



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,IFC7-19-20090403

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.

VD76477,000104D-19-20120627

Manual Identification—READ THIS FIRST!

IMPORTANT:

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

Choosing the Correct Supporting Manuals

John Deere motor graders 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 serial numbers and engine model numbers are listed on the front covers of motor grader manuals. These numbers are used to identify the correct supporting manual for your machine.

Product Serial Number Identification



TX1082411A-UN: PIN Plate Location



TX1082394-UN: PIN Plate (13 Digit)



TX1082292-UN: PIN Plate (17 Digit)

LEGEND:

1 - PIN Plate

2 - 13 Digit PIN

3 - 17 Digit PIN

The product identification number (PIN) plate (1) is located on the left-side of equipment frame under operator's station. Each machine has a 13 digit PIN (2) or 17 digit PIN (3) shown on PIN plate. The last 6 digits of the PIN represent the machine's product serial number.

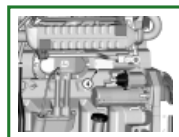
Engine Model Number Identification



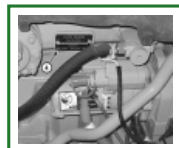
TX1075071-UN: Engine Serial Number Plate



TX1082537A-UN: Engine Serial Number Plate Location—6068HDW75



TX1084929A-UN: Engine Serial Number Plate Location—6090HDW01



TX1082493A-UN: Engine Serial Number Plate Location—6090HDW16

LEGEND:

4 - Engine Serial Number Plate 5 - Engine Model Number

The engine serial number plate (4) is located on the left or right-side of the engine depending on engine model. Each engine has a 9 digit engine model number (5) shown on this plate.

Engine Emissions Level Identification

The 9 digit engine model number corresponds to a specific engine emissions level.

-: 1

Engine Model Number	Engine Emission Level
6090HDW16	Interim Tier 4/Stage III B
6090HDW01	Tier 3/Stage III A

Engine Model Number	Engine Emission Level
6068HDW75	Tier 2/Stage II

For machines equipped with a 17 digit PIN, where the 11th digit is "E," "D," or "C," this digit corresponds to a specific engine emissions level.

NOTE:
Earlier machines with a 17 digit PIN do not identify engine emissions level with the 11th digit.

-: PIN Classification

17 Digit PIN (11 th digit)	Engine Emissions Level
XXXXXXXXXX E XXXXXX	Interim Tier 4/Stage III B
XXXXXXXXXX D XXXXXX	Tier 3/Stage III A
XXXXXXXXXX C XXXXXX	Tier 2/Stage II

NM00125,00005B7-19-20101217

EPA Non-road Emissions Control Warranty Statement—Compression Ignition

-: Emissions Control Warranty Statement



DXLOGOV1-UN: Logo

**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."

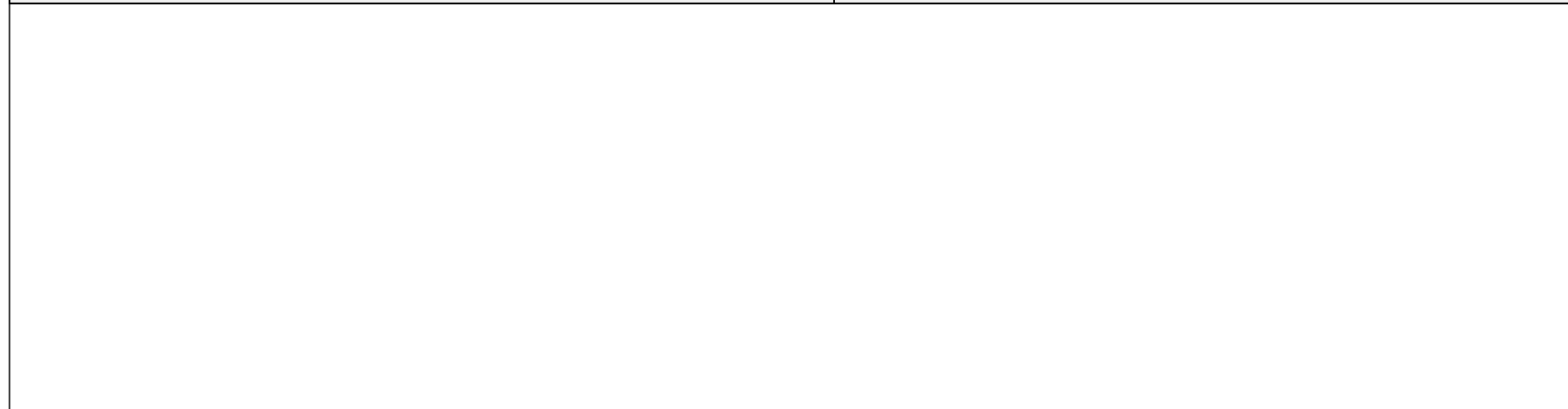
Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete engine warranty, less emissions-related parts and components, is provided separately. If you have any questions about your warranty rights and responsibilities, you should contact John 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	Aftertreatment Devices
Fuel System	Crankcase Ventilation Valves
Ignition System	Sensors
Exhaust Gas Recirculation Systems	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: EPA Non-road Emissions Control Warranty Statement

DX,EMISSIONS,EPA-19-20121212

CARB Non-road Emissions Control Warranty Statement—Compression Ignition

Emissions Control Warranty Statement 2019 through 2021

-: Emissions Control Warranty Statement 2019 through 2021 — 1/2



DXLOGOV1-UN: Logo

**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.

-: Emissions Control Warranty Statement 2019 through 2021 — 2/2

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:

<p>Air Induction System</p> <ul style="list-style-type: none"> • Intake manifold • Turbocharger • Charge air cooler <p>Fuel Metering system</p> <ul style="list-style-type: none"> • Fuel injection system <p>Exhaust Gas Recirculation</p> <ul style="list-style-type: none"> • EGR valve <p>Catalyst or Thermal Reactor Systems</p> <ul style="list-style-type: none"> • Catalytic converter • Exhaust manifold 	<p>Emission control labels</p> <p>Particulate Controls</p> <ul style="list-style-type: none"> • Any device used to capture particulate emissions • Any device used in the regeneration of the capturing system • Enclosures and manifolding • Smoke Puff Limiters <p>Positive Crankcase Ventilation (PCV) System</p> <ul style="list-style-type: none"> • PCV valve • Oil filler cap 	<p>Advanced Oxides of Nitrogen (NOx) Controls</p> <ul style="list-style-type: none"> • NOx absorbers and catalysts <p>SCR systems and urea containers/dispensing systems</p> <p>Miscellaneous Items used in Above Systems</p> <ul style="list-style-type: none"> • Electronic control units, sensors, actuators, wiring harnesses, hoses, connectors, clamps, fittings, gasket, mounting hardware
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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:

As the off-road diesel engine owner you are responsible for the performance of the required maintenance listed in your Operator's Manual. John Deere recommends that the owner retain all receipts covering maintenance on the off-road diesel engine, but John Deere cannot deny warranty solely for the lack of receipts or for the owner's failure to ensure the performance of all scheduled maintenance. However, as the off-road diesel engine owner, you should be aware that John Deere may deny you warranty coverage if your off-road diesel engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

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 may result in the engine no longer operating in compliance with applicable emissions requirements.

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.



RG29280-UN: Emissions Control Warranty Statement 2019 through 2021



RG29281-UN: Emissions Control Warranty Statement 2019 through 2021

Emissions Control Warranty Statement 2022 through 2024

-: Emissions Control Warranty Statement 2022 through 2024 — 1/2



DXLOGOV1-UN: Logo

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.

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. John Deere warrants that this engine is free from defects in materials and workmanship which would cause the failure of emissions warrantied parts 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. This applies to 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.

-: Emissions Control Warranty Statement 2022 through 2024 — 2/2

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:

<p>Air Induction System</p> <ul style="list-style-type: none"> • Intake manifold • Turbocharger • Charge air cooler <p>Fuel Metering system</p> <ul style="list-style-type: none"> • Fuel injection system <p>Exhaust Gas Recirculation</p> <ul style="list-style-type: none"> • EGR valve <p>Catalyst or Thermal Reactor Systems</p> <ul style="list-style-type: none"> • Catalytic converter • Exhaust manifold 	<p>Emission control labels</p> <p>Particulate Controls</p> <ul style="list-style-type: none"> • Any device used to capture particulate emissions • Any device used in the regeneration of the capturing system • Enclosures and manifolding • Smoke Puff Limiters <p>Positive Crankcase Ventilation (PCV) System</p> <ul style="list-style-type: none"> • PCV valve • Oil filler cap 	<p>Advanced Oxides of Nitrogen (NOx) Controls</p> <ul style="list-style-type: none"> • NOx absorbers and catalysts <p>SCR systems and urea containers/dispensing systems</p> <p>Miscellaneous Items used in Above Systems</p> <ul style="list-style-type: none"> • Electronic control units, sensors, actuators, wiring harnesses, hoses, connectors, clamps, fittings, gasket, mounting hardware
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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:

As the off-road diesel engine owner you are responsible for the performance of the required maintenance listed in your Operator's Manual. John Deere recommends that the owner retain all receipts covering maintenance on the off-road diesel engine, but John Deere cannot deny warranty solely for the lack of receipts or for the owner's failure to ensure the performance of all scheduled maintenance. However, as the off-road diesel engine owner, you should be aware that John Deere may deny you warranty coverage if your off-road diesel engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

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 may result in the engine no longer operating in compliance with applicable emissions requirements.

