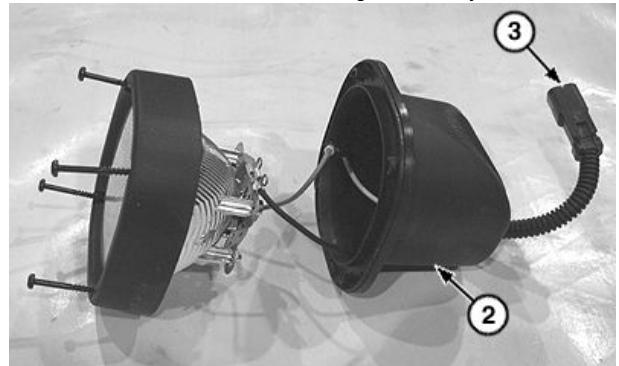
5. Connect new halogen bulb and install into lamp.
6. Install retainer clip.
7. Connect harness connector and install lamp housing back into machine.
8. Install TORX® screws.

1—TORX® Screw (4 used)  
2—Lamp Housing  
3—Harness Connector

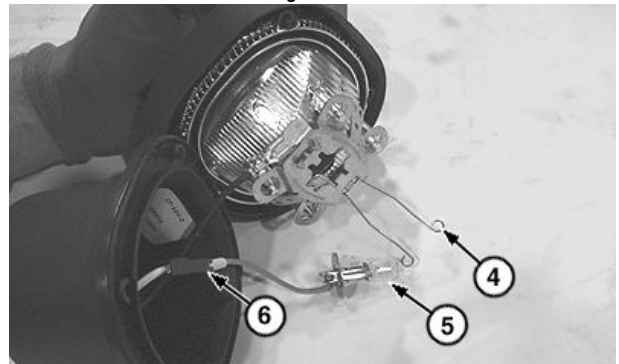
4—Retainer Clip  
5—Halogen Bulb  
6—Connector



Four Screws for Light Assembly



Bulb Housing and Wire Connector



Retainer Clip and Halogen Bulb

TORX is a trademark of Camcar/Textron

CN93077,000005A -19-16MAY13-1/1

TX1066041A —UN—13OCT09

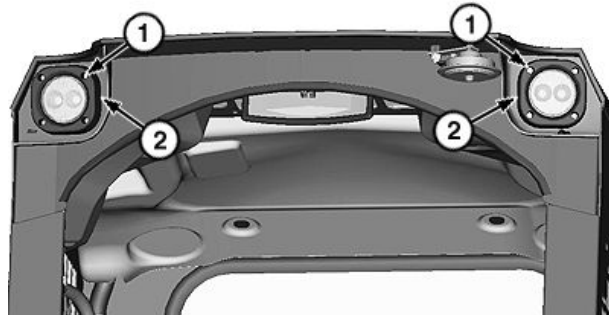
TX1066042A —UN—13OCT09

TX1066043A —UN—13OCT09

## Remove and Install Light-Emitting Diode (LED) Lights

### Front LED Lights

1. Remove TORX® screws (1) and pull out light-emitting diode (LED) lights (2) from machine.
2. Disconnect harness connectors.
3. Connect harness connectors and install new LED lights into machine.
4. Install TORX® screws.



Front Light-Emitting Diode (LED) Lights

- 1— TORX® Screw (8 used)      2— Light-Emitting Diode (LED) Light

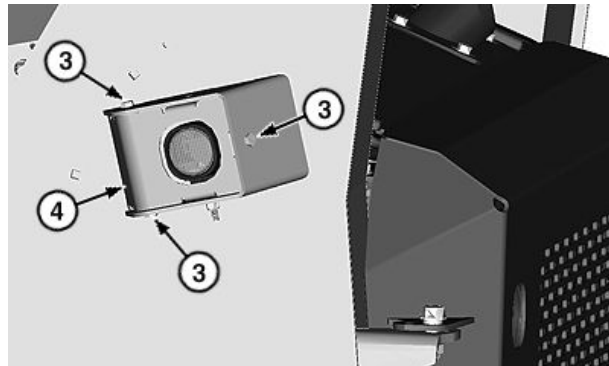
TORX is a trademark of Camcar/Textron

TX1207065 —UN—09DEC15

CN93077,000073A -19-10DEC15-1/3

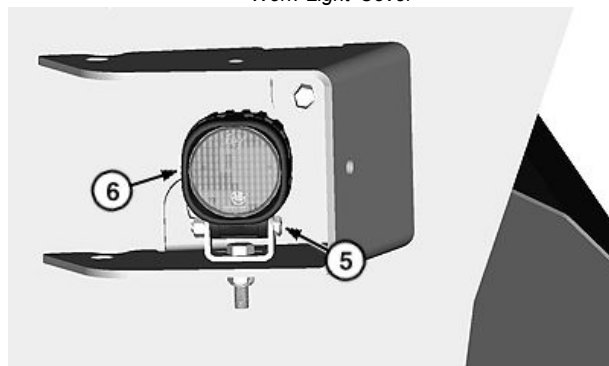
### Rear LED Lights

1. Remove cap screws (3).
2. Remove work light covers (4).
3. Remove pedestal mount cap screws (5) from pedestal mounts and pull out LED lights (6).
4. Disconnect harness connectors.
5. Connect harness connectors and install new LED lights into pedestal mounts.
6. Install pedestal mount cap screws.
7. Install work light covers and cap screws.



Work Light Cover

- 3— Cap Screw (6 used)      5— Pedestal Mount Cap Screw (2 used)  
 4— Work Light Cover (2 used)      6— Light-Emitting Diode (LED) Light (2 used)



Rear LED Light (left side of machine shown)

Continued on next page

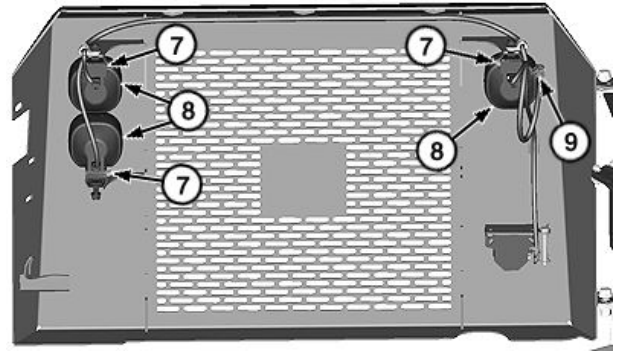
CN93077,000073A -19-10DEC15-2/3

TX1207399 —UN—09DEC15

TX1207400 —UN—09DEC15

### Service Door LED Lights

1. Open rear service door.
2. Remove pedestal mount cap screws (7) from pedestal mounts and pull out LED lights (8).
3. Disconnect rear door harness connector (9).
4. Install new LED lights back into pedestal mounts and install pedestal mount cap screws.
5. Connect rear door harness connector.
6. Close rear service door.



Service Door LED Lights

- 7— Pedestal Mount Cap Screw (3 used)      9— Rear Door Harness Connector  
 8— Light-Emitting Diode (LED) Light (3 used)

CN93077,000073A -19-10DEC15-3/3

TX1207401 —UN—09DEC15

### Adding Rear Counterweights

**⚠ CAUTION:** Prevent possible crushing injury from heavy component. Use appropriate lifting device.

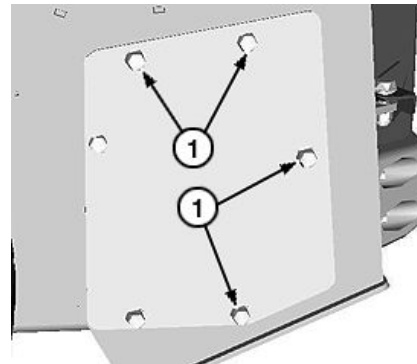
Use a suitable lifting device to put each counterweight on machine.

#### Specification

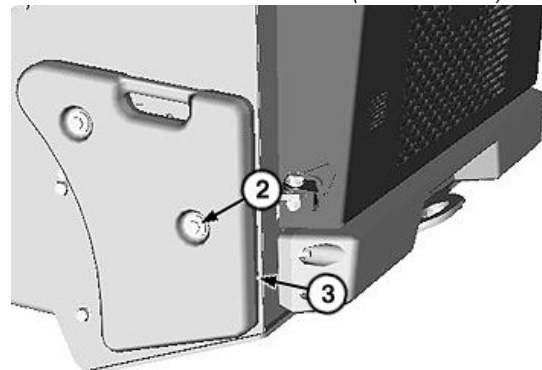
Counterweight—Weight  
 (approximate, each)..... 46 kg  
 101 lb

1. Remove cap screws (1) from rear side service panel.
2. Line up counterweight (3) holes with two threaded holes on machine.
3. Install counterweight and tighten M18 x 75 mm flange cap screws (2).

- 1— Cap Screw (8 used)      3— Counterweight (2 used)  
 2— M18 x 75 mm Flange Cap Screw (4 used)



Rear Service Panel (left side shown)



Counterweight

CN93077,000072D -19-10DEC15-1/1

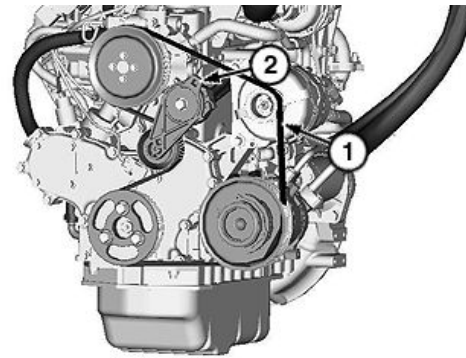
TX1206363 —UN—09DEC15

TX1206362 —UN—25NOV15

## Replacing Accessory Drive Belt

### With Air Conditioning

1. Check belt (1) regularly for wear, especially for cracks at the bottom of grooves and for frayed edges.
2. Install a 3/8 in drive socket wrench to the belt tension adjuster (2). Turn wrench to pull tension adjuster pulley away from belt, releasing belt tension.
3. Hold tension adjuster away from belt while removing old belt and installing new belt.
4. Slowly release wrench tension to allow tension adjuster to move against new belt. Tension is automatically adjusted.
5. Remove wrench.
6. Start engine and check belt alignment.



Engine With Air Conditioner

1— Belt

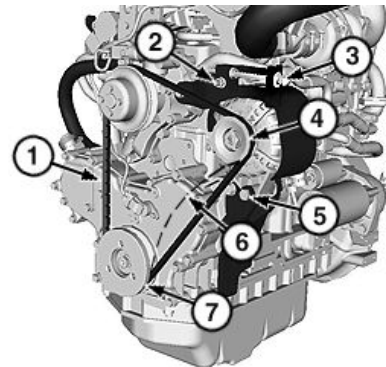
2— Belt Tension Adjuster

TX1206367 —UN—25NOV15

CN93077,000072F -19-07DEC15-1/2

### Without Air Conditioning

1. Loosen top and bottom alternator cap screw (2 and 5).
2. Turn belt tension adjusting cap screw (3) to move alternator towards engine.
3. Replace accessory drive belt (1) and adjust tension.
4. Check belt tension by depressing the midpoint between the alternator pulley (4) and crankshaft pulley (7) with thumb. Deflection (6) must be within specification.



