318E , 320E, and 324E Skid Steer Loader

(PIN: 1T0318E_ _ _G253889—)
(PIN: 1T0320E_ _ _G254913—)
(PIN: 1T0324E_ _ _G297141—)

JOHN DEERE

OPERATOR'S MANUAL

318E, 320E, and 324E Skid Steer Loaders

OMT312630 ISSUE F3 (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.

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

Introduction

Foreword

READ THIS MANUAL carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage. This manual and safety signs on your machine may also be available in other languages. (See your John Deere dealer to order.)

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your machine and should remain with the machine when you sell it.

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 should it be stolen. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place off the 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 you should have received from your dealer.

This warranty provides you the assurance that John Deere will back its 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 will result in such action.

THE TIRE MANUFACTURER'S warranty supplied with your machine may not apply outside the U.S.

If you are not the original owner of this machine, it is in your interest to contact your local John Deere dealer to inform them of this unit's serial number. This will help John Deere notify you of any issues or product improvements.

DX,IFC7 -19-03APR09-1/1

Manual Identification—READ THIS FIRST!

IMPORTANT: Use only supporting manuals designated for 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.

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

For more information, see Engine Identification. (Section 3-2.)

Product Serial Number Identification

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

PIN Plate Location

TX1140197 —UN—29JUL13

Example of PIN Plate

TX1140815 —UN—21AUG13

1— PIN Plate **2— 17-Character PIN**

Continued on next page

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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 318E machine that meets Interim Tier 4 and Stage III A (37-56 kW) emission level:

17-Character PIN Example																
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
1	T	0	3	1	8	E	_	_	_	G	2	5	3	8	8	9
1	T	0	3	2	0	E	_	_	_	G	2	5	4	9	1	3
1	T	0	3	2	4	E	_	_	_	G	2	9	7	1	4	1

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

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

1DW ..... Davenport Works

1T8 ..... Thibodaux Works

1T0 ..... Dubuque Works

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

318E ..... **Machine Model Identifier**

_ ..... **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)

C 2012

D 2013

E 2014

F 2015

G 2016

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

G ..... **Engine Emission Code**

C ..... Tier 2 and Stage II

D ..... Tier 3 and Stage III A

E ..... Interim Tier 4 and Stage III B

F ..... Tier 4

G ..... Interim Tier 4 and Stage III A (19-56 kW)

H ..... Final Tier 4 and Stage III A (19-37 kW)

J ..... Final Tier 4 and Stage III A (37-56 kW)

K ..... Final Tier 4 (8-19 kW)

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

253889 ..... **Machine Serial Number**

JK47244,00002BC -19-21APR16-2/2

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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License Agreement for John Deere Software

LICENSE AGREEMENT FOR JOHN DEERE SOFTWARE

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regulations, laws, safety laws, or voluntary safety standards (e.g., ISO standards) that are supported by LPs, LMs, or (e) apply any circumvention devices or hacking devices from any third parties in an attempt to reverse engineer the LM or that could be used to access trade secrets or other confidential information in the LM that is protected under applicable law. You also agree not to permit any third party acting under your control to do any of the foregoing activities related to circumvention of SM.

6. **Consideration, License Fees**. The license fees or other good and valuable consideration paid by you are paid in consideration of the licenses granted under this License Agreement.

7. **Limited Warranty**. Licensor warrants, for your benefit alone and not for the benefit of any other party, that during the "**Warranty Period**" defined below, the Software will operate substantially in accordance with the applicable functional specifications ("**Specifications**") set forth in the Operators' Manuals. If, prior to expiration of the Warranty Period, the Software fails to perform substantially in accordance with the Specifications, you may return the LP to the place of purchase for repair or replacement of the non-performing Software. As used in this License Agreement. The "Warranty Period" is one (1) year from the date you take delivery of the LP.

8. **DISCLAIMER OF WARRANTIES**. YOU HEREBY AGREE THAT THE LIMITED WARRANTY PROVIDED ABOVE (THE "**LIMITED WARRANTY**") CONSTITUTES YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY PROBLEM WHATSOEVER WITH THE LM. EXCEPT AS PROVIDED IN THE LIMITED WARRANTY, THE LM IS LICENSED "AS IS," AND LICENSOR, ITS AFFILIATES AND THIRD PARTY SUPPLIERS EXPRESSLY DISCLAIM AND YOU EXPRESSLY WAIVE, RELEASE AND RENOUNCE ALL WARRANTIES ARISING BY LAW OR OTHERWISE WITH RESPECT TO THE LM, INCLUDING, BUT NOT LIMITED TO: ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE; ANY IMPLIED WARRANTY ARISING FROM COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE; ANY WARRANTY OF TITLE OR NON-INFRINGEMENT; AND, ANY OTHER WARRANTY ARISING UNDER ANY THEORY OF LAW, INCLUDING TORT, NEGLIGENCE, STRICT LIABILITY, CONTRACT OR OTHER LEGAL OR EQUITABLE THEORY. NO REPRESENTATION OR OTHER AFFIRMATION OF FACT INCLUDING, BUT NOT LIMITED TO, STATEMENTS REGARDING SUITABILITY FOR USE, SHALL BE DEEMED TO BE A WARRANTY BY LICENSOR OR ANY OF ITS AFFILIATES OR THIRD PARTY SUPPLIERS. LICENSOR DOES NOT WARRANT THAT THE LM AND/OR LP IS ERROR-FREE OR WILL OPERATE WITHOUT INTERRUPTION.

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13. **Costs of Litigation**. If any claim or action is brought by either party to this License Agreement against the other party regarding the subject matter hereof, the prevailing party shall be entitled to recover, in

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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.

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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 System Certification Label

RG33429 —UN—04FEB21

Engine Emissions Label

CAUTION: Statutes providing severe penalties for tampering with emissions controls may apply to the user or dealer.

The emissions warranty applies to those engines marketed by John Deere that have been certified by the United States Environmental Protection Agency (EPA) and/or California Air Resources Board (CARB); and used in the United States and Canada in Non-road equipment. The presence of an emissions label like the one shown signifies that the engine has been certified with the EPA and/or CARB. The EPA and CARB warranties only apply to new engines having the certification label affixed to the engine and sold as stated above in the geographic areas. The presence of an EU number signifies that the engine has been certified with the European Union countries per Regulation (EU) 2016/1628 and supplementing legislation. The EPA and/or CARB emissions warranties do not apply to the EU countries.

The emissions label has applicable US EPA and/or CARB regulatory year. The regulatory year determines which warranty statement is applicable to engine. See “EPA Non-road Emissions Control Warranty Statement—Compression Ignition” and “CARB Non-road Emissions Control Warranty Statement—Compression Ignition”. For additional regulatory year warranty statements, see www.JohnDeere.com or contact the nearest John Deere service dealer for assistance.

Emission Control System(s) Laws

The U.S. EPA and California ARB prohibit the removal or rendering inoperative of any device or element of design installed on or in engines/equipment in compliance with applicable emission regulations prior to or after the sale and delivery of the engines/equipment to the ultimate purchaser.

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EPA Non-road Emissions Control Warranty Statement—Compression Ignition

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JOHN DEERE

U.S. AND CANADA EMISSION CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

To determine if the John Deere engine qualifies for the additional warranties set forth below, look for the "Emissions Control Information" label located on the engine. If the engine is operated in the United States or Canada and the Emissions Control information label states: "This engine complies with US EPA regulations for nonroad and stationary diesel engines", or "This engine conforms to US EPA nonroad compression-ignition regulations", refer to the "U.S. and Canada Emission Control Warranty Statement." If the engine is operated in California, and the label states: "This engine complies with US EPA and CARB regulations for nonroad diesel engines", or "This engine conforms to US EPA and California nonroad compression-ignition emission regulations", also refer to the "California Emission Control Warranty Statement."

Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete engine warranty, less emissions-related parts and components, is provided separately. If you have any questions about your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400.

JOHN DEERE'S WARRANTY RESPONSIBILITY

John Deere warrants to the ultimate purchaser and each subsequent purchaser that this off-road diesel engine including all parts of its emission-control system was designed, built and equipped so as to conform at the time of the sale with Section 213 of the Clean Air Act and is free from defects in materials and workmanship which would cause the engine to fail to conform with applicable US EPA regulations for a period of five years from the date the engine is placed into service or 3,000 hours of operation, whichever first occurs.

Where a warrantable condition exists, John Deere will repair or replace, as it elects, any part or component with a defect in materials or workmanship that would increase the engine's emissions of any regulated pollutant within the stated warranty period at no cost to you, including expenses related to diagnosing and repairing or replacing emission-related parts. Warranty coverage is subject to the limitations and exclusions set forth herein. Emission- related components include engine parts developed to control emissions related to the following:

Air-Induction System
Fuel System
Ignition System
Exhaust Gas Recirculation Systems
Aftertreatment Devices
Crankcase Ventilation Valves
Sensors
Engine Electronic Control Units

EMISSION WARRANTY EXCLUSIONS

John Deere may deny warranty claims for malfunctions or failures caused by:

- Non-performance of maintenance requirements listed in the Operator's Manual
- The use of the engine/equipment in a manner for which it was not designed
- Abuse, neglect, improper maintenance or unapproved modifications or alterations
- Accidents for which it does not have responsibility or by acts of God

The off-road diesel engine is designed to operate on diesel fuel as specified in the Fuels, Lubricants and Coolants section in the Operators Manual. Use of any other fuel can harm the emissions control system of the engine/equipment and is not approved for use.

To the extent permitted by law John Deere is not liable for damage to other engine components caused by a failure of an emission-related part, unless otherwise covered by standard warranty.

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Emission_CI_EPA (18Dec09)

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JOHN DEERE

U.S. AND CANADA EMISSION CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

To determine if the John Deere engine qualifies for the additional warranties set forth below, look for the "Emissions Control Information" label located on the engine. If the engine is operated in the United States or Canada and the Emissions Control information label states: "This engine complies with US EPA regulations for nonroad and stationary diesel engines", or "This engine conforms to US EPA nonroad compression-ignition regulations", refer to the "U.S. and Canada Emission Control Warranty Statement." If the engine is operated in California, and the label states: "This engine complies with US EPA and CARB regulations for nonroad diesel engines", or "This engine conforms to US EPA and California nonroad compression-ignition emission regulations", also refer to the "California Emission Control Warranty Statement."

Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete engine warranty, less emissions-related parts and components, is provided separately. If you have any questions about your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400.

JOHN DEERE'S WARRANTY RESPONSIBILITY

John Deere warrants to the ultimate purchaser and each subsequent purchaser that this off-road diesel engine including all parts of its emission-control system was designed, built and equipped so as to conform at the time of the sale with Section 213 of the Clean Air Act and is free from defects in materials and workmanship which would cause the engine to fail to conform with applicable US EPA regulations for a period of five years from the date the engine is placed into service or 3,000 hours of operation, whichever first occurs.

Where a warrantable condition exists, John Deere will repair or replace, as it elects, any part or component with a defect in materials or workmanship that would increase the engine's emissions of any regulated pollutant within the stated warranty period at no cost to you, including expenses related to diagnosing and repairing or replacing emission-related parts. Warranty coverage is subject to the limitations and exclusions set forth herein. Emission- related components include engine parts developed to control emissions related to the following:

Air-Induction System
Fuel System
Ignition System
Exhaust Gas Recirculation Systems
Aftertreatment Devices
Crankcase Ventilation Valves
Sensors
Engine Electronic Control Units

EMISSION WARRANTY EXCLUSIONS

John Deere may deny warranty claims for malfunctions or failures caused by:

- Non-performance of maintenance requirements listed in the Operator's Manual
- The use of the engine/equipment in a manner for which it was not designed
- Abuse, neglect, improper maintenance or unapproved modifications or alterations
- Accidents for which it does not have responsibility or by acts of God

The off-road diesel engine is designed to operate on diesel fuel as specified in the Fuels, Lubricants and Coolants section in the Operators Manual. Use of any other fuel can harm the emissions control system of the engine/equipment and is not approved for use.

To the extent permitted by law John Deere is not liable for damage to other engine components caused by a failure of an emission-related part, unless otherwise covered by standard warranty.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. REMEDIES UNDER THIS WARRANTY ARE LIMITED TO THE PROVISIONS OF MATERIAL AND SERVICES AS SPECIFIED HEREIN. WHERE PERMITTED BY LAW, NEITHER JOHN DEERE NOR ANY AUTHORIZED JOHN DEERE ENGINE DISTRIBUTOR, DEALER, OR REPAIR FACILITY OR ANY COMPANY AFFILIATED WITH JOHN DEERE WILL BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Emission_CI_EPA (18Dec09)

TS1721 —UN—15JUL13

DX,EMISSIONS,EPA -19-12DEC12-2/2

CARB Non-road Emissions Control Warranty Statement—Compression Ignition

Emissions Control Warranty Statement 2019 through 2021

DXLOGOV1 —UN—28APR09

JOHN DEERE

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

To determine if the John Deere engine qualifies for the additional warranties set forth below, look for the “Emission Control Information” label located on the engine. If the engine is operated in the United States or Canada and the engine label states: “This engine complies with US EPA regulations for nonroad and stationary diesel engines”, or “This engine complies with US EPA regulations for stationary emergency diesel engines”, refer to the “U.S. and Canada Emission Control Warranty Statement.” If the engine is operated in California, and the engine label states: “This engine complies with US EPA and CARB regulations for nonroad diesel engines” also refer to the “California Emissions Control Warranty Statement.”

Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete engine warranty, less emission-related parts and components, is provided separately. If you have any questions about your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400.

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT:

The California Air Resources Board (CARB) is pleased to explain the emission-control system warranty on 2019 through 2021 off-road diesel engines. In California, new off-road engines must be designed, built and equipped to meet the State’s stringent anti-smog standards. John Deere 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 and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

John Deere warrants to the ultimate purchaser and each subsequent purchaser that this off-road diesel engine was designed, built, and equipped so as to conform at the time of sale with all applicable regulations adopted by CARB and is free from defects in materials and workmanship which would cause the failure of a warranted part to be identical in all material respects to the part as described in John Deere's application for certification for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first for all engines rated at 19 kW and greater. In the absence of a device to measure hours of use, the engine shall be warranted for a period of five years.

EMISSIONS WARRANTY EXCLUSIONS:

John Deere may deny warranty claims for failures caused by the use of an add-on or modified part which has not been exempted by the CARB. A modified part is an aftermarket part intended to replace an original emission-related part which is not functionally identical in all respects and which in any way affects emissions. An add-on part is any aftermarket part which is not a modified part or a replacement part.

In no event will John Deere, any authorized engine distributor, dealer, or repair facility, or any company affiliated with John Deere be liable for incidental or consequential damage.

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DX,EMISSIONS,CARB -19-26AUG20-1/8

JOHN DEERE'S WARRANTY RESPONSIBILITY:

Where a warrantable condition exists, John Deere will repair or replace, as it elects, your off-road diesel engine at no cost to you, including diagnosis, parts or labor. Warranty coverage is subject to the limitations and exclusions set forth herein. The off-road diesel engine is warranted for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first. The following are emissions-related parts:

Air Induction System

- Intake manifold
- Turbocharger
- Charge air cooler

Fuel Metering system

- Fuel injection system

Exhaust Gas Recirculation

- EGR valve

Catalyst or Thermal Reactor Systems

- Catalytic converter
- Exhaust manifold

Emission control labels

Particulate Controls

- Any device used to capture particulate emissions
- Any device used in the regeneration of the capturing system
- Enclosures and manifolding
- Smoke Puff Limiters

Positive Crankcase Ventilation (PCV) System

- PCV valve
- Oil filler cap

Advanced Oxides of Nitrogen (NOx) Controls

- NOx absorbers and catalysts

SCR systems and urea containers/dispensing systems

Miscellaneous Items used in Above Systems

- Electronic control units, sensors, actuators, wiring harnesses, hoses, connectors, clamps, fittings, gasket, mounting hardware

Any warranted emissions-related part scheduled for replacement as required maintenance is warranted by John Deere for the period of time prior to the first scheduled replacement point for the part. Any warranted emissions-related part not scheduled for replacement as required maintenance or scheduled only for regular inspection is warranted by John Deere for the stated warranty period.

OWNER'S WARRANTY RESPONSIBILITIES:

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The owner is responsible for initiating the warranty process, and should present the machine to the nearest authorized John Deere dealer as soon as a problem is suspected. The warranty repairs should be completed by the authorized John Deere dealer as quickly as possible.

Emissions regulations require the customer to bring the unit to an authorized servicing dealer when warranty service is required. As a result, John Deere is NOT liable for travel or mileage on emissions warranty service calls.

Emission_CI_CARB (01Feb17)

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DX,EMISSIONS,CARB -19-26AUG20-2/8

Emissions Control Warranty Statement 2019 through 2021

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JOHN DEERE

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

To determine if the John Deere engine qualifies for the additional warranties set forth below, look for the “Emission Control Information” label located on the engine. If the engine is operated in the United States or Canada and the engine label states: “This engine complies with US EPA regulations for nonroad and stationary diesel engines”, or “This engine complies with US EPA regulations for stationary emergency diesel engines”, refer to the “U.S. and Canada Emission Control Warranty Statement.” If the engine is operated in California, and the engine label states: “This engine complies with US EPA and CARB regulations for nonroad diesel engines” also refer to the “California Emissions Control Warranty Statement.”

Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete engine warranty, less emission-related parts and components, is provided separately. If you have any questions about your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400.

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT:

The California Air Resources Board (CARB) is pleased to explain the emission-control system warranty on 2019 through 2021 off-road diesel engines. In California, new off-road engines must be designed, built and equipped to meet the State’s stringent anti-smog standards. John Deere 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 and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

John Deere warrants to the ultimate purchaser and each subsequent purchaser that this off-road diesel engine was designed, built, and equipped so as to conform at the time of sale with all applicable regulations adopted by CARB and is free from defects in materials and workmanship which would cause the failure of a warranted part to be identical in all material respects to the part as described in John Deere's application for certification for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first for all engines rated at 19 kW and greater. In the absence of a device to measure hours of use, the engine shall be warranted for a period of five years.

EMISSIONS WARRANTY EXCLUSIONS:

John Deere may deny warranty claims for failures caused by the use of an add-on or modified part which has not been exempted by the CARB. A modified part is an aftermarket part intended to replace an original emission-related part which is not functionally identical in all respects and which in any way affects emissions. An add-on part is any aftermarket part which is not a modified part or a replacement part.

In no event will John Deere, any authorized engine distributor, dealer, or repair facility, or any company affiliated with John Deere be liable for incidental or consequential damage.

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JOHN DEERE'S WARRANTY RESPONSIBILITY:

Where a warrantable condition exists, John Deere will repair or replace, as it elects, your off-road diesel engine at no cost to you, including diagnosis, parts or labor. Warranty coverage is subject to the limitations and exclusions set forth herein. The off-road diesel engine is warranted for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first. The following are emissions-related parts:

Air Induction System

- Intake manifold
- Turbocharger
- Charge air cooler

Fuel Metering system

- Fuel injection system

Exhaust Gas Recirculation

- EGR valve

Catalyst or Thermal Reactor Systems

- Catalytic converter
- Exhaust manifold

Emission control labels

Particulate Controls

- Any device used to capture particulate emissions
- Any device used in the regeneration of the capturing system
- Enclosures and manifolding
- Smoke Puff Limiters

Positive Crankcase Ventilation (PCV) System

- PCV valve
- Oil filler cap

Advanced Oxides of Nitrogen (NOx) Controls

- NOx absorbers and catalysts

SCR systems and urea containers/dispensing systems

Miscellaneous Items used in Above Systems

- Electronic control units, sensors, actuators, wiring harnesses, hoses, connectors, clamps, fittings, gasket, mounting hardware

Any warranted emissions-related part scheduled for replacement as required maintenance is warranted by John Deere for the period of time prior to the first scheduled replacement point for the part. Any warranted emissions-related part not scheduled for replacement as required maintenance or scheduled only for regular inspection is warranted by John Deere for the stated warranty period.

OWNER'S WARRANTY RESPONSIBILITIES:

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Emissions regulations require the customer to bring the unit to an authorized servicing dealer when warranty service is required. As a result, John Deere is NOT liable for travel or mileage on emissions warranty service calls.

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Emissions Control Warranty Statement 2022 through 2024

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JOHN DEERE

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

To determine if the John Deere engine qualifies for the additional warranties set forth below, look for the “Emission Control Information” label located on the engine. If the engine is operated in the United States or Canada and the engine label states: “This engine complies with US EPA regulations for nonroad and stationary diesel engines”, or “This engine complies with US EPA regulations for stationary emergency diesel engines”, refer to the “U.S. and Canada Emission Control Warranty Statement.” If the engine is operated in California, and the engine label states: “This engine complies with US EPA and California regulations for nonroad/off-road diesel engines” also refer to the “California Emissions Control Warranty Statement.”

Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete engine warranty, less emission-related parts and components, is provided separately. If you have any questions about your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400.

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT:

The California Air Resources Board (CARB) is pleased to explain the emission-control system warranty on 2022 through 2024 off-road diesel engines. In California, new off-road engines must be designed, built and equipped to meet the State’s stringent anti-smog standards. John Deere 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 and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

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DX,EMISSIONS,CARB -19-26AUG20-5/8

JOHN DEERE'S WARRANTY RESPONSIBILITY:

Where a warrantable condition exists, John Deere will repair or replace, as it elects, your off-road diesel engine at no cost to you, including diagnosis, parts or labor. Warranty coverage is subject to the limitations and exclusions set forth herein. The off-road diesel engine is warranted for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first. The following are emissions-related parts:

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- Charge air cooler

Fuel Metering system

- Fuel injection system

Exhaust Gas Recirculation

- EGR valve

Catalyst or Thermal Reactor Systems

- Catalytic converter
- Exhaust manifold

Emission control labels

Particulate Controls

- Any device used to capture particulate emissions
- Any device used in the regeneration of the capturing system
- Enclosures and manifolding
- Smoke Puff Limiters

Positive Crankcase Ventilation (PCV) System

- PCV valve
- Oil filler cap

Advanced Oxides of Nitrogen (NOx) Controls

- NOx absorbers and catalysts

SCR systems and urea containers/dispensing systems

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- Electronic control units, sensors, actuators, wiring harnesses, hoses, connectors, clamps, fittings, gasket, mounting hardware

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Emissions regulations require the customer to bring the unit to an authorized servicing dealer when warranty service is required. As a result, John Deere is NOT liable for travel or mileage on emissions warranty service calls.

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Emissions Control Warranty Statement 2022 through 2024

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JOHN DEERE

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

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JOHN DEERE'S WARRANTY RESPONSIBILITY:

Where a warrantable condition exists, John Deere will repair or replace, as it elects, your off-road diesel engine at no cost to you, including diagnosis, parts or labor. Warranty coverage is subject to the limitations and exclusions set forth herein. The off-road diesel engine is warranted for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first. The following are emissions-related parts:

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Fuel Metering system

- Fuel injection system

Exhaust Gas Recirculation

- EGR valve

Catalyst or Thermal Reactor Systems

- Catalytic converter
- Exhaust manifold

Emission control labels

Particulate Controls

- Any device used to capture particulate emissions
- Any device used in the regeneration of the capturing system
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Positive Crankcase Ventilation (PCV) System

- PCV valve
- Oil filler cap

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Emissions regulations require the customer to bring the unit to an authorized servicing dealer when warranty service is required. As a result, John Deere is NOT liable for travel or mileage on emissions warranty service calls.

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Safety and Operator Convenience Features

TX1139694

TX1139694 —UN—02JUL13

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. Options are available.

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

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

JK47244,00002F6 -19-23JUN17-1/1

Information for European Union Directives and Eurasian Economic Union Technical Regulations Compliance

Skid Steer Loader

TX1213396 —UN—25APR16

TX1066144 —UN—19OCT09

CE Mark

TX1066156 —UN—15OCT09

PIN Plate

TX1175987 —UN—03NOV14

EAC Marking

TX1066630 —UN—21OCT09

EU Flex Label

1— PIN Plate
2— CE Mark (if required)
3— EAC Marking (if required)
4— EU Flex Label (if required)

To the Customer

Effective June, 2006, all machines sold in the European Union must comply with the machinery directive 2006/42/EC and any amendments. Each machine meeting these requirements must bear the conformity mark CE. In addition, each machine must be accompanied with a Declaration of Conformity by the machine manufacturer. This declaration must be kept with the machine at all times and does not declare conformity to national road regulations.

Effective February 15, 2013, all machines sold in the Eurasian Economic Union must comply with the Technical Regulations of the Eurasian Economic Union TR TS 010/2011 “On Safety of machinery and Equipment.” Each machine meeting these requirements must bear the EAC Marking.

NOTE: This machine may need country approval for travel on public roads in Europe as some European countries require special equipment and approvals.

Product Identification Number (PIN), CE Mark, EAC Marking, and EU Flex Label Locations

The machine is identified by the PIN that is stamped on a serial number plate. The PIN plate (1), CE Mark or EAC Marking, and if required, EU flex label are located on the machine as indicated in the machine image.

Continued on next page

MB60223,0005009 -19-26JUL16-1/2

NOTE: If this machine was certified (homologated) to the requirements of the Eurasian Economic Union, there will be a CE mark affixed in indicated area (2). If required this machine will also be affixed with an EU Flex label (4) beside the CE mark in the indicated area.

If this machine was certified (homologated) to the requirements of the Eurasian Economic Union, there will be a EAC marking (3) affixed in the indicated area.

Sound and Vibration Specifications

Model	**324E**
Operator sound pressure and exterior sound power levels are:	
Cab	82 dB(A) and 90 dB(A) or less *
NOTE: Factors affecting listed values include operator performance, machine age, seat condition, the use of accessories, environment, and any machine movement. *(*) Data acquisition system precision values with a 2% technical uncertainty.* Sound levels were obtained using the test method specified per ISO 6396:2008 and ISO 6395:2008, respectively.	
Operator vibration levels with properly maintained machines operating on a flat dirt area free of large objects such as trees and rocks are:	
Whole Body	0.5 m/s^2 or less **
Hand Arm	2.5 m/s^2
NOTE: Factors affecting listed values include operator performance, machine age, the condition of window and door seals, the use of accessories, environment, and any machine movement. *(*) Data acquisition system precision values with a 2% technical uncertainty.* *(**) Vibration levels were obtained using the test method specified per GOST 31191.1:2004.*	

MB60223,0005009 -19-26JUL16-2/2

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.

DANGER

WARNING

CAUTION

T133555 —UN—15APR13

T133588 —19—28AUG00

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

Follow Safety Instructions

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

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

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

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

TS201 —UN—15APR13

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

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

Operate Only If Qualified

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

Operator should be familiar with the job site and surroundings before operating. Try all controls and machine functions with the machine in an open area before starting to work.

Know and observe all safety rules that may apply to every work situation and work site.

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

Wear Protective Equipment

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

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

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

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protection such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises. Radio or music headphones are not suitable to use for hearing protection.

TS206 —UN—15APR13

TX,WEAR,PE -19-16JUN21-1/1

Avoid Unauthorized Machine Modifications

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

Modifications to 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 that 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.