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.



RG32758-UN: Emissions Control Warranty Statement 2022 through 2024



RG32759-UN: Emissions Control Warranty Statement 2022 through 2024

DX,EMISSIONS,CARB-19-20230804

Required Emission-Related Information

Service Provider

-: Required Emission-Related Information

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-19-20150612

Service ADVISOR™ Remote (SAR)—SOFTWARE TERMS AND CONDITIONS

IMPORTANT -- READ CAREFULLY: THIS SOFTWARE LICENSE AGREEMENT IS A LEGAL CONTRACT BETWEEN YOU AND THE LICENSOR ("LICENSOR") IDENTIFIED BELOW AND GOVERNS YOUR USE OF THE SOFTWARE DELIVERED TO YOUR MACHINE (THE "MACHINE").

BY INDICATING YOUR ACCEPTANCE ON A DISPLAY ON THE MACHINE, BY INSTALLING SOFTWARE TO THE MACHINE, OR USING SOFTWARE ON THE MACHINE, YOU ARE ACCEPTING AND AGREEING TO THE TERMS OF THIS LICENSE AGREEMENT WITH RESPECT TO THE SOFTWARE (THE "Software") THAT IS DELIVERED TO YOUR MACHINE. YOU AGREE THAT THIS SOFTWARE LICENSE AGREEMENT, INCLUDING THE WARRANTY DISCLAIMERS, LIMITATIONS OF LIABILITY AND TERMINATION PROVISIONS BELOW, IS BINDING UPON YOU, AND UPON ANY COMPANY ON WHOSE BEHALF YOU USE THE SOFTWARE AS WELL AS THE EMPLOYEES OF ANY SUCH COMPANY (COLLECTIVELY REFERRED TO AS "YOU" IN THIS SOFTWARE LICENSE AGREEMENT). IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, OR IF YOU ARE NOT AUTHORIZED TO ACCEPT THESE TERMS ON BEHALF OF YOUR COMPANY OR ITS EMPLOYEES, PLEASE CLICK THE [Decline] ICON ON THE DISPLAY ON THE MACHINE TO DECLINE THESE TERMS AND CONDITIONS. THIS LICENSE AGREEMENT REPRESENTS THE ENTIRE AGREEMENT CONCERNING THE SOFTWARE BETWEEN YOU AND THE LICENSOR.

1. Delivery of Software. Software may be delivered to your Machine by Licensor wirelessly or via an agent of Licensor, such as a dealer. If it is delivered wirelessly, you may be responsible for any data transmission fees incurred due to such delivery.

2. License. Licensor hereby grants to you, and you accept, a nonexclusive license to use the Software in machine-readable, object code form, only as authorized in this License Agreement and the applicable provisions of the Operators' Manuals, which you agree to review carefully prior to using the Software. The Software may be used only on the Machine to which it was initially delivered. You agree that you will not assign, sublicense, transfer, pledge, lease, rent, or share your rights under this License Agreement, except that you may permanently transfer all of your rights under this License Agreement in connection with the sale of the Machine on which the Software covered by this Agreement is installed.

3. Licensor's Rights. You acknowledge and agree that the Software is proprietary to Licensor and is protected under copyright law. You further acknowledge and agree that all right, title, and interests in and to the Software, including associated intellectual property rights, are and shall remain with Licensor. This License Agreement does not convey to you any title or interest in or to the Software, but only a limited right of use revocable in accordance with the terms of this License Agreement. You agree that you will not: (a) reverse assemble, reverse compile, modify, or otherwise translate the Software, or attempt to defeat the copyright protection and application enabling mechanisms therein; (b) copy or reproduce the Software; or, (b) remove or obliterate any copyright, trademark or other proprietary rights notices from the Software. You also agree not to permit any third party acting under your control to do any of the foregoing.

4. License Fees. The license fees paid by you, if any, are paid in consideration of the licenses granted under this License Agreement.

5. 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 Machine to the place of purchase for repair or replacement of the non-performing Software. The Warranty Period is ninety (90) days from the date of installation of the Software or the duration of the warranty period of the component of the Machine on which the Software is installed, whichever is longer. The Software Warranty Period does not affect the warranty period of the Machine itself or any component thereof.

6. 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 SOFTWARE. EXCEPT AS PROVIDED IN THE LIMITED WARRANTY, THE SOFTWARE 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 SOFTWARE, 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 SOFTWARE IS ERROR-FREE OR WILL OPERATE WITHOUT INTERRUPTION.

7. LIMITATION OF LIABILITY. EXCEPT AS SET FORTH IN THE LIMITED WARRANTY, UNDER NO CIRCUMSTANCES SHALL LICENSOR, ITS AFFILIATES OR ITS THIRD PARTY SUPPLIERS BE LIABLE TO YOU OR TO ANY THIRD PARTIES FOR DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, INCLUDING ANY LOSS OR DAMAGE CAUSED BY THE SOFTWARE; ANY PARTIAL OR TOTAL FAILURE OF THE SOFTWARE; PERFORMANCE, NONPERFORMANCE OR DELAYS IN CONNECTION WITH ANY INSTALLATION, MAINTENANCE, WARRANTY OR REPAIRS OF THE SOFTWARE, DAMAGES FOR CROP LOSS, DAMAGE TO LAND, LOST PROFITS, LOSS OF BUSINESS OR LOSS OF GOODWILL, LOSS OF USE OF EQUIPMENT OR SERVICES OR DAMAGES TO BUSINESS OR REPUTATION ARISING FROM THE PERFORMANCE OR NON-PERFORMANCE OF ANY ASPECT OF THIS AGREEMENT, WHETHER IN

CONTRACT, TORT OR OTHERWISE, AND WHETHER OR NOT LICENSOR, ITS AFFILIATES OR ITS THIRD PARTY SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL LICENSOR'S CUMULATIVE LIABILITY TO YOU OR TO ANY OTHER PARTY FOR ANY LOSSES OR DAMAGES RESULTING FROM ANY CLAIMS, LAWSUITS, DEMANDS, OR ACTIONS ARISING FROM OR RELATING TO USE OF THE SOFTWARE EXCEED YOUR TOTAL PAYMENT FOR THE MACHINE AND FOR THE LICENSE OF THE SOFTWARE.

8. Termination of License. Licensor may terminate the license granted under this Agreement upon written notice of termination provided to you if you violate any material term of this Agreement pertaining to your use of the Software or Licensor's rights, including, without limitation, the provisions of Sections 2 and 3 above.

9. Compliance with Law. You agree that you will use the Software in accordance with United States law and the laws of the country in which you are located, as applicable, including foreign trade control laws and regulations. The Software may be subject to export and other foreign trade controls restricting re-sales and/or transfers to other countries and parties. By accepting the terms of this Agreement, you acknowledge that you understand that the Software may be so controlled, including, but not limited to, by the Export Administration Regulations and/or the foreign trade control regulations of the Treasury Department of the United States. Any other provision of this Agreement to the contrary notwithstanding, you agree that the Software will not be resold, re-exported or otherwise transferred. The Software remains subject to applicable U.S. laws.

10. Indemnification. You agree to defend, indemnify and hold Licensor, its affiliates and third party supplier, and their, officers, directors, employees, agents and representatives (each an " **Indemnified Party** "), harmless from and against all claims, demands proceedings, injuries, liabilities, losses, or costs and expenses (including reasonable legal fees) brought by any third party against any such persons arising from or in connection with your use of the Software, regardless of whether such losses are caused, wholly or partially, by any negligence, breach of contract or other fault of an Indemnified Party.

11. 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 addition to any other relief granted, reasonable attorney fees and expenses of litigation.

12. Severability and Waiver. Should any term of this Agreement be declared void or unenforceable by any court of competent jurisdiction, such declaration shall have no effect on the remaining terms hereof. The failure of either party to enforce any rights granted hereunder or to take action against the other party in the event of any breach hereunder shall not be deemed a waiver by that party as to subsequent enforcement of rights of subsequent actions in the event of future breaches.

13. Language Clause. If you are a resident of Canada at the time you accept this Agreement, then the parties hereby acknowledge that they have required this Agreement, and all other documents relating hereto, be drawn up in the English language only. Les parties reconnaissent avoir demandé que le présent contrat ainsi que toute autre entente ou avis requis ou permis à être conclu ou donné en vertu des stipulations du présent contrat, soient rédigés en langue anglaise seulement. If you are a resident of any country other than the United States, Canada, Great Britain, Australia or New Zealand then you agree as follows: there may be a translated version of this Agreement. If there is an inconsistency or contradiction between the translated version and the English version of this Agreement, the English version of this Agreement shall control.

14. Assignment by Licensor. Licensor may assign this Agreement without your prior consent to any company or entity affiliated with Licensor, or by an assignment associated with a corporate restructuring, merger or acquisition.