Engine Without Air Conditioner

1— Accessory Drive Belt  
 2— Top Alternator Cap Screw  
 3— Belt Tension Adjusting Cap Screw  
 4— Alternator Pulley

5— Bottom Alternator Cap Screw  
 6— Deflection  
 7— Crankshaft Pulley

TX1204137 —UN—21OCT15

#### Specification

Belt—Deflection (6).....	5.0 mm
	0.20 in
Belt—Depressing Force.....	160.0 N
	36.0 lbf

5. If tension is not within specification, move alternator towards or away from engine by turning belt tension adjusting cap screw. Adjust until tension meets specification.
6. Tighten top and bottom alternator cap screws to specification.

#### Specification

Top Alternator Cap Screw—Torque.....	25.0 N·m
	221.3 lb·in

Bottom Alternator Cap Screw—Torque.....	70.0 N·m
	51.6 lb·ft

CN93077,000072F -19-07DEC15-2/2



## Replacing Seat Belt

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

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

*NOTE: Shoulder belt remove and install procedure shown. Lap belt procedure is similar.*

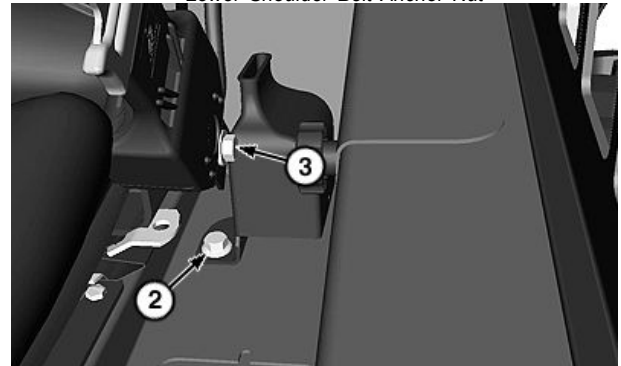
1. Park machine on a level surface.
2. Remove any attachment.
3. Engage park brake and stop engine.
4. Raise and lock operator's station. See Raising Operator's Station. (Section 3-2.)
5. Remove shoulder belt lower anchor nut (1).
6. Lower operator's station.
7. Slide seat forward.
8. Remove shoulder belt lower anchor cap screw (2).
9. Remove left seat belt-to-seat anchor nut (3).

1—Shoulder Belt Lower  
Anchor Nut  
2—Shoulder Belt Lower  
Anchor Cap Screw

3—Left Seat Belt-to-Seat  
Anchor Nut



Lower Shoulder Belt Anchor Nut



Seat Belt Anchor

TX1206595 —UN—01DEC15

TX1206596 —UN—01DEC15

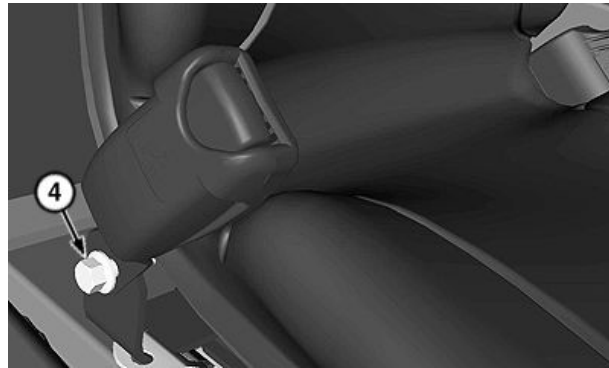
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CN93077.0000738 -19-22JAN16-1/2

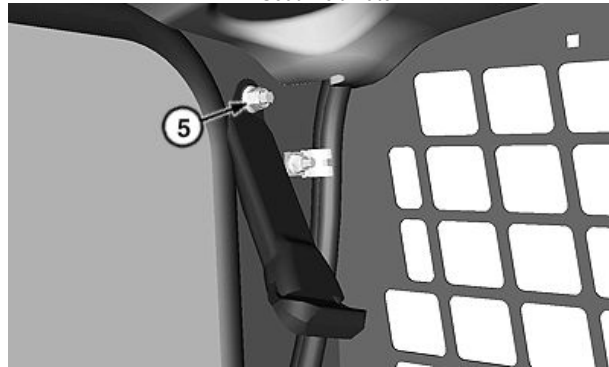
10. Remove right seat belt latch-to-seat anchor nut (4).
11. Remove shoulder belt upper anchor nut (5).
12. Remove seat belt.
13. Clean and inspect parts. Repair or replace as necessary.
14. Install right seat belt latch-to-seat anchor nut.
15. Install left seat belt-to-seat anchor nut.
16. Install shoulder belt upper anchor nut.
17. Lower operator's station. See Raising Operator's Station. (Section 3-2.)
18. Install shoulder belt lower anchor nut.
19. Lower operator's station.

4— Right Seat Belt  
Latch-to-Seat Anchor Nut

5— Shoulder Belt Upper  
Anchor Nut



Seat Belt Latch



Shoulder Belt Upper Anchor

TX1206597 —UN—01DEC15

TX1206598 —UN—01DEC15

CN93077,0000738 -19-22JAN16-2/2

### Replacing Fuses

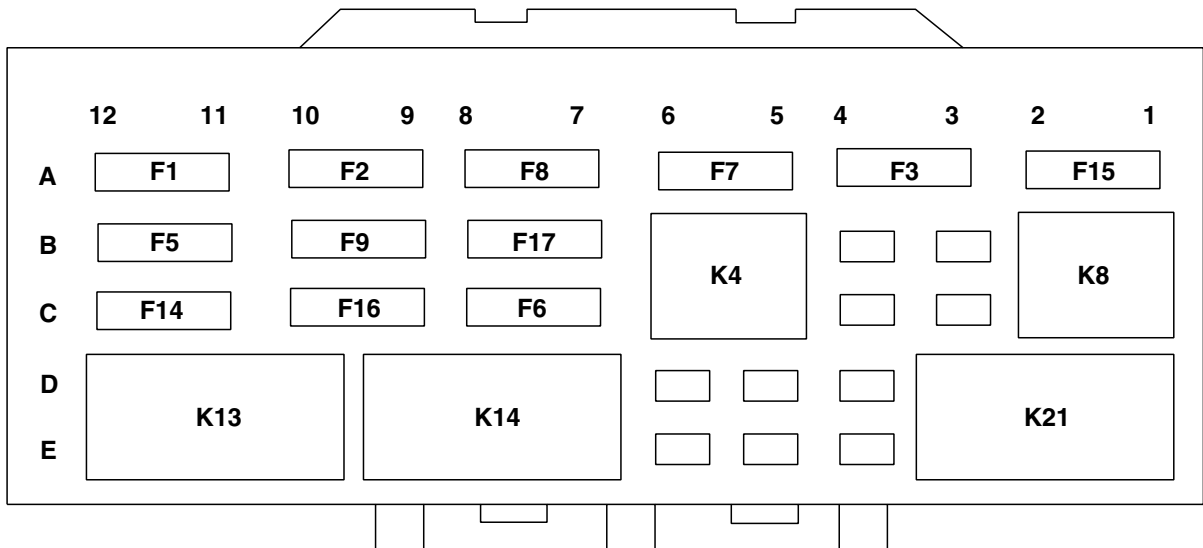
The fuse panel is located on right side of operator's station. Remove fuse panel cover to access fuse block.

Fuses protect all electrical circuits. Amperage rating is marked on each fuse and fuses are color coded to ensure proper replacement. Fuse and circuit identification is provided in the following illustration.

**IMPORTANT: Install fuse with correct amperage rating to prevent electrical system damage from overload. DO NOT replace original fuse with higher rated fuse.**

**If original size fuse continues to blow, have the electrical system checked by an authorized John Deere dealer.**

Amperage Rating	Color
1	Black
3	Violet
4	Pink
5	Tan
7.5	Brown
10	Red
15	Light Blue
20	Yellow
25	Natural (white)
30	Light Green



#### TX1204738

#### Fuse Block

- |                                                          |                                          |                               |                                            |
|----------------------------------------------------------|------------------------------------------|-------------------------------|--------------------------------------------|
| F1— Unswitched Power 7.5 A Fuse                          | F6— Lights 25 A Fuse                     | F15— Switched Power 20 A Fuse | K14— Quik-Tatch™ Relay (unlock)            |
| F2— Monitor Unswitched Power 10 A Fuse                   | F7— Accessory 20 A Fuse                  | F16— Horn 10 A Fuse           | K21— Exhaust Gas Recirculation (EGR) Relay |
| F3— Engine Control Unit (ECU) Unswitched Power 25 A Fuse | F8— Air Conditioner and Heater 30 A Fuse | F17— Handle Switches 5 A Fuse |                                            |
| F5— Dome Light and Accessory Power Outlet 10 A Fuse      | F9— Seat 15 A Fuse                       | K4— Accessory Relay           |                                            |
|                                                          | F14— Quik-Tatch™ 30 A Fuse               | K8— Switched Power Relay      |                                            |
|                                                          |                                          | K13— Quik-Tatch™ Relay (lock) |                                            |

*NOTE: The following items are located outside the fuse block.*

- F10—Left flasher light in-line 5 A fuse (if equipped).
- F11—Right flasher light in-line 5 A fuse (if equipped).
- F12—Radio in-line 3 A fuse (if equipped).
- F31—Glow plug 80 A fuse.
- F32—Auxillary power harness 10 A fuse (if equipped).

Continued on next page

CN93077,0000734 -19-03DEC15-1/2

TX1204738 —UN—05NOV15

K19—Blower motor (high speed) relay (if equipped).

*Quik-Tatch is a trademark of Deere & Company*

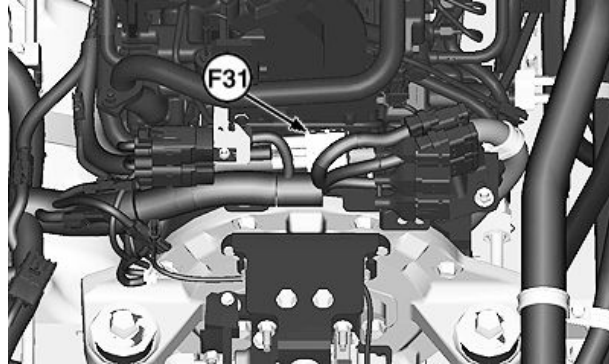
CN93077,0000734 -19-03DEC15-2/2

### Replacing Glow Plug Fuse

1. Park machine on level surface.
2. Raise and lock operator's station. See Raising Operator's Station. (Section 3-2.)

*NOTE: Glow plug 80 A fuse (F31) is located above flywheel housing.*

3. Pull glow plug fuse out of socket.
4. Check metal clip in fuse window. Discard fuse if clip is broken.
5. Push new fuse into socket. Be sure new fuse is same amperage as removed fuse.
6. Lower operator's station.