TX,AVOID,MACH,MODS -19-24FEB20-1/1

Inspect Machine

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

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

T6607AQ —UN—15APR13

TX,INSPECT -19-16MAY23-1/1

Stay Clear of Moving Parts

Entanglements in moving parts can cause serious injury.

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

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

T133592 —UN—15APR13

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

Avoid High-Pressure Fluids

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

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

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

If an accident occurs, seek medical assistance immediately.

X9811 —UN—23AUG88

TX,FLUID -19-21DEC21-1/1

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, seek medical assistance immediately.

T133509 —UN—15APR13

T133840 —UN—20SEP00

TX,HPOILS -19-21DEC21-1/1

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

High Debris Applications

Many operations create flammable debris such as mulching, shredding, recycling, and agricultural applications. Operating in such environments may require frequent cleaning of the machine and attachments. Frequency of cleaning will vary depending on a number of factors, including operating conditions and weather.

Flammable Debris

T133552 —UN—15APR13

TX,HIGH,DEBRIS,APP -19-06MAR22-1/1

Prevent Fires, Clean Debris From Machine

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: Engine temperatures may be elevated following engine shut-down. Keep flammable debris (trash, leaves, twigs, straw, etc.), grease and oil from accumulating in or around engine compartment, radiator, batteries, fuel tank, operator station, fuel lines, hydraulic lines, exhaust components, and electrical wiring. Never store oily rags or flammable materials inside any 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: debris may contain sparks or embers. Do not operate near any flames.

T133552 —UN—15APR13

Handle Fuel Safely

T133553 —UN—07SEP00

Clean Machine Regularly

T133554 —UN—07SEP00

Carry a Fire Extinguisher

T133555 —UN—15APR13

Caution

TX,PREVENT,FIRE -19-02NOV22-1/1

In Case of Machine Fire

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

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

TS227 —UN—15APR13

In Case of Machine Fire

TX,MACH,FIRE -19-24FEB20-1/1

Prevent Battery Explosions

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

Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

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

Keep battery electrolyte levels properly maintained.

TS204 —UN—15APR13

Battery Explosions

TX,PREVENT,BATT -19-24FEB20-1/1

Handle Chemical Products Safely

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

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

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

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

TS1132 —UN—15APR13

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

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); 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.

TS1133 —UN—15APR13

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

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 -19-16MAY23-1/1

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

Use Steps and Handholds Correctly

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

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

T133468 —UN—15APR13

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

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.

Operate Only From Operators Seat

TX1314398 —UN—29JUN21

TX,SOFOS -19-29JUN21-1/1

Use and Maintain Seat Belt

Use seat belt when operating machine. Remember to fasten seat belt when loading and unloading from trucks and during other uses.

CAUTION: Prevent personal injury. Check condition of seat belt and mounting hardware before operating machine. Replace if worn, frayed, or damaged.

Replace seat belt at least every 3 years, regardless of condition.

USE SEAT BELT

TX1165594 —19—23JUL14

TX,SEAT,BELT -19-27JUL20-1/1

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)

TX1125062 —UN—31OCT12

Key Start Control Panel

TX1123971A —UN—11DEC12

Sealed Switch Module (SSM)

JK47244,00001A6 -19-02SEP15-1/1

Avoid Work Site Hazards

Before digging, check local requirements and call utility line location services to identify and mark all underground utilities in digging area before starting work. Avoid contact with gas lines, buried cables and water lines.

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

Reduce machine speed when operating with tool on or near ground when obstacles may be hidden (e.g., during snow removal or clearing mud, dirt, etc.). At high speeds hitting obstacles (rocks, uneven concrete, or manholes) can cause a sudden stop. Always wear seat belt. On units equipped with shoulder belts always wear both the seat and shoulder belt and **do not lean forward** while operating.

T192984 —UN—26AUG03

Contact With Electrical Lines

TX1064889 —UN—02OCT09

Operate on Solid Footing

TX1286211 —UN—03OCT19

811 Call Before You Dig

OUT4001,00004A4 -19-07OCT19-1/1

Keep Riders Off Machine

Always use seat belt.

Only allow operator on machine.

The instructional seat, if equipped, is used to accommodate trainers, persons that need to observe machine operation, and for coworkers to provide further operational instructions.

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

T192977 —UN—26AUG03

Keep Riders Off Machine

TX,NO,RIDERS,SSL -19-23APR20-1/1

Avoid Backover Accidents

Before moving machine, be sure that all bystanders or machines 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.

T192978 —UN—26AUG03

Avoid Backover Accidents

VD76477,0000095 -19-11JUL19-1/1

Avoid Machine Tip Over and Machine Damage

Use seat belt at all times.

Do not jump if the machine tips. Operator is unlikely to jump clear and the machine can 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. To aid in visibility and lower center of gravity, carry tools and loads close to the ground. 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 do not uniformly support the wheels, especially when raising the boom. Do not operate close to banks or open excavations that can cave in and cause machine to tip or fall.

T133716 —19—17APR13

Use Seat Belt

T192979 —UN—26AUG03

Avoid Machine Tip Over

VD76477,0000096 -19-24JUL19-1/1

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.

TX1063677 —UN—01SEP09

Operating On Slopes-Wheeled

OUT4001,0000470 -19-25MAY18-1/1

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.

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

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

Park and Prepare for Service Safely

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

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

Securely support machine or attachment before working under it.

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

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

When performing above-ground maintenance, use appropriate support devices such as ladders, lifts, or platforms. If equipped, use the machine anchorage points and approved fall arrest harnesses and lanyards.

T133332 —19—17APR13

TS229 —UN—23AUG88

TX,PARK,SSL -19-21AUG20-1/1

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.

TS220 —UN—15APR13

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

Dispose of paint and solvent properly.

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

Make Welding Repairs Safely

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

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

Avoid welding or heating near pressurized fluid lines. Flammable spray may result and cause severe burns if pressurized lines malfunction as a result of heating. Do not let heat go beyond work area to nearby pressurized lines.

Remove paint properly. Do not inhale paint dust or fumes. Use a qualified welding technician for structural repairs.

Heating Near Pressurized Fluid Lines

T133547 —UN—15APR13

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

TX,WELD,SAFE -19-08MAY20-1/1

Drive Metal Pins Safely

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

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

T133738 —UN—15APR13

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

Service Tires Safely

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

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

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

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

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

TS211 —UN—15APR13

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

Handle Cab Door Safely

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

TX1142008 —UN—07AUG13

JK47244,0000339 -19-08AUG13-1/1

Safety Signs and Other Instructions

TX1143601

TX1143601 —UN—06SEP13

Safety Signs, Left Side Shown

1— **CAUTION, Before Raising ROPS**
2— **Protective Structure Certification**
3— **WARNING, Always Install Boom Lock**
4— **WARNING, Pinch Area Keep Away**
5— **CAUTION, Avoid Overturn**
6— **WARNING, Seat Belt Should Be Worn At All Times**
7— **CAUTION, Before Operating This Machine**
8— **WARNING, Prevent Injury**
9— **DANGER, Avoid Crushing Injury**
10— **WARNING, No Riders/Keep Riders Off Machine**

Continued on next page

MB60223,0000025 -19-12APR16-1/15

TX1143602

TX1143602 —UN—06SEP13

Safety Signs, Right Side Shown

4— WARNING, Pinch Area Keep Away
11— WARNING, Avoid Crushing Injury
12— WARNING, Avoid Rotating Fan
13— WARNING, Pressurized System

MB60223,0000025 -19-12APR16-2/15

1. **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 safety label is located inside the cab behind the right joystick.

TX1143572 —19—06SEP13

CAUTION, Before Raising ROPS

Continued on next page

MB60223,0000025 -19-12APR16-3/15

2. **Protective Structure Certification**

To maintain unimpaired operator protection and manufacturer's protective structure certification:

- Damaged Roll Over Protective Structure (ROPS) or Falling Object Protective Structure (FOPS) must be replaced, not repaired or revised.

- Any alteration to the ROPS or FOPS must be approved by the manufacturer.

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

TX1125729 —19—06SEP13

Protective Structure Certification

MB60223,0000025 -19-12APR16-4/15

3. **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 safety label is located inside the cab near the right joystick.

TX1125786 —19—14NOV12

WARNING, Always Install Boom Lock

MB60223,0000025 -19-12APR16-5/15

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

Pinch area keep away.

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

TX1125566 —19—17DEC12

WARNING, Pinch Area Keep Away

Continued on next page

MB60223,0000025 -19-12APR16-6/15

5. **CAUTION, Avoid Overturn**

- Carry load low.

- Avoid steep slopes and high speed turns.

- Do not operate over rated capacity.

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

TX1125788 —19—13NOV12

CAUTION, Avoid Overturn

MB60223,0000025 -19-12APR16-7/15

6. **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 safety label is located inside the cab near the left joystick.

TX1125804 —19—13NOV12

WARNING, Seat Belt Should Be Worn At All Times

MB60223,0000025 -19-12APR16-8/15

7. **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 safety sign is located inside the cab near the right joystick.

TX1125787 —19—14NOV12

CAUTION, Before Operating This Machine

Continued on next page

MB60223,0000025 -19-12APR16-9/15

8. **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 safety label is located on the front of the machine near the bucket cylinder.

TX1125728 —19—03JAN13

WARNING, Prevent Injury

MB60223,0000025 -19-12APR16-10/15

9. **DANGER, Avoid Crushing Injury**

Always install boom lock before entering this area.

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

TX1125726 —19—17DEC12

DANGER, Avoid Crushing Injury

MB60223,0000025 -19-12APR16-11/15

10. **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 operators view resulting in the machine being operated in an unsafe manner.

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

TX1143599 —UN—06SEP13

WARNING, No Riders/Keep Riders Off Machine

Continued on next page

MB60223,0000025 -19-12APR16-12/15

11. **WARNING, Avoid Crushing Injury**

Avoid crushing injury.

Boom linkage moves near engine hood and frame.

Never stand or lean anywhere on loader.

This safety label is located at the rear of the machine on the engine hood.

WARNING, Avoid Crushing Injury

TX1125731 —19—17DEC12

MB60223,0000025 -19-12APR16-13/15

12. **WARNING, Avoid Rotating Fan**

Avoid rotating fan.

Stop engine.

Keep clear to avoid serious injury.

This safety label is located on the rear of the machine behind the grill.

WARNING, Avoid Rotating Fan

TX1125730 —19—17DEC12

MB60223,0000025 -19-12APR16-14/15

13. **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 safety message is positioned on the surge tank cap.

WARNING, Pressurized System

TX1099924 —UN—24OCT11

MB60223,0000025 -19-12APR16-15/15

Machine Control

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

- Electrohydraulic (EH) Hands Only (ISO pattern) Controls
- Electrohydraulic (EH) Hands Only (H pattern) Controls
- Electrohydraulic (EH) Hand and Foot Controls
- Manual Hands Only Controls
- Manual Hand and Foot 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, EH hands only (H pattern) controls or EH hand and foot controls (if equipped), for operator preference.

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 (H pattern) Controls—Joysticks operate loader boom, bucket, and auxiliary hydraulic functions. Joysticks also steer machine using an H pattern. Engine speed is controlled by either engine speed control dial or the engine speed control pedal.

EH Hand and Foot Controls—Joysticks operate auxiliary hydraulic functions and steer machine using an H pattern. Loader boom and bucket functions are controlled by left and right pedals (13 and 14). Engine speed is controlled by engine speed control dial.

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

TX1066656 —UN—22OCT09

Left and Right Joysticks

TX1127336 —UN—04DEC12

Engine Speed Control Dial

TX1066696A —UN—23OCT09

Left and Right Pedals

TX1066697A —UN—23OCT09

Engine Speed Control Pedal

Continued on next page

DB84312,00000B8 -19-04OCT13-1/2

Manual Machine Without Horn or Two-Speed Option

Manual Machine With Attachment Controls

Engine Speed Control Dial

Manual Machine With Horn and Two-Speed Option

Manual Controls

Manual Hands Only Control—Control levers (1 and 2) operate loader boom, bucket, and auxiliary hydraulic functions. Control levers also steer machine. Engine speed is controlled by either the engine speed control dial (12) or the engine speed control pedal (15).

Manual Hand and Foot Control—Control levers operate auxiliary hydraulic functions and steer machine. Loader boom and bucket functions are controlled by left and right pedals (13 and 14). Engine speed is controlled by engine speed control dial.

1— Left Control Lever
2— Right Control Lever
3— Auxiliary Flow Set Switch
4— Auxiliary Proportional Switch
5— Horn (if equipped)
6— Two-Speed Switch (if equipped)
7— Not Used
8— Auxiliary Third Function A Switch (if equipped)
9— Auxiliary Third Function B Switch (if equipped)
10— Auxiliary Second Function A Switch (if equipped)
11— Auxiliary Second Function B Switch (if equipped)
12— Engine Speed Control Dial
13— Left Pedal
14— Right Pedal
15— Engine Speed Control Pedal

Left and Right Pedals

Engine Speed Control Pedal—Hands Only Machine

DB84312,00000B8 -19-04OCT13-2/2

Control Panel—Key Start

TX1124805A —UN—16NOV12

Contol Panel—Key Start

1— Quik-Tatch™ Switch (if equipped)
2— Work Lights Switch
3— Auxiliary Fourth Function Switch (if equipped)
4— Reversing Fan Switch (if equipped)
5— Self Level Switch (if equipped)
6— High Flow Switch (if equipped)
7— Dual Flasher Switch (if equipped)
8— Air Conditioner Switch (if equipped)
9— Blower Speed Control Dial (if equipped)
10— Cab Temperature Control Dial (if equipped)
11— Engine Speed Control Dial
12— Park Brake Switch
13— Key Switch

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, 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—Reversing Fan Switch (if equipped): Used to reverse the direction of fan rotation for purging debris from cooling package. This switch has three positions:

- Off—Disables reversing fan function.
- Auto (middle position)—This position is used to prevent machine from overheating caused by accumulated debris against cooling package. Hydraulic oil temperature must be above 12°C (54°F).
  The fan reverse interval can be changed using the engagement and monitor unit (EMU). See Engagement and Monitor Unit—Main Menu—Fan Reverse Interval. (Section 2-3.)
- Manual—Press and hold switch in this position to manually activate reversing fan for 10 seconds. The switch can be used at any engine speed. Hydraulic oil temperature must be above 12°C (54°F). Switch is programmed to wait 60 seconds before allowing fan to reverse cycle again.

5—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

JK47244,0000136 -19-03MAY13-1/2

6—High Flow Switch (if equipped): Used for attachments that require a high hydraulic flow rate to operate. Push upper half of switch momentarily to activate high flow option. Amber hydraulic high flow icon will appear on engagement and monitor unit (EMU). Push upper half of switch again to turn high flow option off. For more information, see Operating Auxiliary Hydraulics. (Section 2-2.)

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:

NOTE: 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.

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 will return to RUN position.

Quik-Tatch is a trademark of Deere & Company

JK47244,0000136 -19-03MAY13-2/2

Control Panel—Keyless Start

Control Panel—Keyless Start

1— Quik-Tatch™ Switch (if equipped)
2— Work Lights Switch
3— Auxiliary Fourth Function Switch (if equipped)
4— Reversing Fan Switch (if equipped)
5— Self Level Switch (if equipped)
6— High Flow Switch (if equipped)
7— Dual Flasher Switch (if equipped)
8— Air Conditioner Switch (if equipped)
9— Blower Speed Control Dial (if equipped)
10— Cab Temperature Control Dial (if equipped)
11— Engine Speed Control Dial
12— Sealed Switch Module (SSM)

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, 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—Reversing Fan Switch (if equipped): Used to reverse the direction of fan rotation for purging debris from cooling package. This switch has three positions:

- Off—Disables reversing fan function.
- Auto (middle position)—This position is used to prevent machine from overheating caused by accumulated debris against cooling package. Hydraulic oil temperature must be above 12°C (54°F).
  The fan reverse interval can be changed using the engagement and monitor unit (EMU). See Engagement and Monitor Unit—Main Menu—Fan Reverse Interval. (Section 2-3.)
- Manual—Press and hold switch in this position to manually activate reversing fan for 10 seconds. The switch can be used at any engine speed. Hydraulic oil temperature must be above 12°C (54°F). Switch is programmed to wait 60 seconds before allowing fan to reverse cycle again.

5—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

JK47244,0000137 -19-03MAY13-1/2

6—High Flow Switch (if equipped): Used for attachments that require a high hydraulic flow rate to operate. Push upper half of switch momentarily to activate high flow option. Amber hydraulic high flow icon will appear on engagement and monitor unit (EMU). Push upper half of switch again to turn high flow option off. For more information, see Operating Auxiliary Hydraulics. (Section 2-2.)

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.

Quik-Tatch is a trademark of Deere & Company

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:

NOTE: 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.

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

JK47244,0000137 -19-03MAY13-2/2

Sealed Switch Module (SSM)

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

- Press and release switch (left 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 will shutdown 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 will be 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 will be 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 (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—Not Used

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 and foot controls.

TX1125372A —UN—21NOV12

Sealed Switch Module (SSM)

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

- 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 and foot 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.)

Continued on next page

12—Creep Mode Switch (EH machines only): If machine is equipped with joystick performance package, this switch limits travel speed while maintaining engine speed. Engagement and monitor unit (EMU) displays prompts for selecting desired percentage. For more information, see Creep Mode—If Equipped. (Section 2-2.)

13—Not Used

14—Not Used

15—Not Used

JK47244,000034C -19-13SEP13-2/2

Gauges and Indicators

TX1125651 —UN—09NOV12

TX1125651

Gauges and Indicators

1— MENU Button
2— BACK Button
3— NEXT Button
4— SELECT Button
5— Engagement and Monitor Unit (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 (4TNV98C and 4TNV98CT 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 (EH machines only)
21— Hydraulic High Flow Indicator

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

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, 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.

11—Exhaust Filter Cleaning Indicator (4TNV98C and 4TNV98CT engines only): White indicator will illuminate when elevated idle is active or exhaust filter cleaning is in process.

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.

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.

Continued on next page

JK47244,0000340 -19-04OCT13-1/2

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.

JK47244,0000340 -19-04OCT13-2/2

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

TX1066761A —UN—23OCT09

Interlocking Seat Bar

TX1119802 —UN—07AUG12

Locking Seat Bar Adjustment

OUT4001,000050D -19-27MAR13-1/1

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 (S.N. —269401)

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. Hold on to bar (2) and push-button (3) up with thumb or palm of hand. Swing door open and exit the cab safely using handholds.

1— Handle
2— Bar
3— Button

TX1066866A —UN—27OCT09

Cab Door (view shown from outside cab)

TX1066865A —UN—27OCT09

Cab Door (view shown from inside cab)

JK47244,00001B8 -19-25AUG14-1/9

Entering and Exiting the Cab (S.N. 269402—)

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. Hold on to bar (2) and push-button (3) up with thumb or palm of hand. Swing door open and exit the cab safely using handholds.

1— Handle
2— Bar
3— Button

TX1166655A —UN—23JUL14

Cab Door (view shown from outside cab)

TX1166657A —UN—23JUL14

Cab Door (view shown from inside cab)

Continued on next page

JK47244,00001B8 -19-25AUG14-2/9

Removing and Installing Door (S.N. —269401)

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

To remove the 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 of 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.
8. Open door until the stop (10) hits on door frame.

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

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

Specification

Door—Weight..... 23 kg
50 lb.

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

To install the 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.

TX1066868A —UN—12NOV09

Gas Shock Rod (view shown from inside cab)

TX1067684A —UN—12NOV09

Wiper Motor Harness Connector

TX1066919A —UN—12NOV09

Cab Door (view shown from outside cab)

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

Continued on next page

JK47244,00001B8 -19-25AUG14-3/9

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.

Continued on next page

JK47244,00001B8 -19-25AUG14-4/9

Removing and Installing Door (S.N. 269402—)

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

To remove the 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 of 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—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 the 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.

TX1166664A —UN—23JUL14

Gas Shock Rod (view shown from inside cab)

TX1067684A —UN—12NOV09

Wiper Motor Harness Connector

TX1166670A —UN—23JUL14

Cab Door (view shown from outside cab)

4— Wire Retainer
5— Gas Shock Rod
6— Wiper Motor Harness Connector
7— Washer Fluid Line
8— Check Valve
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.

Continued on next page

JK47244,00001B8 -19-25AUG14-5/9

Door Adjustment (S.N. —269401)

TX1074040A —UN—16MAR10

Striker Bolt

TX1074094A —UN—16MAR10

Hinge Fasteners

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

1. Position the striker bolt (11) 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 (12). 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 (13) to the left or right so there is approximately 3 mm (1/8 in.) gap between striker bolt and upper jaw of latch (14).
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 will be 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-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.

TX1074095A —UN—16MAR10

Upper Part of Hinge

TX1074096A —UN—16MAR10

Door Latch

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

Continued on next page

JK47244,00001B8 -19-25AUG14-6/9

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

15— Door Sensor Bracket **16— Sensor**

TX1074098A —UN—16MAR10

Door Sensor Bracket and Sensor

JK47244,00001B8 -19-25AUG14-7/9

Door Adjustment (S.N. 269402—)

If door needs to be adjusted 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 will be 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-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.

TX1166677A —UN—23JUL14

Cab Door Hinge

TX1166680A —UN—23JUL14

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

JK47244,00001B8 -19-25AUG14-8/9

8. 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**

TX1166688A —UN—23JUL14

Cab Door Sensor Bracket and Sensor

JK47244,00001B8 -19-25AUG14-9/9

Side Windows—If Equipped

To open side window, squeeze latch (1) and slide window rearward.

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

Removing and Installing Side Windows (S.N. —269401)

To remove side windows:

1. Remove cap screws (2).
2. Remove glass retainer (3).
3. Slide back window section (4) forward to center of frame. Lift and pull bottom edge out towards operator. Remove back window section and place in a safe area.
4. Slide front window section (5) back to center of frame. Lift and pull bottom edge out towards operator. Remove front window section.
5. Store both sections in a protected area.

To install side windows:

1. Install front window section first, lining up groove on bottom of window with the track in frame. Slide forward into stationary position.
2. Install back window section, lining up groove on bottom of window with the inner track in frame. Slide rearward into stationary position.
3. Install glass retainer.
4. Install cap screws.

TX1066940A —UN—28OCT09

Window Latch

TX1066947A —UN—28OCT09

Side Windows

1— Latch
2— Cap Screw (2 used)
3— Glass Retainer
4— Back Window Section
5— Front Window Section

Continued on next page

JK47244,0000138 -19-25AUG14-1/2

Removing and Installing Side Windows (S.N. 269402—)

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.

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

TX1166695A —UN—25AUG14

Side Windows

TX1166696A —UN—21AUG14

Side Window Glass Retainer

TX1169824A —UN—21AUG14

Side Window Center post

JK47244,0000138 -19-25AUG14-2/2

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

1— Top Window **2— Knob (4 used)**

TX1126577 —UN—26NOV12

Top Window

DB84312,0000002 -19-27MAR13-1/1

Rear Window (Alternative Exit)

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

1— Bottom Corner

TX1066770A —UN—23OCT09

Alternative Exit

OUT4001,0000513 -19-23JUN17-1/1

Secondary Alternative Exit

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.

TX1217612 —UN—17JUN16

Secondary Alternative Exit

1— Upper Ratchet Handle **2— Lower Ratchet Handle**

JB92884,0000156 -19-23JUN17-1/1

Fire Extinguisher Location

IMPORTANT: Avoid damage to machine wire harness drill may contact wire harness if installing fire extinguisher on left-rear ROPS post.

The recommended location for the fire extinguisher is inside the cab on the right-rear ROPS post, boom lock side of the rear window.

NOTE: All fire extinguishers do not operate the same. Read operating instructions on canister.

The portable fire extinguisher is used to aid in the extinguishing of small fires. Refer to individual manufacturers' instructions and proper fire fighting procedures before the need to use the fire extinguisher arises. For fire prevention safety rules, see Prevent Fires. (Section 1-2.)

IMPORTANT: Avoid possible machine damage. Replace or recharge fire extinguisher after every use according to the manufacturer's instructions.

Check gauge (if equipped) on fire extinguisher. If fire extinguisher is not fully charged, recharge or replace it according to the manufacturer's instructions.

TX1169358A —UN—18AUG14

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.

ER79617,0000C6B -19-18AUG14-1/1

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

TX1066774A —UN—11NOV09

Power Outlet

Service ADVISOR is a trademark of Deere & Company

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

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.

1— Windshield Wiper Switch

TX1168915A —UN—12AUG14

Windshield Wiper and Washer Switch

MB60223,0000054 -19-12AUG14-1/1

Heating/Defrosting Controls—If Equipped

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

TX1126147A —UN—16NOV12

Heating/Defrosting Controls (S.N. —366356)

TX1285099A —UN—11SEP19

Heating/Defrosting Controls (S.N. 366357—)

JK47244,00001BD -19-30SEP22-1/1

Air Conditioner Controls—If Equipped

TX1126149A —UN—16NOV12

Air Conditioner Controls (S.N. —366356)

JK47244,00001BE -19-30SEP22-1/2

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

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 on early production machines has four speed settings plus an OFF position. Blower on late production machines has three speed settings plus an OFF position..

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

TX1285100A —UN—11SEP19

Air Conditioner Controls (S.N. 366357—)

JK47244,00001BE -19-30SEP22-2/2

Seat Adjustment

Standard Seat—If Equipped

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

1— Lever

TX1127895 —UN—11DEC12

Vinyl Standard Seat

Continued on next page

JK47244,00001B9 -19-11DEC12-1/3

Mechanical Suspension Seat—If Equipped

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

1— Lever **2— Handle**

TX1066793A —UN—10NOV09

Vinyl Mechanical Suspension Seat

JK47244,00001B9 -19-11DEC12-2/3

Air Suspension Seat—If Equipped

1. Pull up on lever (1).
2. Slide seat forward or backward to desired position.
3. Release 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 front seat tab (2) to adjust seat to weight of operator.
5. See weight indicator (3) for correct adjustment range.
6. Pull up on handle (4) to recline back of seat to desired comfort.
7. Flip lumbar knob (5) up to add support to the upper back area. Flip lumbar knob down to add support to the lower back area.

1— Lever
2— Front Seat Tab
3— Weight Indicator
4— Handle
5— Lumbar Knob

TX1066794A —UN—26OCT09

Cloth Air Suspension Seat

JK47244,00001B9 -19-11DEC12-3/3

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

Radio (S.N. —366356)

1. Power Button (1)—Press to turn radio on or off.
2. Mute Button (2)—Press to silence radio audio. MUTE message appears on display. If mute feature is active when radio is turned off, the volume returns to the programmed turn on volume level when radio is turned on.Mute Button (2)—Press to silence radio audio. MUTE message appears on display. If mute feature is active when radio is turned off, the volume returns to the programmed turn on volume level when radio is turned on.
3. Display Button (3)—Press to switch between tuner, auxiliary input, or weather band function modes and clock mode. Frequency, time, and activated functions appear on display.
4. AM/FM Button (4)—Press 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 Button (5)—Press to select auxiliary input mode. To connect a portable device to radio, connect device to the auxiliary audio input jack (15).
6. Weather Band Button (6)—Press to access the weather band mode from any other function mode.
7. Timer Button (7)—Press to access timer mode. Press timer button again to start the timer function; TIMER message flashes in the display. Press timer button again to stop timer (TIMER icon remains 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 Jack (15)—Use to connect portable audio devices.
9. Preset Buttons (16—21)—Six numbered preset buttons 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 a preset button for 3 seconds. Current station is stored and the corresponding preset number appears in display. To recall a station, select a band and then press a preset button. Radio automatically tunes to the stored station.