15. Governing Law and Forum. This Agreement will be governed by and construed in accordance with the substantive laws identified in the table in Section 18, below. The respective courts of the venue identified in the table in Section 18, below, for the location of the Machine shall have non-exclusive jurisdiction over all disputes relating to this Agreement. This Agreement will not be governed by the conflict of law rules of any jurisdiction or the United Nations Convention on Contracts for the International Sale of Goods, the application of which is expressly excluded.

16. Specific Exceptions.

16.1 Limited Warranty for Users Residing in European Economic Area Countries or Switzerland. If you obtained the Software in any European Economic Area country or Switzerland, and you usually reside in such country, then Section 6 does not apply, instead, Licensor warrants that the Software provides the functionalities set forth in the Operators Manuals (the " **agreed upon functionalities** ") for the Warranty Period. As used in this Section, "Warranty Period" means one (1) year. Non-substantial variation from the agreed upon functionalities shall not be considered and does not establish any warranty rights. THIS LIMITED WARRANTY DOES NOT APPLY TO SOFTWARE PROVIDED TO YOU FREE OF CHARGE, FOR EXAMPLE, UPDATES, OR SOFTWARE THAT HAS BEEN ALTERED BY YOU, TO THE EXTENT SUCH ALTERATIONS CAUSED A DEFECT. To make a warranty claim, during the Warranty Period you must return, at our expense, the Software and proof of purchase to the location where you obtained it. If the functionalities of the Software vary substantially from the agreed upon functionalities, Licensor is entitled -- by way of re-performance and at its own discretion -- to repair or replace the Software. If this fails, you are entitled to a reduction of the purchase price (reduction) or to cancel the purchase agreement (rescission). For further warranty information, please contact Licensor at the address listed in Section 18.

16.2 Limitation of Liability for Users Residing in European Economic Area Countries or Switzerland.

- (a) If you obtained the Software in any European Economic Area country or Switzerland, and you usually reside in such country, then Sections 7 and 10 do not apply, Instead, Licensor's statutory liability for damages shall be limited as follows: (a) Licensor shall be liable only up to the amount of damages as typically foreseeable at the time of entering into this Agreement in respect of damages caused by a slightly negligent breach of a material contractual obligation and (b) Licensor shall not be liable for damages caused by a slightly negligent breach of a non-material contractual obligation.
- (b) The aforesaid limitation of liability shall not apply to any mandatory statutory liability, in particular, to liability under the German Product Liability Act, liability for assuming a specific guarantee or liability for culpably caused personal injuries.
- (c) You are required to take all reasonable measures to avoid and reduce damages, in particular to make back-up copies of the Software and your computer data subject to the provisions of this Agreement.

17. Representations of Licensee. BY ACCEPTING THIS AGREEMENT, YOU: (A) ACKNOWLEDGE THAT YOU HAVE READ AND UNDERSTAND THIS AGREEMENT; (B) REPRESENT THAT YOU HAVE THE AUTHORITY TO ENTER INTO THIS AGREEMENT; (C) AGREE THAT THIS AGREEMENT IS ENFORCEABLE AGAINST YOU AND ANY LEGAL ENTITY THAT OBTAINED THE SOFTWARE AND ON WHOSE BEHALF IT IS USED; AND, (D) AGREE TO PERFORM THE OBLIGATIONS OF THIS AGREEMENT.

18. Identification of Licensor and Notices . The Licensor is the entity identified in the table below. All notices to Licensor shall be sent by certified or registered mail to the corresponding address for the Licensor given below. In each case a copy of the notice shall also be sent to John Deere Intelligent Solutions Group, ATTN: Legal, 4140 114th Street Urbandale, IA 50322 U.S.A. All notices to Licensor shall be effective upon receipt. All notices required to be given to you shall, in Licensor's sole discretion, either be sent via certified or registered mail to the address given to Licensor in connection with your purchase of the Machine. Either method of notification used by Licensor shall be effective upon dispatch. You agree to notify Licensor of any change in your address in the manner set forth above.

-. Table

Place of Purchase	Address	Governing Law	Venue

United States of America	John Deere Shared Services, Inc. One John Deere Place Moline, IL 61265 U.S.A.	State of Illinois, USA	Rock Island County, Illinois, USA
Argentina	Industrias John Deere Argentina, S.A. Casilla de Correo 80 Rosario (Santa Fe), 2000, Argentina	Province of Santa Fe, Argentina	Province of Santa Fe, Argentina
Australia or New Zealand	John Deere Limited (Australia) P.O. Box 2022 Crestmead, Queensland, Australia 4132	State of Queensland, Australia	State of Queensland, Australia
Canada	John Deere Limited 295 Hunter Road P.O. Box 1000 Grimsby, ON L9K 1M3	Province of Ontario, Canada	Province of Ontario, Canada
Chile	John Deere Water, S.A. Cerro Santa Lucia 9990 Quilicura, Santiago, Chile	Province of Santiago, Chile	Province of Santiago, Chile
Mexico	Industrias John Deere, S.A. de C.V. Boulevard Diaz Ordaz #500 Garza Garcia Nuevo Leon 66210, Mexico	State of Nuevo Leon, Mexico	State of Nuevo Leon, Mexico
Europe	ETIC Strassburgerallee 5 67657 Kaiserslautern, Germany	Federal Republic of Germany	Kaiserslautern, Germany

Other	The John Deere entity identified for the location of your Machine on www.JDLink.com.	The John Deere entity identified for the location of your Machine on www.JDLink.com.	The John Deere entity identified for the location of your Machine on www.JDLink.com.
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OUT4001,00006C5-19-20101108

Technical Information Feedback Form

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

-. Technical Manual Fax

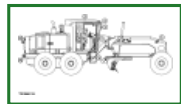
SEND TO:	John Deere Dubuque Works
	18600 South John Deere Road
	Attn: Publications, Dept. 324
	Dubuque, IA 52004-0538
	USA
FAX NUMBER:	1-563-589-5800 (USA)

Publication Number: <hr/>
Page Number: <hr/>
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Email Address:	
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THANK YOU!	

TX, TM, FAX-19-20010703

Safety and Operator Convenience Features



TX1086119-UN: Safety Features

Please remember, the operator is the key to preventing accidents.

- 1. Pressurized Cab with Heater/Defroster—if equipped.** Positive pressure ventilation system circulates both outside and inside air through filters for a clean working environment. Built-in defroster vents direct air flow for effective window defogging/deicing. Rear window has defrost grid.
- 2. ROPS, FOPS, and OPS.** Structures designed to help protect the operator are certified to ISO and OSHA standards. Enclosures also deflect sun and rain.
- 3. Mirrors.** Large exterior mirrors on both sides and an inside mirror offers operator a broad view of area behind machine. Optional heated mirrors are also available.

4. **Large Windshield Wiper.** Extra-long wiper cleans large windshield area.
5. **Handholds.** Large conveniently placed handholds make it easy to enter or exit the operator's station.
6. **Bright Halogen Lights.** High intensity halogen driving lights with high and low beams are standard. Turn indicators are standard. Optional work lights are available.
7. **Park Start.** Park start feature prevents the engine from being started unless the transmission shift control is in the BRAKE ON position P.
8. **Park Brake.** Park brake is easily engaged simply by moving the transmission shift control to the park brake P position. The park brake automatically engages whenever the engine is stopped.
9. **Steps.** Wide, skid-resistant steps provide excellent footing while getting in/out of the operator's station.
10. **Seat Belt Retractor.** Seat belt retractor helps keep belts clean and convenient to use.
11. **Fire Extinguisher—if equipped.** A fire extinguisher is provided in the cab.
12. **Articulation Lock.** A self-storing lock pin can be installed to prevent articulation during maintenance or transport.
13. **Bypass Start Protection.** Shielding over the starter solenoid terminals helps prevent dangerous bypass starting.
14. **Fan Guard.** A fan guard inside the radiator compartment helps prevent contact with the rotating fan blades.
15. **Stop and Turn Signal Lights.** Highly visible stop lights and turn signal lights are standard equipment.
16. **Backup Alarm.** Alerts bystanders when reverse travel direction is selected by operator.
17. **Electrohydraulics (Grade Pro Machines Only).** Press the hydraulic enable switch ON to activate hydraulics (both armrests must be lowered). Press the hydraulic enable switch OFF to deactivate hydraulics.

NM00125,00007CC-19-20110506

Recognize Safety Information



T133555-UN: Safety alert Symbols



T133588-19: Safety Alert Symbols

This is the safety alert symbol. When you see this symbol on your machine or in this manual, be alert for the potential of personal injury.

Follow the precautions and safe operating practices highlighted by this symbol.

A signal word — DANGER, WARNING, or CAUTION — is used with the safety alert symbol. DANGER identifies the most serious hazards.

On your machine, DANGER signs are red in color, WARNING signs are orange, and CAUTION signs are yellow. DANGER and WARNING signs are located near specific hazards. General precautions are on CAUTION labels.

TX,RECOGNIZE-19-20100628

Follow Safety Instructions



TS201-UN: Safety Messages

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 at your John Deere dealer.