*Glow Plug Fuse*

**F31— Glow Plug 80 A Fuse**

TX1206576—UN—01DEC15

CN93077,0000736 -19-03DEC15-1/1

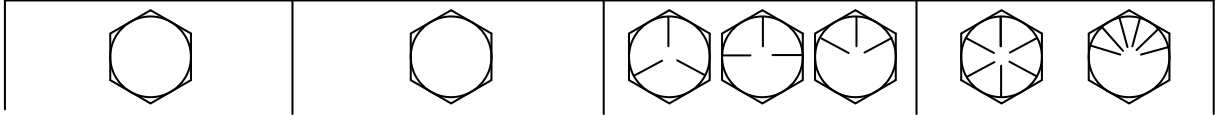
### Hardware Torque Specifications

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

TX,90,FF1225 -19-16JAN08-1/1

## Unified Inch Bolt and Screw Torque Values

TS1671 —UN—01MAY03



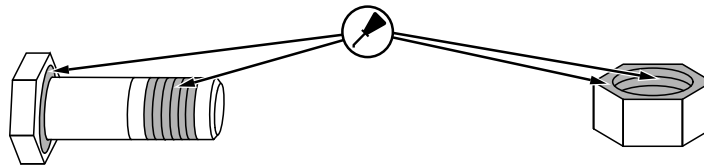
Bolt or Screw Size	SAE Grade 1 <sup>a</sup>				SAE Grade 2 <sup>b</sup>				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Hex Head <sup>c</sup>		Flange Head <sup>d</sup>		Hex Head <sup>c</sup>		Flange Head <sup>d</sup>		Hex Head <sup>c</sup>		Flange Head <sup>d</sup>		Hex Head <sup>c</sup>		Flange Head <sup>d</sup>	
	N-m	lb-in	N-m	lb-in	N-m	lb-in	N-m	lb-in	N-m	lb-in	N-m	lb-in	N-m	lb-in	N-m	lb-in
1/4	3.1	27.3	3.2	28.4	5.1	45.5	5.3	47.3	7.9	70.2	8.3	73.1	11.2	99.2	11.6	103
													N-m	lb-ft	N-m	lb-ft
5/16	6.1	54.1	6.5	57.7	10.2	90.2	10.9	96.2	15.7	139	16.8	149	22.2	16.4	23.7	17.5
									N-m	lb-ft	N-m	lb-ft				
3/8	10.5	93.6	11.5	102	17.6	156	19.2	170	27.3	20.1	29.7	21.9	38.5	28.4	41.9	30.9
					N-m	lb-ft	N-m	lb-ft								
7/16	16.7	148	18.4	163	27.8	20.5	30.6	22.6	43	31.7	47.3	34.9	60.6	44.7	66.8	49.3
	N-m	lb-ft	N-m	lb-ft												
1/2	25.9	19.1	28.2	20.8	43.1	31.8	47	34.7	66.6	49.1	72.8	53.7	94	69.3	103	75.8
9/16	36.7	27.1	40.5	29.9	61.1	45.1	67.5	49.8	94.6	69.8	104	77	134	98.5	148	109
5/8	51	37.6	55.9	41.2	85	62.7	93.1	68.7	131	96.9	144	106	186	137	203	150
3/4	89.5	66	98	72.3	149	110	164	121	230	170	252	186	325	240	357	263
7/8	144	106	157	116	144	106	157	116	370	273	405	299	522	385	572	422
1	216	159	236	174	216	159	236	174	556	410	609	449	785	579	860	634
1-1/8	305	225	335	247	305	225	335	247	685	505	751	554	1110	819	1218	898
1-1/4	427	315	469	346	427	315	469	346	957	706	1051	775	1552	1145	1703	1256
1-3/8	564	416	618	456	564	416	618	456	1264	932	1386	1022	2050	1512	2248	1658
1-1/2	743	548	815	601	743	548	815	601	1665	1228	1826	1347	2699	1991	2962	2185

The nominal torque values listed are for general use only with the assumed wrenching accuracy of 20%, such as a manual torque wrench. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application.

Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original.

- Make sure that fastener threads are clean.
- Apply a thin coat of Hy-Gard™ or equivalent oil under the head and on the threads of the fastener, as shown in the following image.
- Be conservative with the amount of oil to reduce the potential for hydraulic lockup in blind holes due to excessive oil.
- Properly start thread engagement.

TS1741 —UN—22MAY18



<sup>a</sup>Grade 1 applies for hex cap screws over 6 in (152 mm) long, and for all other types of bolts and screws of any length.

<sup>b</sup>Grade 2 applies for hex cap screws (not hex bolts) up to 6 in (152 mm) long.

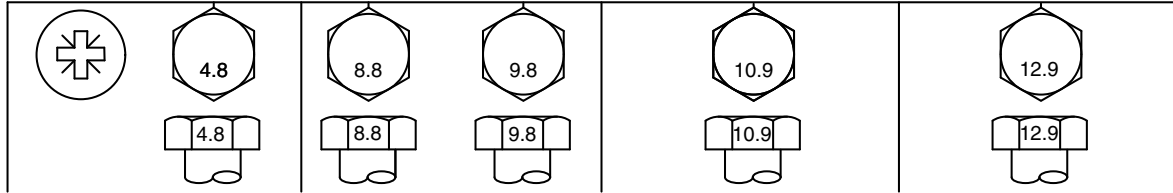
<sup>c</sup>Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.

<sup>d</sup>Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.

DX,TORQ1 -19-30MAY18-1/1

### Metric Bolt and Screw Torque Values

TS1742 —UN—31MAY18



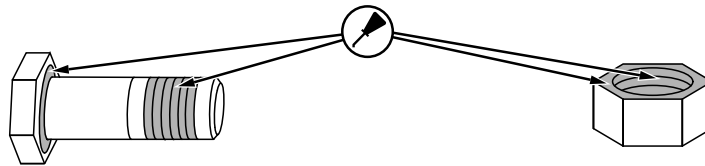
Bolt or Screw Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Hex Head <sup>a</sup>		Flange Head <sup>b</sup>		Hex Head <sup>a</sup>		Flange Head <sup>b</sup>		Hex Head <sup>a</sup>		Flange Head <sup>b</sup>		Hex Head <sup>a</sup>		Flange Head <sup>b</sup>	
	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in
M6	3.6	31.9	3.9	34.5	6.7	59.3	7.3	64.6	9.8	86.7	10.8	95.6	11.5	102	12.6	112
M8	8.6	76.1	9.4	83.2	16.2	143	17.6	156	23.8	17.6	25.9	19.1	27.8	20.5	30.3	22.3
M10	16.9	150	18.4	13.6	31.9	23.5	34.7	25.6	46.8	34.5	51	37.6	55	40.6	60	44.3
M12	—	—	—	—	55	40.6	61	45	81	59.7	89	65.6	95	70.1	105	77.4
M14	—	—	—	—	87	64.2	96	70.8	128	94.4	141	104	150	111	165	122
M16	—	—	—	—	135	99.6	149	110	198	146	219	162	232	171	257	190
M18	—	—	—	—	193	142	214	158	275	203	304	224	322	245	356	263
M20	—	—	—	—	272	201	301	222	387	285	428	316	453	334	501	370
M22	—	—	—	—	365	263	405	299	520	384	576	425	608	448	674	497
M24	—	—	—	—	468	345	518	382	666	491	738	544	780	575	864	637
M27	—	—	—	—	683	504	758	559	973	718	1080	797	1139	840	1263	932
M30	—	—	—	—	932	687	1029	759	1327	979	1466	1081	1553	1145	1715	1265
M33	—	—	—	—	1258	928	1398	1031	1788	1319	1986	1465	2092	1543	2324	1714
M36	—	—	—	—	1617	1193	1789	1319	2303	1699	2548	1879	2695	1988	2982	2199

The nominal torque values listed are for general use only with the assumed wrenching accuracy of 20%, such as a manual torque wrench. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application.

Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original.

- Make sure that fastener threads are clean.
- Apply a thin coat of Hy-Gard™ or equivalent oil under the head and on the threads of the fastener, as shown in the following image.
- Be conservative with the amount of oil to reduce the potential for hydraulic lockup in blind holes due to excessive oil.
- Properly start thread engagement.

TS1741 —UN—22MAY18



<sup>a</sup>Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.

<sup>b</sup>Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.

DX,TORQ2 -19-30MAY18-1/1

# Miscellaneous—Operational Checkout

## Operational Checkout

Use this procedure to perform a quick check of machine operation by doing a walk-around inspection and performing specific checks from the operator's seat.

Complete visual checks (oil levels, oil condition, external leaks, loose hardware, linkage, wiring, etc.) before performing checkout.

Most checks will require machine to be on a level surface with adequate space to operate functions and systems to

be at normal operating temperatures. Some checks may require varied surfaces.

No special tools are necessary to perform checkout.

If no problem is found, go to next check. If a problem is indicated, an additional check or repair procedure will be suggested.

CN93077,00006DC -19-14DEC15-1/38

## Diagnostic Trouble Code Check

CN93077,00006DC -19-14DEC15-2/38

### Display and Clear Diagnostic Trouble Codes

**Always check for diagnostic trouble codes (DTCs) and correct them before performing operational checkout.**

Check for active and stored DTCs.

DTCs can be displayed by using one of the following methods:

- Engagement and Monitor Unit (EMU)
  - To access DTCs using EMU, see Codes (EMU). (Section 2-3.)
- Service ADVISOR™ Diagnostic Application

*LOOK: Are DTCs present?*

*Service ADVISOR is a trademark of Deere & Company*

**YES:** Correct all DTCs before proceeding.

**NO:** Go to next check.

CN93077,00006DC -19-14DEC15-3/38

## Operational Checks—Switched Power OFF, Engine OFF Checks

CN93077,00006DC -19-14DEC15-4/38

### Periodic Maintenance Decal Check

Periodic maintenance decal check.

*LOOK: Is periodic maintenance decal legible?*

**YES:** Go to next check.

**NO:** Replace decal.

CN93077,00006DC -19-14DEC15-5/38

### Cab Door and Window Seals Check (if equipped)

Open and close cab door and windows. Inspect seals.

*LOOK/FEEL: Do cab door and windows seal properly?*

*LOOK/FEEL: Do cab door and windows latch properly?*

**YES:** Go to next check.

**NO:** Adjust door and windows to close against seals properly. Replace seals as necessary.

**NO:** Adjust or replace latches as necessary.

CN93077,00006DC -19-14DEC15-6/38

### Seat Belt Check

Latch seat belt.

*LISTEN: Is a click heard when seat belt is latched?*

*FEEL/LOOK: Does seat belt remain latched?*

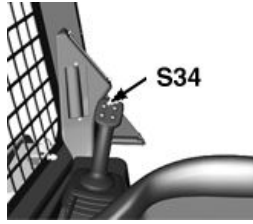
**YES:** Go to next check.

**NO:** See Use and Maintain Seat Belt. (Section 1-3.)

Continued on next page

CN93077,00006DC -19-14DEC15-7/38

**Horn Circuit Check**



TX1200747A —UN—02SEP15

*Horn Switch*

**S34— Horn Switch**

Press horn switch (S34).