Volume Adjustment:

Use the adjustment buttons to increase or decrease volume setting.

- Increase Volume Button (9)—Press to increase the volume setting.
- Decrease Volume Button (10)—Press to decrease the volume setting.

Audio Adjustment:

1. Press audio and menu adjustment button (8) to step through the audio adjustment options. The following options can be adjusted:
   - Bass
   - Treble
   - Balance (left to right)

TX1128038 —UN—12DEC12

Radio

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

2. When desired option appears on display, press increase volume button or decrease volume button to adjust audio feature.
3. When no adjustments have been made for 3 seconds, radio resumes normal operation.

Tuning Radio:

- Increase Manual Tune Frequency Button (11)—Press to tune the next higher radio frequency. Press and hold increase manual tune frequency button for more than 1 second to tune continuously in selected direction.
- Decrease Manual Tune Frequency Button (12)—Press to tune the next lower radio frequency. Press and hold decrease manual tune frequency button for more than 1 second to tune continuously in selected direction.
- Increase Automatic Tune Frequency Button (14)—Press to tune the frequency automatically up to the next strong station.
- Decrease Automatic Tune Frequency Button (13)—Press to tune the frequency automatically down to the next strong station.

Menu Adjustment:

Continued on next page

DB84312,0000020 -19-20OCT22-1/4

1. Press and hold audio and menu adjustment button for more than 3 seconds to enter menu adjustment mode.
2. Press audio and menu adjustment button to step through the menu adjustment options. The following menu options can be adjusted using the menu adjustment mode:
   - Operation Region (USA or Euro)—Select the appropriate operating region.
   - Beep Confirm (on and off)—Select to sound an audible beep each time a button is pressed.
   - Clock Display (12 or 24)—Select a 12-hour or 24-hour clock display.
   - Display Brightness (low, mid, or high)—Select the brightness level of display.
   - Backlight Color (Amber or Green)—Select the backlight color of radio.
   - Turn On Volume (0—40)—Select the desired volume level for radio to assume when radio is powered on.
   - WB Alert (on or off)—Select if the weather band alert feature is activated.
3. When desired menu adjustment option appears on the display, press increase volume button or decrease volume button to adjust that option.

Setting the Clock:

1. Press and hold the display button for more than 3 seconds to enter the clock setting mode (time flashes on display).
2. Hours Adjustment—Press decrease manual tune frequency button until correct hour is displayed.
3. Minutes Adjustment—Press increase manual tune frequency button until correct minute is displayed.
4. When no adjustment is made for 10 seconds, time is set and normal operation resumes.

Continued on next page

DB84312,0000020 -19-20OCT22-2/4

Radio (S.N. 366357—)

1. Power/Mute Button (1)—Press power/mute button to turn on radio. Press and hold button to turn off radio. When radio is on, press and release button to mute the audio. Press button again to restore audio.
2. Radio Station #1/Play/Pause Button (4)—When radio is selected, press radio station #1/play/pause button to recall a memorized radio station. Press and hold button to program a radio station into memory #1. When Bluetooth® is selected, press button to pause or start playback.
3. Menu Button (5)—Press to toggle between bass (BAS), treble (TRE), balance (BAL), equalizer (EQ OFF, ROCK, JAZZ, CLASSICS, POP), and boost (BOOST ON, BOOST OFF).
   Press and hold button to enter second menu: MONO/STEREO, local/distance (LOCAL/DX), AREA USA 1/AREA USA 2/EUROPE, ALARM ON/ALARM OFF, and clock display priority (DISP ON/DISP OFF).
4. Display Area (9)—Display area displays mode information. When radio is selected, the radio frequency is displayed. When Bluetooth® is selected, song track information is displayed.
5. AM/FM Button (11)—Press and hold until RADIO appears on display. After a brief moment, an FM or AM station appears on the display. Press AM/FM button to select from FM1, FM2, FM3, AM1, or AM2.

Volume Adjustment:

Use volume buttons (7) to increase or decrease volume.

- Increase Volume—Press volume + button to increase volume setting.
- Decrease Volume—Press volume - button to decrease volume setting.

Audio Adjustment:

Press menu button to step through audio adjustment options: Bass, Treble, Balance (left to right), Equalizer, and Boost. 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 resumes normal operation.

When desired option appears on display, press increase volume button or decrease volume button to adjust that option.

Tuning Radio:

Use tune/track buttons (6) to select preferred station frequency.

When Bluetooth® is selected, press button to select next or previous tracks.

- Automatic Tune Using Seek—Press tune/track + button to scan up to the next strong station and begin playing. Press tune/track - button to scan down to the next strong station.

Radio

1— Power/Mute Button
2— Clock Button
3— Alarm Button
4— Radio Station #1/Play/Pause Button
5— Menu Button
6— Tune/Track Button (2 used)
7— Volume Button (2 used)
8— Auxiliary/Bluetooth® Button
9— Display Area
10— Auxiliary Jack
11— AM/FM Button
12— Radio Station Recall Button 2
13— Radio Station Recall Button 3
14— Radio Station Recall Button 4

NOTE: After 5 seconds of inactivity, the tuner reverts to seek mode and AUTO briefly displays on the liquid-crystal display (LCD).

- Manual Tune—Press and hold the + or - tune/track button (6) until MANUAL appears on the display. Press tune/track + button to tune to a higher frequency station or press tune/track - button to tune to a lower frequency station.
  Hold either button down when in MANUAL mode to move the scan quickly.
- Scanning and Automatically Storing Radio Stations—While unit is in RADIO mode, press and hold the auxiliary/Bluetooth® button (8) until tuner begins to scan forward. The tuner goes through all the frequencies, automatically storing in the strongest available stations. The new stored stations replace stations that were previously stored. When in FM band mode, the 12 strongest frequency stations are stored: FM1 = 4 stations, FM2 = 4 stations, and FM3 = 4 stations. When in AM band mode, the eight strongest frequency stations are stored: AM1 = 4 stations and AM2 = 4 stations.
- Memorizing Radio Stations—Tune in desired radio station within FM1, FM2, FM3, AM1, or AM2. Hold anyone of the four radio station recall buttons (4, 12, 13, or 14) until the preset number appears. Selected station is now stored into the recall memory (FM = 12 total, AM = 8 total) for that button.

Continued on next page

DB84312,0000020 -19-20OCT22-3/4

- Stereo/Mono Operation—To switch from stereo to mono reception, press and hold menu button until STEREO appears in the display. Press either volume + or volume - button and MONO appears in the display. Pressing again toggles back to STEREO. For weaker FM stereo stations, selecting mono usually improves reception.
- Distance/Local Reception Operation—To eliminate weaker fringe stations when scanning for stations, change radio reception from Distance (DX) to Local (LOCAL). To switch from distance to local reception, press and hold menu button until STEREO or MONO appears on display. Then press button again until DX appears in display. Press volume + or volume - button. LOCAL appears in the display. Pressing button again toggles back to DX.

Current Time/Display Selection:

1. Press and hold menu button to enter the second menu. The first screen displayed in the second menu is either STEREO or MONO.
2. Press MENU until DISP OFF or DISP ON appears on the screen.
3. Press volume button (7) + or - to select one of two screen appearances:
   - DISP ON—Screen remains on clock display.
   - DISP OFF—When radio is selected, screen displays radio station.
     When Bluetooth® or auxiliary is selected, screen displays track information.

Setting the Clock:

1. Press the clock button (2) to switch between the information display and clock display.
2. Press the clock button to display the current time.
3. Press and hold clock button until the time begins blinking on the display.
4. Press volume + button to adjust hours and volume - button to adjust minutes.
5. After clock time is set, press any button to exit clock programming feature or unit will automatically exit after 8 seconds of inactivity.

Setting the Alarm Clock:

1. Press the alarm button (3) to switch between the information display and the alarm clock display.
2. Press and hold the alarm button to enter alarm adjustment setup or press and hold the menu button to enter the second set of programming features. The first displayed feature on the second menu is either: STEREO or MONO.
3. Press the menu button continuously until ALARM OFF is displayed. Press volume + or volume - button to toggle to ALARM ON.
4. Press the alarm button (3). Display the alarm time.
5. Press and hold alarm button again until displayed time begins blinking on the display.
6. Press volume + button to adjust hours and volume - button to adjust minutes.
7. After alarm time is set, press any button to exit alarm programming feature or unit will automatically exit after 8 seconds of inactivity.

Pairing Bluetooth® Devices:

1. Open Bluetooth® setup program on mobile device and activate Bluetooth® feature.
2. With mobile device in range, scan and select AT449150 on mobile device to connect to radio.
3. When mobile device has been paired, the Bluetooth® icon appears in radio display.
4. Press auxiliary/Bluetooth® button (8) until BT AUDIO appears on display. Audio from mobile device can now be played through radio.

Connecting MP3 Player or Other Portable Audio Device:

1. Connect headphone or line level output of device to auxiliary jack (10) using a 3.5 mm audio patch cord (not included).
2. Press auxiliary/Bluetooth® button until AUX IN appears in display.
3. Use radio controls to adjust volume and sound quality levels.

Bluetooth is a trademark of Bluetooth SIG

DB84312,0000020 -19-20OCT22-4/4

Horn Button—If Equipped

Horn button (1) is located on left joystick (EH machine) or left control lever (manual machine). Push-button to sound horn.

1— Horn Button (if equipped)

TX1066807A —UN—24OCT09

EH Control

TX1066808A —UN—24OCT09

Manual Controls Shown (with optional horn)

OUT4001,0000518 -19-16APR13-1/1

Beacon—If Equipped

Beacon light is located on the top of the operator's station. Beacon is powered by machine switched power and will be on whenever machine switched power is on.

OUT4001,0000519 -19-13NOV18-1/1

Before Starting Work

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

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

T133556 —UN—24AUG00

Reading Operator's Manual

TX,BEFORE,WORK -19-16MAY23-1/1

Operator's Daily Machine Check Before Starting

Safety and Protective Device Checks

Walk around machine to clear all persons from machine area before starting machine.

Check condition of guards, shields, and covers.

Overall Machine Checks

Check for worn or frayed electrical wires and loose or corroded connections.

Check for bent, broken, loose, or missing boom, bucket, or sheet metal parts.

Check for loose or missing hardware.

Check for oil leaks, missing or loose hose clamps, kinked hoses, and lines or hoses that rub against each other or other parts.

TX14740,00000D7 -19-06FEB08-1/1

Entering and Exiting Skid Steer 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 (1), boom handhold (2), and door handle (8) for first step. Use cab handhold (6), door handle, and footwell step (5) for next step.

From the front with a bucket attached: Use bucket step (4), boom handhold (2), and door handle (8) for first step. Continue holding boom handhold and door handle, then step onto boom step (1). Use cab handhold (6), door handle, and footwell step (5) for next step.

When the boom is raised on the boom lock: Enter from the front. Use cab handhold (6), door handle (8), and footwell step (5).

Entering Machine Without a Cab Door

From the side or the front without a bucket attached: Use the boom step (1) and boom handholds (2 and 3) for first step. Use cab handholds (6 and 7) and footwell step (5) for next step.

From the front with a bucket attached: Use bucket step (4) and boom handholds (2 and 3) for first step. Continue holding boom handholds and step onto boom step (1). Use cab handholds (6 and 7) and footwell step (5) for next step.

When the boom is raised on the boom lock: Enter from the front. Use cab handholds (6 and 7) and footwell step (5).

TX1139361A —UN—01JUL13

Entering Skid Steer Loader

1— Boom Step
2— Boom Handhold
3— Boom Handhold
4— Bucket Step
5— Footwell Step
6— Cab Handhold
7— Cab Handhold
8— Door Handle

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 footwell step first, then boom step, then bucket step (if equipped), and then onto the ground.

JK47244,00002C3 -19-01JUL13-1/1

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.

TX,BREAKIN,YANMAR -19-23JUN20-1/1

Starting the Engine

Key Start

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.

NOTE: 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.

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.

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.

NOTE: 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.

TX1126173A —UN—16NOV12

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.

Continued on next page

JK47244,00002AF -19-18JUL13-1/2

Keyless Start

1. Fasten seat belt.
2. Lower interlocking seat bar.
3. Be sure all joysticks/control levers and pedals are in neutral position.

NOTE: 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.

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.

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.

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

TX1126175A —UN—12DEC12

Control Panel—Keyless Start

1— Engine Speed Control Dial 2— Engine Start Switch

8. Release switch 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.
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.

JK47244,00002AF -19-18JUL13-2/2

Cold Weather Starting

Key Start

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 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: 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 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.

JK47244,0000356 -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 5°F (-15°C) 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 when ambient temperature is between 5°F (-15°C) and -13°F (-25°C). Connect engine block heater cord to electrical power for a minimum of 10 hours when ambient temperature is below -13°F (-25°C).

TX1139394A —UN—26JUN13

Engine Block Heater Cord

1— Engine Block Heater Cord

JK47244,00002C8 -19-07OCT13-1/1

Engine Speed Control

Electrohydraulic (EH) Control Machine

TX1126177A —UN—04DEC12

Engine Speed Control Dial

TX1125505 —UN—07NOV12

Engine Speed Control Pedal

1— Engine Speed Control Dial **2— Engine Speed Control Pedal**

NOTE: 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)

Continued on next page

JK47244,0000357 -19-28OCT13-1/2

Manual Control Machine

NOTE: 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)

All machines will have both the engine speed control dial and engine speed control pedal unless machine is equipped with hydraulic hand and foot controls. Machines with hydraulic hand and foot controls only have the engine speed control dial.

1— Engine Speed Control Dial **2— Engine Speed Control Pedal**

Engine Speed Control Dial

TX1126177A —UN—04DEC12

Engine Speed Control Pedal

TX1125505 —UN—07NOV12

JK47244,0000357 -19-28OCT13-2/2

Stopping the Engine

1. For electrohydraulic (EH) control machines, move joysticks to neutral position. For manual control machines, move control levers 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.

IMPORTANT: Avoid engine damage. If engine stalls while operating under load, restart engine immediately. Idle at slow speed for 2 minutes before stopping to allow coolant to continue circulating through engine.

IMPORTANT: To avoid damage to turbocharger, run engine at slow speed and idle with no load for 2 minutes.

5. Reduce engine speed by turning the engine speed control dial down to slow (turtle) speed. Idle engine without load for 2 minutes.

IMPORTANT: Prevent engine damage. Do not bypass cool down mode unless absolutely necessary. Cool down allows engine to cool down before shutdown. The system automatically provides the necessary time needed for engine cool down.

6. If equipped with key start, turn key switch to the OFF position. If equipped with keyless start, press engine stop switch.
7. Raise interlocking seat bar.
8. Release seat belt.

JK47244,000027F -19-03OCT22-1/1

Required Machine Stop Warning

NOTE: Engine emissions system malfunction indicator is for machines equipped with F or L engine.

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.

RG22491 —UN—21AUG13

Engine Emissions System Malfunction Indicator

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

TX,MACH,STOP,WARNING -19-23JUN20-1/6

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

RG22492 —UN—21AUG13

Warning Indicator

TX,MACH,STOP,WARNING -19-23JUN20-2/6

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

RG22493 —UN—21AUG13

Engine Stop Indicator

TX,MACH,STOP,WARNING -19-23JUN20-3/6

Emission System Fault Has Occurred

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.

RG26361 —UN—04SEP14

Engine Emissions System Malfunction and Warning Indicators

Continued on next page

TX,MACH,STOP,WARNING -19-23JUN20-4/6

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.

- 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.

RG26972 —UN—26MAR15

Engine Emissions System Malfunction and Engine Stop Indicators

TX,MACH,STOP,WARNING -19-23JUN20-5/6

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.

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

RG26972 —UN—26MAR15

Engine Emissions System Malfunction and Engine Stop Indicators

TX,MACH,STOP,WARNING -19-23JUN20-6/6

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 towards seat to extend boom lock to locked position.
5. Slowly lower boom onto boom lock.

Disengaging boom lock

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

1— Boom Lock Lever **2— Boom Lock**

TX1149260A —UN—16DEC13

Boom Lock Lever

TX1139724 —UN—02JUL13

Boom Lock

JK47244,00002FE -19-13DEC13-1/1

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.

Electrohydraulic (EH) Control Machine

Key Start

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

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

6. Lower boom.

   If boom does not lower, see your authorized dealer.

Keyless Start

1. Close cab door, if equipped.
2. Fasten seat belt.
3. Lower interlocking seat bar.
4. Press engine start switch to turn switched power ON. Do not start engine.
5. Press park brake switch.

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

6. Lower boom.

   If boom does not lower, see your authorized dealer.

Manual Control Machine

Key Start

1. Close cab door, if equipped.
2. Fasten seat belt.
3. Lower interlocking seat bar.
4. Remove wing screw (1) from cover in lower left corner of cab. Remove cover.
5. Turn key switch to RUN position. Do not start engine.
6. Cycle park brake to middle position to engage hydraulic functions.
7. Pull handle (2) and hold.

Boom Release Cover

TX1067098A —UN—30OCT09

Boom Release Handle

TX1067099A —UN—30OCT09

1— Wing Screw **2— Handle**

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

8. Lower boom.

   If boom does not lower, see your authorized dealer.

Keyless Start

1. Close cab door, if equipped.
2. Fasten seat belt.
3. Lower interlocking seat bar.
4. Remove wing screw (1) from cover in lower left corner of cab. Remove cover.
5. Press engine start switch to turn switched power ON. Do not start engine.
6. Press park brake switch.

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

7. Pull handle and hold.
8. Lower boom.

   If boom does not lower, see your authorized dealer.

Continued on next page

JK47244,000027B -19-16JAN15-1/2

JK47244,000027B -19-16JAN15-2/2

Steering—Manual Controls

To steer the machine:

NOTE: The left control lever (1) controls left drive and the right control lever (2) controls right drive.

- Push both control levers (1 and 2) forward at the same time to go forward.
- Pull both control levers back at the same time to go backward.
- Push one control lever forward and pull the other control lever back at the same time to make a short turn.
- Slowly return control levers to neutral position to stop.

1— Left Control Lever **2— Right Control Lever**

TX1133048 —UN—14MAR13

Hand and Foot Machine Shown

TX1133049 —UN—14MAR13

Hands Only Machine Shown

JK47244,00002A2 -19-12AUG13-1/1

Operating Boom—Manual Controls

Hand and Foot Machines

The left pedal (1) controls the boom:

- Push back of left pedal down to raise boom.
- Push front of left pedal down to lower boom.
- Boom will move faster the farther the left pedal is pushed down.
- Left pedal will return to neutral-hold position when released if not in float position.

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.

To activate float:

1. Push front of left pedal down into detent position. Boom will stay in float until the rear of left pedal is pushed down.

To deactivate float:

1. Push rear of left pedal down. Allow pedal to return to neutral position.

1— Left Pedal

TX1133050 —UN—14MAR13

Left Pedal

TX1067116 —UN—04NOV09

Left Pedal Operation—Hand and Foot Machine

Continued on next page

JK47244,00002A3 -19-10APR13-1/2

Hands Only Machines

The left control lever (2) controls the boom:

- Pivot control lever left to raise boom.
- Pivot control lever right to lower boom.
- Boom will move faster the farther the control lever 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.

To activate float:

1. Pivot left control lever right into detent position.

To deactivate float:

1. Pivot control lever left. Allow control lever to return to neutral position.

2— Left Control Lever

TX1133051 —UN—14MAR13

Left Control Lever

TX1067119 —UN—04NOV09

Left Control Lever Operation—Hands Only Machine

JK47244,00002A3 -19-10APR13-2/2

Operating Bucket—Manual Controls

Hand and Foot Machines

The right pedal (1) controls the bucket:

- Push back of right pedal down to roll bucket back.
- Push front of right pedal down to dump bucket.
- Bucket will move faster the farther the right pedal is pushed down.
- Right pedal will return to neutral-hold position when it is released.

1— Right Pedal

TX1133052 —UN—14MAR13

Right Pedal

TX1067117 —UN—04NOV09

Right Pedal Operation—Hand and Foot Machine

Continued on next page

JK47244,00002A4 -19-08APR13-1/2

Hands Only Machines

The right control lever (2) controls the bucket:

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

2— Right Control Lever

TX1133053 —UN—14MAR13

Right Control Lever

TX1067118 —UN—04NOV09

Right Control Lever Operation—Hands Only Machine

JK47244,00002A4 -19-08APR13-2/2

Steering—EH Controls

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

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

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.

TX1126816 —UN—18DEC12

EH Hands Only (ISO pattern) Controls

1— Left Joystick

Continued on next page

JK47244,0000143 -19-24MAY17-1/3

EH Hands Only (H Pattern) Controls

NOTE: The left joystick (1) controls left drive and the right joystick (2) controls right drive.

- Push both joysticks (1 and 2) forward at the same time to go forward.
- Pull both joysticks back at the same time to go backward.
- Push one joystick forward and pull the other joystick back at the same time to make a short turn.
- Slowly return joysticks to neutral position to stop.

1— Left Joystick **2— Right Joystick**

TX1126817 —UN—18DEC12

EH Hands Only (H pattern) Controls

JK47244,0000143 -19-24MAY17-2/3

EH Hand and Foot Controls

NOTE: The left joystick (1) controls left drive and the right joystick (2) controls right drive.

- Push both joysticks (1 and 2) forward at the same time to go forward.
- Pull both joysticks back at the same time to go backward.
- Push one joystick forward and pull the other joystick back at the same time to make a short turn.
- Slowly return joysticks to neutral position to stop.

1— Left Joystick **2— Right Joystick**

TX1127964 —UN—18DEC12

EH Hand and Foot Controls

JK47244,0000143 -19-24MAY17-3/3

Operating Boom—EH Controls

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

TX1126818 —UN—18DEC12

Right Joystick

TX1067123 —UN—04NOV09

Right Joystick Operation—ISO Pattern

Continued on next page

JK47244,0000144 -19-01MAY17-1/3

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**

Left Joystick

TX1126819 —UN—18DEC12

Left Joystick Operation—H Pattern

TX1067122 —UN—04NOV09

Continued on next page

JK47244,0000144 -19-01MAY17-2/3

EH Hand and Foot Controls

The left pedal (1) controls the boom:

- Push back of left pedal down to raise boom.
- Push front of left pedal down to lower boom.
- Boom will move faster the farther the left pedal is pushed down.
- Left pedal will return to neutral-hold position when released, if not in float position.

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).

1. Push front of left pedal down into detent position.
2. Press and release float switch (2).

NOTE: Pressing float switch again will not deactivate float.

To deactivate float:

1. Push rear of left pedal down. Allow pedal to return to neutral position.

1— Left Pedal **2— Float Switch**

TX1126820 —UN—18DEC12

Left Pedal

TX1067116 —UN—04NOV09

Left Pedal Operation—Hand and Foot Machine

JK47244,0000144 -19-01MAY17-3/3

Operating Bucket—EH Controls

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

TX1126821 —UN—18DEC12

Right Joystick

TX1067123 —UN—04NOV09

Right Joystick Operation—ISO Pattern

Continued on next page

JK47244,0000145 -19-01MAY17-1/3

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

TX1126821 —UN—18DEC12

Right Joystick Operation—H Pattern

TX1067124 —UN—04NOV09

Continued on next page

JK47244,0000145 -19-01MAY17-2/3

EH Hand and Foot Controls

The right pedal (1) controls the bucket:

- Push back of right pedal down to roll bucket back.
- Push front of right pedal down to dump bucket.
- Bucket will move faster the farther the right pedal is pushed down.
- Right pedal will return to neutral-hold position when it is released.

1— Right Pedal

TX1126822 —UN—18DEC12

Right Pedal

TX1067117 —UN—04NOV09

Right Pedal Operation—Hand and Foot Machine

JK47244,0000145 -19-01MAY17-3/3

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 and foot 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. For more information, see Creep Mode—If Equipped in this section.

TX1125790 —UN—20NOV12

Sealed Switch Module (SSM)

1— Transmission Response Switch
2— Pattern Select Switch
3— Hydraulic Response Switch
4— Creep Mode Switch

JK47244,00001D6 -19-03JAN13-1/1

Transmission Response Rate (Travel and Steer)—If Equipped

For 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 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

TX1126261 —UN—19NOV12

Transmission Response Switch

JK47244,00001D5 -19-03JAN13-1/1

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 EH hands only (ISO pattern) controls, EH hands only (H pattern) controls, or EH hand and foot 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 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 and foot controls.

Pattern Select Switch

TX1125849 —UN—13NOV12

1— Pattern Select Switch

JK47244,0000146 -19-01MAY13-1/1

Hydraulic Response Rate (Boom and Bucket)—If Equipped

For 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 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.

Hydraulic Response Switch

TX1126260 —UN—19NOV12

1— Hydraulic Response Switch

JK47244,00001D4 -19-09JAN13-1/1

Creep Mode—If Equipped

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

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 or creep mode switch (2) located on sealed switch module (SSM) 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.

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.

TX1128397 —UN—18DEC12

Creep Mode Speed Switch

TX1124317 —UN—19NOV12

Creep Mode Switch

1— Creep Mode Speed Switch **2— Creep Mode Switch**

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

LD74059,0000135 -19-19JUN18-1/1

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.

TX1128692 —UN—27DEC12

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 your authorized 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.

Quik-Tatch is a trademark of Deere & Company

Continued on next page

JK47244,00001BF -19-10APR13-1/3

Power Quik-Tatch™

TX1124964 —UN—19NOV12

Control Panel

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.

TX1128700 —UN—27DEC12

Power Quik-Tatch™

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

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.

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.

Continued on next page

JK47244,00001BF -19-10APR13-2/3

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

JK47244,00001BF -19-10APR13-3/3

Auto-Idle

Auto-idle can be enabled or disabled based on a selection in the engagement and monitor unit (EMU) operator menus. See Engagement and Monitor Unit (EMU)—Main Menu—Auto-Idle. (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

NOTE: When the creep mode is active, the limted auto idle function will not active.

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%.

LD74059,000012E -19-10JAN23-1/1

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.

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

Connecting Auxiliary Hydraulics

Machine comes equipped with connect under pressure (CUP) couplers to allow for easier attachment connection.

A coupler adaptor field kit will be required to operate high flow equipment. See your authorized dealer.

NOTE: Male (13) and female auxiliary port couplers (15) move in and out of housing (16), allowing system pressure to bleed back to hydraulic tank through auxiliary case drain port (14).

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 (11) or 14-pin electrical connector (12).

See attachment operator's manual for additional connection information.

Disconnecting Auxiliary Hydraulics

TX1144678 —UN—26SEP13

Standard Flow and Attachment Control Shown

11— 3-Pin Electrical Connector (if equipped)
12— 14-Pin Electrical Connector (if equipped)
13— Male Auxiliary Port Coupler (standard flow)
14— Auxillary Case Drain Port
15— Female Auxiliary Port Coupler (standard flow)
16— Housing

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.

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.