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

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

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

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

TX,FOLLOW-19-20230828

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-19-20110118

Wear Protective Equipment



TS206-UN: Protective Clothing

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

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

TX,WEAR,PE-19-20230828

Avoid Unauthorized Machine Modifications

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

Modifications of this machine, or addition of unapproved products or attachments, may affect machine stability or reliability, and may create a hazard for the operator or others near the machine. The installer of any modification which may affect the electronic controls of this machine is responsible for establishing that the modification does not adversely affect the machine or its performance.

Always contact an authorized dealer before making machine modifications that change the intended use, weight or balance of the machine, or that alter machine controls, performance, or reliability.

AM40430,00000A9-19-20150701

Inspect Machine



T6607AQ-UN: 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.

TX,INSPECT-19-20230516

Stay Clear of Moving Parts



T133592-UN: 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.

TX,MOVING,PARTS-19-20110120

Avoid High-Pressure Fluids



X9811-UN: High Pressure

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

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

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

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

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

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

DX,FLUID-19-2011012

Avoid High-Pressure Oils



T133509-UN: Avoid High Pressure Oils



T133840-UN: 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.

TX,HPOILS-19-20211221

Work In Ventilated Area



TS220-UN: Engine exhaust fumes

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.

DX,AIR-19-19990217

Prevent Fires, Clean Debris From Machine



T133552-UN: Handle Fuel Safely



T133553-UN: Clean Machine Regularly



T133554-UN: Carry a Fire Extinguisher



T133555-UN: Caution

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.

Prevent Battery Explosions



TS204-UN: Battery Explosions

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

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

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

DX,SPARKS-19-19930303

Handle Chemical Products Safely



TS1132-UN: Material Safety Data Sheet

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

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

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

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

DX,MSDS,NA-19-19930303

Decommissioning — Proper Recycling and Disposal of Fluids and Components



TS1133-UN: Recycle Waste

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.

DX,DRAIN-19-20150601

Exhaust Filter Ash Handling and Disposal

⚠ CAUTION:

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

TX,ASH,DISP-19-20220331

Prepare for Emergencies



TS291-UN: First Aid Kit

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.

DX,FIRE2-19-19930303

Clean Debris from Machine



T6669AG-UN: 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.

TX,DEBRIS-19-20230516

Use Steps and Handholds Correctly



T133468-UN: Use Handholds And Steps

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

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

TX,STEPS-19-20110209

Start Only From Operator's Seat



TX1314398-UN: Operate Only From Operators Seat

Avoid unexpected machine movement. Start engine only while sitting in operator's seat. Ensure that all controls and working tools are in proper position for a parked machine.

Never attempt to start engine from the ground. Do not attempt to start engine by shorting across the starter solenoid terminals.

TX,SOFOS-19-20210629

Use and Maintain Seat Belt



TX1165594-19: 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.

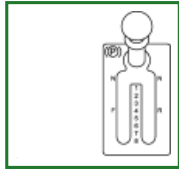
⚠ CAUTION:

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.

TX,SEAT,BELT-19-20200727

Prevent Unintended Machine Movement



T147606-UN: Prevent Unintended Machine Movement

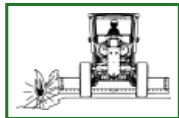
Be careful not to accidentally actuate controls when coworkers are present.

Lower all equipment to the ground during work interruptions. Place transmission control and park brake lever in park position P before allowing anyone to approach the machine.

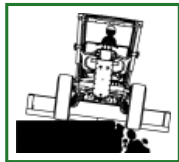
Follow these same precautions before standing up, leaving the operator's seat, or exiting the machine.

TX03679,00017C5-19-20161021

Avoid Work Site Hazards



TX1054279-UN: Contact With Gas Line



TX1054280-UN: Operate Only on Solid Footing

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.

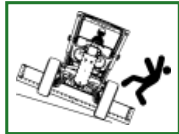
Operate only on solid footing with strength sufficient to support machine. Be especially alert working near embankments or excavations.

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 your seat belt.

OUT4001,0000388-19-20200506

Keep Riders Off Machine



TX1054281-UN: 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.

TX,NO,RIDERS,MGR-19-20200424

Avoid Backover Accidents



PC10857XW-UN: Avoid Backover Accidents

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

Be certain 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.

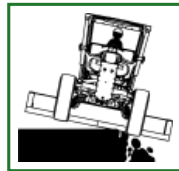
Do not rely on the rear camera and radar object detection systems, if equipped, to determine if personnel are behind the machine. The system has limitations due to maintenance practices, environmental conditions, and operating range.

TX,AVOID,BACKOVER-19-20160304

Avoid Machine Tip Over and Machine Damage



T133716-19: Use Seat Belt



TX1054283-UN: Ensure Solid Footing

Use seat belt at all times.

Do not jump if the machine tips. You will be unlikely to jump clear and the machine may crush you.

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

Be careful on slopes. Drive directly up or down steep slopes whenever possible. Minimize articulation for best machine stability when driving and turning across slopes. Use extra care on wet, soft or frozen surfaces because machine may slide more easily with these conditions.

Ensure solid footing. Do not operate close to banks or open excavations that may cave in and cause machine to tip or fall.

OUT4001,000038A-19-20181205

Operating or Traveling On Public Roads



T141891-UN: 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-19-20110120

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-19-20110120

Operating in Water and Mud

IMPORTANT:

Damage to machine components could occur if fording depth is exceeded. Never exceed maximum fording depth (1) (centerline of axles).

When it is necessary to operate machine in water or drive through water, water level must not go higher than centerline of axles.

After working in water or mud, lubricate all grease and lubrication points.



XJ1275751-UN: Maximum Fording Depth

LEGEND:

1 - Maximum Fording Depth

BJ21193,000027F-19-20190404

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-19-20110120

Park and Prepare for Service Safely



T133332-19: Do Not Operate Tag



TS229-UN: Support Machine Properly

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

- Do not support machine with any hydraulically actuated equipment.
- 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.
- 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.

TX,PARK,MGR-19-20200821

Clean Exhaust Filter Safely



TS227-UN: Fire Safety



TS271-UN: Hand Over Flame



TS1693-UN: Moving Parts



TS1695-UN: Stop

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

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

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

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

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

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

Avoid contact with these components until cooled to safe temperatures.

If service procedure requires engine to be running:

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

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

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

Shut off the engine before leaving the machine unattended.

Service Cooling System Safely



TS281-UN: Cooling System

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.

TX,SURGE-19-20110119

Remove Paint Before Welding or Heating



TS220-UN: Toxic Fumes

Avoid potentially toxic fumes and dust.

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

Remove paint before heating:

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

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

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

Dispose of paint and solvent properly.

DX,PAINT-19-20020724

Make Welding Repairs Safely



T133547-UN: Avoid Heating Near Pressurized Fluid Lines

IMPORTANT:

Disable electrical power before welding. Turn off main battery switch or disconnect positive battery cable. Separate harness connectors to engine and vehicle microprocessors.

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

Remove paint properly. Do not inhale paint dust or fumes. Use a qualified welding technician for structural repairs. Make sure there is good ventilation. Wear eye protection and protective equipment when welding.

TX03679,00016D5-19-20080425

Drive Metal Pins Safely



T133738-UN: Hardened Metal Parts

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

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

TX,PINS-19-20110120

Service Tires Safely



TS211-UN: Explosive Tire and Rim Parts

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.

DX,RIM-19-19900824

Clean Exhaust Filter Safely



TS227-UN: Fire Safety



TS271-UN: Hand Over Flame



TS1693-UN: Moving Parts



TS1695-UN: Stop

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

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

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

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

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

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

Avoid contact with these components until cooled to safe temperatures.

If service procedure requires engine to be running:

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

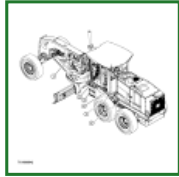
Keep hands, feet, and clothing away from power-driven parts.

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

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

DX,EXHAUST,FILTER-19-20110112

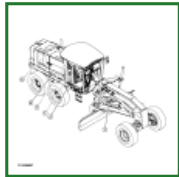
Safety Signs



TX1099842-UN: Right Side Shown

LEGEND:

- | | | | | |
|---|--|-------------------------------------|--|----------------------------------|
| 1 - WARNING, Avoid Injury From Escaping Fluid | 2 - WARNING, Seat Belt Should Be Worn At All Times | 3 - CAUTION, Operate Machine Safely | 4 - WARNING, Install Articulation Lock | 5 - DANGER, Start Only From Seat |
|---|--|-------------------------------------|--|----------------------------------|



TX1099927-UN: Safety Decals

LEGEND:

- | | | | | |
|---|--|---------------------------------------|--|---------------------------------|
| 1 - WARNING, Avoid Injury From Escaping Fluid | 4 - WARNING, Install Articulation Lock | 6 - WARNING, Prevent Machine Movement | 7 - WARNING, Unexpected Blade Movement | 8 - WARNING, Pressurized System |
|---|--|---------------------------------------|--|---------------------------------|

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

Avoid injury from escaping fluid. Contents of this accumulator are under pressure. Refer to proper Machine Model Technical Manual for disassembly or charging instructions and equipment required.

Charge with DRY NITROGEN only.

This safety message is positioned on or near all accumulators.



TX1099886-19: WARNING, Avoid Injury From Escaping Fluid.