*LISTEN: Does horn sound?*

**YES:** Go to next check.

**NO:** Check unswitched power 7.5 A fuse (F1).

**NO:** Check horn 10 A fuse (F16).

**IF OK:** See an authorized John Deere dealer.

CN93077,00006DC -19-14DEC15-8/38

**Seat Control Checks**

*NOTE: For seat adjustment procedures, see Operator Seat. (Section 2-1.)*

Does seat angle change easily?

Does lever move easily to unlock seat support?

Does seat move forward and backward easily?

Does lever lock seat support in position when released?

Does seat lumbar knob turn easily, if equipped?

Does seat raise and lower easily while pressing button in front of seat, if equipped?

Does lever unlock and lock easily to hold seat back in position?

**YES:** Go to next check.

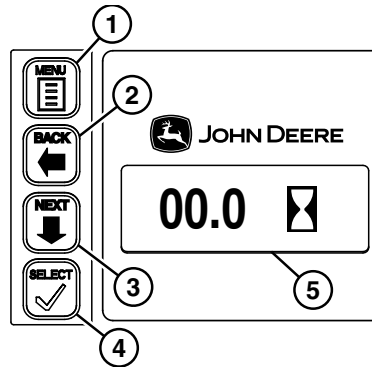
**NO:** Inspect linkage and repair.

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CN93077,00006DC -19-14DEC15-9/38



Engagement and Monitor Unit (EMU) Circuits Check



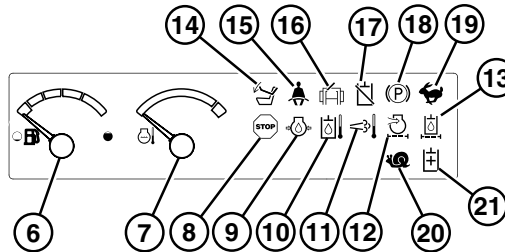
TX1126613 —UN—26NOV12

EMU Display

- 1— MENU Button
- 2— BACK Button
- 3— NEXT Button
- 4— SELECT Button
- 5— EMU Display

Sit in operator's seat.

**LOOK:** Do all EMU display segments turn on, turn off, display TMC BY DEERE for 2 seconds, display correct machine model and speed setting for 2 seconds, and then display the hour meter?



TX1127054 —UN—03DEC12

EMU Display

- 6— Fuel Gauge
- 7— Engine Coolant Temperature Gauge
- 8— STOP Indicator
- 9— Engine Low Oil Pressure Indicator
- 10— Hydraulic Oil Temperature Indicator
- 11— Exhaust Filter Cleaning Indicator (4TNV86CT and 4TNV86CHT engines only)
- 12— Engine Air Filter Restriction Indicator
- 13— Hydraulic Oil Filter Restriction Indicator
- 14— Interlocking Seat Bar Switch Indicator
- 15— Seat Belt Switch Indicator
- 16— Cab Door Switch Indicator
- 17— Hydraulics OFF Indicator
- 18— Park Brake Indicator
- 19— Two-Speed Indicator
- 20— Creep Mode Indicator
- 21— Hydraulic High Flow Indicator

**LOOK:** Do all indicators illuminate and then go out depending on machine status?

Lower interlocking seat bar.

**LOOK:** Does interlocking seat bar switch indicator (14) go off?

**YES:** Go to next check.

**NO:** Check monitor unswitched power 10 A fuse (F2).

IF OK: See an authorized John Deere dealer.

Continued on next page

CN93077,00006DC -19-14DEC15-10/38

Miscellaneous—Operational Checkout

**Battery Check**

Sit in operator's seat.  
Observe battery voltage from operator's seat on the engagement monitor unit (EMU) using SELECT button.

*LOOK: Does battery have a minimum of 12 V when engine is not running?*

**YES:** Go to next check.  
**NO:** Clean and tighten battery terminals.  
Charge battery. See Using Battery Charger. (Section 4-1.)  
**IF OK:** See an authorized John Deere dealer.

CN93077,00006DC -19-14DEC15-11/38

**Operational Checks—Switched Power ON, Engine OFF Checks**

CN93077,00006DC -19-14DEC15-12/38

**EMU Circuits Check**

Turn key switch ON or press engine start switch on sealed switch module (SSM), if equipped.

*LOOK: Do gauges move to the far right position, then move to the center position, and then display the machine status?*

*LOOK: Do switches on instrument panel illuminate?*

*LISTEN: Does EMU alarm sound?*

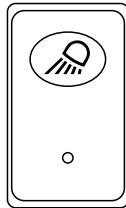
Close cab door (if equipped).

*LOOK: Does the cab door indicator go off?*

**YES:** Go to next check.  
**NO:** Check unswitched power 7.5 A fuse (F1).  
**NO:** Check monitor unswitched power 10 A fuse (F2).  
**NO:** Check switched power 15 A fuse (F15).  
**IF OK:** See an authorized John Deere dealer.

CN93077,00006DC -19-14DEC15-13/38

**Lights Circuit Check**



TX1125104 —UN—02NOV12

*Work Light Switch*

Press work light switch to middle position.

*LOOK: Do front work lights and taillights come on?*

**YES:** Continue check.

**NO:** Check lights 25 A fuse (F6).  
**NO:** Check unswitched power 7.5 A fuse (F1).  
**IF OK:** See an authorized John Deere dealer.

Press work light switch to upper position.

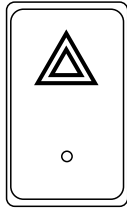
*LOOK: Do front work lights and taillights stay on and rear work light come on?*

**YES:** Go to next check.  
**NO:** See an authorized John Deere dealer.

Continued on next page

CN93077,00006DC -19-14DEC15-14/38

**Dual Flasher Light Check  
(if equipped)**



TX1125311 —UN—06NOV12

*Dual Flasher Light Switch*

Press dual flasher switch to the upper position.

*LOOK: Do the dual flashers come on?*

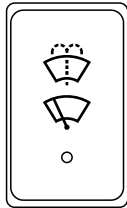
**YES:** Go to next check.

**NO:** Check left flasher light in-line 5 A fuse (F10). Check right flasher light in-line 5 A fuse (F11). Check switched power 15 A fuse (F15).

IF OK: See an authorized John Deere dealer.

CN93077,00006DC -19-14DEC15-15/38

**Windshield Wiper Circuit  
Check (if equipped)**



TX1125050 —UN—02NOV12

*Windshield Wiper and Washer Switch*

Close cab door.

Press windshield wiper and washer switch to the middle position.

*LOOK: Does wiper operate?*

**YES:** Go to next check.

**NO:** Check accessory 20 A fuse (F7).

**NO:** Check unswitched power 7.5 A fuse (F1).

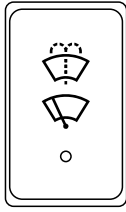
IF OK: See an authorized John Deere dealer.

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CN93077,00006DC -19-14DEC15-16/38

Miscellaneous—Operational Checkout

Windshield Washer  
Circuit Check (if  
equipped)



TX1125050 —UN—02NOV12

Windshield Wiper and Washer Switch

Close cab door.

Turn on windshield wiper.

**IMPORTANT: Avoid damage to washer motor. Washer motor may be damaged if washer switch is held for more than 20 seconds, or continually operated with no fluid in the washer fluid tank.**

Press and hold windshield wiper and washer switch in the upper position.

*LOOK: Does washer operate?*

**YES:** Go to next check.

**NO:** Check washer fluid level.

**NO:** Check washer hose for kinks or obstructions.

**NO:** Check accessory 20 A fuse (F7).

**NO:** Check unswitched power 7.5 A fuse (F1).

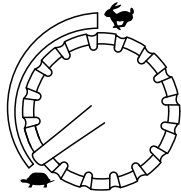
IF OK: See an authorized John Deere dealer.

CN93077,00006DC -19-14DEC15-17/38

Operational Checks—Switched Power ON, Engine ON Checks

CN93077,00006DC -19-14DEC15-18/38

Engine Start Check



TX1126582 —UN—26NOV12

Engine Speed Control Dial

Position engine speed control dial in slow idle position.

Start engine.

*LISTEN/LOOK: Does engine speed increase briefly, then return to slow idle?*

**YES:** Go to next check.

**NO:** Check slow idle and fast idle engine speeds.

CN93077,00006DC -19-14DEC15-19/38

Engine Idle Check

Position engine speed control dial in slow idle position.

*LISTEN: Does engine idle poorly?*

**YES:** Check primary fuel filter and water separator. See Check and Drain Primary Fuel Filter and Water Separator. (Section 3-3.)

**YES:** Test diesel fuel. See Testing Diesel Fuel. (Section 3-1.)

IF OK: See an authorized John Deere dealer.

Continued on next page

CN93077,00006DC -19-14DEC15-20/38

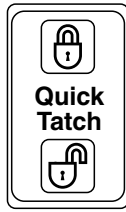
*Miscellaneous—Operational Checkout*

<b>Engine Speed Check</b>	<p>Set engagement and monitor unit (EMU) to display engine rpm.</p> <p>Set engine speed at slow idle with engine speed control dial and engine speed control pedal released.</p> <p><i>LOOK/LISTEN: Does engine run between 1150—1250 rpm?</i></p> <p>Rotate engine speed control dial to set the engine speed at fast idle. Engine speed control pedal must be released.</p> <p><i>LOOK/LISTEN: Does engine run between 2650—2750 rpm?</i></p> <p>Fully depress engine speed control pedal to set engine speed at fast idle. Engine speed control dial must be in slow idle position.</p> <p><i>LOOK/LISTEN: Does engine run between 2650—2750 rpm?</i></p>	<p><b>YES:</b> Go to next check.</p> <p><b>NO:</b> Check engine speed control dial and engine speed control pedal.</p> <p>IF OK: See an authorized John Deere dealer.</p>
<small>CN93077,00006DC -19-14DEC15-21/38</small>		

<b>Auto-Idle Circuit Check (if equipped)</b>	<p>Enable auto-idle in EMU. See Auto-Idle (EMU). (Section 2-3.)</p> <p>Position engine speed control dial in fast idle position.</p> <p><i>LOOK/LISTEN: Does engine speed decrease after 4—6 seconds?</i></p>	<p><b>YES:</b> Go to next step in this check.</p> <p><b>NO:</b> See an authorized John Deere dealer.</p>
	<p>Slowly actuate any boom or bucket function.</p> <p><i>LOOK/LISTEN: Does engine speed return to its original setting?</i></p>	<p><b>YES:</b> Go to next check.</p> <p><b>NO:</b> See an authorized John Deere dealer.</p>
<small>CN93077,00006DC -19-14DEC15-22/38</small>		

<b>Hydraulic Control Enable Check</b>	<p>Close cab door (if equipped).</p> <p>Position engine speed control dial in slow idle position.</p> <p>Engage park brake.</p> <p>Actuate boom and bucket functions.</p> <p><i>LOOK: Do boom and bucket move?</i></p>	<p><b>NO:</b> Continue check.</p> <p><b>YES:</b> Check diagnostic trouble codes (DTCs).</p> <p>IF OK: See an authorized John Deere dealer.</p>
	<p>Press park brake rocker switch to the run position or hydraulic enable switch on sealed switch module (SSM) (if equipped) to enable hydraulics.</p> <p>Actuate boom and bucket functions.</p> <p><i>LOOK: Do boom and bucket move?</i></p>	<p><b>YES:</b> Go to next check.</p> <p><b>YES:</b> Check diagnostic trouble codes (DTCs).</p> <p>IF OK: See an authorized John Deere dealer.</p>
<small>Continued on next page</small>		<small>CN93077,00006DC -19-14DEC15-23/38</small>

**Power Quik-Tatch™  
Check (if equipped)**



TX1125100 —UN—02NOV12

*Quik-Tatch Switch*

**IMPORTANT: Avoid damage to Quik-Tatch™ motor. Damage to Quik-Tatch motor will occur if motor is immersed in liquid. Do not immerse in liquid.**

Close cab door, if equipped.