JK47244,0000349 -19-26SEP13-1/1

Operating Auxiliary Hydraulics

IMPORTANT: Avoid attachment damage. Only use high flow switch (10) with high flow attachments.

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 will be cancelled and proportional auxiliary hydraulic flow will resume.

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 Engagement and Monitor Unit (EMU)—Main Menu—Auxiliary Hydraulic Override. (Section 2-3.)

TX1067175 —UN—04NOV09

Auxiliary Hydraulic Controls (EH controls)

TX1067177 —UN—04NOV09

Auxiliary Hydraulic Controls (manual controls)

TX1125010 —UN—13DEC12

Control Panel (keyless start shown)

1— Left Joystick/Control Lever
2— Right Joystick/Control Lever
3— Auxiliary Flow Set Switch
4— Auxiliary Proportional Switch
5— Auxiliary Third Function A Switch
6— Auxiliary Third Function B Switch
7— Auxiliary Second Function A Switch
8— Auxiliary Second Function B Switch
9— Auxiliary Fourth Function Switch
10— High Flow Switch (if equipped)

JK47244,000027D -19-20NOV13-1/1

Hydraulic System Pressure Release—Manual Controls

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.

This procedure is 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.
5. Raise and then lower interlocking seat bar.
6. Remove access cover (1).
7. Pull up on boom release handle (2) and hold.

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.

8. Cycle both the boom and bucket functions.
9. Stop cycling functions once pressure has been released.
10. Cycle auxiliary hydraulic functions.
11. Stop cycling auxiliary hydraulic functions once pressure has been released.
12. 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.
5. Raise and then lower interlocking seat bar.

Boom Release Handle Access Cover

TX1133790 —UN—26MAR13

Boom Release Handle

TX1133789 —UN—26MAR13

1— Access Cover **2— Boom Release Handle**

6. Remove access cover (1).
7. Pull up on boom release handle (2) and hold.

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.

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

JK47244,0000298 -19-09OCT13-1/1

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.
5. Raise and then lower interlocking seat bar.

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.

6. Cycle both the boom and bucket functions.
7. Stop cycling functions once pressure has been released.
8. Cycle auxiliary hydraulic functions.
9. Stop cycling auxiliary hydraulic functions once pressure has been released.
10. 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.
5. Raise and then lower interlocking seat bar.

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.

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

JK47244,0000148 -19-09DEC15-1/1

Self Leveling Hydraulics—If Equipped

TX1124968 —UN—19NOV12

Self Leveling Switch

1— Self Leveling Switch

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

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

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

JK47244,00001C0 -19-09JAN13-1/1

Ride Control—If Equipped

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.

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

Operating Ride Control

1. Press ride control switch (1) on sealed switch module (SSM) (left 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.

TX1124972 —UN—19NOV12

Sealed Switch Module (SSM)

1— Ride Control Switch

JK47244,00002B0 -19-25MAR13-1/1

High Flow Hydraulics—If Equipped

TX1124969 —UN—19NOV12

Control Panel

1— High Flow Switch

IMPORTANT: Avoid attachment damage. Only use high flow switch (1) with high flow attachments.

If machine is equipped with high flow hydraulics and attachment requires a high hydraulic flow rate to operate, connect attachment to high flow male and female couplers. See Connecting and Disconnecting Auxiliary Hydraulics in this section.

Push upper half of high flow switch (1) momentarily to turn on and activate high flow option. Amber hydraulic high flow icon will appear on engagement and monitor unit (EMU). Push upper half of switch again to turn high flow option off.

JK47244,00001C1 -19-03JAN13-1/1

Two-Speed Operation—If Equipped

Two-speed operation allows operator to travel in low or high range.

NOTE: If engine is shutdown with high range activated, machine will default back to low range when engine is started. Two-speed switch (1) must be pressed to enable high range.

Press two-speed switch (1) on left joystick/control lever to activate or deactivate two-speed option.

1— Two-Speed Switch

TX1144060 —UN—16SEP13

Two-Speed Switch

JK47244,000027E -19-16SEP13-1/1

Two-Speed Operation—If Equipped

Two-speed operation allows operator to travel in low or high range.

NOTE: If engine is shutdown with high range activated, machine will default back to low range when engine is started. Two-speed switch (1) must be pressed to enable high range.

Press two-speed switch (1) on left joystick/control lever to activate or deactivate two-speed option.

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 EMU.

TX1144060 —UN—16SEP13

Two-Speed Switch

1— Two-Speed Switch

LD74059,0000134 -19-19JUN18-1/1

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.

NOTE: Use extra caution in wet or muddy conditions.

1. Use a heavy-duty trailer to transport machine.
2. Park trailer on firm, level ground.
3. Keep trailer bed clean.
4. Place chock blocks (1) 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 tie downs (2) in front and rear of machine. Both front and rear straps must be directed down and outward from machine.
9. Trailer must have signs and lights required by law.

1— Chock Block **2— Tie Down (3 used)**

TX1126846 —UN—29NOV12

Loading Machine On a Trailer

TX1144824 —UN—30SEP13

Tie Down (front of machine shown, boom raised for clarity)

TX1141840 —UN—06AUG13

Tie Downs (rear of machine shown)

JK47244,00002CC -19-01OCT13-1/1

Engagement and Monitor Unit (EMU)

The engagement and monitor unit (EMU) can be used to display vital operating information, hours, diagnostic trouble codes, diagnostics, and to configure units of measure for operator preference. It can also be used to lock the machine using an anti-theft security system. When the EMU powers up, the display initially reads TMC by John Deere for 1.5 seconds before showing the machine model and speeds for 3 seconds. If the anti-theft system has not been enabled or is not active, the display will default to the runtime screen. If the anti-theft system is enabled and unlocked, the display will default to the runtime screen. If the anti-theft system is enabled on the machine, the user will be prompted to enter their code. See Anti-Theft Security System for more information.

Run Data Items

The Run Data Items are the default display when the EMU is powered up. The Run Data Items may also be displayed by cycling through the menu items by pressing the NEXT button, or by pressing MENU button at any time while in a submenu. Pressing SELECT button while viewing a Run Data Item will scroll through all the Run Data Items:

- Hours
- Volts
- Job Timer
- Hydraulic Oil Temperature
- Engine Coolant Temperature
- Engine RPM

If CHECK SERVICE CODES appears in the EMU display, press SELECT button to return to the Run Data Items. CHECK SERVICE CODES will appear for any hydraulic, park brake, or auto-shutdown diagnostic trouble codes. If possible, move machine to a safe location before checking the diagnostic trouble codes. See Engagement and Monitor Unit (EMU)—Main Menu—Codes in this section.

If MENU button is pressed during the runtime display, screen will advance to Main Menu. At any other time, the MENU button will go to last selected runtime screen. If BACK button is pressed during the runtime display, screen will return to the previous runtime screen. At any other time, pressing BACK button will return to previous display screen. If NEXT button is pressed during the runtime display, screen will advance to the next runtime screen. At any other time, pressing NEXT button will scroll through menu items. If SELECT button is pressed during the runtime display, screen will advance to the next runtime screen. At any other time, pressing SELECT button will advance to next display screen.

- **Auxiliary Hydraulic Override**
  The Auxiliary Hydraulic Override Menu allows operator to enable or disable auxiliary hydraulic functions. For more information, see Engagement and Monitor Unit (EMU)—Main Menu—Auxiliary Hydraulic Override in this section.
- **Creep Limit Menu (if equipped)**
  The Creep Limit Menu allows operator to set creep speed limit when equipped and engaged. For more information, see Engagement and Monitor Unit (EMU)—Main Menu—Creep Limit in this section.
- **Courtesy Lighting Menu**
  The Courtesy Lighting Menu allows operator to set amount of time front cab lights and the taillights remain illuminated after the machine is turned off. For more information, see Engagement and Monitor Unit (EMU)—Main Menu—Courtesy Lighting in this section.
- **Fan Reverse Interval Menu (if equipped)**
  The Fan Reverse Interval Menu allows operator to set time interval for reversing fan activation. For more information, see Engagement and Monitor Unit (EMU)—Main Menu—Fan Reverse Interval in this section.
- **Codes Menu**
  The Codes Menu allows operator to view active and stored diagnostic trouble codes (DTCs). For more information, see Engagement and Monitor Unit (EMU)—Main Menu—Codes in this section.
- **Monitor Menu**
  The Monitor Menu allows operator to select language and units format for their monitor. For more information, see Engagement and Monitor Unit (EMU)—Main Menu—Monitor in this section.
- **Job Timer Menu**
  The Job Timer Menu allows operator to record time for a specific job. For more information, see Engagement and Monitor Unit (EMU)—Main Menu—Job Timer in this section.
- **Auto Idle Menu**
  The Auto Idle Menu allows operator to enable or disable auto-idle feature. For more information, see Engagement and Monitor Unit (EMU)—Main Menu—Auto Idle in this section.
- **Anti-Theft Menu (if equipped)**
  The Anti-Theft Menu provides owner a basic level of machine theft protection. For more information, see Engagement and Monitor Unit (EMU)—Main Menu—Anti-Theft—If Equipped in this section.

Anti-Theft Security System

The optionally enabled anti-theft security system within the EMU provides a basic level of machine theft protection. When the anti-theft security system is enabled, the machine can be unlocked and locked with the use of either a 3-digit or 5-digit security code (depending on how the system is configured). This security code, along with the machine power switch, is necessary to start and run the engine. When locked, the anti-theft security system prevents the engine from starting by disabling the fuel shutoff solenoid.

Continued on next page

There are three levels of security within the anti-theft security system: Operator, Owner, and Master. The Operator level of security provides five different security codes that can be used by machine operators. The Owner level of security is designed for the owner or equipment manager. This security level is primarily to be used as a safeguard in the event an Operator code is forgotten or unknown, and the owner wishes to change or replace that security code.

After entering a valid Owner security code, the owner can:

- Lock and unlock the machine.
- Change the Owner security code.
- Change/reset an Operator security code.
- Enable/disable the auto lock feature.

The Master level of security is the highest security level and is used to enable or disable the anti-theft security system. A Master security code can be obtained for a machine by an owner by contacting their John Deere dealer. The dealer will need the current engine hour meter reading and the machine's serial number to generate a new Master security code.

All security codes are three digit numbers that are entered using the MENU and SELECT buttons on the EMU. Unlock or lock prompts appear on the EMU display at machine power up or power down, respectively. If the anti-theft security system is not enabled on the machine, no prompts will appear.

For more information, see Engagement and Monitor Unit (EMU)—Main Menu—Anti-Theft—If Equipped in this section.

Auto Lock Feature

The auto lock feature, when enabled, automatically locks the machine 5 minutes or 60 minutes after the operator leaves the seat if the machine has been left unlocked when turning engine to OFF position.

For more information, see Engagement and Monitor Unit (EMU)—Main Menu—Anti-Theft—If Equipped in this section.

JK47244,00002CE -19-14NOV13-2/2

Engagement and Monitor Unit (EMU)—Normal Display

When switched power is turned ON, display monitor will go into check mode. All indicators on display monitor will come on, all gauges will position gauge needle to the 12 o'clock position, and alarm will sound. If security system has been enabled by owner, operator logon screen appears on display unit. Operator must enter valid personal identification number (PIN) code.

Approximately 5 seconds later, the normal display will be shown.

Display window (1) has six active selectable displays.

Press NEXT button repeatedly to scroll through the six selectable displays.

- Hour meter shows total machine hours to nearest tenth of an hour and accumulates time only when engine is running.
- Battery voltage is displayed to nearest tenth of a volt.
- Job timer can be set to record time for a specific job or operator. To reset, see Engagement and Monitor Unit (EMU)—Main Menu—Job Timer in this section.

NOTE: To change unit selection, see Engagement and Monitor Unit (EMU)—Main Menu—Monitor in this section.

TX1144063 —UN—16SEP13

Display Window (hour meter shown)

1— Display Window

- Hydraulic oil temperature is displayed in either degrees Fahrenheit (°F) or Celsius (°C) depending on the units selected.
- Engine coolant temperature is displayed in either degrees Fahrenheit (°F) or Celsius (°C) depending on the units selected.
- Tachometer shows engine speed in revolutions per minute (rpm).

JK47244,0000154 -19-16SEP13-1/1

Engagement and Monitor Unit (EMU) Display Messages

The engagement and monitor unit (EMU) automatically displays a message for specific machine situations and certain diagnostic trouble codes (DTCs). Depending on machine situation or if a DTC is initially active, a message displays on the EMU until the situation changes, the DTC is resolved, or the operator presses any button on the EMU.

If multiple display messages are generated, the one with the highest EMU priority displays. Pressing any button on the EMU closes the displayed message, allowing the next message to display in order of EMU importance until all generated messages have been displayed.

Display Message	Message Trigger
A/C OFF	The air conditioner system has shut off because of either high engine coolant temperature or high hydraulic oil temperature.
Auto Idle	Auto-idle is active.
Auxiliary Hydraulic Bypass	Auxiliary hydraulics are in override mode.
Check Service Code	A DTC is active that should trigger the Check Service Code monitor message.
Door Open	Operator attempted to activate the hydraulics without door closed (cab machine).
Enable Hydraulics	Operator attempted to move joystick/control lever for hydraulic function after engine start-up and seat belt fastened, but before enabling hydraulics (using park brake switch).
Engine Air Filter Restriction	Engine air filter restriction warning indicator comes on and EMU not in self-test. ECU DTC 5222323.00 is triggered.
Engine Derate	Engine power or speed is limited because of malfunction in system. Check for ECU DTCs.
Engine Oil Pressure Low	Engine oil pressure indicator comes on after engine is running. ECU DTC 000100.01 is triggered.
Engine Temperature High	Engine temperature goes to the red zone of gauge and the engine is running. ECU DTC 000100.00 is triggered.
Fasten Seat Belt Lower Lap Bar	Operator attempted to release park brake without fastening seat belt and lowering interlocking seat bar.
Function Not Available	Function selected is not currently available on production machine.
H Pattern Foot Selected	Pattern select option installed. H-pattern with foot pedals, steering, and bucket control is active.
H Pattern Selected	Pattern select option installed. H-pattern steering and bucket control is active.
High Voltage	Battery voltage high while engine is running. EMU DTC 000158.00 is triggered.
Hydraulic Oil Filter Restriction	Hydraulic oil filter restriction warning indicator comes on after EMU start-up. VCU DTC 001713.00 is triggered.
Hydraulic Oil Temperature High	Hydraulic oil temperature indicator comes on after EMU start-up. VCU DTC 001508.00 is triggered.
Hydraulic Oil Temperature Too Low for Shift	Hydraulic oil temperature is below specification for two-speed shift to occur.
ISO Pattern Selected	Pattern select option installed. ISO pattern steering and bucket control is active.
Left Joystick/Control Lever Not in Center	Joystick/control lever is out of neutral when park brake switch is actuated to enable hydraulics or release park brake.
Loader Precision Rate	Adjustable boom and bucket rate installed. Precision mode is active.
Loader Production Rate	Adjustable boom and bucket rate installed. Production mode is active.
Loader Utility Rate	Adjustable boom and bucket rate installed. Utility mode is active.
Low Fuel	Fuel level low after engine is running.
Low Voltage	Battery voltage low with engine running. EMU DTC 000158.01 is triggered.
Propel Precision Rate	Adjustable boom and bucket rate installed. Precision mode is active.
Propel Production Rate	Adjustable boom and bucket rate installed. Production mode is active.
Propel Utility Rate	Adjustable boom and bucket rate installed. Utility mode is active.
Ready to Start Engine	Starter cool down wait-to-start time has elapsed and the engine is ready to start.
Release Park Brake	Operator attempted to move joystick/control lever for travel function after engine start-up and seat belt fastened, but before releasing park brake (using park brake switch).
Remote Start Connected	Remote start box installed.

Continued on next page

JK47244,00002CF -19-19JUN18-1/2

Display Message	Message Trigger
Return Controls to Center	Appears when pattern select switch is cycled.
Right Joystick/Control Lever Not in Center	Joystick/control lever is out of neutral when park brake switch is actuated to enable hydraulics or release park brake.
Service Menu	When the menu button is held for 5 seconds, the Service Menu will appear.
Set Park Brake to Start Engine	The seat switch is active, switched power is ON, and the engine is not running. Park brake switch must be ON to start engine.
Set Throttle to Low Idle	Appears for the first step in the parked cleaning procedure.
Wait to Release Park Brake	When hydrostatic transmission oil temperature is below 40°C (105°F), park brake must be applied to shift to low range.
Wait to Start XX Seconds	Starter has been on for more than 30 seconds.
Wait to Start XX Seconds	Switched power ON and preheat time not 0 seconds.

JK47244,00002CF -19-19JUN18-2/2

Engagement and Monitor Unit (EMU)—Main Menu

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

NOTE: Translations shown on display may be abbreviated.

The MAIN MENU is accessed by pressing the MENU button (1).

The submenus under MAIN MENU that appear on display include:

- **AUXILIARY HYDRAULIC OVERRIDE—**allows operator to enable or disable auxiliary hydraulic functions.
- **CREEP LIMIT—**allows operator to set creep speed limit when equipped and engaged.
- **COURTESY LIGHTING—**allows operator to set amount of time front cab lights and the taillights remain illuminated after the machine is turned off.
- **FAN REVERSE INTERVAL—**allows operator to set time interval for reversing fan activation.
- **CODES—**allows operator to view active and stored diagnostic trouble codes (DTCs).
- **MONITOR—**allows operator to select language and units format for their monitor.
- **JOB TIMER—**allows operator to record time for a specific job.
- **AUTO IDLE—**allows operator to enable or disable auto-idle feature.

TX1128102 —UN—13DEC12

Engagement and Monitor Unit (EMU)

1— MENU Button
2— BACK Button
3— NEXT Button
4— SELECT Button

- **ANTI-THEFT (if equipped)—**provides a basic level of machine theft protection.

At MAIN MENU, press NEXT button (3) to move to desired submenu.

Press SELECT button (4) to activate chosen submenu.

Press BACK button (2) to return to previous menu.

Press MENU button to return to runtime screen.

JK47244,00002D0 -19-26JUN13-1/1

Engagement and Monitor Unit (EMU)—Main Menu—Auxiliary Hydraulic Override

The AUXILIARY HYDRAULIC OVERRIDE menu allows operator to exit machine with auxiliary hydraulic functions engaged.

The submenus under MAIN MENU that appear on display include:

- **AUXILIARY HYDRAULIC OVERRIDE**
- **CREEP LIMIT**
- **COURTESY LIGHTING**
- **FAN REVERSE INTERVAL**
- **CODES**
- **MONITOR**
- **JOB TIMER**
- **AUTO IDLE**
- **ANTI-THEFT**

Press NEXT button (3) at MAIN MENU to highlight AUXILIARY HYDRAULIC OVERRIDE.

Press SELECT button (4) to display AUXILIARY HYDRAULIC OVERRIDE menu.

Press SELECT button to enable or disable auxiliary hydraulic function.

TX1128102 —UN—13DEC12

Engagement and Monitor Unit (EMU)

1— MENU Button
2— BACK Button
3— NEXT Button
4— SELECT Button

Press BACK button (2) to return to previous menu.

Press MENU button (1) to return to runtime screen at any time.

JK47244,00002D1 -19-23JUL18-1/1

Engagement and Monitor Unit (EMU)—Main Menu—Creep Limit

The CREEP LIMIT menu allows operator to set creep speed limit when equipped and engaged.

The submenus under MAIN MENU that appear on display include:

- **AUXILIARY HYDRAULIC OVERRIDE**
- **CREEP LIMIT**
- **COURTESY LIGHTING**
- **FAN REVERSE INTERVAL**
- **CODES**
- **MONITOR**
- **JOB TIMER**
- **AUTO IDLE**
- **ANTI-THEFT**

NOTE: Speed limit increments will increase by 1% between 1% and 20% and by 10% between 20% and 100%.

Press NEXT button (3) at MAIN MENU to highlight CREEP LIMIT.

Press SELECT button (4) to display CREEP LIMIT menu.

TX1128102 —UN—13DEC12

Engagement and Monitor Unit (EMU)

1— MENU Button
2— BACK Button
3— NEXT Button
4— SELECT Button

Press BACK button (2) to decrease creep speed limit.

Press NEXT button to increase creep speed limit.

Press MENU button (1) to return to runtime screen at any time.

JK47244,00002D2 -19-08JUL13-1/1

Engagement and Monitor Unit (EMU)—Main Menu—Courtesy Lighting

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.

The submenus under MAIN MENU that appear on display include:

- **AUXILIARY HYDRAULIC OVERRIDE**
- **CREEP LIMIT**
- **COURTESY LIGHTING**
- **FAN REVERSE INTERVAL**
- **CODES**
- **MONITOR**
- **JOB TIMER**
- **AUTO IDLE**
- **ANTI-THEFT**

Press NEXT button (3) at MAIN MENU to highlight COURTESY LIGHTING.

Press SELECT button (4) to display COURTESY LIGHTING menu.

Press SELECT to display time delay options.

TX1128102 —UN—13DEC12

Engagement and Monitor Unit (EMU)

1— MENU Button
2— BACK Button
3— NEXT Button
4— SELECT Button

Press NEXT button to highlight desired time delay.

Press SELECT button to return to MAIN MENU.

Press MENU button (1) to return to runtime screen at any time.

JK47244,00002D3 -19-26JUN13-1/1

Engagement and Monitor Unit (EMU)—Main Menu—Fan Reverse Interval

The FAN REVERSE INTERVAL menu allows operator to set time interval for reversing fan activation.

The submenus under MAIN MENU that appear on display include:

- **AUXILIARY HYDRAULIC OVERRIDE**
- **CREEP LIMIT**
- **COURTESY LIGHTING**
- **FAN REVERSE INTERVAL**
- **CODES**
- **MONITOR**
- **JOB TIMER**
- **AUTO IDLE**
- **ANTI-THEFT**

Press NEXT button (3) at MAIN MENU to highlight FAN REVERSE INTERVAL.

Press SELECT button (4) to display FAN REVERSE INTERVAL menu.

Press SELECT to display time interval options.

Press NEXT button to highlight desired time interval.

TX1128102 —UN—13DEC12

Engagement and Monitor Unit (EMU)

1— MENU Button
2— BACK Button
3— NEXT Button
4— SELECT Button

Press SELECT button to return to MAIN MENU.

Press MENU button (1) to return to runtime screen at any time.

JK47244,00002D4 -19-26JUN13-1/1

Engagement and Monitor Unit (EMU)—Main Menu—Codes

The CODES menu allows operator to view active and stored diagnostic trouble codes (DTCs).

The submenus under MAIN MENU that appear on display include:

- **AUXILIARY HYDRAULIC OVERRIDE**
- **CREEP LIMIT**
- **COURTESY LIGHTING**
- **FAN REVERSE INTERVAL**
- **CODES**
- **MONITOR**
- **JOB TIMER**
- **AUTO IDLE**
- **ANTI-THEFT**

Press NEXT button at MAIN MENU to highlight CODES.

The submenus under CODES that appear on display include:

- **ACTIVE (total number of codes is displayed below heading)—**if selected, allows operator to view all active codes. Continue to press SELECT button to scroll through more information about each code.
- **STORED (total number of codes is displayed below heading)—**if selected, allows operator to view all stored codes. Continue to press SELECT button to scroll through more information about each code.

Press NEXT button to move to desired menu item.

Press SELECT button to display desired menu item.

Press SELECT button to scroll through more information about each code.

Press BACK button to return to previous menu.

Press MENU button to return to runtime screen at any time.

JK47244,00002D5 -19-25SEP13-1/1

Engagement and Monitor Unit (EMU)—Main Menu—Monitor

The MONITOR menu allows operator to choose language and units format for their monitor.

The submenus under MAIN MENU that appear on display include:

- **AUXILIARY HYDRAULIC OVERRIDE**
- **CREEP LIMIT**
- **COURTESY LIGHTING**
- **FAN REVERSE INTERVAL**
- **CODES**
- **MONITOR**
- **JOB TIMER**
- **AUTO IDLE**
- **ANTI-THEFT**

Press NEXT button at MAIN MENU to highlight MONITOR.

The submenus under MONITOR that appear on display include:

- **UNITS**
- **LANGUAGE**

Press NEXT button to move to desired menu item.

Press SELECT button to display desired menu item.

Press NEXT button to display desired units or language.

Press SELECT button to select desired units or language.

Press BACK button to return to previous menu.

Press MENU button to return to runtime screen at any time.

JK47244,00002D6 -19-26JUN13-1/1

Engagement and Monitor Unit (EMU)—Main Menu—Job Timer

The JOB TIMER menu allows operator to record time for a specific job.

The submenus under MAIN MENU that appear on display include:

- **AUXILIARY HYDRAULIC OVERRIDE**
- **CREEP LIMIT**
- **COURTESY LIGHTING**
- **FAN REVERSE INTERVAL**
- **CODES**
- **MONITOR**
- **JOB TIMER**
- **AUTO IDLE**
- **ANTI-THEFT**

Press NEXT button (3) at MAIN MENU to highlight JOB TIMER.

Press SELECT button (4) to display JOB TIMER menu.

Press SELECT button to reset job timer.

TX1128102 —UN—13DEC12

Engagement and Monitor Unit (EMU)

1— MENU Button
2— BACK Button
3— NEXT Button
4— SELECT Button

Press BACK button to return to previous menu.

Press MENU button to return to runtime screen at any time.

JK47244,00002D7 -19-26JUN13-1/1

Engagement and Monitor Unit (EMU)—Main Menu—Auto-Idle

The AUTO IDLE menu allows operator to enable or disable auxiliary hydraulic functions.

The submenus under MAIN MENU that appear on display include:

- **AUXILIARY HYDRAULIC OVERRIDE**
- **CREEP LIMIT**
- **COURTESY LIGHTING**
- **FAN REVERSE INTERVAL**
- **CODES**
- **MONITOR**
- **JOB TIMER**
- **AUTO IDLE**
- **ANTI-THEFT**

Press NEXT button (3) at MAIN MENU to highlight AUTO IDLE.

Press SELECT button (4) to display AUTO IDLE menu.

Press SELECT button to enable or disable auto-idle function.

TX1128102 —UN—13DEC12

Engagement and Monitor Unit (EMU)

1— MENU Button
2— BACK Button
3— NEXT Button
4— SELECT Button

Press BACK button (2) to return to previous menu.

Press MENU button (1) to return to runtime screen at any time.

JK47244,00002D8 -19-26JUN13-1/1

Engagement and Monitor Unit (EMU)—Anti-Theft—If Equipped

NOTE: When providing operator security codes to machine users, owners should not provide operators with the default codes. Instead, owners should first change the default operator security codes to other values before providing codes to machine users.

Operator Presets

NOTE: If SELECT button is not pressed in the prompt to lock mode, the machine will remain unlocked on next power up and default machine configurations will be recalled.

Operator presets can be saved for selectable machine performance options. This allows each operator to have personalized machine settings available after entering operator code.

Operator presets will be recalled when anti-theft is enabled, and machine power ups in locked state in which the operator code is entered prior to starting.