2. **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 message is positioned on the steering column.



TX1099887-19: WARNING, Seat Belt Should Be Worn At All Times

3. **CAUTION, Operate Machine Safely**

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

Operate machine only from operator's seat.

Before leaving operator's seat:

- Lower equipment to ground
- Apply Park Brake with transmission control lever.
- Stop engine.

Do not permit riders

This safety message is positioned on the steering column.



TX1099888-19: CAUTION, Operate Machine Safely

4. **WARNING, Install Articulation Lock**

Crushing injury may result in hinge area if machine is turned.

Stay clear of machine when engine is started or when the machine is being operated.

Install articulation lock before performing service near center of machine or transporting on a truck.

Disconnect lock and secure before resuming operation.

This safety message is positioned on the left and right of the operator station.



TX1099847-19: WARNING, Install Articulation Lock

5. **DANGER, Start Only From Seat**

Start only from seat in park or neutral. Starting in gear kills.

This safety message is positioned on the starter inside the engine compartment.



TX1099889-19: DANGER, Start Only From Seat

6. **WARNING, Prevent Machine Movement**

AVOID SERIOUS INJURY - Block wheels to prevent machine movement before deactivating park brake for towing.

This safety message is positioned on the left and right of the engine compartment.



TX1099922-19: WARNING, Prevent Machine Movement

7. **WARNING, Unexpected Blade Movement**

Personal injury could result from sudden movement of the blade when the locking pin is removed. To prevent unexpected blade movement and possible injury, lower the blade to the ground before releasing locking pin.

This safety message is positioned inside the cab above the left door.



TX1099919-19: WARNING, Unexpected Blade Movement

8. **WARNING, Pressurized System**

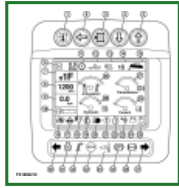
Pressurized system. Hot coolant can cause serious burns, injury or death. To open the cooling system filler cap, stop the engine and wait until the cooling system components are cool. Loosen the cooling system pressure cap slowly in order to relieve the pressure.

This safety message is positioned on the surge tank cap.



TX1099924-UN: WARNING, Pressurized System

Advanced Display Unit (ADU)



TX1082219-UN: Advanced Display Unit

LEGEND:

1 - INFO Button	8 - Tachometer	16 - Check Diagnostic Code Indicator	24 - Low Battery Voltage Indicator	31 - Not Used
2 - BACK Button	9 - Speedometer	17 - Differential Lock Indicators	25 - Filter Restriction Indicator	32 - Lever Steering Indicator—If Equipped
3 - SELECT Button	10 - Fuel Level Gauge	18 - Saddle Lock Indicator	26 - Articulation Gauge	33 - STOP Indicator
4 - DOWN Button	11 - Autoshift Indicator	19 - Engine Speed Control Indicator	27 - Transmission Oil Temperature Gauge	34 - Exhaust Filter Cleaning Indicator
5 - UP Button	12 - 6WD Indicator—If Equipped	20 - High Beam Indicator	28 - Hydraulic Oil Temperature Gauge	35 - Park Brake Indicator
6 - Hour Meter, Odometer, Ambient Temperature Indicator, or Exhaust Filter Restriction Level Indicator	13 - Precision Mode Indicator	21 - Service Required Indicator	29 - Engine Coolant Temperature Gauge	36 - Brake Pressure Indicator
7 - Current or Selected Gear Indicator	14 - Precision Speed Indicator	22 - Check Engine Indicator	30 - Left Turn Indicator	37 - Right Turn Indicator
	15 - Automatic Blade Control Indicator	23 - 6WD Indicators—If Equipped		

NM00125,00005C2-19-20101222

Display Unit Functions

1—INFO Button: Press this button to return to normal display from menu display mode. Machines equipped with rear camera, press button to toggle between rear camera view and normal display.

2—BACK Button: Press this button to change to the previous menu displayed.

3—SELECT Button: Press this button to move from normal display to main menu display. In menu mode, press button to activate menu function currently highlighted. Press button to make selections on individual submenu displays such as, resetting job timer, starting and stopping stopwatch, and storing settings.

4—DOWN Button: Press this button to change to the next selection within a menu or mode.

For Grade Pro machines only, press this button to decrease the GAIN when using automatic blade control.

5—UP Button: Press this button to move to the previous selection within a menu or mode. At the normal display, press this button to toggle between hour meter, odometer, and ambient temperature.

NOTE:

Hour meter, odometer, ambient temperature indicator, and exhaust filter restriction indicator share the same location on the display. Press UP or DOWN button on display unit to toggle between these items.

Either metric or English units can be selected using the MAIN MENU—MONITOR SETTINGS menu on the display unit.

6a—Hour Meter Indicator: Shows accumulated machine hours to nearest 1/10 of an hour. Hours are accumulated only when engine is running. Meter can display up to 999,999.9 hours. Display defaults to show hour meter when ignition is first energized.

6b—Odometer Indicator: Shows total distance traveled to the nearest 1/10 of a kilometer or mile. Odometer is capable of displaying up to 1 609 343 kilometers (999,999.9 miles).

6c—Ambient Temperature Indicator: Shows outside air temperature in °C or °F to the nearest degree. At low ambient temperature, COLD may be displayed.

6d—Exhaust Filter Restriction Indicator: Shows soot level restriction in the exhaust filter. The indicator will start to turn gray as the filter begins to restrict and will continue to fill the whole indicator depending on the soot level restriction.

- **LOW** soot level restriction: The indicator will not show any gray.
- **MODERATE** soot level restriction: Half of the indicator will show gray.
- **HIGH** soot level restriction: The entire indicator will be gray. If auto cleaning is disabled, the exhaust filter auto cleaning disabled indicator appears and a pop-up will appear on the monitor stating auto cleaning needs to be enabled. For more information, see Display Unit—Main Menu—Exhaust Filter—Auto Cleaning in this section.
- **VERY HIGH** soot level restriction: The indicator will remain at 100%, but all sections will turn yellow. Caution indicator will appear and a pop-up will display on the monitor stating that engine power is limited and to begin a parked filter cleaning. See Display Unit—Main Menu—Exhaust Filter—Parked Cleaning in this section.
- **SERVICE** soot level restriction: The indicator will remain at 100%, but all sections will turn red. STOP indicator will begin flashing on monitor and the audible alarm will sound. A pop-up will appear on the monitor stating that engine power is limited and to contact service representative for service filter cleaning.

7—Current or Selected Gear Indicator: Current or selected gear display share the same display location. When engine is running, location shows current active gear. When engine is not running, location shows transmission control lever selected gear.

The “n” prefix in front of gear indicates inching pedal is fully depressed.

8—Tachometer: Shows engine speed in revolutions per minute (rpm). If an engine control unit malfunction occurs, "— — —" is displayed.

9—Speedometer: Shows travel speed in kilometers per hour (km/h) or miles per hour (mph). If a flex load controller malfunction occurs, display readout is lost and an error message is displayed.

10—Fuel Level Gauge: Shows approximate level of fuel remaining in the tank. If fuel level falls below 1/8 full, gauge turns yellow. Always fill tank at end of day to prevent condensation in fuel tank.

11—Autoshift Indicator: Shows that transmission is in Auto mode.

12—6WD Indicator—If Equipped: Shows that 6WD is activated.

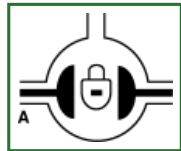
13—Precision Mode Indicator: Shows that precision mode is activated.

14—Precision Speed Indicator: Shows precision mode speed if precision mode is activated.

15—Automatic Blade Control Indicator: Shows that automatic blade control is activated.

16—Check Diagnostic Code Indicator: When a problem is detected in one of the controller circuits, the check diagnostic code indicator will illuminate and flash. Indicator light will go out when machine is shut off or when problem has been resolved.

17—Differential Lock Indicators:



TX1052888-UN: Auto Differential Lock Indicator



TX1052887-UN: Manual Differential Lock Indicator

NOTE:

Manual Differential Lock Indicator and Auto Differential Lock Indicator share the same location on the display.

- **Manual Differential Lock Indicator:** Will illuminate when the manual differential lock switch is in the ON position and the differential lock is engaged.
- **Auto Differential Lock Indicator:** Will illuminate when the machine is in automatic differential lock mode and the parameters are correct for differential lock engagement.

18—Saddle Lock Indicator: When saddle lock pin is disengaged, saddle lock indicator will illuminate.

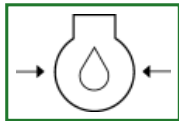
19—Engine Speed Control Indicator: Indicator illuminates when engine speed control is enabled.

20—High Beam Indicator: Indicator illuminates when high beams are on.

21—Service Required Indicator: Indicator illuminates when a problem is developing. It is not necessary to stop the engine immediately, but the cause must be investigated as soon as possible. See Display Unit—Main Menu—Codes—Active Codes and Stored Codes.



TX1052889-UN: Check Engine Indicator



TX1052890-UN: Engine Oil Pressure Indicator



TX1076374-UN: Transmission Fault Indicator

22a—Check Engine Indicator: Indicator illuminates when an engine service code has been detected and the engine requires service or when the engine is operating in a derated state.