Press and hold lower part of Quik-Tatch switch to unlock the Quik-Tatch latches.

*LOOK/LISTEN: Do Quik-Tatch latches release attachment?*

Press and hold upper part of Quik-Tatch switch to lock the Quik-Tatch latches.

*LOOK/LISTEN: Do Quik-Tatch latches secure attachment?*

**YES:** Go to next check.

**NO:** Check Quik-Tatch 30 A fuse (F14), switched power 15 A fuse (F15), and accessory 20 A fuse (F7).

IF OK: See an authorized John Deere dealer.

*Quik-Tatch is a trademark of Deere & Company*

CN93077,00006DC -19-14DEC15-24/38

**Backup Alarm Check**

**⚠ CAUTION: Prevent injury from unexpected machine movement. Keep bystanders clear of machine.**

Engine speed at slow idle.

Drive machine in reverse.

*LOOK/LISTEN: Does backup alarm sound?*

**YES:** Go to next check.

**NO:** Check accessory 20 A fuse (F7) and unswitched power 7.5 A fuse (F1).

IF OK: See an authorized John Deere dealer.

CN93077,00006DC -19-14DEC15-25/38

**Steering Mistracking  
Check**

**⚠ CAUTION: Prevent injury from unexpected machine movement. Keep bystanders clear of machine.**

Position engine speed control dial in fast idle position.

Drive machine at full speed forward on a flat and level surface for 30.5 m (100 ft).

Repeat procedure for reverse direction.

Observe which direction and how much the machine mistracks from a straight line.

*LOOK: Does machine mistrack more than the width of the machine over 30.5 m (100 ft)?*

**YES:** See an authorized John Deere dealer.

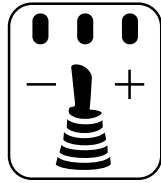
**NO:** Go to next check.

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CN93077,00006DC -19-14DEC15-26/38

**Transmission Response  
Check (EH only, if  
equipped)**

**⚠ CAUTION: Prevent injury from unexpected machine movement.  
Keep bystanders clear of machine.**



TX1125284 —UN—06NOV12

*Transmission Response Switch*

Position engine speed control dial-in slow idle position.

*NOTE: Engagement and monitor unit (EMU) will display the following rates:*

- *Precision Rate—Machine will move at a slower rate suited precise work (1 LED illuminated).*
- *Utility Rate—Machine will move at a rate suited for efficient work (2 LEDs illuminated).*
- *Production Rate—Machine will move at a fast rate suited for quick work (3 LEDs illuminated).*

Press transmission response switch selecting precision rate (1 LED illuminated).

Drive machine forward.

Press transmission response switch selecting utility rate (2 LEDs illuminated).

Drive machine forward.

*LOOK/FEEL: Does machine respond to joystick faster than precision rate?*

Press transmission response switch selecting production rate (3 LEDs illuminated).

Drive machine forward.

*LOOK/FEEL: Does machine respond to joystick faster than utility rate?*

**YES:** Go to next check.

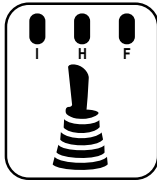
**NO:** See an authorized dealer.

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CN93077,00006DC -19-14DEC15-27/38

**Pattern Select Check  
(if equipped)**

**CAUTION:** Prevent injury from unexpected machine movement.  
Keep bystanders clear of machine.



TX1204766 —UN—30OCT15

*Pattern Select Switch*

Position engine speed control dial in slow idle position.

Park brake and hydraulic enable engaged.

Press pattern select switch on sealed switch module (SSM) to change control pattern, (EMU) will display selected control pattern.

**NOTE:** The LEDs will illuminate with corresponding control pattern.

- I—ISO Pattern
- H—H Pattern
- F—Not Used

Disable park brake.

Enable hydraulics.

Operate machine controls.

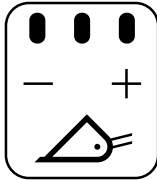
**LOOK/FEEL:** Does machine follow selected control pattern?

**YES:** Go to next check.

**NO:** See an authorized John Deere dealer.

CN93077,00006DC -19-14DEC15-28/38

**Hydraulic Response  
Check (if equipped)**



TX1125304 —UN—06NOV12

*Hydraulic Response Switch*

Position engine speed control dial in slow idle position.

**NOTE:** Engagement and monitor unit (EMU) will display the following rates:

- Precision Rate—Bucket will move at a rate suited for precise work (1 LED illuminated).
- Utility Rate—Bucket will move at a rate suited for efficient work (2 LEDs illuminated).
- Production Rate—Bucket will move at a rate suited for quick work (3 LEDs illuminated).

Press hydraulic response switch selecting precision rate (1 LED illuminated).

Operate boom and bucket functions.

Press hydraulic response switch selecting utility rate (2 LEDs illuminated).

Operate boom and bucket functions.

**LOOK/FEEL:** Do boom and bucket move faster than precision rate?

Press hydraulic response switch selecting production rate (3 LEDs illuminated).

Operate boom and bucket functions.

**LOOK/FEEL:** Do boom and bucket move faster than utility rate?

**YES:** Go to next check.

**NO:** See an authorized John Deere dealer.

Continued on next page

CN93077,00006DC -19-14DEC15-29/38



**Ride Control Check (if equipped)**



TX1125306 —UN—06NOV12

*Ride Control Switch*

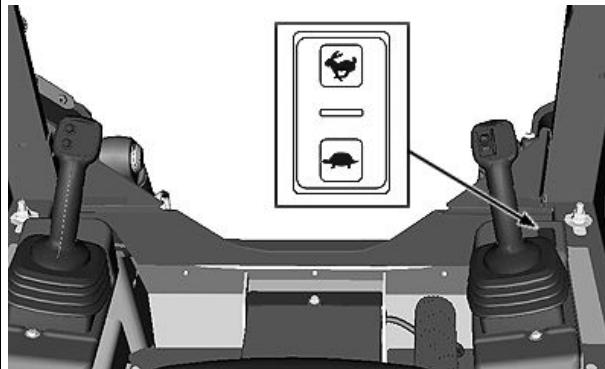
Position engine speed control dial in slow idle position.  
 Load bucket with material.  
 Press ride control switch on sealed switch module (SSM).  
*NOTE: One LED will be illuminated once switch is pressed. The second LED will illuminate once ride control is activated.*  
 Raise boom to maximum height.  
 Lower boom down halfway to the ground.  
 Stop suddenly by releasing controls.  
*LOOK: Is boom cushioned when control is released?*

**YES:** Go to next check.  
**NO:** See an authorized John Deere dealer.

CN93077,00006DC -19-14DEC15-30/38

**Creep Mode Check (if equipped)**

**CAUTION:** Prevent injury from unexpected machine movement. Keep bystanders clear of machine.



TX1205659 —UN—16NOV15

*Creep Mode Speed Switch (S36)*

Position engine speed control dial in slow idle position.  
 Enable creep mode.  
 Creep mode percentage will display on the EMU.  
 Change creep mode speed percentage to 50% by pressing the lower portion of creep mode speed switch.  
 Drive machine forward.  
*LOOK: Does machine move forward at 50% slower speed?*

**YES:** Continue check.  
**NO:** See an authorized John Deere dealer.

Change creep mode speed percentage to 100% by pressing upper portion of creep mode speed switch.  
*LOOK/FEEL: Does machine move forward at normal speed?*

**YES:** Go to next check.  
**NO:** See an authorized John Deere dealer.

Continued on next page

CN93077,00006DC -19-14DEC15-31/38

Miscellaneous—Operational Checkout

**Self Leveling Valve Check  
(if equipped)**

*NOTE: Self leveling function is only active for boom up function.*

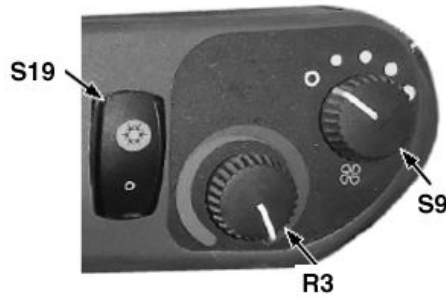
- Close cab door—if equipped.
- Activate self leveling function.
- Lower boom to the ground.
- Position bottom of bucket on the ground.
- Raise boom.

*LOOK: Does bucket self level as boom is raised?*

**YES:** Go to next check.  
**NO:** See an authorized John Deere dealer.

CN93077,00006DC -19-14DEC15-32/38

**Heating and Air  
Conditioning System  
Check (if equipped)**



TX1200985A —UN—09SEP15

*Heater and Air Conditioner Controls*

- R3—Heater Temperature Control Switch**
- S9—Blower Motor Speed Switch**
- S19— Air Conditioner Switch**

*NOTE: Engine will need to be at operating temperature for this check.*

Position engine speed control dial in slow idle position.

Turn blower motor speed switch (S9) from off to slow, medium, and high speeds.

*LISTEN/FEEL: Does fan speed increase and/or decrease as switch is moved?*

Turn blower speed switch to medium speed.

Turn heater temperature control switch (R3) to hot (red).

*FEEL: Does warm air come out of air ducts?*

Turn heater temperature control switch (R3) to cold (blue).

*FEEL: Does cool air come out of air ducts?*

Turn on air conditioner switch (S19).

*FEEL/LISTEN: Does cold air come out of air duct after a couple of minutes?*

**YES:** Go to next check.  
**NO:** Check air conditioner and heater 30 A fuse (F8).  
IF OK: See an authorized John Deere dealer.