Operator presets include the following:
- Reverse Fan
- Pattern Select
- Ride Control
- Creep Mode
- Boom Rate
- Travel Rates
- Accelerate/Decelerate Mode
- Courtesy Light

Unlocking the Machine (Operator and Owner)

1. Sit in the operator's seat to power up the engagement and monitor unit (EMU).
2. Switch power to ON position.
3. The EMU displays ENTER CODE 0 _ _ (3-digit system) or ENTER CODE 0 _ _ _ _ (5-digit system).
4. Enter the appropriate security code:
   a. Press the NEXT button or the BACK button to change the number displayed in the active (flashing) field. The NEXT button increments the current digit; the BACK button decrements the current digit.
   b. Press the SELECT button to accept the number displayed (flashing) in the active field and shift the active field to the next digit to the right.

NOTE: Pressing the SELECT button to accept the last digit (third digit or fifth digit depending on system configuration) processes the entered security code.

5. If a correct security code is entered, the monitor displays ANTITHEFT UNLOCKED for 2 seconds before the EMU returns to the normal runtime display.

   If the security code was incorrect, the display shows INVALID CODE.

NOTE: The anti-theft security system allows three attempts to enter a valid security code before requiring power switch to be turned OFF and ON to restart the process.

Locking the Machine (Operator and Owner)

There are three different locking methods available with the anti-theft security system:

- Prompt for Lock
- Auto Lock—5 Minutes
- Auto Lock—60 Minutes

Prompt for Lock

1. Turn engine to OFF.
2. The monitor display shows PRESS SELECT TO LOCK ATS.

NOTE: If you do not press SELECT to lock the machine within 20 seconds of turning engine OFF, the EMU will NOT lock the machine.

3. Press the SELECT button within 20 seconds to lock the machine.

Auto Lock—5 Minutes

1. Turn engine to OFF.
2. The monitor display shows 5 MIN AUTO LOCK LOCK NOW?
3. Machine remains unlocked for the next 5 minutes. After 5 minutes, a valid 3-digit or 5-digit security code, depending on system configuration is required for machine operation.

   OR

   Press SELECT to lock the machine immediately.

Auto Lock—60 Minutes

1. Turn engine to OFF.
2. The monitor display shows 60 MIN AUTO LOCK LOCK NOW?
3. Machine remains unlocked for the next 60 minutes. After 60 minutes, a valid 3-digit or 5-digit security code, depending on system configuration is required for machine operation.

   OR

   Press SELECT to lock the machine immediately.

Continued on next page

NOTE: The default Owner security code for the anti-theft security system is 111 for 3-digit security systems and 00111 for 5-digit security systems. The default Operator security codes are 000, 999, 998, 997, and 996 for 3-digit security systems, and 00000, 00999, 00998, 00997, and 00996 for 5-digit security systems.

When providing Operator security codes to machine users, owners should not provide operators with the default codes. Instead, owners should first change the default Operator security codes to other values before providing codes to machine users.

Once the anti-theft security system has been enabled, either as a factory installed option or field installation, the system needs to be configured. Select the locking method and change the Owner and Operator security codes as necessary.

Selecting the Locking Method

Complete the following procedure to select the locking method for the anti-theft security system. Only someone with the Owner security code can configure the locking method. There are four locking options available within the anti-theft security system:

- Prompt for Lock—Machine will only be locked if selected during EMU shutdown.
- Auto Lock, 5 Minutes—Machine is locked automatically 5 minutes after operator turns engine to OFF position.
- Auto Lock, 60 Minutes—Machine is locked automatically 60 minutes after operator turns engine to OFF position.
- Anti-Theft Off—Machine is not locked.

1. Press the MENU button on the EMU to access the Main Menu.
2. Press the NEXT button until MAIN MENU ANTITHEFT displays.
3. Press the SELECT button to display ANTITHEFT CHANGE CODES.
4. Press the NEXT button to display ANTITHEFT LOCK MODE.
5. Press the SELECT button to display ENTER OWNER CODE 0 _ _ (3-digit system) or OWNER CODE 0 _ _ _ _ (5-digit system).
6. Enter the current Owner security code.

   The current locking method displays.
7. Press the NEXT button to display the appropriate locking method:
   - Turn ATS Off
   - Prompt to Lock
   - Auto Lock in 5 Min
   - Auto Lock in 60 Min
8. Press the SELECT button to select the displayed locking method.
9. The selected locking method displays for 2 seconds before the EMU returns to the normal runtime display.

Changing an Operator or Owner Security Code

NOTE: If all five available Operator security codes are not intended to be used, make sure the unused codes are changed from the default codes. Leaving access to the machine by means of default codes is not recommended.

The following rules apply when changing security codes:

- An Operator security code can only be changed if that security code or the Owner security code is used during the change procedure.
- The Owner security code can be used to reset all codes back to their defaults by accessing the RESET ALL CODES menu option.
- The anti-theft security system resets all Operator security codes and the Owner security code to the default values when the Master security code is used to enable the system.
- The Owner security code can only be changed by someone using the Owner security code. The Owner security code must be entered before changing that code.
- All Owner and Operator security codes must be unique.

1. Press the MENU button on the EMU to access the Main Menu.
2. Press the NEXT button until MAIN MENU ANTITHEFT displays.
3. Press the SELECT button to display ANTITHEFT CHANGE CODES.
4. Press the SELECT button. Display shows: CHANGE CODES OPERATOR 1 CODE.
5. If changing a different Operator security code or the Owner security code, press the NEXT button to display the appropriate security code to change. Proceed to next step.
6. Press the SELECT button. Display shows ENTER CURRENT CODE 0 _ _ (3-digit system) or ENTER CURRENT CODE 0 _ _ _ _ (5-digit system).
7. Enter the current Operator security code or Owner security code for the code to be changed.
   a. Press the NEXT button or the BACK button to change the number displayed in the active (flashing) field. The NEXT button increments the current digit; the BACK button decrements the current digit.
   b. Press the SELECT button to accept the number displayed (flashing) in the active field and shift the active field to the next digit to the right.

Continued on next page

DB84312,000001E -19-05AUG14-2/3

NOTE: Pressing the SELECT button to accept the last digit (third digit or fifth digit depending on system configuration) processes the entered security code. If the code is incorrect, an error message appears on the monitor display.

The anti-theft security system allows three attempts to enter a valid security code before requiring power switch to be turned OFF and ON to restart the process.

8. Enter the new security code.
9. The new security code displays for 3 seconds before the EMU returns to the normal runtime display.

Resetting Operator and Owner Security Codes

1. Press the MENU button on the EMU to access the Main Menu.
2. Press the NEXT button until MAIN MENU ANTITHEFT displays.
3. Press the SELECT button to display ANTITHEFT CHANGE CODES.
4. Press the SELECT button. Display shows CHANGE CODES OPERATOR 1 CODE.
5. Press the NEXT button until CHANGE CODES RESET ALL CODES displays.
6. Press the SELECT button. Display shows ENTER OWNER CODE 0 _ _ (3-digit system) or ENTER OWNER CODE 0 _ _ _ _ (5-digit system).
7. Enter the current Owner security code.
   a. Press the NEXT button or the BACK button to change the number displayed in the active (flashing) field. The NEXT button increments the current digit; the BACK button decrements the current digit.
   b. Press the SELECT button to accept the number displayed (flashing) in the active field and shift the active field to the next digit to the right.

NOTE: Pressing the SELECT button to accept the last digit (third digit or fifth digit depending on system configuration) processes the entered security code. If the code is incorrect, an error message appears on the monitor display.

The anti-theft security system allows three attempts to enter a valid security code before requiring the power switch to be turned OFF and ON to restart the process.

8. The anti-theft security system resets the Owner and five Operator security codes to their defaults of 111, 000, 999, 998, 997, and 996, respectively, for 3-digit security systems, and 00111, 00000, 00999, 00998, 00997, and 00996 for 5-digit security systems.
9. The default codes display before the EMU returns to the normal display mode menu.

NOTE: If the owner code is not available, security codes can be reset using the Master security code, which a John Deere dealer can obtain through DealerNet. Complete the anti-theft security system enable procedure to reset security codes using the Master security code.

Changing System Security Code Length

Use this procedure to select the length of security code to use with the anti-theft security system, either 3-digit or 5-digit. The system default is 3-digit.

1. Press the MENU button on the EMU to access the Main Menu.
2. Press the NEXT button until MAIN MENU ANTITHEFT displays.
3. Press the SELECT button to display ANTITHEFT CHANGE CODES.
4. Press the NEXT button until ANTITHEFT NUMBER OF DIGITS displays.
5. Press the SELECT button. Display shows ENTER OWNER CODE 0 _ _ (3-digit system) or ENTER OWNER CODE 0 _ _ _ _ (5-digit system).
6. Enter the current Owner security code.
   a. Press the NEXT button or the BACK button to change the number displayed in the active (flashing) field. The NEXT button increments the current digit; the BACK button decrements the current digit.
   b. Press the SELECT button to accept the number displayed (flashing) in the active field and shift the active field to the next digit to the right.

NOTE: Pressing the SELECT button to accept the last digit (third digit or fifth digit depending on system configuration) processes the entered security code. If the code is incorrect, an error message appears on the monitor display.

The anti-theft security system allows three attempts to enter a valid security code before requiring power switch to be turned OFF and ON to restart the process.

7. The current Anti-Theft System will be displayed, either SELECT TO ENABLE 3-DIGIT CODE or SELECT TO ENABLE 5-DIGIT CODE. To change the selection, press the NEXT button to cycle between the different systems and then press the SELECT button to activate. The anti-theft security system resets the owner and five operator security codes to their defaults of 111, 000, 999, 998, 997, and 996, respectively for 3-digit security systems, and 00111, 00000, 00999, 00998, 00997, and 00996 for 5-digit security systems.

DB84312,000001E -19-05AUG14-3/3

Auto-Shutdown With Alarm

The machine is equipped with automatic-shutdown to prevent machine damage.

- Engine coolant temperature gauge will indicate full hot, the alarm will sound, STOP indicator will flash, and the engagement and monitor unit (EMU) will shut the engine down after 5 seconds when engine coolant temperature is too high. The engine can be restarted and will run for 30 seconds before it will shutdown again.
- Oil pressure indicator will light, the alarm will sound, STOP indicator will flash, and the EMU will shut the engine down after 5 seconds when engine oil pressure is too low. The engine can be started and will run for 30 seconds before it will shutdown again.
- Hydraulic oil temperature indicator will light, the alarm will sound, STOP indicator will flash, and the EMU will shut the engine down after 5 minutes when hydraulic oil temperature is too high. The engine can be started and will run for 30 seconds before it will shutdown again.

JK47244,0000161 -19-25APR13-1/1

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.

E-Diesel fuel

CAUTION: Avoid severe injury or death due to the fire and explosion risk from using E-Diesel fuel.

DO NOT use E-Diesel (Diesel fuel and ethanol blend).

Use of E-Diesel fuel in any John Deere machine may void the machine warranty.

Sulfur Content for Engines That Meet Interim Tier 4, Final Tier 4, Stage III B, Stage IV, and Stage V Engines

- Use ONLY ultra low sulfur diesel (ULSD) fuel with a maximum of 15 mg/kg (15 ppm) sulfur content.

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.

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 -19-17MAY23-1/1

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

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

TS1133 —UN—15APR13

TX,COOL,DISP -19-26OCT20-1/1

Lubricant Storage

Your equipment can operate at top efficiency only when clean lubricants are used.

Use clean containers to handle all lubricants.

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 -19-11APR11-1/1

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

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

Minimizing the Effect of Cold Weather on Diesel Engines

John Deere diesel engines are 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 your engine. See your 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.

Air Intake Heater

An air intake heater is an available option for some engines to aid cold weather starting.

Ether

An ether port on the intake is available to aid cold weather starting.

CAUTION: Ether is highly flammable. Do not use ether when starting an engine equipped with glow plugs or an air intake heater.

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 Cold 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. Begin using John Deere Fuel-Protect Diesel Fuel Conditioner (winter formula) or equivalent at 5°C (41°F) to treat biodiesel fuels during the cold-weather season. Use B5 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 any John Deere 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.

Radiator Shutters

If equipped with a thermostatically controlled radiator shutter system, this system should be regulated in such a way that the shutters are completely open by the time the coolant reaches 93°C (200°F) to prevent excessive intake manifold temperatures. Manually controlled systems are not recommended.

If air-to-air aftercooling is used, the shutters must be completely open by the time the intake manifold air temperature reaches the maximum allowable temperature out of the charge air cooler.

For more information, see your John Deere dealer.

DX,FUEL10 -19-13JAN18-1/1

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

Continued on next page

DX,FUEL7 -19-13JAN18-1/2

- 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

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

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

- SAE 0W-40 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

JK47244,000036C -19-10MAR15-1/1

Operating at High Altitude

When operating at high altitudes, a cold start package is available to assist in starting the machine. The cold start package consists of: engine block heater, hydraulic bypass functionality, and lower viscosity oil.

The cold start package is recommended for altitudes over 1829 m (6000 ft.) and required for altitudes over 3048 m (10,000 ft.).

See Engine Block Heater—If Equipped. (Section 2-2.)

Follow cold weather starting procedure. See Cold Weather Starting. (Section 2-2.)

For recommended oils for improving starting performance, see Operating in Cold Temperature Climates in this section.

JK47244,0000335 -19-02OCT13-1/1

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

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).

TX,ENOIL14,SSL -19-27FEB20-1/1

Engine Oil and Filter Service Intervals

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.

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 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.

IMPORTANT: To avoid engine damage:

- **Use only approved oil types.**

Approved Oil Types:

- John Deere Plus-50™ II.
- “Other Oils” include API CJ-4, and ACEA E6.

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

Plus-50 is a trademark of Deere & Company

JK47244,0000165 -19-21DEC12-1/1

Diesel Engine Oil Service Interval for Operation at High Altitude

IMPORTANT: Diesel fuel sulfur content also affects engine oil and filter service intervals. See Engine Oil and Service Intervals in this section to determine the appropriate service interval prior to performing high altitude recommendations.

To avoid excessive oil degradation and potential engine damage, reduce oil and filter service intervals to 50% of the original recommended values when operating engines at altitudes above **1676 m (5500 ft)**.

Oil analysis may allow longer service intervals.

Use only approved oil types.

Example of Original Hours	Corresponding High Altitude Hours
125	60
150	75
175	85
200	100
250	125
275	135
300	150
350	175
375	185
400	200
500	250

TX,ENOIL,SERV,HIALT -19-24JUN20-1/1

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

Hydraulic and Hydrostatic Oil

TX1201169

TX1201169 —UN—10SEP15

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[1]

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[1]

[1]*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

Diesel Engine Coolant (engine without wet sleeve cylinder liners)

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.

Preferred Coolants

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:

- Pre-mix coolant meeting ASTM D6210 requirements
- Are nitrite-free
- Is formulated with a 2-ethylhexanoic acid (2-EHA) free additive package
- Coolant concentrate meeting ASTM D6210 requirements in a 40—60% mixture of concentrate with quality water intended for a 50/50 concentrate
- Pre-mix coolant meeting ASTM D3306 requirements
- Coolant concentrate meeting ASTM D3306 requirements in a 40—60% mixture of concentrate with quality water intended for a 50/50 concentrate

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
- Is formulated with a 2-ethylhexanoic acid (2-EHA) 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.[1]

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.

COOL-GARD is a trademark of Deere & Company

[1]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.

DX,COOL18 -19-15JUL20-1/1

John Deere COOL-GARD™ II Coolant Extender

Some coolant additives gradually deplete during engine operation. For COOL-GARD™ II pre-mix and COOL-GARD II Concentrate, replenish coolant additives between drain intervals by adding COOL-GARD II Coolant Extender.

COOL-GARD II Coolant Extender should not be added unless indicated by COOL-GARD II Test Strips. These test strips provide a simple, effective method to check the freeze point, additive levels, and pH of your engine coolant.

Test the coolant solution at intervals of 12 months and whenever excessive coolant is lost through leaks or overheating.

IMPORTANT: Do not use COOL-GARD II Test Strips with COOL-GARD II PG.

COOL-GARD II Coolant Extender is a chemically matched additive system for use with all COOL-GARD II coolants.

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COOL-GARD II Coolant Extender is not intended for use with nitrite-containing coolants.

IMPORTANT: Do not add a supplemental coolant additive when the cooling system is drained and refilled with any of the following:

- **John Deere COOL-GARD II**
- **John Deere COOL-GARD II PG**

The use of non-recommended supplemental coolant additives can result in additive drop-out, gelation of the coolant, or corrosion of cooling system components.

Add the recommended concentration of COOL-GARD II Coolant Extender. DO NOT add more than the recommended amount.

DX,COOL16 -19-15MAY13-1/1

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

Supplemental Coolant Additives

Some coolant additives will gradually deplete during engine operation. For nitrite-containing coolants, replenish coolant additives between drain intervals by adding a supplemental coolant additive as determined necessary by coolant testing.

John Deere Liquid Coolant Conditioner is recommended as a supplemental coolant additive for nitrite-containing coolants.

John Deere Liquid Coolant Conditioner is not designed for use with John Deere COOL-GARD™ II Premix, COOL-GARD II PG Premix, or COOL-GARD II Concentrate.

IMPORTANT: Do not add a supplemental coolant additive when the cooling system is drained and refilled with any of the following:

- **John Deere COOL-GARD II**
- **John Deere COOL-GARD II PG**

If other coolants are used, consult the coolant supplier and follow the manufacturer's recommendation for use of supplemental coolant additives.

The use of non-recommended supplemental coolant additives may result in additive drop-out and gelation of the coolant.

Add the manufacturer's recommended concentration of supplemental coolant additive. DO NOT add more than the recommended amount.

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DX,COOL4 -19-14APR11-1/1

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 -19-17FEB20-1/1

Additional Information About Diesel Engine Coolants and John Deere COOL-GARD™ II Coolant Extender

Engine coolants are a combination of three chemical components: ethylene glycol (EG) or propylene glycol (PG) antifreeze, inhibiting coolant additives, and quality water.

Coolant Specifications

John Deere COOL-GARD™ II Premix either EG or PG, are fully formulated coolants that contain all three components in their correct concentrations. DO NOT add an initial charge of John Deere COOL-GARD II Coolant Extender to COOL-GARD II Premix. DO NOT add any other supplemental coolant additive or water to COOL-GARD II Premix.

John Deere COOL-GARD II Concentrate contains both ethylene glycol and inhibiting coolant additives. Mix this product with quality water, but DO NOT add an initial charge of John Deere COOL-GARD II Coolant Extender or any other supplemental coolant additive.

Replenish Coolant Additives

Some coolant additives will gradually deplete during engine operation. Periodic replenishment of inhibitors is required, even when John Deere COOL-GARD II Premix or COOL-GARD II Concentrate is used. Follow the recommendations in this manual for the use of John Deere COOL-GARD II Coolant Extender.

Why use John Deere COOL-GARD II Coolant Extender?

Operating without proper coolant additives will result in increased corrosion, cylinder liner erosion and pitting, and other damage to the engine and cooling system. A simple mixture of ethylene glycol or propylene glycol and water will not give adequate protection.

John Deere COOL-GARD II Coolant Extender is a chemically matched additive system designed to fortify the proprietary additives used in John Deere COOL-GARD II Premix and COOL-GARD II Concentrate and to provide optimum protection for up to six years or 6000 hours of operation.

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Avoid Automotive-type Coolants

Never use automotive-type coolants (such as those meeting ASTM D3306). These coolants do not contain the correct additives to protect heavy-duty diesel engines. Do not treat an automotive engine coolant with supplemental coolant additives because the high concentration of additives can result in additive fallout.

Water Quality

Water quality is important to the performance of the cooling system. Distilled, 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 dissolved solids	<340 mg/L
Total hardness	<170 mg/L
pH	5.5 to 9.0

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,COOL17 -19-20APR11-1/1

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.

TS1732 —UN—04SEP13

SERVICEGARD™ Part Number 75240

TS1733 —UN—04SEP13

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

Chain Case Oil

Select oil with viscosity that is best suited for the expected air temperature range during the period between oil changes.

The following oils are preferred:

- John Deere Plus-50™ II
- John Deere Hy-Gard™
- John Deere Torq-Gard™

Oil Viscosities for Ambient Temperature Ranges

Plus-50 is a trademark of Deere & Company
Hy-Gard is a trademark of Deere & Company
Torq-Gard is a trademark of Deere & Company

OUT4001,0000495 -19-07JUL21-1/1

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 mm2/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.

Greases for Air Temperature Ranges

Grease-Gard is a trademark of Deere & Company

DX,GREA1 -19-13JAN18-1/1

Engine Identification

Depending upon machine, three engine options are available: 4TNV98CT, 4TNV98C, or 4TNV98T. Use the following information to identify engine model.

IMPORTANT: Use only supporting manuals designated for your 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.

The engine model number (2) can be used to identify an engine as either a turbocharged or naturally-aspirated engine based on machine application.

NOTE: Machines equipped with Yanmar 4TNV98C (naturally-aspirated) engines are not recommended for altitudes above 1524 m (5000 ft.).

Engine Model Number	
4TNV98CT	Final Tier 4 and Stage III A turbocharged engine
4TNV98C	Final Tier 4 and Stage III A naturally-aspirated engine
4TNV98T	Interim Tier 4 and Stage III A turbocharged engine

1— Engine Serial Number
2— Engine Model Number
3— Engine Serial Number Tag

TX1144002 —UN—13SEP13

Example of Engine Serial Number Plate

TX1142565 —UN—19AUG13

Engine Serial Number Final Tier 4

TX1142629 —UN—20AUG13

Engine Serial Number Interim Tier 4

Continued on next page

JK47244,000033C -19-17SEP13-1/2

Engine Component Identification

TX1142558 —UN—13SEP13

4TNV98CT Engine

TX1142559 —UN—13SEP13

4TNV98C Engine

Machines equipped with a 4TNV98CT engine, utilize a turbocharger (3) and diesel exhaust filter (4).

Machines equipped with a 4TNV98C engine, utilize a diesel exhaust filter but no turbocharger (naturally aspirated).

Machines equipped with a 4TNV98T engine, utilize a turbocharger and muffler (5).

3— Turbocharger
4— Diesel Exhaust Filter
5— Muffler

TX1142560 —UN—16SEP13

4TNV98T Engine

JK47244,000033C -19-17SEP13-2/2

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 in engine compartment on left side panel.

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

TX1133017 —UN—11APR13

Periodic Maintenance Chart

JK47244,000031C -19-09JUL13-1/1

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 workday. Shut off engine before filling.

KR46761,0000F5B -19-27SEP22-1/1

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

318E—Operating Weight (approximate)..... 3178 kg / 7000 lb

319E—Operating Weight (approximate)..... 4286 kg / 9440 lb

320E—Operating Weight (approximate)..... 3246 kg / 7150 lb

323E—Operating Weight (approximate)..... 4286 kg / 9440 lb

324E—Operating Weight (approximate)..... 3405 kg / 7500 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

318E—Operating Weight (approximate)..... 3178 kg / 7000 lb

TX1144829A —UN—01OCT13

Front of Machine (boom raised for clarity)

TX1124867 —UN—29OCT12

Rear of Machine (blocked)

1— Front Corner **2— Rear Corner**

319E—Operating Weight (approximate)..... 4286 kg / 9440 lb

320E—Operating Weight (approximate)..... 3246 kg / 7150 lb

323E—Operating Weight (approximate)..... 4286 kg / 9440 lb

324E—Operating Weight (approximate)..... 3405 kg / 7500 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.

LD74059,0000133 -19-18JUN18-1/1

Raising Operator's Station

1. Park machine on level surface.
2. Engage park brake and stop engine.
3. 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.

4. Using hand holds, raise operator's station. Continue raising operator's station until gas spring cylinder locks are in place.
5. Pull forward on red cylinder lock (3) 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.

6. To lower operator's station, push red cylinder lock (4) rearward to unlocked position.
7. Pull operator's station down until seated on mounting studs.
8. Install and tighten washers and nuts on mounting studs.

1— Nut (2 used)
2— Washer (2 used)
3— Cylinder Lock (locked position)
4— Cylinder Lock (unlocked position)

TX1127410 —UN—06DEC12

Operator's Station Mounting Hardware

TX1127411 —UN—06DEC12

Cylinder Lock (locked position)

TX1127412 —UN—06DEC12

Cylinder Lock (unlocked position)

JK47244,0000169 -19-02APR13-1/1

Opening and Closing Engine Cover

Opening engine cover (3):

1. Park machine on a level surface.
2. Engage park brake and stop engine.
3. Hold handle (2) and push up on latch (1).

Closing engine cover:

1. Pull-down on handle to close engine cover.
2. Ensure engine cover is securely latched.

1— Latch
2— Handle
3— Engine Cover

Engine Cover

TX1127181 —UN—03DEC12

JK47244,000016A -19-15APR13-1/1

Engine Side Panels—Remove and Install

Removing engine side panels (1):

NOTE: Boom does not have to be raised to remove engine side panels.

1. Park machine on level surface.
2. Open engine cover. See Opening and Closing Engine Cover in this section.
3. Tilt engine side panel rearward and lift off.

1— Engine Side Panel (2 used, 1 per side)

Engine Side Panel (boom raised and locked for picture clarity)

TX1127210 —UN—03DEC12

Continued on next page

JK47244,000016B -19-16APR13-1/2

Installing engine side panels:

Engine Side Panel Slot and Rod (boom raised and locked for picture clarity)

TX1127211 —UN—03DEC12

TX1127212 —UN—03DEC12

Front Edge of Side Panel

IMPORTANT: Avoid machine damage. Boom can contact engine side panel if not properly installed. Make sure all rods, slots, and tabs are properly aligned.

1. Align rear slot (2) and rear rod (3).
2. Tilt engine side panel forward. Align front slot (4) and front rod (5) while guiding front tab (6) into front outer bracket (7).
3. Ensure metal tab (8) on inside of engine side panel aligns with stand-off (9).
4. Close engine cover.

2— Rear Slot
3— Rear Rod
4— Front Slot
5— Front Rod
6— Front Tab
7— Front Outer Bracket
8— Metal Tab
9— Stand-off

TX1127213 —UN—03DEC12

Inside of Engine Side Panel

TX1127214 —UN—03DEC12

Stand-off

JK47244,000016B -19-16APR13-2/2

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. (Section 3-2.)
6. Remove cap screws (1) from footwell (2).
7. Lift out footwell.