NOTE:

Check Engine Indicator, Engine Oil Pressure Indicator, and Transmission Fault Indicator share the location space on the display. If more than one fault occurs at the same time, the indicators will alternate at 1-second intervals.

22b—Engine Oil Pressure Indicator:

IMPORTANT:

Prevent possible engine damage. If engine oil pressure warning indicator flashes while operating, stop machine and SHUT OFF ENGINE IMMEDIATELY.

NOTE:

Operating machine on steep slopes (off level) can cause indicator to illuminate.

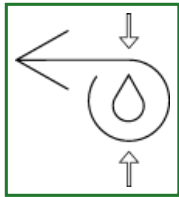
The engine oil pressure indicator illuminates when oil pressure is below a predetermined pressure during engine operation. If this occurs, the oil pressure warning indicator and STOP indicator flash, and the audible alarm activates. Stop the machine and SHUT OFF ENGINE IMMEDIATELY.

22c—Transmission Fault Indicator: Indicator illuminates when a transmission diagnostic trouble code has been detected or if limp home mode has been requested. Transmission shifts to neutral and machine can only be moved in limp home mode. The diagnostic trouble code will be stored in memory. Indicator light remains on while condition exists.

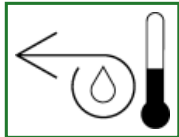
NOTE:

6WD Charge Pressure Indicator and 6WD Oil Temp Indicator share the same location on the display.

23—6WD Indicators—If Equipped:

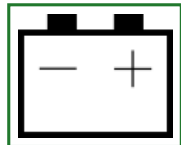


TX1052891-UN: 6WD Charge Pressure Indicator



TX1052892-UN: 6WD Oil Temp Indicator

- **6WD Charge Pressure Indicator:** The 6WD charge pressure indicator will illuminate when 6WD charge pressure is low. The indicator and service required indicator will illuminate. Stop machine and contact your authorized dealer.
- **6WD Oil Temperature Indicator:** Indicator will illuminate when 6WD oil temperature is greater than a predetermined temperature. Service required indicator will also illuminate. Controller will automatically turn 6WD off to allow oil to cool. After oil cools, cycle switch from ON to OFF, then back to ON to engage 6WD. Reduce setting of aggressiveness mode switch.



TX1052893-UN: Low Battery Voltage Indicator



TX1052894-UN: Secondary Steering Indicator



TX1077058-UN: Exhaust Filter Auto Cleaning Disabled Indicator

24a—Battery Voltage Indicator: Indicator illuminates and service required indicator lights when the following occur:

- Battery voltage is less than 25 V for 5 seconds with the engine running.
- Battery voltage is greater than 31 V for 3 seconds with the engine running.

Battery charge can be checked by accessing MAIN MENU—DIAGNOSTICS—BATTERY MONITOR menu on display unit.

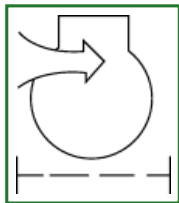
NOTE:

Low Battery Voltage Indicator, Secondary Steering Indicator, and Exhaust Filter Auto Cleaning Disabled Indicator share the same location on the display.

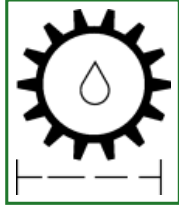
24b—Secondary Steering Indicator—If Equipped: Indicator will illuminate when secondary steering is active. Stop machine immediately if indicator illuminates.

24c—Exhaust Filter Auto Cleaning Disabled Indicator: Green indicator illuminates when exhaust filter auto cleaning has been disabled by the operator. For more information, see Display Unit—Main Menu—Exhaust Filter—Auto Cleaning in this section.

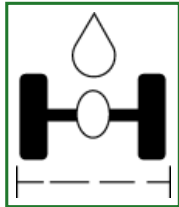
25—Filter Restriction Indicators:



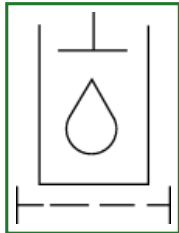
TX1052895-UN: Engine Air Filter Restriction Indicator



TX1052896-UN: Transmission Oil Filter Restriction Indicator



TX1052897-UN: Axle Oil Filter Restriction Indicator



TX1052898-UN: Hydraulic Oil Filter Restriction Indicator

IMPORTANT:

Prevent possible damage to machine. Change filters as soon as possible when a problem occurs.

Any of the following filter restrictions cause the respective indicator to appear in this location. Service required indicator will also illuminate. If more than one filter restriction occurs at the same time, the indicators will alternate at 1-second intervals.

- **Engine Air Filter Restriction Indicator:** When engine is running and air filter elements are restricted, indicator and service required indicator illuminate.
- **Transmission Oil Filter Restriction Indicator:**

IMPORTANT:

Prevent possible transmission damage. Change transmission oil filter as soon as possible when a problem occurs.

NOTE:

Cold oil may cause transmission oil filter restriction indicator to illuminate temporarily.

When transmission filter element is restricted, indicator and service required indicator illuminate.

- **Axle Oil Filter Restriction Indicator:** When axle filter element is restricted, indicator and service required indicator illuminate.
- **Hydraulic Oil Filter Restriction:**

IMPORTANT:

Prevent possible hydraulic pump damage. Change hydraulic oil filter as soon as possible when a problem occurs.

NOTE:

Cold oil can cause hydraulic oil filter restriction indicator to illuminate until oil is warm.

When hydraulic filter element is restricted, indicator and service required indicator illuminate.

26—Articulation Gauge: Direction and amount of articulation are shown. Total articulation of machine either left or right is 22 degrees. Pointer will deflect full left if a sensor error occurs.

27—Transmission Oil Temperature Gauge: Shows whether transmission oil is in normal operating range or in danger zone. Indicator illuminates, the STOP indicator flashes, and the audible alarm activates when pointer is in red zone, indicating that oil temperature is too high. Stop machine and allow machine to cool. Stop engine and see your authorized dealer.

If machine is warmed up and pointer deflects to the far left side of the scale, electronic communication is lost or a sensor error is active. Indicator will not come on.

Temperature reading and other operating parameter data can be obtained by selecting DIAGNOSTICS—TRANSMISSION SENSORS from main menu on display unit.

28—Hydraulic Oil Temperature Gauge: Shows whether hydraulic oil temperature is in normal operating range or in danger zone. Indicator illuminates and service required indicator lights when pointer is in red zone. Stop work and cycle hydraulic functions without load to lower oil temperature.

6WD Machines: If pointer still stays in red zone, stop machine and see your authorized dealer.

Standard Axle Machines: If pointer still stays in red zone, stop engine and check for cause.

If machine is warmed up and pointer deflects to the far left side of the scale, electronic communication is lost or a sensor error is active. Indicator will not come on.

Temperature reading and other operating parameter data can be obtained by selecting DIAGNOSTICS—HYDRAULIC SENSORS from main menu on display unit.

29—Engine Coolant Temperature Gauge: Coolant temperature gauge shows whether engine coolant temperature is in normal operating range or in danger zone. If temperature is too high, the pointer will be in the red segment. The STOP indicator will flash and the audible alarm will activate. Immediately take load off the machine and run engine at idle. If temperature doesn't drop quickly, stop engine and see your authorized dealer.

Temperature readings can be obtained by selecting DIAGNOSTICS—ENGINE SENSORS from main menu on display unit.

30—Left Turn Indicator: Indicator illuminates when left turn signal switch or hazard light switch is engaged.

31—Not Used

32—Lever Steering Indicator—If Equipped: Indicator illuminates when lever steering is enabled.

33—STOP Indicator: Indicator illuminates when a problem has developed. Stop machine immediately and determine cause of problem.



CAUTION:

Prevent possible injury or machine damage. If STOP indicator flashes and alarm sounds, stop machine immediately and investigate cause.

34—Exhaust Filter Cleaning Indicator: Shows when exhaust filter cleaning is in process.

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

If parked cleaning is being performed, machine CANNOT be operated until the process is complete. Indicator will turn off when exhaust filter parked cleaning is complete and exhaust temperatures return to normal.

35—Park Brake Indicator: Indicator illuminates when park brake is engaged.

36—Brake Pressure Indicator:



CAUTION:

Prevent possible injury or machine damage from runaway machine due to brake malfunction. If brake pressure indicator illuminates while operating, stop machine immediately.

Brake pressure indicator and STOP indicator flash, and the audible alarm activates when brake oil pressure is low or brake accumulator has lost its charge. Stop machine immediately and engage park brake or shut off engine.

37—Right Turn Indicator: Indicator illuminates when right turn signal switch or hazard light switch is engaged.

Display Unit—Normal Display



TX1052774-UN: Display Unit Normal Display

NOTE:

In extreme cold situations, it is normal operation for the display to remain off for a period of time to allow the screen to warm up.

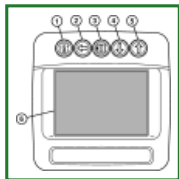
When the engine start switch is pressed the first time, ignition switch power is turned on and applied to the control units and the display unit. The display unit performs a display check sequence as follows:

1. Alarm sounds for approximately 3 seconds.
2. Display screen lights (no data displayed).
3. Eight indicators at the bottom of display unit light momentarily.
4. Backlighting on buttons at top of display unit illuminates.
5. After the display check is complete:

Display screen populates with normal display items. Gauges position pointers to current input values.