Continued on next page

CN93077,00006DC -19-14DEC15-33/38

Miscellaneous—Operational Checkout

<p><b>Boom Down Drift Check</b></p>	<p><i>NOTE: This check may require two people.</i></p> <p><i>NOTE: Machine must be equipped with a bucket for this check.</i></p> <p>Close cab door—if equipped.</p> <p>Operate hydraulic system until hydraulic oil reaches temperature specification.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Hydraulic Oil—Temperature..... 43°C 110°F</p> <p>Actuate boom function to lower boom to ground.</p> <p>Raise boom halfway.</p> <p>Engage park brake.</p> <p>Mark and record a distance on the boom cylinder rod from the cylinder barrel.</p> <p>Disengage park brake.</p> <p>Allow machine to sit with engine speed at slow idle for 5 minutes.</p> <p>Engage park brake.</p> <p>Measure marked distance on boom cylinder rod.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Boom Cylinder—Drift (maximum)..... 12.5 mm/5 min 0.5 in/5 min</p> <p><i>LOOK: Does boom drift down more than specification?</i></p>	<p><b>NO:</b> Go to next check.</p> <p><b>YES:</b> Continue check.</p>
	<p>Raise boom halfway.</p> <p>Engage park brake.</p> <p>Turn engine off.</p> <p>Allow machine to sit for 5 minutes.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Boom Cylinder—Drift (maximum)..... 12.5 mm/5 min 0.5 in/5 min</p> <p><i>LOOK: Does boom drift down more than specification?</i></p>	<p><b>YES:</b> See an authorized John Deere dealer.</p> <p><b>NO:</b> Go to next check.</p>

Continued on next page

CN93077,00006DC -19-14DEC15-34/38

Miscellaneous—Operational Checkout

<p><b>Boom Up Drift Check</b></p>	<p><i>NOTE: This check may require two people.</i></p> <p><i>NOTE: Machine must be equipped with a bucket for this check.</i></p> <p>Close cab door—if equipped.</p> <p>Operate hydraulic system until hydraulic oil reaches temperature specification.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Hydraulic Oil—Temperature..... 43°C 110°F</p> <p><i>NOTE: Bucket may need to be in dump position.</i></p> <p>Actuate boom down function to raise front of machine off the ground.</p> <p>Engage park brake.</p> <p>Mark and record a distance on the boom cylinder rod from the cylinder barrel.</p> <p>Disengage park brake.</p> <p>Allow machine to sit with engine speed at slow idle for 5 minutes.</p> <p>Engage park brake.</p> <p>Measure marked distance on boom cylinder rod.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Boom Cylinder—Drift (maximum)..... 12.5 mm/5 min 0.5 in/5 min</p> <p><i>LOOK: Does boom drift up more than specification?</i></p>	<p><b>NO:</b> Go to next check.</p> <p><b>YES:</b> Continue check.</p>
	<p>Actuate boom down function to raise front of machine off the ground.</p> <p>Engage park brake.</p> <p>Turn engine off.</p> <p>Allow machine to sit for 5 minutes.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Boom Cylinder—Drift (maximum)..... 12.5 mm/5 min 0.5 in/5 min</p> <p><i>LOOK: Does boom drift up more than specification?</i></p>	<p><b>YES:</b> See an authorized John Deere dealer.</p> <p><b>NO:</b> Go to next check.</p>

Continued on next page

CN93077,00006DC -19-14DEC15-35/38

Miscellaneous—Operational Checkout

<p><b>Bucket Dump Drift Check</b></p>	<p><i>NOTE: This check may require two people.</i></p> <p><i>NOTE: Machine must be equipped with a bucket for this check.</i></p> <p>Close cab door—if equipped.</p> <p>Operate hydraulic system until hydraulic oil reaches temperature specification.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Hydraulic Oil—Temperature..... 43°C 110°F</p> <p>Raise boom halfway.</p> <p>Fully roll back bucket.</p> <p>Dump bucket halfway.</p> <p>Engage park brake.</p> <p>Mark and record a distance on the bucket cylinder rod from the cylinder barrel.</p> <p>Disengage park brake.</p> <p>Allow machine to sit with engine speed at slow idle for 5 minutes.</p> <p>Engage park brake.</p> <p>Measure marked distance on bucket cylinder rod.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Bucket Cylinder—Drift (maximum)..... 13.8 mm/5 min 0.5 in/5 min</p> <p><i>LOOK: Does bucket drift down more than specification?</i></p>	<p><b>NO:</b> Go to next check.</p> <p><b>YES:</b> Go to next step in this check.</p>
	<p>Raise boom halfway.</p> <p>Fully roll back bucket.</p> <p>Dump bucket halfway.</p> <p>Engage park brake.</p> <p>Turn engine off.</p> <p>Allow machine to sit for 5 minutes.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Bucket Cylinder—Drift (maximum)..... 13.8 mm/5 min 0.5 in/5 min</p> <p><i>LOOK: Does bucket drift down more than specification?</i></p>	<p><b>YES:</b> See an authorized John Deere dealer.</p> <p><b>NO:</b> Go to next check.</p>

Continued on next page

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Miscellaneous—Operational Checkout

<p><b>Bucket Curl Drift Check</b></p>	<p><i>NOTE: This check may require two people.</i></p> <p><i>NOTE: Machine must be equipped with a bucket for this check.</i></p> <p>Close cab door—if equipped.</p> <p>Operate hydraulic system until hydraulic oil reaches temperature specification.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Hydraulic Oil—Temperature..... 43°C 110°F</p> <p>Dump bucket halfway.</p> <p>Actuate boom down function to raise front of machine off the ground.</p> <p>Engage park brake.</p> <p>Mark and record a distance on the bucket cylinder rod from the cylinder barrel.</p> <p>Disengage park brake.</p> <p>Allow machine to sit with engine speed at slow idle for 5 minutes.</p> <p>Engage park brake.</p> <p>Measure marked distance on bucket cylinder rod.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Bucket Cylinder—Drift (maximum)..... 13.8 mm/5 min 0.5 in/5 min</p> <p><i>LOOK: Does bucket drift up more than specification?</i></p>	<p><b>NO:</b> Go to next check.</p> <p><b>YES:</b> Go to next step in this check.</p>
	<p>Dump bucket halfway.</p> <p>Actuate boom down function to raise front of machine off the ground.</p> <p>Engage park brake.</p> <p>Turn engine off.</p> <p>Allow machine to sit for 5 minutes.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Bucket Cylinder—Drift (maximum)..... 13.8 mm/5 min 0.5 in/5 min</p> <p><i>LOOK: Does bucket drift up more than specification?</i></p>	<p><b>YES:</b> See an authorized John Deere dealer.</p> <p><b>NO:</b> Go to next check.</p>

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<p><b>Cycle Times Check</b></p>	<p><i>NOTE: Operate machine without bucket or attachment for this check.</i></p> <p>Operate hydraulic system until hydraulic oil reaches temperature specification.</p> <p style="text-align: center;"><b>Specification</b></p> <p>Hydraulic Oil—Temperature..... 43°C 110°F</p> <p>Position engine speed control dial in fast idle position.</p> <p>Record cycle time for each function.</p> <p>Does machine perform within specification?</p> <p style="text-align: center;"><b>Cycle Times—Specification</b></p> <p>Boom Raise—Cycle Time (maximum)..... 5.4 s Boom Lower—Cycle Time (maximum)..... 3.2 s Bucket Curl—Cycle Time (maximum)..... 2.4 s Bucket Dump—Cycle Time (maximum)..... 2.4 s</p>	<p><b>YES:</b> Checks complete.</p> <p><b>NO:</b> See an authorized John Deere dealer.</p>
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CN93077,00006DC -19-14DEC15-38/38

## Miscellaneous—Troubleshooting

### Troubleshooting Procedure

*NOTE: Troubleshooting charts are arranged from the simplest to verify, to least likely, more difficult to verify. When diagnosing a problem, use all possible means to isolate the problem to a single component or system. Use the following steps to diagnose problems:*

*Step 1. Operational Checkout Procedure*

*Step 2. Troubleshooting Charts*

*Step 3. Adjustments*

*Step 4. See your authorized John Deere dealer.*

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

**Engine**

Symptom	Problem	Solution
<b>Engine Will Not Start</b>	Park brake switch not engaged (key start only)	Push upper half of switch.
	No power to key switch or park brake switch (key start only)	Check fuse and battery connection.
	No power to starter	Check key switch (if equipped), starter relay, battery connection, and starter connection.
	No fuel	Add correct fuel. Bleed air. See Bleed Fuel System. (Section 4-1.)
	Incorrect fuel	Drain fuel tank. Change primary fuel filter and water separator. See Replace Primary Fuel Filter and Water Separator. (Section 3-8.)
	Fuel shutoff valve is closed	Open fuel shutoff valve.
	Fuel filters restricted	Replace fuel filter. Bleed air. See Replace Final Fuel Filter and Replace Primary Fuel Filter and Water Separator. (Section 3-8.)
	Air leak on suction side of fuel system	Check for bubbles in fuel filter and tighten connections. Inspect fuel lines for damage.
	Slow cranking speed	Check battery and connections.
	Starter	Repair or replace starter.
<b>Engine Surges, Stalls, or Misses</b>	Fuel tank breather restricted	Remove cap and listen for sound of air entering tank. Replace fuel tank breather. See Replace Fuel Tank Breather. (Section 3-9.)
	Restricted air filter	Replace air filter. See Replace Primary and Secondary Engine Air Filter Elements. (Section 3-3.)
	Fuel filters restricted	Replace fuel filter. See Replace Final Fuel Filter and Replace Primary Fuel Filter and Water Separator. (Section 3-8.)
	Air in fuel system	Bleed air from fuel system. See Bleed Fuel System. (Section 4-1.)
	Incorrect fuel	Drain fuel tank. Change primary fuel filter and water separator. See Replace Primary Fuel Filter and Water Separator. (Section 3-8.)

Continued on next page

CN93077,0000739 -19-01DEC15-1/2



Symptom	Problem	Solution
<b>Engine Overheats</b>	Contaminated fuel	Drain fuel tank. Change primary fuel filter and water separator. See Replace Primary Fuel Filter and Water Separator. (Section 3-8.)
	Engine oil level low	Check engine oil level. See Check Engine Oil Level. (Section 3-4.)
	Coolant level low	Check coolant level. See Check Coolant Level. (Section 3-4.)
	Surge tank cap loose	Tighten surge tank cap.
	Debris buildup on cooling package	Clean debris from cooling package. See Check and Clean Cooling Package. (Section 3-3.)
	Restricted air filter	Replace air filter. See Replace Primary and Secondary Engine Air Filter Elements. (Section 3-3.)
	Engine overloaded	Reduce load on engine.
	Loose or damaged accessory drive belt	Check accessory drive belt. See Check and Adjust Accessory Drive Belt Tension. (Section 3-6.)
	Incorrect coolant mixture	Replace coolant. See Drain, Flush, and Refill Cooling System. (Section 3-11.)