1— Cap Screw (6 used, 3 per side) **2— Footwell**

Right Side of Electrohydraulic (EH) Machine Shown

TX1126553 —UN—26NOV12

Footwell Manual Machine

TX1066493A —UN—09APR10

JK47244,0000345 -19-30AUG13-1/1

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

Model:	**PIN/Serial Number:**
Hour Meter Reading:	
SERVICE INTERVALS	
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.	
FLUID SAMPLING	
Fluid samples should be taken from each system at its recommended change interval prior to actually draining the fluid. Regular oil sampling will extend the operational life of the machine.	
As Required	
□ Check and clean cooling package	□ Check cab fresh air and recirculation air filters (if equipped)
□ Check fuel tank breather	□ Check wheel lug nut torque
□ Check accessory drive belt	□ Check tire pressure
□ Check and drain primary fuel filter and water separator	□ Lubricate steering centering mechanism (if equipped)
□ Replace primary engine air filter	□ Add coolant extender as indicated by COOL-GARD™ II test strips
□ Replace secondary engine air filter (every third primary filter replacement or as required)	
Every 10 Hours or Daily	
□ Check engine oil level	□ Check hydraulic oil level
□ Check coolant level	□ Lubricate boom linkage, cylinder pivot points, and Quik-Tatch™ linkage
Every 50 Hours	
□ Check and clean dust unloader valve	
Every 100 Hours	
□ Check and adjust accessory drive belt tension (machines without air conditioning only)	
Every 250 Hours	
□ Take engine oil sample	
Every 500 Hours	
□ Change engine oil and replace oil filter	□ Check chain case oil level
□ Replace primary fuel filter and water separator	□ Take hydraulic oil sample
□ Replace final fuel filter	□ Take chain case oil sample
□ Replace hydraulic oil filter	□ Take diesel fuel sample
□ Lubricate steering linkage (if equipped)	□ Take engine coolant sample
Every 1000 Hours	
□ Check coolant	□ Change hydraulic oil
□ Replace fuel tank breather	□ Change chain case oil
□ Replace hydraulic oil reservoir breather	

Continued on next page

JK47244,0000318 -19-01OCT15-1/2

Every 1500 Hours
□ Check and adjust engine valve lash
Every 6000 Hours
□ Drain, flush, and refill cooling system

COOL-GARD is a trademark of Deere & Company
Quik-Tatch is a trademark of Deere & Company

JK47244,0000318 -19-01OCT15-2/2

Required Parts

Description	Every 250 Hours	Every 500 Hours	Every 1000 Hours	Every 1500 Hours	Every 6000 Hours
Engine Oil Filter		1	1	1	1
Final Fuel Filter		1	1	1	1
Primary Fuel Filter and Water Separator		1	1	1	1
Hydraulic Oil Filter		1	1	1	1
Hydraulic Oil Reservoir Breather			1		1
Fuel Tank Breather			1		1
Engine Rocker Arm Cover Gasket				1	1
Cab Air Filter Elements (if equipped)					
Recirculating Air	As Required				
Fresh Air	As Required				
Engine Air Filter Components					
Primary Filter Element	As Required				
Secondary Filter Element	As Required				
Dust Unloader Valve	As Required				
John Deere Plus-50™ II Engine Oil[1]		12.5 L (3.3 gal)	12.5 L (3.3 gal)	12.5 L (3.3 gal)	12.5 L (3.3 gal)
John Deere Hydrau™ Hydraulic Oil[1]			25.0 L (7.0 gal)		25.0 L (7.0 gal)
John Deere Hy-Gard™Chain Case Oil (per side)[1]			20.0 L (5.3 gal)		20.0 L (5.3 gal)
John Deere COOL-GARD™II Pre-Mix					12.5 L (3.3 gal)
Coolant Extender	As Required				
Fluid Analysis Kits[2]					
Diesel Engine Oil	1	1	1	1	1
Hydraulic Oil		1	1	1	1
Chain Case Oil		1	1	1	1
Diesel Fuel		1	1	1	1
Engine Coolant		1	1	1	1
COOL-GARD™ II Test Strips			1		1

[1]For recommended oil types and oil viscosities based on operating temperatures, see Maintenance—Machine. (Section 3-1.)
[2]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
Hy-Gard is a trademark of Deere & Company
COOL-GARD is a trademark of Deere & Company

JK47244,0000343 -19-26FEB18-1/1

Maintenance Legend

Maintenance Legend Chart

TX1144347 —UN—29OCT13

TX1144348 —UN—20SEP13

Maintenance Icons

1— Lubrication Point
2— Check Engine Oil Level (yellow)
3— Check Track Tension
4— Check Hydraulic Oil Level (orange)
5— Fuel Sulfur/Engine Oil (green) For more information, see table in Engine Oil and Filter Service Intervals. (Section 3-1.)
6— Check Engine Coolant Level (blue)
7— Adjust Belt Tension
8— Consult Operator's Manual

NOTE: The maintenance schedule decal is to be used as quick guide for preventative maintenance checks and service intervals. It is not intended to replace the operator's manual for scheduled maintenance and inspections.

Continued on next page

JK47244,0000352 -19-20DEC18-1/2

The maintenance schedule decal consists of “tracks” located around an outline of a machine. Each track represents an interval at which a maintenance inspection or procedure is performed. Specific maintenance icons are located on each track, indicating which inspection or procedure is to be performed. For certain intervals, the consult operator’s manual (8) icon is shown. This indicates it is necessary to reference the operator’s manual for specific information regarding maintenance inspections or procedures.

JK47244,0000352 -19-20DEC18-2/2

Check and Clean Cooling Package

Check radiator (3), hydraulic oil cooler (5), and air conditioner condenser (1), for dirt, damage, leaks, and loose or broken mounting hardware.

1. Remove any attachment.

CAUTION: Prevent personal injury. Allow engine to cool enough so components can be touched with bare hands.

2. Park machine on level surface.
3. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
4. Open engine cover and remove engine side panels. See Engine Side Panels—Remove and Install. (Section 3-2.)
5. On right side of machine, remove pin (2).
6. Swing bracket (4) away from air conditioner condenser. Move air conditioner condenser away from radiator.
7. Clean air conditioner condenser and radiator fins using compressed air.
8. Close air conditioner condenser and bracket. Install pin.
9. On left side of machine, clean hydraulic oil cooler using compressed air.
10. Clean any dirt buildup in engine area.
11. If any areas require washing after cleaning with air, allow radiator and cooler parts to dry thoroughly before operating machine.
12. Install engine side panels and close engine cover.
13. Lower boom.

1— Air Conditioner Condenser (if equipped)
2— Pin
3— Radiator
4— Bracket
5— Hydraulic Oil Cooler

TX1143770 —UN—16SEP13

Right Side of Machine With Air Conditioning Shown

TX1140962 —UN—23JUL13

Left Side of Machine Shown

JK47244,000034A -19-16SEP13-1/1

Check Coolant

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.

IMPORTANT: John Deere COOL-GARD™ II Coolant Extender does not protect against freezing. Coolant extender prevents rust, scale, and liner cavitation.

NOTE: Check coolant every 1000 hours or 1 year, or when replacing 1/3 or more of coolant. Add coolant extender as indicated by John Deere COOL-GARD™ II test strips.

1. Remove surge tank cap (1) and test coolant solution. Use the following kit to check coolant:
   - **COOL-GARD™ II Test Strips**
     Coolant test strips provide an effective method to check freeze point and additive levels of engine coolant. See your authorized dealer for COOL-GARD™ II test strips and follow instructions on kit.
2. Add John Deere COOL-GARD™ II Coolant Extender as necessary. Follow instructions on container for amount.

Specification

Cooling System—Capacity	12.5 L 3.3 gal.

COOL-GARD is a trademark of Deere & Company

Service Cooling System Safely

TS281 —UN—15APR13

Surge Tank Cap

TX1144777 —UN—30SEP13

1— Surge Tank Cap

3. Install surge tank cap.

JK47244,000030B -19-27SEP13-1/1

Check Tire Pressure

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

Always maintain the correct tire pressure. DO NOT inflate tires above the recommended pressure.

Inspect tires and wheels daily. DO NOT operate with low pressure, cuts, bubbles, damaged rims, or missing lug bolts.

Carefully inspect any tire and rim assembly that has been run flat or severely underinflated before inflating the tire. Damage to the rim and tire may have developed. Call an authorized dealer or a qualified repair service technician to inspect the rim and tire assembly and make necessary repairs.

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

NEVER cut or weld on an inflated tire or rim assembly. Heat from welding could cause an increase in pressure and may result in tire explosion.

Do not attempt to mount a tire if operator does not have the proper equipment and experience to perform the job. See an authorized dealer or a qualified repair service.

TS211 —UN—15APR13

Tire Pressure Safety

Check tire pressure with an accurate gauge having 7.0 kPa (0.07 bar) (1 psi) graduations.

1. Shut off air supply to hose.
2. Move gauge hand to correct pressure.
3. Lock air chuck on tire valve.
4. Turn on air supply. Stand to front or rear of tire when adding air to tire.

NOTE: Tire shipping pressure may not be the same as tire operating pressure. Tire pressures may be changed to suit working conditions according to tire manufacturer's recommendations.

T87502 —UN—21OCT88

Tire Pressure Gauge

Optional Tires and Pressures		
Type	**Size**	**Pressure**
Galaxy "Beefy Baby III" Heavy-Duty (HD)	10 x 16.5 10 ply	410 kPa 4.1 bar 60 psi
Galaxy Hulk	10 x 16.5 10 ply	310 kPa 3.1 bar 45 psi
	12 x 16.5 12 ply	280 kPa 2.8 bar 41 psi

Continued on next page

JK47244,000032D -19-22MAY19-1/2

Optional Tires and Pressures		
Type	**Size**	**Pressure**
Brawler Treaded Solidflex	10 x 16.5	
	12 x 16.5	
Titan HD2000-III	12 x 16.5 10 ply	450 kPa 4.5 bar 65 psi
NHS, CAMSO SKS	10 x 16.5 10 ply	520 kPa 5.2 bar 75 psi
	12 x 16.5 12 ply	550 kPa 5.5 bar 80 psi

JK47244,000032D -19-22MAY19-2/2

Check Wheel Lug Nut Torque

Tighten wheel lug nuts.

Item	Measurement	Specification
Wheel Lug Nut	Torque	260 N·m 192 lb·ft

OUT4001,00004B4 -19-13JUL21-1/1

Check Cab Fresh Air and Recirculation Air Filters—If Equipped

NOTE: Check air filters periodically, especially if running in dirty environments.

1. Park machine on level surface.
2. Behind operator's seat, remove knobs (1) from guard (2).
3. Remove guard.
4. Remove cab fresh air filter (3) and recirculation air filter (4).
5. Inspect filters for debris or damage, replace if necessary.
6. Install filters.
7. Install guard and knobs.

1— Knob (2 used)
2— Guard
3— Cab Fresh Air Filter
4— Recirculation Air Filter

TX1065424A —UN—01OCT09

Air Filter Guard (S.N. —269401)

TX1166848A —UN—23JUL14

Air Filter Guard (S.N. 269402—)

TX1065425A —UN—06JUN13

Cab Fresh Air and Recirculation Air Filters (S.N. —269401)

TX1166850A —UN—23JUL14

Cab Fresh Air and Recirculation Air Filters (S.N. 269402—)

CN93077,0000057 -19-25AUG14-1/1

Check Fuel Tank Breather

IMPORTANT: Prevent possible engine damage. Replace fuel tank breather if damaged.

1. Open engine cover.
2. Inspect fuel tank breather filter (1). Replace if damaged. See Replace Fuel Tank Breather. (Section 3-9.)
3. Close engine cover.

1— Fuel Tank Breather Filter

TX1144771 —UN—30SEP13

Fuel Tank Breather

JK47244,000035C -19-27SEP13-1/1

Replace Primary Engine Air Filter

IMPORTANT: Prevent possible engine damage. Do not clean primary engine air filter. Replace filter when air restriction light is illuminated on engagement and monitor unit (EMU). To prevent dirt from being sucked into engine, do not remove filter when engine is running.

Do not start engine without both primary and secondary filters installed.

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 stop engine.
4. Open engine cover and remove left engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)
5. Squeeze dust unloader valve (2) to remove dust from air cleaner.
6. Replace dust unloader valve if worn or damaged. Install dust unloader valve.
7. Pull up on service cover latch (1) and rotate service cover counterclockwise to remove.
8. To remove primary filter (3), gently move end of filter back and forth to break seal.
9. Gently pull filter out of housing and discard. Avoid dislodging contaminant from filter or knocking filter against housing.

NOTE: Secondary air filter should only be removed at every third primary filter replacement or if visual inspection indicates immediate attention is required.

IMPORTANT: DO NOT use compressed air to clean debris from air cleaner housing. Debris can enter engine, causing internal engine damage.

10. Clean air filter housing.
11. Install new primary filter by gently sliding filter over secondary filter (4) and pressing primary filter in place until fully seated. When installing, apply pressure by hand at outer rim of filter to complete a tight seal. Continue pushing filter into outlet tube until filter stops. The critical sealing area will compress slightly, adjust itself, and distribute sealing pressure evenly.

IMPORTANT: Prevent possible engine damage. If service cover does not fit flush to air filter housing, primary filter is not properly seated in housing.

12. Replace service cover with dust unloader valve facing downword. Rotate service cover clockwise to lock in position. Do not force service cover onto air cleaner or use service cover to push filter into place.

TX1140430 —UN—12JUL13

Service Cover Latch and Dust Unloader Valve

TX1144082 —UN—16SEP13

Primary Filter

TX1140428 —UN—16SEP13

Secondary Filter

1— Service Cover Latch
2— Dust Unloader Valve
3— Primary Filter
4— Secondary Filter

13. Inspect and torque all clamps, cap screws, and connections in the entire air intake system. Check for holes in piping and repair if needed.
14. Start engine and check monitor for air filter restriction indicator to verify there is no restriction.
    - If air restriction indicator still shows restriction, replace secondary filter.
15. Install left engine side panel and close engine cover.
16. Lower boom.

JK47244,000030E -19-03MAR14-1/1

Replace Secondary Engine Air Filter

IMPORTANT: Prevent possible engine damage. Do not clean primary engine air filter. Replace filter when air restriction light is illuminated on engagement and monitor unit (EMU). To prevent dirt from being sucked into engine, do not remove filter when engine is running.

Do not start engine without both primary and secondary filters installed.

NOTE: Secondary air filter should only be removed at every third primary filter replacement or if visual inspection indicates immediate attention is required.

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 stop engine.
4. Open engine cover and remove left engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)
5. Remove dust unloader valve (2) and clean out dust found in drop tube.
6. Replace dust unloader valve if worn or damaged. Install dust unloader valve.
7. Pull up on service cover latch (1) and rotate service cover counterclockwise to remove.
8. To remove primary filter (3), gently move end of filter back and forth to break seal.
9. Gently pull filter out of housing and discard. Avoid dislodging contaminant from filter or knocking filter against housing.
10. Remove secondary filter (4) by pulling straight out. Replace secondary filter if dirty or damaged.

IMPORTANT: DO NOT use compressed air to clean debris from air cleaner housing. Debris can enter engine, causing internal engine damage.

11. Clean air filter housing.
12. Install secondary filter by pressing filter firmly in place until seated. When properly fitted, secondary filter should fit tightly inside outlet tube.
13. Install new primary filter by gently sliding filter over secondary filter and pressing primary filter in place until fully seated. When installing, apply pressure by hand at outer rim of filter to complete a tight seal. Continue pushing filter into outlet tube until filter stops. The critical sealing area will compress slightly, adjust itself, and distribute sealing pressure evenly.

IMPORTANT: Prevent possible engine damage. If service cover does not fit flush to air filter housing, primary filter is not properly seated in housing.

TX1140430 —UN—12JUL13

Service Cover Latch and Dust Unloader Valve

TX1144082 —UN—16SEP13

Primary Filter

TX1140428 —UN—16SEP13

Secondary Filter

1— Service Cover Latch
2— Dust Unloader Valve
3— Primary Filter
4— Secondary Filter

14. Replace service cover with dust unloader valve facing downward. Rotate service cover clockwise to lock in position. Do not force service cover onto air cleaner or use service cover to push filter into place.
15. Inspect and torque all clamps, cap screws, and connections in the entire air intake system. Check for holes in piping and repair if needed.
16. Start engine and check monitor for air filter restriction indicator to verify there is no restriction.

Continued on next page

JK47244,000030F -19-06MAR14-1/2

17. Install left engine side panel and close engine cover.
18. Lower boom.

JK47244,000030F -19-06MAR14-2/2

Check and Drain Primary Fuel Filter and Water Separator

1. Park machine on level surface.
2. Raise boom and lock in raised position for better access. See Boom Lock. (Section 2-2.)
3. Open engine cover and remove right engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)
4. Place suitable container under drain valve (2) of primary fuel filter and water separator (1).
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. Install right engine side panel and close engine cover.

TX1133183 —UN—18MAR13

Primary Fuel Filter and Water Separator

1— Primary Fuel Filter and Water Separator
2— Drain Valve
3— Fuel Shutoff Valve

11. Lower boom.

JK47244,0000334 -19-29JUL13-1/1

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

TX1140237 —UN—10JUL13

Without Air Conditioning

TX1142384 —UN—15AUG13

With Air Conditioning

JK47244,00001A1 -19-15AUG13-1/1

Lubricate Steering Centering Mechanism—If Equipped

NOTE: If steering levers are not performing smoothly the steering centering mechanism may need to be lubricated with an aerosol graphite lubricant.

IMPORTANT: Avoid debris buildup within the centering mechanism, do not use a petroleum-based lubricant.

Lubricate center bushing (1) with an aerosol graphite lubricant.

1— Center Bushing

Centering Mechanism

TX1134440 —UN—05APR13

JK47244,00002B3 -19-23APR13-1/1

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 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. Open engine cover.
2. Make sure dipstick (1) is fully seated.
3. Remove dipstick to check oil level.

   BEFORE THE ENGINE IS STARTED: The engine is full when oil level is in the cross hatch area. It is acceptable to run the engine when the oil level is above the ADD mark.

   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, the engine oil level must be above the ADD mark.
4. If necessary, remove fill tube cap (2) to add oil. For recommended oil, see Diesel Engine Oil. (Section 3-1.)
5. Close engine cover.

TX1144772 —UN—27SEP13

Engine Oil Dipstick and Fill Tube Cap

1— Dipstick **2— Fill Tube Cap**

ER93822,000027E -19-01OCT15-1/1

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. Check oil level at sight glass location (1) on left side of machine. Hydraulic oil level should be between the arrow marks (2) on site glass.

If adding oil is necessary:

1. Open engine cover.
2. Remove hydraulic reservoir fill cap (3).
3. Add hydraulic oil. For recommended oil, see Hydraulic and Hydrostatic Oil. (Section 3-1.)
4. Install hydraulic reservoir fill cap.
5. Close engine cover.

1— Sight Glass Location
2— Arrow Mark (2 used)
3— Hydraulic Reservoir Fill Cap

TX1139512 —UN—08JUL13

Hydraulic Sight Glass Location

TX1139514 —UN—27JUN13

Hydraulic Sight Glass (engine side panel removed for clarity)

TX1144769 —UN—04OCT13

Hydraulic Reservoir Fill Cap

JK47244,00002E2 -19-27SEP13-1/1

Check Coolant Level

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.

Check coolant level by viewing coolant in surge tank (2) when engine is cold.

1. Park machine on level surface.
2. Allow engine to cool.
3. Open engine cover.
4. Check surge tank for coolant level. Coolant should be above the MIN COLD line (4), but below the MAX COLD line (3).
5. 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.)
6. Close engine cover and run engine.

TX1144778 —UN—30SEP13

Surge Tank

1— Surge Tank Cap
2— Surge Tank
3— MAX COLD Line
4— MIN COLD Line

7. Allow engine to cool and check coolant level again.
8. If level is still low, repeat procedure.

JK47244,00002E3 -19-01OCT15-1/1

Lubricate Boom Linkage, Cylinder Pivot Points, and Quik-Tatch™ Linkage

TX1146080

TX1146080 —UN—23OCT13

Boom Linkage, Cylinder, Pivot Points, and Quik-Tatch™Linkage Lubrication Points

1— Boom Linkage Point (8 used) **2— Cylinder Pivot Point (8 used)** **3— Quik-Tatch™ Linkage Point (2 used)**

NOTE: In severe operating conditions, Quik-Tatch™ linkage points (3) may need more frequent lubrication.

Lubricate boom linkage points (1), cylinder pivot points (2), and Quik-Tatch™ linkage 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

JK47244,00002EE -19-24OCT13-1/1

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. Open engine cover to access dust unloader valve (1).
3. Squeeze dust unloader valve to remove dust from the air cleaner.
4. Check condition of dust unloader valve. Replace if hardened or damaged.
5. Close engine cover.

1— Dust Unloader Valve

TX1139640 —UN—09SEP13

Dust Unloader Valve—Turbocharged Engine (4TNV98CT engine shown, 4TNV98T engine similar)

TX1139638 —UN—09SEP13

Dust Unloader Valve—Naturally-Aspirated Engine (4TNV98C engine shown)

JK47244,00002EF -19-14JAN15-1/1

Check and Adjust Accessory Drive Belt Tension

NOTE: Machines with air conditioning come equipped with an automatic belt tension adjuster. This procedure is only necessary on machines without air conditioning.

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 (2) and crankshaft pulley (3) with thumb. Deflection (4) must be within specification.

Specification

Belt—Deflection (4)..... 6 mm
0.25 in.
Belt—Depressing Force.....149 N
33.5 lb.-force

3. If tension is not within specification, loosen cap screws on top and bottom of alternator.
4. Move alternator forward or backwards by turning adjusting cap screw (5). Adjust until tension meets specification.

TX1140236 —UN—10JUL13

Without Air Conditioning

1— Acessory Drive Belt
2— Alternator Pulley
3— Crankshaft Pulley
4— Deflection
5— Adjusting Cap Screw

5. Tighten cap screws on top and bottom of alternator to specification.

Specification

Cap Screw—Torque.....37 N·m
27 lb.-ft.

JK47244,0000331 -19-19NOV13-1/1

Take Engine Oil Sample

See your authorized dealer.

OUT4001,000039B -19-14MAR12-1/1

Change Engine Oil and Replace Oil 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. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
4. Engage park brake and stop engine.
5. Under left rear side of machine, remove cap screws (2) from access cover (1) and pull out cover with attached engine oil drain hose.
6. Place suitable container under hose plug (3). Remove hose plug using two wrenches to avoid twisting hose. Allow oil to drain into container. Dispose of waste oil properly.
7. After oil is drained, install hose plug.
8. Make sure O-ring is still intact when installing hose plug.
9. Open engine cover and remove left engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)
10. Clean dirt or debris around engine oil filter (4).
11. Remove bottom panel from underneath machine.
12. Place suitable container under engine oil filter.
13. 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.

14. Apply a film of clean engine oil on seal of new filter.

Access Cover

TX1144107A —UN—16SEP13

Hose Plug

TX1140303A —UN—11JUL13

Engine Oil Filter

TX1140324A —UN—11JUL13

1— Access Cover
2— Cap Screw (2 used)
3— Hose Plug
4— Engine Oil Filter

15. Install filter. Turn filter until seal contacts mounting surface. Then turn filter by hand 2/3—1 turn more.

Continued on next page

ER93822,000027F -19-01OCT15-1/2

16. Remove engine oil fill cap (5).

IMPORTANT: Avoid engine damage. Do not overfill engine oil.

17. Add oil. For recommended oil, see Diesel Engine Oil. (Section 3-1.)

Specification	
Engine—Oil Capacity	
With Filter	12.5 L 3.3 gal.

18. Check engine oil level on dipstick (6).
19. Install engine oil fill cap.
20. Start engine and run for 2 minutes. Check for leaks around filter and drain plug.
21. Stop engine.
22. Check engine oil level on dipstick.
23. Install access cover and cap screws.

TX1140217 —UN—10JUL13

Engine Oil Fill Cap and Dipstick

5— Engine Oil Fill Cap **6— Dipstick**

24. Install left engine side panel and close engine cover.
25. Lower boom.

ER93822,000027F -19-01OCT15-2/2

Replace Primary Fuel Filter and Water Separator

1. Park machine on a level surface.
2. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
3. Engage park brake and stop engine.
4. Open engine cover and remove right engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)
5. Turn fuel shutoff valve (3) to OFF position.
6. Thoroughly clean exterior of primary fuel filter and water separator assembly (1) and surrounding area.
7. Place a suitable container under drain valve (2) of primary fuel filter and water separator.
8. Loosen drain valve to drain water, sediment, and fuel into container. Dispose of waste properly.
9. Close drain valve.
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.

TX1133183 —UN—18MAR13

Fuel Filter and Water Separator

1— Primary Fuel Filter and Water Separator Assembly
2— Drain Valve
3— Fuel Shutoff Valve

13. Install new filter element.
14. Install water separator bowl. Tighten 1/2 turn after seal contacts mounting base.
15. Turn fuel shutoff valve to ON position.
16. Bleed fuel system. See Bleed Fuel System. (Section 4-1.)
17. Install right engine side panel and close engine cover.
18. Lower boom.

JK47244,000029B -19-17APR13-1/1

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. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
3. Open engine cover and remove left engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)
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.

TX1138782 —UN—12SEP13

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. Install left engine side panel and close engine cover.
10. Lower boom.

JK47244,000034E -19-12SEP13-1/1

Replace Hydraulic Oil Filter

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 stop engine.
4. Open engine cover and remove left engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)
5. Place suitable container under hydraulic oil filter bowl (1).
6. Turn hydraulic oil filter bowl counterclockwise to remove.
7. Remove filter element and discard.
8. Install new filter element into hydraulic oil filter bowl. Ensure O-ring is properly seated around filter element.
9. Turn hydraulic oil filter bowl clockwise to install. Tighten to specification.

Specification	
Filter Bowl—Torque	39 N·m 29 lb.-ft.

TX1144062A —UN—16SEP13

Hydraulic Oil Filter Bowl

1— Hydraulic Oil Filter Bowl

10. Install left engine side panel and close engine cover.
11. Check hydraulic reservoir oil level. See Check Hydraulic Oil Level. (Section 3-4.)
12. Lower boom.

JK47244,0000324 -19-20SEP13-1/1

Lubricate Steering Linkage—If Equipped

1. Raise operator's station. See Raising Operator's Station. (Section 3-2.)
2. Lubricate universal drive shaft grease fittings (1) and steering arm grease fittings (2) with 1—2 shots of grease. For recommended grease, see Grease. (Section 3-1.)
3. Lower operator's station.

1— Universal Drive shaft Grease Fitting (2 used)

2— Steering Arm Grease Fitting (2 used)

TX1134438 —UN—05APR13

Universal Drive Shaft and Steering Arm Grease Fittings

JK47244,00002B2 -19-17JUL13-1/1

Check Chain Case Oil Level

1. Park machine on level surface.
2. Remove fill plugs (1) located on each side of the machine frame.
3. Oil level should be just below fill plug threads.
4. If necessary, add oil. For recommended oil, see Chain Case Oil. (Section 3-1.)
5. Install fill plugs.

1— Fill Plug (2 used)

TX1065752A —UN—08OCT09

Chain Case Fill Plug

CN93077,0000059 -19-28NOV12-1/1

Take Fluid Samples

See an authorized dealer for taking the following fluid samples:

- Hydraulic Oil
- Chain Case Oil
- Diesel Fuel
- Engine Coolant

KR46761,0000FC4 -19-30SEP15-1/1

Check Coolant

See Check Coolant. (Section 3-3.)

OUT4001,0000365 -19-28JUL14-1/1

Replace Fuel Tank Breather

1. Open engine cover.
2. Rotate fuel tank breather filter (1) counterclockwise to remove.
3. Discard fuel tank breather filter.
4. Install new breather filter.
5. Close engine cover.

1— Fuel Tank Breather Filter

TX1144771 —UN—30SEP13

Fuel Tank Breather Filter

JK47244,00002F1 -19-27SEP13-1/1

Replace Hydraulic Oil Reservoir Breather

1. Park machine on a level surface.
2. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
3. Open engine cover and remove left engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)
4. Loosen and slide hose clamps away from hydraulic oil reservoir breather (1). Remove hoses.
5. Remove breather.
6. Install new breather.
7. Install hoses and tighten clamps.
8. Install left engine side panel and close engine cover.
9. Lower boom.