NM00125,00005C4-19-20110104

Display Unit—Main Menu



TX1051892-UN: Display Unit

LEGEND:

- | | | |
|-----------------|-------------------|---------------|
| 1 - INFO Button | 3 - SELECT Button | 5 - UP Button |
| 2 - BACK Button | 4 - DOWN Button | 6 - Display |

The main menu displays submenus (six submenus for standard machines and seven submenus for Grade Pro machines), which can be selected to view diagnostic information or change various operating characteristics of the machine or display unit.

NOTE:

The display will not appear gray to the operator.

Translations shown on the display (6) may be abbreviated.

The main menu is accessed by pressing the SELECT button (3).

The submenus under MAIN MENU that appear on the display include:

1. **CODES**— allows service personnel or the operator to view active or stored diagnostic trouble codes.
2. **SETTINGS**— allows the operator to change various operating characteristics of the machine and display unit.
3. **DIAGNOSTICS**— provides a limited set of tools, and is intended for use by service personnel and machine operators for diagnostic and troubleshooting functions.
4. **SECURITY**— provides means for the machine owner to assign personal identification numbers (PINs) to authorized operators to prevent theft or unauthorized use of the machine. When security system is on, the operator must enter valid PIN when prompted or the machine will not start.
5. **EXHAUST FILTER**— allows operator to enable or disable exhaust filter auto cleaning and start a parked cleaning, if needed.
6. **SOFTWARE DELIVERY**— allows for machine controller software to be updated remotely.

7.

NOTE:

Only Grade Pro machines will show the seventh submenu.

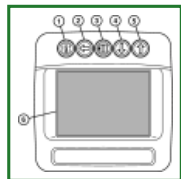
MACHINE CONFIGURATION— allows calibration of electrohydraulic valves and sensors.

At MAIN MENU, press DOWN button (4) to move to the next submenu.

Press SELECT button to activate the currently chosen (highlighted) submenu.

NM00125,00005C5-19-20101022

Display Unit—Main Menu—Codes



TX1051892-UN: Display Unit

LEGEND:

- | | | |
|-----------------|-------------------|---------------|
| 1 - INFO Button | 3 - SELECT Button | 5 - UP Button |
| 2 - BACK Button | 4 - DOWN Button | 6 - Display |

The CODES menu provides the capability to select and display active and stored diagnostic trouble codes (DTCs) and information about each DTC.

The submenus under MAIN MENU that appear on the display include:

1. **CODES**
2. **SETTINGS**
3. **DIAGNOSTICS**
4. **SECURITY**
5. **EXHAUST FILTER**
6. **SOFTWARE DELIVERY**

7.

NOTE:

Only Grade Pro machines will show the seventh submenu.

MACHINE CONFIGURATION

At the MAIN MENU with CODES highlighted, press SELECT button (3) to open the ACTIVE AND STORED CODES screen.

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

NM00125,00005C6-19-20101022

Display Unit—Main Menu—Codes—Active Codes and Stored Codes

The ACTIVE AND STORED CODES menu provides the capability to display in sequence up to 30 of the latest diagnostic trouble codes (DTCs) that are currently active and stored on the machine. As each active DTC is resolved or fixed, the code is removed from the active code list and added to the stored code list. Each DTC is saved in the order it occurred.

Press SELECT button to display first active and stored code.

The following is displayed for each active and stored code:

NOTE:

Circuit information varies based upon diagnostic trouble code.

- Text description of the DTC

- SPN (Suspect Parameter Number)
- FMI (Failure Mode Indicator)
- Source control unit of fault
 - ECU (Engine Control Unit)
 - ADU (Advanced Display Unit)
 - FLC (Flex Load Controller)
 - OC3 (Sealed Switch Module)
 - PCU (Transmission Control Unit)
 - HWD (Hydrostatic Front Wheel Drive Controller)—If Equipped
 - HVC (Hydraulic Valve Controller)—If Equipped
 - AVC (Auxiliary Valve Controller)—If Equipped
 - LJ1 (Circle Rotate Lever Control)
 - LJ2 (Blade Side Shift/Steering Lever Control)
 - LJ3 (Left Blade Lift Lever Control)
 - LJ4 (Blade Pitch/Ripper Lever Control)
 - RJ1 (Saddle Side Shift Lever Control)
 - RJ2 (Wheel Lean Lever Control)
 - RJ3 (Right Blade Lift Lever Control)
 - RJ4 (Articulation/Scarifier Lever Control)
- Number of occurrences
- Engine hours at first occurrence
- Engine hours at last occurrence
- Current engine hours

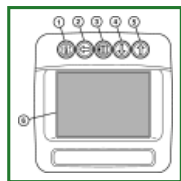
Press DOWN button to display next active or stored code.

Press UP button to display previous active or stored code.

Press BACK button to return to MAIN MENU.

NM00125,00005C7-19-20101221

Display Unit—Main Menu—Settings



TX1051892-UN: Display Unit

LEGEND:

1 - INFO Button

3 - SELECT Button

5 - UP Button

2 - BACK Button

4 - DOWN Button

6 - Display

The SETTINGS menu allows the operator to change settings or operating modes of various machine functions, change display measurement units (English or metric), and change language (English, French, Spanish, or Russian). Normally, the last setting is stored when the engine is shut off and is retrieved when the engine is restarted.

The submenus under MAIN MENU that appear on the display (6) include:

1. **CODES**
2. **SETTINGS**
3. **DIAGNOSTICS**
4. **SECURITY**
5. **EXHAUST FILTER**
6. **SOFTWARE DELIVERY**

7.

NOTE:

Only Grade Pro machines will show the seventh submenu.

MACHINE CONFIGURATION

Press DOWN button (4) at MAIN MENU to highlight SETTINGS.

Press SELECT button (3) to display SETTINGS menu page 1.

The submenus under the SETTINGS menu include:

1. REVERSE FAN CYCLE
2. MANUAL FAN REVERSAL
3. JOB TIMER
4. STOPWATCH
5. AUTO SHUTDOWN
6. LANGUAGE
7. DISPLAY UNITS
8. REAR CAMERA MODE

Press DOWN button to move to desired menu item.

Press SELECT button to activate chosen menu item.

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

Display Unit—Main Menu—Settings—Reverse Fan Cycle

The REVERSE FAN CYCLE menu allows the operator to select the interval for the hydraulic cooling fan motor reversal. This function spins the cooling fan in reverse direction for approximately 15 seconds to clear debris from the coolers and grille. The intervals can be set from 20—40 minutes in 10-minute increments or 60 and 90 minutes. The default interval is set at 40 minutes.

The submenus under the SETTINGS menu include:

1. REVERSE FAN CYCLE
2. MANUAL FAN REVERSAL
3. JOB TIMER
4. STOPWATCH
5. AUTO SHUTDOWN
6. LANGUAGE
7. DISPLAY UNITS
8. REAR CAMERA MODE

Press DOWN button at SETTINGS menu to highlight REVERSE FAN CYCLE.

Press SELECT button to display REVERSE FAN CYCLE menu.

Highlight desired interval setting, then press SELECT button to activate chosen mode.

Press BACK button to return to previous screen.

Display Unit—Main Menu—Settings—Manual Fan Reversal

The MANUAL FAN REVERSAL function controls the direction of rotation of the radiator cooling fan. The controller software activates this function at preset intervals to reverse the fan for 15 seconds to blow debris from the radiator. The function can be manually activated by the operator when necessary but must not be activated within 1 minute of the last reverse cycle (automatic or manual).

The submenus under the SETTINGS menu include:

1. REVERSE FAN CYCLE
2. MANUAL FAN REVERSAL
3. JOB TIMER
4. STOPWATCH

5. AUTO SHUTDOWN
6. LANGUAGE
7. DISPLAY UNITS
8. REAR CAMERA MODE

Press the DOWN button to highlight MANUAL FAN REVERSAL on the SETTINGS menu.

Press SELECT button to activate the manual fan reversal status. The status displayed on the screen changes from OFF to ON. At cycle completion, the status automatically reverts to OFF.

Press BACK button to return to previous screen.

NM00125,00006A1-19-20101019

Display Unit—Main Menu—Settings—Job Timer

The job timer is a resettable hour meter that can be used to time tasks to the nearest tenth of an hour. The maximum time displayed is 9999.9 hours. The job timer stops and the value is set to zero when it exceeds 9999.9 hours. Once started, the job timer runs even when JOB TIMER menu is hidden. The job timer value is stored when engine stop switch is pressed and is retrieved when engine start switch is pressed again.

The submenus under the SETTINGS menu include:

1. REVERSE FAN CYCLE
2. MANUAL FAN REVERSAL
3. JOB TIMER
4. STOPWATCH
5. AUTO SHUTDOWN
6. LANGUAGE
7. DISPLAY UNITS
8. REAR CAMERA MODE

Press DOWN button at SETTINGS menu to highlight JOB TIMER.

Press SELECT button to display job timer menu.