CN93077,0000739 -19-01DEC15-2/2

## Electrical System

Symptom	Problem	Solution
<b>Park Brake Will Not Disengage</b>	Interlocking seat bar switch is not activated	Lower interlocking seat bar to activate seat switch.  Raise/lower interlocking seat bar to reactivate seat switch.
	Park brake has not gone through the momentary down (UNLOCKED) position (key start only)	Push lower half of switch.
<b>Park Brake Will Not Engage</b>	Park brake is not in the up (LOCKED) position (key start only)	Push upper half of switch.
<b>Starting Motor Will Not Turn</b>	Blown fuse	Replace fuse. See Replacing Fuses. (Section 4-1.)
	Battery dead or low charge	Check battery voltage and charge as necessary.
	Loose or corroded battery cables	Clean and tighten cables as necessary.
	Loose connection at starter or starter relay	Check electrical connections.
	Starter	Repair or replace starter.
<b>Engine Cranks Slowly</b>	Low battery input	Check battery voltage and charge as necessary.
	Loose or corroded battery cables	Clean and tighten cables as necessary.
	Engine oil viscosity too heavy	Drain engine oil and refill with correct oil. See Drain and Refill Engine Oil and Replace Filter. (Section 3-8.)
	Starter	Repair or replace starter.
<b>Battery Will Not Charge</b>	Low engine speed or excessive idling	Increase engine speed.
	Battery malfunction	Replace battery. See Replacing Battery. (Section 4-1.)
	Battery cables and terminals corroded	Clean cables and connections as necessary.
	Loose or damaged accessory drive belt	Check accessory drive belt. See Check and Adjust Accessory Drive Belt Tension. (Section 3-6.)
	Alternator	Repair or replace alternator.

Continued on next page

CN93077,0000722 -19-01DEC15-1/2

Miscellaneous—Troubleshooting

Symptom	Problem	Solution
<b>Lights Do Not Work</b>	Blown fuse	Replace fuse. See Replacing Fuses. (Section 4-1.)
	Bulb malfunction	Check bulb connection or replace as necessary.
<b>Battery Voltage Indicator Remains On With Engine Running</b>	Low battery input	Check battery voltage and charge as necessary.
	Loose or damaged accessory drive belt	Check accessory drive belt. See Check and Adjust Accessory Drive Belt Tension. (Section 3-6.)
	Alternator	Repair or replace alternator.

CN93077,0000722 -19-01DEC15-2/2

## Hydraulic System

Symptom	Problem	Solution
<b>Boom and Bucket Will Not Move</b>	Joysticks not in neutral (EH machines)	Move joysticks to neutral position.
	Interlocking seat bar switch is not activated	Lower interlocking seat bar to activate seat switch.
	Park brake engaged	Disengage park brake.
<b>Excessive Pump Noise</b>	Low oil level	Check hydraulic oil level. See Check Hydraulic Oil Level. (Section 3-4.)
	Suction line restricted	Check for line restriction or replace hose as necessary.
	Air leaks at pump inlet line fittings	Check all hydraulic connections and tighten as necessary.
<b>Slow Hydraulic Function</b>	Auxiliary hydraulic roller (EH machines) locked in detent position	Return roller to neutral position.
	Low engine speed	Increase engine speed.
	Cold oil	Warm oil up to operating temperature by operating hydraulic functions.
	Boom or bucket overloaded	Lighten load on hydraulic function.
	Low hydraulic oil level	Check hydraulic oil level. See Check Hydraulic Oil Level. (Section 3-4.)
	Cylinder, hose, or line leakage	Inspect and tighten fittings.
	Air leaks at pump inlet line fittings	Check all hydraulic connections and tighten as necessary.
	Restricted hydraulic filter	Replace hydraulic oil filter. See Drain and Refill Hydraulic Oil and Replace Filter. (Section 3-9.)
	Hydraulic oil aerated	Drain hydraulic oil and refill with correct oil. See Drain and Refill Hydraulic Oil and Replace Filter. (Section 3-9.)
	Stuck pivot pins	See an authorized John Deere dealer.
Bent or damaged cylinder rods	See an authorized John Deere dealer.	
<b>Machine Loses Power</b>	Low hydraulic oil level	Check hydraulic oil level. See Check Hydraulic Oil Level. (Section 3-4.)

Continued on next page

CN93077,0000725 -19-14DEC15-1/2

Miscellaneous—Troubleshooting

Symptom	Problem	Solution
	Restricted fuel filter	Replace fuel filter. See Replace Final Fuel Filter and Replace Primary Fuel Filter and Water Separator. (Section 3-8.)
	Restricted hydraulic filter	Replace hydraulic oil filter. See Drain and Refill Hydraulic Oil and Replace Filter. (Section 3-9.)
	Restricted engine air filter	Replace primary and secondary engine air filter elements. See Replace Primary and Secondary Engine Air Filter Elements. (Section 3-3.)
<b>Hydraulic System Overheats</b>	Low hydraulic oil level	Check hydraulic oil level. See Check Hydraulic Oil Level. (Section 3-4.)
	Restricted oil cooler air flow	Clean cooling package. See Check and Clean Cooling Package. (Section 3-3.)
<b>Machine Will Not Move</b>	Park brake switch engaged (key start only)	Push lower half of switch.
<b>Machine Mistracks</b>	Left and right track sag not adjusted the same	Adjust track tension. See Check Track Tension. (Section 3-5.)

CN93077,0000725 -19-14DEC15-2/2

# Miscellaneous—Machine Storage

## Prepare Machine for Storage

**IMPORTANT: Avoid machine damage. Do not use biodiesel during machine storage. When using biodiesel blends, switch to petroleum diesel for long-term storage.**

1. Before storage, operate engine on at least one complete tank of petroleum diesel fuel to purge the fuel system. Ensure that the fuel tank is full during storage to prevent water buildup due to condensation.

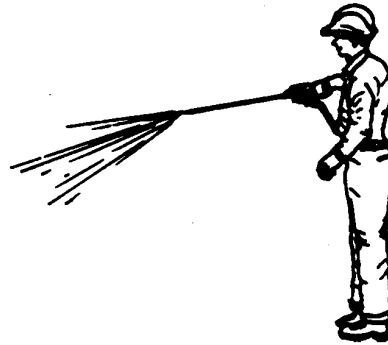
**NOTE:** For blends up to and including B20, it is recommended that biodiesel be used within 3 months of its manufacture. For blends greater than B20, it is recommended that the biodiesel be used within 45 days. The poor oxidation stability characteristic of biodiesel can result in long-term storage problems. John Deere does not recommend using biodiesel in engines powering standby applications or vehicles operating on a seasonal basis. Consult an authorized John Deere dealer or fuel supplier for additives to improve fuel storage and performance of biodiesel fuels. These additives must be added to the biodiesel close to its time of production for them to be effective.

2. Repair worn or damaged parts. If necessary, install new parts to avoid needless delays later.
3. Replace air cleaner elements.

**IMPORTANT: High-pressure washing greater than 1379 kPa (13.8 bar) (200 psi) can damage freshly painted finishes. Paint should be allowed to air-dry for a minimum of 30 days after receipt of machine before cleaning parts or machines with high pressure. Use low-pressure wash operations until 30 days have elapsed.**

4. Wash the machine. Use low-pressure wash operations (less than 1379 kPa [13.8 bar] [200 psi]) until 30 days

*LPS 3 Rust Inhibitor is a trademark of Illinois Tool Works.*



Prepare Machine for Storage

after receipt of machine have elapsed. Paint areas to prevent rust. Replace decals where needed.

5. Store machine in a dry, protected place. If stored outside, cover with a waterproof material.

**IMPORTANT: LPS 3® Rust Inhibitor can destroy painted finish. DO NOT spray LPS 3 Rust Inhibitor on painted areas.**

6. Retract all hydraulic cylinders if possible. If not, coat exposed cylinder rods with LPS 3® Rust Inhibitor.
7. Place a DO NOT OPERATE tag on the right control lever.
8. Lubricate all grease points.
9. Remove the battery and store in a dry, protected place after charging fully. If not removed, disconnect the negative battery cable from the (—) terminal.
10. Drain water separator fuel filter.
11. Remove keys and lock engine cover and door if equipped.

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## Monthly Storage Procedure

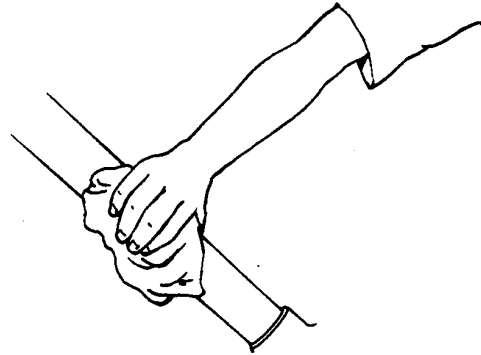
**⚠ CAUTION: Prevent possible injury or death from asphyxiation. Engine exhaust fumes can cause sickness or death. Start engine ONLY in a well-ventilated area.**

1. Drain water and sediment from fuel tank when air temperature is above freezing.
2. Remove LPS 3® Rust Inhibitor from cylinder rods with a cleaning solvent.

**IMPORTANT: Prevent possible engine damage. During cold temperatures, check fluidity of engine oil on dipstick. If the oil appears waxy and/or jelly-like rather than liquid, DO NOT attempt to start engine. Use external heat source to warm the crankcase until oil appears fluid.**

3. Check all fluid levels. If low, check for leaks and add oil as required.
4. Check belts.
5. Check condition of all hoses and connections.
6. Check battery electrolyte level. Charge and install battery.
7. For machines with **tires**, check condition of tires and tire pressure.  
For machines with **tracks**, check condition of tracks and track sag.  
On crawler machines with non-sealed and lubricated track chains, apply oil to the pin-to-bushing joints. Run machine back and forth several times.
8. Park machine on a hard surface to prevent tracks from freezing to ground.
9. Fill fuel tank.
10. Pre-lubricate turbocharger bearings if equipped:
  - a. Disconnect fuel shutoff fuse.
  - b. Crank engine for 10 seconds.
  - c. Connect fuel shutoff fuse.
11. Inspect engine compartment and remove any foreign material that may have accumulated. Start engine and run until machine reaches operating temperature.

*LPS 3 Rust Inhibitor is a trademark of Illinois Tool Works*



Clean Cylinder Rods



Check Oil on Dipstick

Run at 1/2 speed for 5 minutes. Do not run at fast or slow idle.

- If engine does not start or runs poorly after starting, change fuel filters. Bleed fuel system.

12. Operate all controls, levers, seat adjustments, etc.

**⚠ CAUTION: Prevent possible injury from unexpected machine movement. Clear the area of all persons before running machine through the operation procedure.**

13. Make sure the area is clear to allow for movement. Cycle all hydraulic functions several times. Check condition of all hoses and connections.
14. Park the machine with cylinder rods retracted, if possible. Shut engine off.
15. Apply LPS 3 Rust Inhibitor to exposed cylinder rod areas.

CN93077,000069F -19-13APR16-1/1

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T6181AU—UN—18OCT88

## Miscellaneous—Machine Numbers

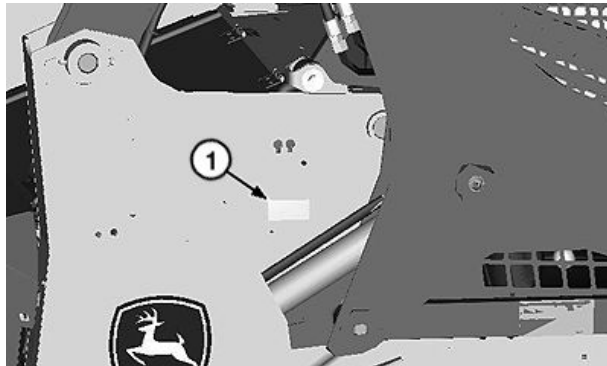
### Record Product Identification Number (PIN)

Product Identification Number (PIN) \_\_\_\_\_

Record all 17 characters of the product identification number (PIN).