TX1139684 —UN—01JUL13

Hydraulic Breather

1— Hydraulic Oil Reservoir Breather

JK47244,00002F4 -19-01JUL13-1/1

Change Hydraulic Oil

IMPORTANT: To prevent 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 breather or fill cap.

1. Park machine on level surface.
2. Raise and block machine. See Raising and Blocking Machine. (Section 3-2.)
3. Open engine cover.
4. Remove hydraulic reservoir fill cap (4).
5. Remove bottom panel (1).
6. Position a suitable container under drain plug (2).
7. Remove drain plug and drain oil. Dispose of waste oil properly.
8. Install drain plug.
9. Fill hydraulic oil reservoir. For recommended hydraulic oil, see Hydraulic and Hydrostatic Oil. (Section 3-1.)

Specification	
Hydraulic Reservoir Oil—Capacity	25 L 7 gal

10. Check hydraulic reservoir oil level on sight glass (3). Oil level should be between the two arrows.
11. Inspect drain plug for leaks.
12. Install bottom panel.
13. Install hydraulic reservoir fill cap.
14. Close engine cover.

1— Bottom Panel
2— Drain Plug
3— Sight Glass
4— Fill Cap

Bottom Panel (underside of wheeled machine shown)

TX1241203 —UN—30JUN17

Drain Plug (underside of wheeled machine shown)

TX1213456 —UN—29MAR16

Sight Glass

TX1145011 —UN—03OCT13

Hydraulic Reservoir Fill Cap

TX1145010 —UN—04OCT13

JK47244,00002F2 -19-30JUN17-1/1

Change Chain Case Oil

1. Park machine on level surface.
2. Position a suitable container underneath drain plugs (1) located on bottom rear of each side of machine.
3. Remove drain plugs.
4. Allow oil to drain into container. Dispose of waste oil properly.
5. Install drain plugs.
6. Remove fill plugs (2) located on each side of the machine frame.
7. Fill each chain case until oil level is just below fill plug threads. For recommended oil, see Chain Case Oil. (Section 3-1.)

Specification

Chain Case
Oil—Capacity (per side)..... 20.0 L
5.3 gal

8. Install fill plugs.

1— Drain Plug (2 used) **2— Fill Plug (2 used)**

T194683A —UN—22SEP03

Drain Plug

TX1065770A —UN—08OCT09

Fill Plug

JK47244,00002F3 -19-11JUN19-1/1

Check and Adjust Engine Valve Lash

See an authorized John Deere dealer.

JK47244,0000180 -19-09SEP15-1/1

Drain Cooling System

1. Park machine on a level surface.
2. Allow engine to cool.
3. Open engine cover and remove right engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)

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.

4. Slowly turn surge tank cap (1) to release pressure. Remove cap.
5. Under left rear side of machine, remove cap screws (2) from access cover (3) and pull out access cover.
6. Route coolant drain hose through access cover opening. Place suitable container under drain hose.
7. On right side of machine, open cooling system drain valve (4) and allow coolant to drain into container. Dispose of used coolant properly.
8. Close cooling system drain valve.
9. Flush cooling system. See Flush Cooling System in this section.

1— Surge Tank Cap
2— Cap Screw (2 used)
3— Access Cover
4— Drain Valve

Surge Tank Cap

TX1144777 —UN—30SEP13

Access Cover

TX1143769A —UN—10SEP13

Cooling System Drain Valve

TX1140864A —UN—19JUL13

JK47244,000032F -19-27SEP13-1/1

Flush Cooling System

IMPORTANT: To prevent engine damage:

- **Do not pour coolant into a hot engine.**
- **Do not operate engine without coolant.**

1. Fill system with a solution of clean water and John Deere Restore. Follow directions on container.
2. Install surge tank cap.
3. Start and run engine until it reaches operating temperature.
4. Stop engine.
5. Place suitable container under drain hose.

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 surge tank cap and open cooling system drain valve. Allow flushing solution to drain into container. Dispose of waste properly.
7. Close cooling system drain valve and install access cover.

TX1144779 —UN—30SEP13

Surge Tank

1— Surge Tank

8. Remove and clean surge tank (1) and coolant system drain hose.
9. Install surge tank and coolant system drain hose.
10. Fill cooling system with proper coolant. See Fill Cooling System in this section.

JK47244,0000365 -19-26JUL17-1/1

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 your authorized dealer.
2. Fill system with coolant to the MAX COLD line (3) on surge tank (2). For recommended coolant, see Diesel Engine Coolant (engine without wet sleeve cylinder liners). (Section 3-1.)

Specification	
Cooling System—Capacity	12.5 L 3.3 gal.

3. Install surge tank cap (1).
4. Start engine and run until engine reaches operating temperature, allowing entire system to be filled with coolant.

COOL-GARD is a trademark of Deere & Company

TX1144778 —UN—30SEP13

Surge Tank

1— Surge Tank Cap
2— Surge Tank
3— MAX COLD Line
4— MIN COLD Line

5. Stop engine.
6. Allow engine to cool.
7. Check coolant level on surge tank. Coolant should be above the MIN COLD line (4), but below the MAX COLD line.

JK47244,00002F8 -19-01OCT15-1/1

Clean Machine Regularly

Remove any grease, oil, fuel, or debris buildup to avoid possible injury or machine damage.

IMPORTANT: Avoid using high-pressure washing for electronic or electric devices, including the engine control unit (ECU), relays, and harness couplers.

Never steam-clean or pour cold water on the high-pressure fuel pump while it is still warm; doing so may cause pump parts to seize. Also, avoid steam-cleaning electrical components, wiring, sensors, and the ECU.

Avoid using high-pressure washing when cleaning the exhaust stack to prevent damage to engine.

Avoid machine damage. Machine is equipped with a sealed and lubricated track, avoid water being forced between the plastic pins and rubber plugs while washing machine with pressure washer.

Steam-clean engine thoroughly. High-pressure washing is not recommended.

T6642EJ —UN—18OCT88

Clean Machine Regularly

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 30 days minimum after receipt of machine before cleaning with high pressure. Use low-pressure wash operations until 30 days have elapsed.

Do not spray oil cooler fins at an angle; doing so may bend the cooler fins.

BB11933,0000076 -19-16NOV22-1/1

Inspect and Clean Polycarbonate Windows

Polycarbonate windows are important for the protection of the operator and the safe operation of the machine. Inspect the windows system regularly, and if surface crazing or cracks are observed, replace windows using only John Deere replacement parts to ensure the original operator protection level. Inspect the windows after any significant impact to the windows or frame.

NOTE: The use of cleaning agents, solvents, polishing compounds, or waxes not listed in this instruction block is not recommended. Contact an authorized dealer for additional information regarding glazing materials.

IMPORTANT: DO NOT use glass cleaners on polycarbonate windows.

NEVER use abrasive or highly alkaline cleaners on polycarbonate windows. Some cleaning compounds may attack the polycarbonate material, resulting in cracks.

NEVER use aromatic or halogenated solvents like toluene, benzene, acetone, tetrachloride, or petroleum products. Gasoline should not be used.

Acceptable cleaning agents are John Deere Polycarbonate Cleaner and John Deere Polycarbonate Wash.

Acceptable soap based cleaning agents are Joy®, Palmolive® Liquid, and Scott® Pink Lotion Skin Cleanser.

Cleaning should never be done in direct sunlight or at high temperatures, as this can lead to staining.

Before washing or applying any cleaning agents or solvents, inspect the hard coating of window for microcrazing or cracking. Do NOT apply solvents or cleaning agents to window with microcrazing or cracks.

Minor scratches and abrasions can be minimized by using a buffing compound or polish agent like NOVUS 1 or 2. Test any intended polishing product in a small area before using on the entire window. All polishing should follow the manufacturer's instructions to prevent further damage to the window's hard coat.

To begin the cleaning process, flush away as much loose dirt as possible with water, then clean the windows using a solution of approved cleaner and lukewarm water. Use a soft, grit-free cloth or sponge to loosen any dirt or grime. Never scrub with brushes, steel wool, or other abrasive materials. Never use squeegees, razor blades, or other sharp instruments to remove deposits or spots. The windows are made of a polycarbonate material, which is less abrasion resistant than glass. The windows will scratch.

Use of incompatible cleaning materials can cause structural and/or surface damage.

IMPORTANT: Always rinse window with water prior to cleaning process.

The edges of polycarbonate sheet are not protected with an abrasion and chemical resistance coating. Do not allow cleaning solutions and solvents to pool along the edges at any time. Always rinse edges thoroughly with generous amounts of clean, lukewarm water.

CAUTION: Make sure the work area is well ventilated when working with organic solvents.

Solvent fumes can be hazardous to health if proper safety precautions are not taken.

Do not smoke around organic solvents. Solvents can cause risk of fire if proper safety precautions are not taken.

For all mentioned chemicals, consult the manufacturer's material safety data sheet (MSDS) for proper safety precautions.

Masking adhesive and glazing compounds can be removed by applying Isopropyl Alcohol or Naphtha VM&P grade to a soft cloth and rubbing lightly; additionally, any of these cleaning agents or butyl cellosolve can be used to remove paints, marking pen inks, lipstick, or other forms of graffiti. Afterwards, wash the window using a solution of approved cleaner and lukewarm water. Rinse thoroughly to remove any trace of solvents.

Masking tape and adhesive tape work well for lifting off old, weathered paints.

To remove labels and stickers, the use of kerosene is generally effective. If the solvent does not penetrate the sticker material, apply heat using a hair dryer to soften the adhesive and promote removal. Afterwards, wash the window using a solution of approved cleaner and lukewarm water. Rinse thoroughly to remove any trace of solvents.

To remove tree sap, flush away as much loose dirt as possible, then use John Deere Polycarbonate Cleaner, kerosene, or Naphtha VM&P grade on a soft cloth and rub lightly. Rinse well with clean water and dry with a chamois or softer cloth to prevent water spotting.

Joy is a trademark of Procter & Gamble
Palmolive is a trademark of Colgate-Palmolive
Scott is a trademark of Kimberly-Clark Corporation

MB60223,0000088 -19-11MAY17-1/1

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. Make sure fuel tank is full.
2. Open engine cover and remove right engine side panel to access primary fuel filter and water separator (1). See Engine Side Panels—Remove and Install. (Section 3-2.)
3. Check that fuel shutoff valve (2) is in the ON position.
4. Turn switched power ON. The electric low-pressure fuel pump will start to bleed air.

   If fuel filter 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.

TX1133224 —UN—18MAR13

Fuel System

1— Primary Fuel Filter and Water Separator

2— Fuel Shutoff Valve

5. Start engine. Check fuel supply system for leaks. If engine does not start or starts and stalls, repeat procedure.
6. Install right engine side panel and close engine cover.

JK47244,000029D -19-10JUL13-1/1

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 -19-13AUG20-1/1

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 that 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 the 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.
9. Before washing machine, place a water repellent cover over the alternator.
10. To prevent component damage, the water jets need to be set at a 45-degree angle with reduced water pressure. Avoid direct contact with electrical and electronic connectors.

CED,OUO1021,185 -19-04MAR20-1/1

Handling Batteries Safely

CAUTION: Battery gas can explode. Keep sparks and flames away from batteries.

Never check battery charge by placing a metal object across the posts. Use a voltmeter to check voltage.

Always remove grounded (-) battery clamp first and replace it last.

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. Inspect batteries for leakage before handling. Wear eye protection and rubber gloves.

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.**

Exploding Battery Gas

TS204 —UN—15APR13

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.

DP99999,0000312 -19-12JUL13-1/1

Using Battery Charger

12-Volt System

CAUTION: Prevent possible injury from exploding battery. Do not charge a battery if ambient temperature is below 0°C (32°F). 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.

NOTE: Some battery chargers may also be used as a booster to start the engine. Follow battery charger manufacturer's operating instruction before boosting.

1. Turn the battery disconnect switch (if equipped) to the OFF position.
2. Ventilate the area where battery is being charged.
3. Connect positive (+) cable to the positive (+) terminal of machine battery.
4. Connect negative (-) cable to the negative (-) terminal of machine battery.

CAUTION: Prevent possible injury from exploding battery. Follow battery charger manufacturer's operating instructions before charging.

IMPORTANT: Prevent battery or machine damage from improper use of charger. Follow battery charger manufacturer's operation instruction before charging.

TS204 —UN—15APR13

Prevent Battery Explosions

N36890 —UN—07OCT88

Charger

5. Stop or cut back charging rate if battery case becomes hot or is venting electrolyte. Battery temperature must not exceed 52°C (125°F).
6. Remove charger cables in reverse order of connection.

Continued on next page

OUT4001,0000239 -19-15SEP21-1/2

24-Volt System

CAUTION: Prevent possible injury from exploding battery. Do not charge a battery if ambient temperature is below 0°C (32°F). Warm each 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.

NOTE: Some battery chargers may also be used as a booster to start the engine. Follow battery charger manufacturer's operating instruction before boosting.

1. Turn the battery disconnect switch (if equipped) to the OFF position.
2. Ventilate the area where batteries are being charged.
3. Connect positive (+) cable to the positive (+) terminal of one machine battery.
4. Connect negative (-) cable to the negative (-) terminal of second machine battery.

CAUTION: Prevent possible injury from exploding battery. Follow battery charger manufacturer's operating instructions before charging.

IMPORTANT: Prevent battery or machine damage from improper use of charger. Follow battery charger manufacturer's operation instruction before charging.

TS204 —UN—15APR13

Prevent Battery Explosions

TX1314241 —UN—22JUN21

Charger

5. Stop or cut back charging rate if battery case becomes hot or is venting electrolyte. Battery temperature must not exceed 52°C (125°F).
6. Remove charger cables in reverse order of connection.

OUT4001,0000239 -19-15SEP21-2/2

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.

TS204 —UN—15APR13

Using Booster Batteries

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.

NOTE: If battery is dead, battery will need to be charged or engine boost started before removal procedure so boom can be raised.

1. Remove attachment.
2. Park machine on level surface.
3. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
4. Engage park brake and stop engine.
5. Open engine cover and remove left engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)
6. Disconnect negative (-) terminal (2) cable from battery.
7. Pull back red positive terminal cover (1) and disconnect positive (+) cable from battery.
8. Clean battery with a damp cloth or rag. Keep dirt out of battery cells.
9. Loosen J-bolts (3) on battery hold-down bracket.
10. Lift battery from battery compartment.
11. 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.
12. 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.

TX1139742 —UN—16SEP13

Battery

1— Positive Terminal Cover
2— Negative Terminal
3— J-Bolt (2 used)

13. Place battery in battery compartment.
14. Install battery hold-down bracket.
15. Install J-bolts and tighten hardware.
16. 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.
17. Connect negative (-) cable to battery negative (-) terminal. Apply petroleum or silicone spray to terminal to prevent corrosion. Make sure connection is tight.
18. Install left engine side panel and close engine cover.
19. Lower boom.

JK47244,000030A -19-12JUL13-1/1

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

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

TX1066041A —UN—13OCT09

Bulb Housing and Wire Connector

TX1066042A —UN—13OCT09

Retainer Clip and Halogen Bulb

TX1066043A —UN—13OCT09

TORX is a trademark of Camcar/Textron

CN93077,000005A -19-16MAY13-1/1

Adding Rear Counterweights

There are three optional sets of counterweights that can be added to machine.

Use a suitable lifting device to put each counterweight on machine.

Specification

Counterweight—Weight (each)	39 kg 86 lb

1. Line up counterweight holes with three threaded holes on machine.

NOTE: For the top two cap screws, place spacers between the counterweight and machine frame.

2. Install spacers and tighten M16 x 70 mm flange cap screws (1).
3. Stack second counterweight on first counterweight and line up holes.
4. Install M16 x 120 mm flange cap screws (2) and tighten with nuts.
5. Stack third counterweight on second counterweight and line up holes.
6. Install M16 x 120 mm flange cap screws (3) and tighten with nuts.

1— M16 x 70 mm Flange Cap Screw (3 used)
2— M16 x 120 mm Flange Cap Screw (2 used)
3— M16 x 120 mm Flange Cap Screw (3 used)

TX1139474 —UN—27JUN13

One Counterweight

TX1139475 —UN—27JUN13

Two Counterweights

TX1139476 —UN—27JUN13

Three Counterweights

JK47244,00002DE -19-01FEB18-1/1

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.

TX1140226 —UN—15AUG13

With Air Conditioning

1— Belt **2— Belt Tension Adjuster**

JK47244,0000320 -19-01FEB18-1/2

Without Air Conditioning

1. Check belt (1) regularly for wear, especially for cracks at the bottom of grooves and for frayed edges.
2. Check belt tension by depressing the midpoint between the alternator pulley (2) and crankshaft pulley (3) with thumb. Deflection (4) must be within specification.

Specification	
Belt—Deflection (4)	6 mm
	0.25 in
Belt—Depressing Force	149 N
	33.5 lbf

3. If tension is not within specification, loosen cap screws on top and bottom of alternator.
4. Move alternator forward or backwards by turning adjusting cap screw (5). Adjust until tension meets specification.
5. Tighten cap screws on top and bottom of alternator to specification.

Specification	
Cap screw—Torque	37 N·m
	27 lb·ft

TX1140236 —UN—10JUL13

Without Air Conditioning

1— Belt
2— Alternator Pulley
3— Crankshaft Pulley
4— Deflection
5— Adjusting Cap Screw

JK47244,0000320 -19-01FEB18-2/2

Adjusting Boom and Bucket Linkage—Manual Hands Only Controls

If boom and bucket cycle times are slow, adjust boom and bucket linkage.

1. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
2. Park machine and shut engine off.
3. Turn switched power ON.
4. If equipped with key start, press park brake switch to middle position to hydraulically enable boom and bucket while park brake is engaged.

   If equipped with keyless start, press hydraulic enable switch on sealed switch module (SSM) to hydraulically enable boom and bucket while park brake is engaged.
5. Pivot each control lever left and right. Ensure that boom control valve locks into detent.
6. Confirm that when control levers are returned to neutral position, they are in the center of opening range.
7. Raise and lock operator's station. See Raising Operator's Station. (Section 3-2.)
8. Remove footwell. See Footwell Removal. (Section 3-2.)

TX1066107A —UN—15OCT09

Boom and Bucket Linkage

1— Nut (2 used)

9. If necessary, adjust position of cables forward or backward using nuts (1) to properly position control levers.
10. Install footwell and lower operator's station.
11. Lower boom to the ground.

JK47244,00002A5 -19-04OCT13-1/1

Adjusting Pedal Angle—Manual Hand and Foot Controls

The angle of the pedals can be adjusted to suit different operators or different footwear.

Adjust the angle by increasing or decreasing the length of the rods (1).

Increasing length of the rod, increases pedal angle. Decreasing length of the rod, decreases pedal angle.

1. Park machine on level surface.
2. Raise and lock operator's station. See Raising Operator's Station. (Section 3-2.)
3. Remove footwell. See Footwell Removal. (Section 3-2.)
4. Loosen nuts (2).
5. Turn the rod to desired length until pedal is at comfortable angle. Make sure there is still thread engagement.

TX1066428A —UN—16OCT09

Pedal Angle Adjustment

1— Rod (2 used) **2— Nut (4 used)**

6. Tighten nuts.
7. Install footwell and lower operator's station.

JK47244,00002A6 -19-09SEP13-1/1

Replacing Fuses

The fuse panel is located on right side of operator's station. Remove fuse panel cover (1) 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 a 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

Fuse Panel Cover

TX1066401A —UN—16OCT09

1— Fuse Panel Cover

Continued on next page

JK47244,00001DF -19-31JAN17-1/2

1— Left Joystick
2— Right Joystick
F1— Unswitched Power 7.5 A Fuse
F2— Monitor Unswitched Power 10 A Fuse
F3— Engine Control Unit (ECU) Unswitched Power 25 A Fuse
F4— Air Seat 10 A Fuse
F5— Dome Light and Accessory Power Outlet 10 A Fuse
F6— Lights 25 A Fuse
F7— Accessory 20 A Fuse
F8— Air Conditioner and Heater 30 A Fuse
F14— Quik-Tatch™ 30 A Fuse
F15— Switched Power 15 A Fuse
F16— Horn 10 A Fuse (switch A)
F17— Handle Switches 5 A Fuse (switches B, G, and H)
F18— Handle Switches 5 A Fuse (switches C, D, E, and F)
V1— Diode
V2— Diode

TX1127170 —UN—04JAN13

Fuse Designations

Quik-Tatch is a trademark of Deere & Company

JK47244,00001DF -19-31JAN17-2/2

Replacing Air Heater Fuse

1. Park machine on level surface.
2. Raise and lock operator's station. See Raising Operator's Station. (Section 3-2.)

NOTE: Air heater 80 A fuse (F31) is located above flywheel housing.

3. Pull 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.

TX1128723 —UN—28DEC12

Air Heater Fuse

F31— Air Heater 80 A Fuse

JK47244,0000371 -19-07OCT13-1/1

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[a]				SAE Grade 2[b]				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]	
	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

[a]*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.*
[b]*Grade 2 applies for hex cap screws (not hex bolts) up to 6 in (152 mm) long.*
[c]*Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.*
[d]*Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.*

DX,TORQ1 -19-09MAY22-1/1

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[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]	
	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
									N·m	lb·ft	N·m	lb·ft	N·m	lb·ft	N·m	lb·ft
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
			N·m	lb·ft	N·m	lb·ft	N·m	lb·ft								
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
	N·m	lb·ft														
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

[a]Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.
[b]Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.

DX,TORQ2 -19-09MAY22-1/1

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 the checkout.

If no problem is found, go to next check. If a problem is indicated, an additional check or repair procedure will be suggested.

JB92884,00000FB -19-27AUG19-1/41

Diagnostic Trouble Code Check

JB92884,00000FB -19-27AUG19-2/41

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 diagnostic trouble codes (DTCs). Diagnostic trouble codes can be displayed by using one of the following methods: • Engagement and Monitor Unit (EMU) - To access DTCs using EMU, See Engagement and Monitor Unit (EMU)—Main Menu—Codes. (Section 2-3.) • Service ADVISOR™ Diagnostic Application *LOOK: Are diagnostic trouble codes present?*	**YES:** Correct all diagnostic trouble codes before proceeding. **NO:** Continue with operational checkout.

Service ADVISOR is a trademark of Deere & Company

JB92884,00000FB -19-27AUG19-3/41

Operational Checks—Switched Power OFF, Engine OFF Checks

JB92884,00000FB -19-27AUG19-4/41

Periodic Maintenance Decal Check	Periodic maintenance decal check. *LOOK: Is periodic maintenance decal legible?*	**YES:** Go to next check. **NO:** Replace decal.

JB92884,00000FB -19-27AUG19-5/41

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.

Continued on next page

JB92884,00000FB -19-27AUG19-6/41

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.)

JB92884,00000FB -19-27AUG19-7/41

Horn Circuit Check (if equipped)

TX1126584A —UN—30NOV12

Cab Interior

YES: Go to next check.

1— Horn Switch

Press horn switch (1).

LISTEN: Does horn sound?

NO: Check unswitched power 7.5 A fuse (F1).

NO: Check horn 10 A fuse (F16).

IF OK: See an authorized John Deere dealer.

JB92884,00000FB -19-27AUG19-8/41

Seat Control Checks	*NOTE: For seat adjustment procedures, see Seat Adjustment. (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.

Continued on next page

JB92884,00000FB -19-27AUG19-9/41

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 (4TNV98C and 4TNV98CT 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?

YES: Go to next check.

Continued on next page

JB92884,00000FB -19-27AUG19-10/41

	Lower interlocking seat bar.	**NO:** Check monitor unswitched power 10 A fuse (F2).
	LOOK: Do seat and interlocking seat bar indicators go off?	IF OK: See an authorized John Deere dealer.

JB92884,00000FB -19-27AUG19-11/41

Battery Check	Sit in operator's seat.	**YES:** Go to next check.
	Observe battery voltage from operator's seat on the engagement monitor unit (EMU) using SELECT button.	**NO:** Clean and tighten battery terminals.
		Charge battery. See Using Battery Charger. (Section 4-1.)
	LOOK: Does battery have a minimum of 12 volts when engine is not running?	IF OK: See an authorized John Deere dealer.

JB92884,00000FB -19-27AUG19-12/41

Operational Checks—Switched Power ON, Engine OFF Checks

JB92884,00000FB -19-27AUG19-13/41

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?	**YES:** Go to next check.
	LOOK: Do switches on instrument panel illuminate?	**NO:** Check unswitched power 7.5 A fuse (F1).
	LISTEN: Does EMU alarm sound?	**NO:** Check monitor unswitched power 10 A fuse (F2).
	Close cab door (if equipped).	**NO:** Check switched power 15 A fuse (F15).
	LOOK: Does the cab door indicator go off?	IF OK: See an authorized John Deere dealer.

Continued on next page

JB92884,00000FB -19-27AUG19-14/41

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:** Go to next step in this 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.

JB92884,00000FB -19-27AUG19-15/41

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.

Continued on next page

JB92884,00000FB -19-27AUG19-16/41

Windshield Wiper Circuit Check (if equipped)	 TX1125050 —UN—02NOV12 *Windshield Wiper and Washer Switch*	**YES:** Go to next check.
	Close cab door.	**NO:** Check accessory 20 A fuse (F7).
	Press windshield wiper and washer switch to the middle position.	**NO:** Check unswitched power 7.5 A fuse (F1).
	LOOK: Does wiper operate?	IF OK: See an authorized John Deere dealer.

JB92884,00000FB -19-27AUG19-17/41

Windshield Washer Circuit Check (if equipped)	 TX1125050 —UN—02NOV12 *Windshield Wiper and Washer Switch*	**YES:** Go to next check.
	Close cab door.	**NO:** Check washer fluid level.
	Turn on windshield wiper.	**NO:** Check washer hose for kinks and obstructions.
	Press and hold windshield wiper and washer switch in the upper position.	**NO:** Check accessory 20 A fuse (F7).
	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.	**NO:** Check unswitched power 7.5 A fuse (F1).
	LOOK: Does washer operate?	IF OK: See an authorized John Deere dealer.

JB92884,00000FB -19-27AUG19-18/41

Operational Checks—Switched Power ON, Engine ON Checks

Continued on next page

JB92884,00000FB -19-27AUG19-19/41

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.

JB92884,00000FB -19-27AUG19-20/41

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.

JB92884,00000FB -19-27AUG19-21/41

Engine Speed Check	Set engagement and monitor unit (EMU) to display engine rpm. Set engine speed at slow idle with engine speed control dial and engine speed control pedal released. *LOOK/LISTEN: Does engine run between 1150—1250 rpm?* Rotate engine speed control dial to set the engine speed at fast idle. Engine speed control pedal must be released. *LOOK/LISTEN: Does engine run between 2650—2750 rpm?* Fully depress engine speed control pedal to set engine speed at fast idle. Engine speed control dial must be in slow idle position. *LOOK/LISTEN: Does engine run between 2650—2750 rpm?*	**YES:** Go to next check. **NO:** Check diagnostic trouble codes (DTCs). **NO:** Check engine speed control dial and engine speed control pedal. IF OK: See an authorized John Deere dealer

JB92884,00000FB -19-27AUG19-22/41

Auto-Idle Circuit Check (if equipped)	Verify auto-idle operation. See Auto-Idle (EMU). (Section 2-3.) *LOOK/LISTEN: Does auto-idle function properly?*	**YES:** Go to next check. **NO:** See an authorized John Deere dealer.

Continued on next page

JB92884,00000FB -19-27AUG19-23/41

Hydraulic Control Enable Check	Close cab door (if equipped).	
	Position engine speed control dial in slow idle position.	
	Engage park brake.	**NO:** Go to next step in this check.
	Actuate boom and bucket functions.	**YES:** Check diagnostic trouble codes (DTCs).
	LOOK: Do boom and bucket move?	IF OK: See an authorized John Deere dealer.
	Press park brake rocker switch to the run position or hydraulic enable switch on sealed switch module (SSM) (if equipped) to enable hydraulics.	
	Actuate boom and bucket functions.	**YES:** Go to next check.
	LOOK: Do boom and bucket move?	**NO:** Check diagnostic trouble codes (DTCs).
		IF OK: See an authorized John Deere dealer.

JB92884,00000FB -19-27AUG19-24/41

Power Quik-Tatch™ Check (if equipped)

TX1125100 —UN—02NOV12

Quik-Tatch Switch

IMPORTANT: Avoid damage to Quik-Tatch™ motor. Damage to Quick-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?	**YES:** Go to next check.
Press and hold upper part of Quik-Tatch switch to lock the Quik-Tatch latches.	**NO:** Check Quik-Tatch 30 A fuse (F14), switched power 15 A fuse (F15) and accessory 20 A fuse (F7).
LOOK/LISTEN: Do Quik-Tatch latches secure attachment?	IF OK: See an authorized John Deere dealer.

Quik-Tatch is a trademark of Deere & Company

JB92884,00000FB -19-27AUG19-25/41

Backup Alarm Check (if equipped)

CAUTION: Prevent injury from unexpected machine movement. Keep bystanders clear of machine.

Engine speed at slow idle.	**YES:** Go to next check.
Drive machine in reverse.	**NO:** Check accessory 20 A fuse (F7) and unswitched power 7.5 A fuse (F1).
LOOK/LISTEN: Does backup alarm sound?	IF OK: See an authorized John Deere dealer.

Continued on next page

JB92884,00000FB -19-27AUG19-26/41

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: See an authorized John Deere dealer.

JB92884,00000FB -19-27AUG19-27/41

Two-Speed Check (if equipped)

TX1126585A —UN—27NOV12

Cab Interior

1— Two-Speed Switch

CAUTION: Prevent injury from unexpected machine movement. Keep bystanders clear of machine.

NOTE: Two-speed mode will not activate if creep mode is enabled.

Position engine speed control dial in slow idle position.

Drive machine at full speed forward on a flat and level surface.

Press two-speed switch to activate fast speed mode.

YES: Go to next check.

NOTE: For wheeled machines, downshift requires machine to be stopped and park brake to be set if hydraulic oil temperature is less than 40°C (105°F). Once hydraulic oil temperature is 40°C (105°F) or greater, downshift is allowed without stopping machine and applying park brake.

NO: Check handle switches 5 A fuse (F17).

Press two-speed switch to activate slow speed mode.

NO: Check unswitched power 7.5 A fuse (F1).

LOOK/FEEL: Does machine accelerate then decelerate?

IF OK: See an authorized John Deere dealer.

Continued on next page

JB92884,00000FB -19-27AUG19-28/41

Reversing Fan Check (if equipped)

TX1125087 —UN—02NOV12

Reversing Fan Switch

Press reversing fan switch to upper position.

LISTEN/LOOK: Does fan reverse direction and operate at full speed for 15 seconds?

YES: Go to next check.

IF OK: See an authorized John Deere dealer.

JB92884,00000FB -19-27AUG19-29/41

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 move faster than precision rate?

Press transmission response switch selecting production rate (3 LEDs illuminated).

Drive machine forward.

LOOK/FEEL: Does machine move faster than utility rate?

YES: Go to next check.

IF OK: See an authorized John Deere dealer.

Continued on next page

JB92884,00000FB -19-27AUG19-30/41

Pattern Select Check (EH only, if equipped)

CAUTION: Prevent injury from unexpected machine movement. Keep bystanders clear of machine.

TX1125299 —UN—06NOV12

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—EH Hands Only (ISO pattern) Controls*
- *H—EH Hands Only (H pattern) Controls*
- *F—EH Hand and Foot Controls (H pattern LED will stay lit)*

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.

Continued on next page

JB92884,00000FB -19-27AUG19-31/41

Hydraulic Response Check (EH only, 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.

JB92884,00000FB -19-27AUG19-32/41

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 the sealed switch module (SSM) (left light-emitting diode [LED] illuminated) to enable ride control in standby mode.

Activate ride control by pressing right joystick trigger (both LEDs illuminated).

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.

Continued on next page

JB92884,00000FB -19-27AUG19-33/41

Creep Mode Check (EH only, if equipped)

CAUTION: Prevent injury from unexpected machine movement. Keep bystanders clear of machine.

TX1125307 —UN—06NOV12

Creep Mode Switch

TX1127270 —UN—03DEC12

Creep Mode Speed Switch

Position engine speed control dial in slow idle position.

Press creep mode switch on SSM.

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: Go to next step in this 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

JB92884,00000FB -19-27AUG19-34/41

Boom Down Drift Check	*NOTE: This check may require two people.* *NOTE: Machine must be equipped with a bucket for this check.* Close cab door—if equipped. Operate hydraulic system until hydraulic oil reaches temperature specification. **Specification** Hydraulic Oil—Temperature.....43°C 110°F Actuate boom function to lower boom to ground. Raise boom halfway. Engage park brake. Mark and record a distance on the boom cylinder rod from the cylinder barrel. Disengage park brake. Allow machine to sit with engine speed at slow idle for 5 minutes. Engage park brake. Measure marked distance on boom cylinder rod. **Specification** Boom Cylinder—Drift (maximum)..... 13 mm/5 min 0.5 in/5 min *LOOK: Does boom drift down more than specification?*	**NO:** Go to next check. **YES:** Go to next step in this check.
	Raise boom halfway. Engage park brake. Turn engine off. Allow machine to sit for 5 minutes. **Specification** Boom Cylinder—Drift (maximum)..... 13 mm/5 min 0.5 in/5 min *LOOK: Does boom drift down more than specification?*	**YES:** See an authorized John Deere dealer. **NO:** Go to next check.

Continued on next page

JB92884,00000FB -19-27AUG19-35/41

Boom Up Drift Check	*NOTE: This check may require two people.* *NOTE: Machine must be equipped with a bucket for this check.* Close cab door—if equipped. Operate hydraulic system until hydraulic oil reaches temperature specification. **Specification** Hydraulic Oil—Temperature.....43°C 110°F *NOTE: Bucket may need to be in dump position.* Actuate boom down function to raise front of machine off of the ground. Engage park brake. Mark and record a distance on the boom cylinder rod from the cylinder barrel. Disengage park brake. Allow machine to sit with engine speed at slow idle for 5 minutes. Engage park brake. Measure marked distance on boom cylinder rod. **Specification** Boom Cylinder—Drift (maximum)..... 13 mm/5 min 0.5 in/5 min *LOOK: Does boom drift up more than specification?*	**NO:** Go to next check. **YES:** Go to next step in this check.
	Actuate boom down function to raise front of machine off of the ground. Engage park brake. Turn engine off. Allow machine to sit for 5 minutes. **Specification** Boom Cylinder—Drift (maximum)..... 13 mm/5 min 0.5 in/5 min *LOOK: Does boom drift up more than specification?*	**YES:** See an authorized John Deere dealer. **NO:** Go to next check.

Continued on next page

JB92884,00000FB -19-27AUG19-36/41

Bucket Dump Drift Check	*NOTE: This check may require two people.* *NOTE: Machine must be equipped with a bucket for this check.* Close cab door—if equipped. Operate hydraulic system until hydraulic oil reaches temperature specification. **Specification** Hydraulic Oil—Temperature.....43°C 110°F Raise boom halfway. Fully roll back bucket. Dump bucket halfway. Engage park brake. Mark and record a distance on the bucket cylinder rod from the cylinder barrel. Disengage park brake. Allow machine to sit with engine speed at slow idle for 5 minutes. Engage park brake. Measure marked distance on bucket cylinder rod. **Specification** Bucket Cylinder—Drift (maximum)..... 13 mm/5 min 0.5 in/5 min *LOOK: Does bucket drift down more than specification?*	**NO:** Go to next check. **YES:** Go to next step in this check.
	Raise boom halfway. Fully roll back bucket. Dump bucket halfway. Engage park brake. Turn engine off. Allow machine to sit for 5 minutes. **Specification** Bucket Cylinder—Drift (maximum)..... 13 mm/5 min 0.5 in/5 min *LOOK: Does bucket drift down more than specification?*	**YES:** See an authorized John Deere dealer. **NO:** Go to next check.

Continued on next page

JB92884,00000FB -19-27AUG19-37/41

Bucket Curl Drift Check	*NOTE: This check may require two people.* *NOTE: Machine must be equipped with a bucket for this check.* Close cab door—if equipped. Operate hydraulic system until hydraulic oil reaches temperature specification. **Specification** Hydraulic Oil—Temperature.....43°C 110°F Dump bucket halfway. Actuate boom down function to raise front of machine off of the ground. Engage park brake. Mark and record a distance on the bucket cylinder rod from the cylinder barrel. Disengage park brake. Allow machine to sit with engine speed at slow idle for 5 minutes. Engage park brake. Measure marked distance on bucket cylinder rod. **Specification** Bucket Cylinder—Drift (maximum)..... 13 mm/5 min 0.5 in/5 min *LOOK: Does bucket drift up more than specification?*	**NO:** Go to next check. **YES:** Go to next step in this check.
	Dump bucket halfway. Actuate boom down function to raise front of machine off of the ground. Engage park brake. Turn engine off. Allow machine to sit for 5 minutes. **Specification** Bucket Cylinder—Drift (maximum)..... 13 mm/5 min 0.5 in/5 min *LOOK: Does bucket drift up more than specification?*	**YES:** See an authorized John Deere dealer. **NO:** Go to next check.

JB92884,00000FB -19-27AUG19-38/41

Cycle Times Check	*NOTE: Operate machine without bucket or attachment for this check.* Operate hydraulic system until hydraulic oil reaches temperature specification. **Specification** Hydraulic Oil—Temperature.....43°C 110°F Position engine speed control dial in fast idle position. Record cycle time for each function. Does machine perform within specification? **Cycle Times—Specification** Boom Raise—Cycle Time (maximum)..... 4.4 s Boom Lower—Cycle Time (maximum)..... 2.8 s Bucket Curl—Cycle Time (maximum)..... 2.2 s Bucket Dump—Cycle Time (maximum)..... 2.2 s	**YES:** Go to next check. **NO:** See an authorized John Deere dealer.

Continued on next page

JB92884,00000FB -19-27AUG19-39/41

Self Leveling Valve Check (if equipped)

NOTE: Self leveling function only operates during boom up function.

Close cab door—if equipped.

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

Activate self leveling by pressing right joystick trigger (both LEDs illuminated).

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 Deer dealer.

JB92884,00000FB -19-27AUG19-40/41

Heating and Air Conditioning System Check (if equipped)

TX1126149A —UN—16NOV12

Heating and Air Conditioning Controls

1— Blower Motor Speed Switch
2— Heater Temperature Control Switch
3— 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 (1) 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 (2) to hot (red).

FEEL: Does warm air come out of air ducts?

Turn heater temperature control switch (2) to cold (blue).

FEEL: Does cool air come out of air ducts?

Turn on air conditioner switch (3).

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.

JB92884,00000FB -19-27AUG19-41/41

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
Machine Will Not Start	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), start relay, battery connection, and starter connection.
	Fuel tank empty	Refill with proper fuel.
	Improper fuel	Drain fuel tank and refill with proper fuel.
	Restricted fuel filter	Replace fuel filter.
	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.
	Restricted air filter	Check air filter restriction indicator and air filter.
Engine Surges, Stalls, Or Misses	Fuel tank breather restricted	Remove cap and listen for sound of air entering tank. Replace fuel tank breather.
	Improper fuel	Drain fuel tank and refill with proper fuel.
	Restricted air filter	Check air filter restriction indicator and air filter.
	Restricted fuel filter	Replace fuel filter.
Engine Overheats	Restricted air filter	Check air filter restriction indicator and air filter.
	Incorrect coolant mixture	Check coolant mixture.
	Engine oil level low	Check engine oil level.
	Loose or damaged accessory drive belt	Check accessory drive belt.

JK47244,000018D -19-12DEC12-1/1

Electrical System

Symptom	Problem	Solution
Park Brake Will Not Disengage	Interlocking seat bar switch is not activated	Lower interlocking seat bar to activate seat switch.
		Raise/lower interlocking seat bar to reactivate seat switch.
	Joysticks not in neutral (EH machines)	Move joysticks to neutral position.
	Park brake has not gone through the momentary down (UNLOCKED) position (key start only)	Push lower half of switch.
Park Brake Will Not Engage	Park brake is not in the up (LOCKED) position (key start only)	Push upper half of switch.
Starting Motor Will Not Turn	Battery cables and terminals corroded	Clean cables and connections as necessary.
	Loose connection at starter or starter relay	Check electrical connections.
	Blown fuse	Replace fuse.
	Battery dead or low charge	Check battery voltage and charge as necessary.
Engine Cranks Slowly	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 proper oil.
Battery Will Not Charge	Battery malfunction	Replace battery.
	Low engine speed or excessive idling	Increase engine speed.
	Battery cables and terminals corroded	Clean cables and connections as necessary.
	Loose or damaged accessory drive belt	Check accessory drive belt.
Lights Do Not Work	Blown fuse	Replace fuse.
	Bulb malfunction	Check bulb connection or replace as necessary.

Continued on next page

JK47244,00002AA -19-02APR13-1/2

Symptom	Problem	Solution
Battery Voltage Indicator Remains On With Engine Running	Loose or damaged accessory drive belt	Check accessory drive belt.
	Low battery input	Check battery voltage and charge as necessary.

JK47244,00002AA -19-02APR13-2/2

Hydraulic System

Symptom	Problem	Solution
Boom And Bucket Will Not Move	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.
Excessive Pump Noise	Low oil level	Check hydraulic oil level.
	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.
Low Hydraulic Power	Hydraulic oil aerated	Drain hydraulic oil and refill with proper oil.
	Low oil level	Check hydraulic oil level.
	Air leaks at pump inlet line fittings	Check all hydraulic connections and tighten as necessary.
Slow Hydraulic Function	Auxiliary hydraulic roller locked in detent position	Return roller to neutral position.
	Boom or bucket overloaded	Lighten load on hydraulic function.
	Low oil level	Check hydraulic oil level.
	Low engine speed	Increase engine speed.
	Hydraulic oil aerated	Drain hydraulic oil and refill with proper oil.
	Hose or line leakage	Inspect and tighten fittings.
Machine Loses Power	Restricted fuel filter	Replace fuel filter.

JK47244,00002AB -19-03APR13-1/1

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 after receipt of machine have elapsed. Paint areas to prevent rust. Replace decals where needed.

LPS 3 Rust Inhibitor is a trademark of Illinois Tool Works.

T5813AM —UN—09FEB89

Prepare Machine for Storage

5. If possible, raise machine high enough so tires do not touch the ground. If not, park on a hard surface to prevent tires from freezing to ground.
6. 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.

7. Retract all hydraulic cylinders if possible. If not, coat exposed cylinder rods with LPS 3® Rust Inhibitor.
8. Place a DO NOT OPERATE tag on the right control lever.
9. Lubricate all grease points.
10. Remove the battery and store in a dry, protected place after charging fully. If not removed, disconnect the negative battery cable from the (—) terminal.
11. Drain water separator fuel filter.
12. Remove keys and lock engine cover and door if equipped.

OUT4001,00004E9 -19-06APR17-1/1

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.

T6191AA —UN—18OCT88

Clean Cylinder Rods

LPS 3 Rust Inhibitor is a trademark of Illinois Tool Works.

JK47244,0000190 -19-07DEC12-1/2

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.

T6181AU —UN—18OCT88

Check Oil on Dipstick

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 it reaches operating temperature. Run at 1/2 speed for five minutes. Do not run at fast or slow idle.

    - If engine does not start or runs poorly after starting, change fuel filter(s). Bleed fuel system.
12. Operate all controls, levers, seat adjustments, and others.

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.

JK47244,0000190 -19-07DEC12-2/2

Record Product Identification Number (PIN)

Product Identification Number (PIN)_____

NOTE: Record all 17 characters of the PIN.

The PIN tag (1) is located on the right side of machine, above the boom lock.

1— PIN Tag

TX1140197 —UN—29JUL13

Product Identification Number

JK47244,000031D -19-10JUL13-1/1

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

TX1143104 —UN—28AUG13

Engine Serial Number

JK47244,0000332 -19-28AUG13-1/1

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 that can be taken:
   - Mark machine with unique numbering system.
   - Take color photographs from several angles of each machine.

OUT4001,000063E -19-17JAN19-1/1

Keep Machines Secure

1. Install vandal-proof devices.
2. When machine is in storage:
   - Lower equipment to the ground
   - Remove any keys and 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.

JK47244,0000193 -19-06MAY13-1/1

318E Machine Dimensions

Machine Dimensions—Side View

Machine Dimensions—Top View

NOTE: Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with ISO and SAE standards.

Except where otherwise noted, these specifications are based on a machine equipped with standard tracks and bucket.

Item	Measurement	Specification
1—Overall Length (less bucket)	Length	2.85 m 9 ft. 4 in.
2—Overall Length (with foundry bucket)	Length	3.47 m 11 ft. 5 in.
2—Overall Length (with construction bucket)	Length	3.71 m 12 ft. 2 in.
3—Overall Width (less bucket)	Width	1.61 m 5 ft. 3 in.
4—Height to Top of ROPS	Height	1.98 m 6 ft. 6 in.
5—Height to Hinge Pin	Height	3.05 m 10 ft. 0 in.
6—Dump Height (with foundry bucket)	Height	2.43 m 8 ft. 0 in.
6—Dump Height (with construction bucket)	Height	2.26 m 7 ft. 5 in.
7—Dump Reach (with foundry bucket)	Reach	0.78 m 2 ft. 7 in.
7—Dump Reach (with construction bucket)	Reach	0.96 m 3 ft. 2 in.
8—Wheel Base	Distance	1.13 m 3 ft. 8 in.

Continued on next page

JK47244,00002E4 -19-21OCT13-1/2

Item	Measurement	Specification
9—Ground Clearance	Height	0.19 m 0 ft. 7 in.
10—Angle of Departure	Angle	26°
11—Front Turn Radius (with foundry bucket)	Distance	2.03 m 6 ft. 8 in.
12—Dump Angle (full lift height)	Angle	43°
13—Bucket Rollback (ground level)	Angle	33°
Base Machine	Operating Weight	3178 kg 7000 lb.

JK47244,00002E4 -19-21OCT13-2/2

318E Machine Specifications

Item	Measurement	Specification
Yanmar 4TNV98T	Non-Road Emission Standards	Meets Interim Tier 4 and Stage III A Emissions
	Type	4-Stroke Cycle, Turbocharged
	Bore and Stroke	98 x 110 mm 3.86 x 4.33 in.
	Cylinders	4
	Displacement	3.3 L 203 cu in.
	Rated Gross Horsepower @ 2500 rpm	51.7 kw 69 hp
	Cooling Fan	Hydraulic Variable Speed
	Electrical System	12 Volt
	Battery	150 Minutes Reserve Capacity

JK47244,00002E5 -19-12SEP13-1/1

318E Drain and Refill Capacities

Item	Measurement	Specification
Fuel Tank	Capacity	76.0 L 20.0 gal.
Cooling System	Capacity	12.5 L 3.3 gal.
Engine Oil (including filter)	Capacity	12.5 L 3.3 gal.
Hydraulic Tank	Capacity	25.0 L 7.0 gal.
Chain Case (per side)	Capacity	16.1 L 4.3 gal.

JK47244,00002E6 -19-05AUG13-1/1

320E Machine Dimensions

Machine Dimensions—Side View

Machine Dimensions—Top View

NOTE: Specifications and design subject to change without notice. Wherever 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—Overall Length (less bucket)	Length	2.85 m 9 ft. 4 in.
2—Overall Length (with foundry bucket)	Length	3.47 m 11 ft. 5 in.
2—Overall Length (with construction bucket)	Length	3.71 m 12 ft. 2 in.
3—Overall Width (less bucket)	Width	1.76 m 5 ft. 9 in.
4—Height to Top of ROPS	Height	2.00 m 6 ft. 7 in.
5—Height to Hinge Pin	Height	3.07 m 10 ft. 1 in.
6—Dump Height (with foundry bucket)	Height	2.45 m 8 ft. 0 in.
6—Dump Height (with construction bucket)	Height	2.28 m 7 ft. 6 in.
7—Dump Reach (with foundry bucket)	Reach	0.74 m 2 ft. 5 in.
7—Dump Reach (with construction bucket)	Reach	0.92 m 3 ft. 0 in.
8—Wheel Base	Distance	1.13 m 3 ft. 8 in.

Continued on next page

JK47244,00002E9 -19-10SEP13-1/2

Item	Measurement	Specification
9—Ground Clearance	Height	0.22 m 0 ft. 9 in.
10—Angle of Departure	Angle	28°
11—Front Turn Radius (with foundry bucket)	Distance	2.03 m 6 ft. 8 in.
12—Dump Angle (full lift height)	Angle	43°
13—Bucket Rollback (ground level)	Angle	33°
Base Machine	Operating Weight	3246 kg 7150 lb.

JK47244,00002E9 -19-10SEP13-2/2

320E Machine Specifications

Item	Measurement	Specification
Yanmar 4TNV98T	Non-Road Emission Standards	Meets Interim Tier 4 Stage III A Emissions
	Type	4-Stroke Cycle, Turbocharged
	Bore and Stroke	98 x 110 mm 3.86 x 4.33 in.
	Cylinders	4
	Displacement	3.3 L 203 cu in.
	Rated Gross Horsepower @ 2500 rpm	51.7 kw 69 hp
	Cooling Fan	Hydraulic Variable Speed
	Electrical System	12 Volt
	Battery	150 Minutes Reserve Capacity

JK47244,00002EA -19-12SEP13-1/1

320E Drain and Refill Capacities

Item	Measurement	Specification
Fuel Tank	Capacity	79.0 L 21.0 gal.
Cooling System	Capacity	12.5 L 3.3 gal.
Engine Oil (including filter)	Capacity	12.5 L 3.3 gal.
Hydraulic Tank	Capacity	24.0 L 6.0 gal.
Chain Case (per side)	Capacity	16.1 L 4.3 gal.

JK47244,00002EB -19-31JUL13-1/1

324E Machine Dimensions

Machine Dimensions—Side View

Machine Dimensions—Top View

NOTE: Specifications and design subject to change without notice. Wherever 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—Overall Length (less bucket)	Length	2.85 m 9 ft 4 in
2—Overall Length (with foundry bucket)	Length	3.47 m 11 ft 5 in
2—Overall Length (with construction bucket)	Length	3.71 m 12 ft 2 in
3—Overall Width (less bucket)	Width	1.78 m 5 ft 10 in
4—Height to Top of ROPS	Height	2.02 m 6 ft 7 in
5—Height to Hinge Pin	Height	3.19 m 10 ft 6 in
6—Dump Height (with foundry bucket)	Height	2.56 m 8 ft 5 in
6—Dump Height (with construction bucket)	Height	2.39 m 7 ft 10 in
7—Dump Reach (with foundry bucket)	Reach	0.74 m 2 ft 5 in
7—Dump Reach (with construction bucket)	Reach	0.92 m 3 ft 0 in
8—Wheel Base	Distance	1.13 m 3 ft 8 in

Continued on next page

JB92884,00000F8 -19-31MAR16-1/2

Item	Measurement	Specification
9—Ground Clearance	Height	0.22 m 0 ft 9 in
10—Angle of Departure	Angle	25°
11—Front Turn Radius (with foundry bucket)	Distance	2.03 m 6 ft 8 in
12—Dump Angle (full lift height)	Angle	43°
13—Bucket Rollback (ground level)	Angle	33°
Base Machine (approximate)	Operating Weight	3405 kg 7500 lb

JB92884,00000F8 -19-31MAR16-2/2

324E Machine Specifications

Item	Measurement	Specification
Yanmar 4TNV98T	Non-Road Emission Standards	Meets Interim Tier 4 Stage III A Emissions
	Type	4-Stroke Cycle, Turbocharged
	Bore and Stroke	98 x 110 mm 3.86 x 4.33 in
	Cylinders	4
	Displacement	3.3 L 203 in^3
	Rated Gross Horsepower at 2500 rpm	55.0 kW 74 hp
	Cooling Fan	Hydraulic Variable Speed
	Electrical System	12 V
	Battery	150 Minutes Reserve Capacity

JB92884,00000F9 -19-21MAR16-1/1

324E Drain and Refill Capacities

Item	Measurement	Specification
Fuel Tank	Capacity	76.0 L 20.1 gal
Cooling System	Capacity	12.5 L 3.3 gal
Engine Oil (including filter)	Capacity	12.5 L 3.3 gal
Hydraulic Tank	Capacity	25.0 L 6.6 gal
Chain Case (per side)	Capacity	16.1 L 4.3 gal

JB92884,00000FA -19-21MAR16-1/1

Rated Operating Capacity

SAE Rated Operating Capacity	
Model	**Weight**
318E	885 kg (1950 lb)
320E	999 kg (2200 lb)
324E	1221 kg (2690 lb)

JB92884,00000F7 -19-08MAR16-1/1

Pallet Fork Lift Chart

Pallet Fork Lift Chart						
Pallet Fork	**318E (without counterweights)**	**318E (with counterweights)***	**320E (without counterweights)**	**320E (with counterweights)***	**324E (without counterweights)**	**324E (with counterweights)***
1070 mm (42 in)	600 kg (1322 lb)	645 kg (1422 lb)	606 kg (1337 lb)	652 kg (1436 lb)	825 kg (1815 lb)	954 kg (2099 lb)
1220 mm (48 in)	579 kg (1247 lb)	608 kg (1342 lb)	572 kg (1261 lb)	615 kg (1356 lb)	777 kg (1710 lb)	901 kg (1983 lb)
Rating based on SAE J1197. Load at 50% tipping capacity and 50% of fork length and fork height giving maximum reach. * Measurements given include a total of six counterweights weighing 234 kg (516 lb).						

JK47244,00002ED -19-06APR16-1/1

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”

Address of the authorized representative:
142050, Russia, Moscow region, Domodedovo district, Domodedovo, Beliye Stolbi micro district, vladenye “Warehouse 104”, Building 2

For technical support, contact an authorized John Deere dealer.

EAC Marking

1— Month of Manufacture **2— Year of Manufacture**

Date of manufacture is denoted by the product marking on or near the serial number plate.

TX1333032 —UN—10NOV22

MB60223,0005008 -19-10NOV22-1/1

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