The PIN tag (1) is located on the right side of machine, behind the cab.

1— PIN Tag



Product Identification Number

TX1201890 —UN—18SEP15

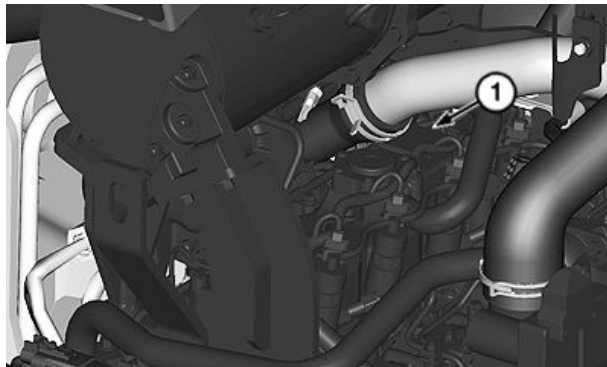
CN93077,0000672 -19-08OCT15-1/1

### Record Engine Serial Number

Engine Serial Number \_\_\_\_\_

The engine serial number tag (1) is located on top of engine rocker arm cover.

1— Engine Serial Number Tag



Engine Serial Number

TX1201873 —UN—18SEP15

CN93077,0000673 -19-18SEP15-1/1

### Keep Proof of Ownership

1. Maintain in a secure location an up-to-date inventory of all product and component serial numbers.
2. Regularly verify that identification plates have not been removed. Report any evidence of tampering to law enforcement agencies and order duplicate plates.

3. Other steps you can take:
  - Mark your machine with your own numbering system
  - Take color photographs from several angles of each machine

OUT4001,000063E -19-24JUL12-1/1

### Keep Machines Secure

1. Install vandal-proof devices.
2. When machine is in storage:
  - Lower equipment to the ground
  - Set wheels to widest position to make loading more difficult
  - Remove batteries

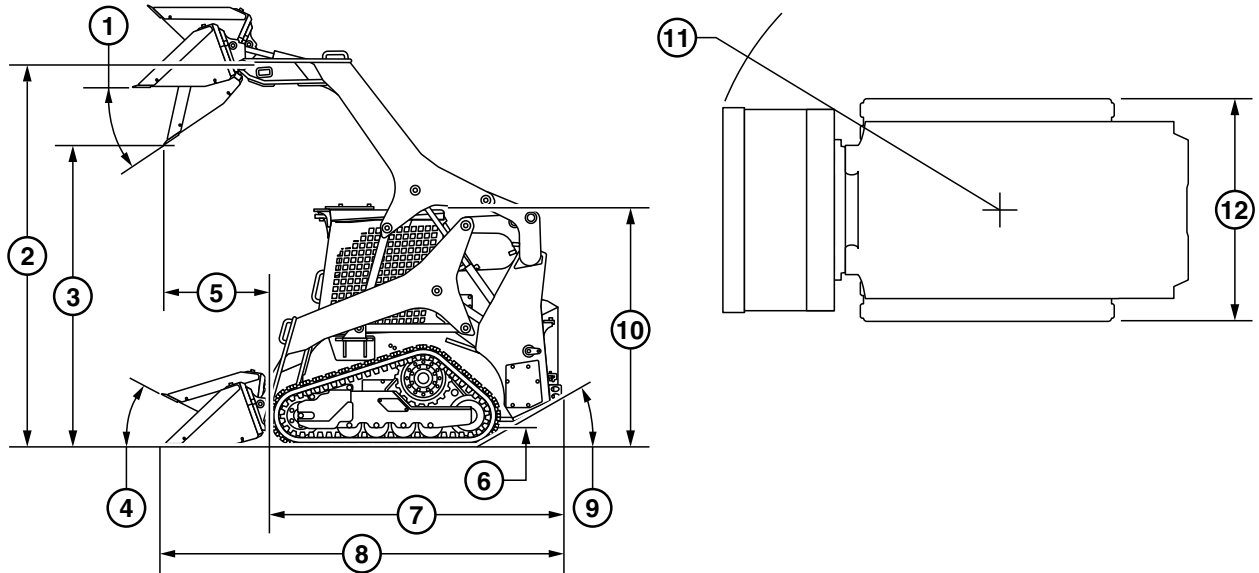
3. When parking indoors, put large equipment in front of exits and lock your storage buildings.
4. When parking outdoors, store in a well-lighted and fenced area.
5. Make note of suspicious activity and report any thefts immediately to law enforcement agencies.
6. Notify your John Deere dealer of any losses.

OUT4001,000063D -19-21JUN10-1/1



# Miscellaneous—Specifications

## 317G Machine Dimensions



**TX1201931**

*Machine Dimensions*

**NOTE:** Specifications and design are subject to change without notice. Whenever applicable, specifications are in accordance with ISO and SAE standards.

*Except where otherwise noted, these specifications are based on a machine equipped with standard tires and bucket.*

Item	Measurement	Specification
1—Dump (full lift height)	Angle	42°
2—Hinge Pin	Height	3.07 m 10 ft 1 in
3—Dump With Foundry Bucket	Height	2.43 m 8 ft 0 in
3—Dump With Construction Bucket	Height	2.26 m 7 ft 5 in
4—Bucket Rollback (ground level)	Angle	30°
5—Dump With Foundry Bucket	Reach	0.79 m 2 ft 7 in
5—Dump With Construction Bucket	Reach	0.98 m 3 ft 3 in
6—Ground Clearance	Height	0.21 m 0 ft 8 in
7—Overall Without Bucket	Length	2.63 m 8 ft 7 in
8—Overall With Foundry Bucket	Length	3.24 m 10 ft 7 in

Continued on next page

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TX1201931—UN—22SEP15

Miscellaneous—Specifications

Item	Measurement	Specification
8—Overall With Construction Bucket	Length	3.49 m 11 ft 5 in
9—Departure	Angle	32.3°
10—Top of ROPS	Height	1.99 m 6 ft 6 in
11—Front Turn Radius With Foundry Bucket	Distance	1.97 m 6 ft 6 in
12—Overall Without Bucket	Width	1.82 m 6 ft 0 in
Base Machine	Operating Weight 320 mm (1 ft 1 in) (approximate)	3721 kg 8203 lb
	Operating Weight 400 mm (1 ft 4 in) (approximate)	3789 kg
		8353 lb

CN93077,0000652 -19-19OCT15-2/2

**317G Machine Specifications**

Item	Measurement	Specification
Engine—Yanmar 4TNV86CHT		
Type		Turbocharged
Non-Road Emission Standards		Certified EPA Final Tier 4
Bore and Stroke		86 x 90 mm 3.38 x 3.54 in
Rated Net Power (SAE J1349, ISO 9249) at 2500 rpm	Power	45.6 kW 61.2 hp
Rated Gross Power (ISO 14396) at 2600 rpm	Power	48.5 kW 65.0 hp
Peak Torque at 1690 rpm	Torque	207 N·m 152.7 lb·ft
Cylinders	Quantity	4
Displacement	Volume	2.1 L 127.6 in <sup>3</sup>
Electrical System		
System	Voltage	12 V
Alternator Rating	Amperage	70 A
Battery	Capacity	750 CCA (optional 925 CCA)
Reserve	Capacity	150 min (optional 180 min)
Hydraulic System		
System Pressure at Couplers	Pressure	23 787 kPa 238 bar 3450 psi
Standard Pump	Flow Rate	59 L/min 16 gal/min
Powertrain		
Single	Speed	11.3 km/h 7.0 mph
Cooling		
Fan Type		Direct Belt Drive
Maximum Fan	Speed	2495 rpm

CN93077,0000653 -19-19OCT15-1/1

### 317G Drain and Refill Capacities

Item	Measurement	Specification
Fuel Tank	Capacity	71.2 L 18.8 gal
Cooling System	Capacity	12.0 L 3.2 gal
Engine Oil (including filter)	Capacity	7.5 L 2.0 gal
Hydraulic Tank	Capacity	22.7 L 6.0 gal
Hydrostatic Motor Brake Cavity Oil	Capacity (per side)	0.35 L 11.83 fl oz

CN93077,0000654 -19-07DEC15-1/1

### Rated Operating Capacity

Model	SAE Rated Operating Capacity	
	Tipping Load (foundry bucket)	Weight
317G	35%	965 kg (2127 lb)
317G	50%	1378 kg (3038 lb)

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### Pallet Fork Lift Chart

Pallet Fork Lift Chart		
Pallet Fork	317G (without counterweights)	317G (with counterweights)*
1070 mm (42 in)	620 kg (1366 lb)	658 kg (1451 lb)
1220 mm (48 in)	575 kg (1268 lb)	611 kg (1347 lb)

Ratings based on ISO 14397.  
\*One counterweight set includes a total of two counterweights weighing 90 kg (198 lb).

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### Eurasian Economic Union

This information applies only to products which bear the EAC conformity mark of the Eurasian Economic Union member states.

**Manufacturer:**

Deere & Company, Moline, Illinois U.S.A.

**Name of the authorized representative in the Eurasian Economic Union:**

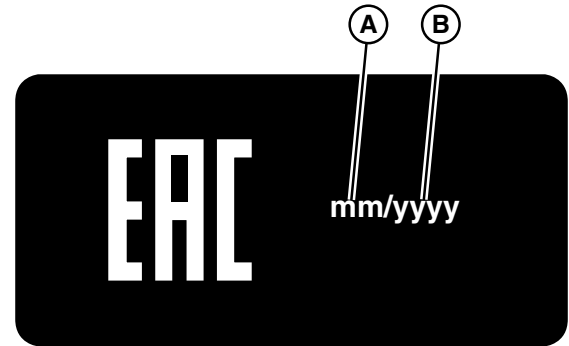
Limited Liability Company  
“John Deere Rus”

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Domodedovo, Beliye Stolbi micro district, vladenye  
“Warehouse 104”, Building 2

For technical support, contact an authorized John Deere dealer.

Date of manufacture is denoted by the product marking on or near the serial number plate.



EAC Marking

A—Month of Manufacture

B—Year of Manufacture

TX1252009 —UN—08FEB18

MB60223,0005008 -19-08FEB18-1/1

### Machine Design Life

This machine is designed and manufactured to provide a long life of productive operation, however actual attainable life depends on a number of factors including the severity of working conditions and completion of recommended maintenance. (See the Service section of this manual.)

Periodically inspect and review the machine in conjunction with your John Deere dealer. The review may result in recommendations for service, component repair,

remanufacture or replacement, or, if at the end of life, that the machine be removed from operation. (See separate decommissioning section of this manual for information on disposal and recycling of machine components.)

No machine should be operated if safety-related components are missing or in need of service. All missing or damaged safety-related components, including safety signs, should be repaired or replaced before operating.

DX\_MACH\_DESIGN\_LIFE -19-14SEP15-1/1



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