Press DOWN button to reset timer to zero.

Press BACK button to return to previous screen.

NM00125,00006A2-19-20101019

Display Unit—Main Menu—Settings—Stopwatch

The stopwatch is a resettable timer that is used to measure time in hours, minutes, seconds, and tenths of seconds. The maximum time displayed is 99:00:00:0 hours. The timer stops and the value is set to zero when it exceeds 99:00:00:0 hours. Once started, the timer runs even when STOPWATCH menu is hidden. The timer turns off and resets to zero when engine stop switch is pressed.

The submenus under the SETTINGS menu include:

1. REVERSE FAN CYCLE
2. MANUAL FAN REVERSAL
3. JOB TIMER
4. STOPWATCH
5. AUTO SHUTDOWN
6. LANGUAGE
7. DISPLAY UNITS
8. REAR CAMERA MODE

At SETTINGS menu, press DOWN button to highlight STOPWATCH.

Press SELECT button to display STOPWATCH menu.

Press SELECT button again to start timer when it is off and has a value of zero.

Press SELECT button to stop timer when it is on.

Press DOWN button to reset timer.

Press BACK button to return to previous screen.

NM00125,00006A3-19-20101019

Display Unit—Main Menu—Settings—Auto Shutdown

Automatic shutdown feature turns off ignition power and shuts down the engine after the machine has been idle for a preset period of time.

Automatic shutdown can be disabled or set to activate after 1-, 2-, 3-, 4-, 5-, 10-, 15-, 20-, 25-, or 30-minute increments.

With automatic shutdown enabled, the vehicle controller monitors various operating parameters. When all parameters meet prerequisites, the automatic shutdown timer is started. When timer reaches 30 seconds remaining, an audible alarm sounds and a pop-up displays a countdown timer indicating that the machine is about to power down.

Momentarily increase engine speed, shift to gear, or press SELECT on the monitor to cancel the automatic shutdown.

Prerequisites that must be met for features to operate are:

- Transmission is in neutral or park.
- Accelerator pedal is not pressed.
- Vehicle speed is less than 0.5 km/h (0.31 mph).
- Engine coolant temperature is greater than a minimum value.
- No calibrations are currently active.
- Exhaust filter cleaning is not currently active.

If any of these parameters vary from preset values, or CAN communication is lost with the ECU or transmission control unit, the automatic shutdown will be cancelled.

The submenus under the SETTINGS menu include:

1. REVERSE FAN CYCLE
2. MANUAL FAN REVERSAL
3. JOB TIMER
4. STOPWATCH
5. AUTO SHUTDOWN
6. LANGUAGE
7. DISPLAY UNITS
8. REAR CAMERA MODE

At SETTINGS menu, press DOWN button to highlight AUTO SHUTDOWN.

Press UP or DOWN button to select desired time.

Press SELECT to activate currently chosen setting.

Press BACK button to return to previous screen.

NM00125,00006A4-19-20110105

Display Unit—Main Menu—Settings—Language

The LANGUAGE menu allows the operator to choose the desired language (English, French, Spanish, or Russian) used on the display.

The submenus under the SETTINGS menu include:

1. REVERSE FAN CYCLE
2. MANUAL FAN REVERSAL
3. JOB TIMER
4. STOPWATCH

5. AUTO SHUTDOWN
6. LANGUAGE
7. DISPLAY UNITS
8. REAR CAMERA MODE

Press the DOWN button to highlight LANGUAGE on the SETTINGS menu.

Press SELECT button to display LANGUAGE menu.

Press DOWN button to highlight desired language selection.

Press SELECT button change language selection.

Press BACK button to return to previous screen.

NM00125,00006A5-19-20101019

Display Unit—Main Menu—Settings—Display Units

The DISPLAY UNITS function allows the operator to select the desired measurement units (English or metric).

The submenus under the SETTINGS menu include:

1. REVERSE FAN CYCLE
2. MANUAL FAN REVERSAL
3. JOB TIMER
4. STOPWATCH
5. AUTO SHUTDOWN
6. LANGUAGE
7. DISPLAY UNITS
8. REAR CAMERA MODE

Press the DOWN button to highlight DISPLAY UNITS on the SETTINGS menu.

Press SELECT button to toggle between English and metric units.

Press BACK button to return to previous screen.

NM00125,00006A6-19-20101019

Display Unit—Main Menu—Settings—Rear Camera Mode—If Equipped

On machines equipped with the rear camera mode, the operator can choose from the following three camera operating modes:

- **Off**— Camera system is off until mode is changed.
- **Reverse**— Camera comes on when transmission is engaged in reverse gear. Image is displayed on display unit.
- **Manual**— Camera is off. Operator can turn camera on by pressing INFO button on display unit.

The submenus under the SETTINGS menu display include:

1. REVERSE FAN CYCLE
2. MANUAL FAN REVERSAL
3. JOB TIMER
4. STOPWATCH
5. AUTO SHUTDOWN
6. LANGUAGE
7. DISPLAY UNITS
8. REAR CAMERA MODE

Press DOWN button to highlight REAR CAMERA MODE.

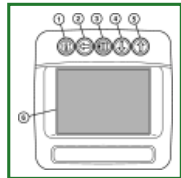
Press SELECT button to activate camera mode selection screen.

Press DOWN button to highlight desired camera operating mode, then press SELECT to activate chosen mode.

Press BACK button to return to previous screen.

NM00125,00006A8-19-20101022

Display Unit—Main Menu—Diagnostics



TX1051892-UN: Display Unit

LEGEND:

1 - INFO Button

2 - BACK Button

3 - SELECT Button

4 - DOWN Button

5 - UP Button

6 - Display

The DIAGNOSTICS menu provides a limited set of tools and is intended for use by service personnel and machine operators for diagnostic and troubleshooting functions.

The submenus under MAIN MENU that appear on the display (6) include:

1. **CODES**
2. **SETTINGS**
3. **DIAGNOSTICS**
4. **SECURITY**
5. **EXHAUST FILTER**
6. **SOFTWARE DELIVERY**

7.

NOTE:

Only Grade Pro machines will show the seventh submenu.

MACHINE CONFIGURATION

Press DOWN button (4) at MAIN MENU to highlight DIAGNOSTICS.

Press SELECT button (3) to display DIAGNOSTICS menu page 1.

The submenus under the DIAGNOSTICS menu page 1 include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button to highlight MORE, then press SELECT button to display DIAGNOSTICS menu page 2.

DIAGNOSTICS page 2 menu items on display include:

8. MACHINE SWITCHES
9. JDLINK SYSTEM INFO
10. 6WD SENSORS

11.

NOTE:**Only Grade Pro machines will show submenus 11—13.**

CROSS SLOPE SENSORS

12. GRADE PRO CONTROLS

13. GRADE PRO SWITCHES

14. ARMREST SWITCHES

Press DOWN button to highlight desired menu item, then press SELECT button to display the menu.

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

NM00125,00006A9-19-20101201

Display Unit—Main Menu—Diagnostics—Machine ID

This menu provides the means to view the part number and serial number for control units, the part number and version of software installed, and the machine serial number.

The submenus under the DIAGNOSTICS menu page 1 include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button at the diagnostics menu to highlight MACHINE ID.

Press SELECT button to display the MACHINE ID menu.

Press DOWN button to highlight the desired menu selection, then press SELECT to obtain information about the unit selected.

The information on display for each selection includes:

NOTE:**The machine serial number is shown at the top of the display.**

PCU— The transmission control unit part number, serial number, and software identification is displayed.

FLC— The flex load controller (FLC) part number, serial number, software part number, and software version is displayed.

ADU— The advanced display unit (ADU) part number, serial number, and software identification is displayed.

OC3— The sealed switch module part number, serial number, and software identification is displayed.

ECU— The engine control unit (ECU) part number, serial number, engine model number, and software identification is displayed.

HWD (if equipped)— The six wheel drive (6WD) part number, serial number, and software identification is displayed.

HVC (if equipped)— The hydraulic valve controller (HVC) part number, serial number, and software identification is displayed.

AVC (if equipped)— The auxiliary valve controller (AVC) part number, serial number, and software identification is displayed.

Press BACK button to return to previous screen.

NM00125,00005D0-19-20110104

Display Unit—Main Menu—Diagnostics—Battery Monitor

This menu shows the current battery voltage.

DIAGNOSTICS menu page 1 menu items on display include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button at DIAGNOSTICS menu to highlight BATTERY MONITOR.

Press SELECT button to view the current voltage of the battery.

Press BACK button to return to previous screen.

NM00125,00005D1-19-20101022

Display Unit—Main Menu—Diagnostics—Engine Sensors

This menu displays current data from all engine sensors that provide input to the engine control unit (ECU).

DIAGNOSTICS menu page 1 menu items on display include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button at DIAGNOSTICS menu to highlight ENGINE SENSORS.

Press SELECT button to display ENGINE SENSORS menu. This menu allows the operator or technician to monitor temperature, throttle sensor, and starter sensor data.

ENGINE SENSORS menu items on display include:

1. TEMPERATURES
2. PRESSURES

THROTTLE SENSOR— Throttle sensor position is displayed as a percentage.

COOLANT LEVEL— Coolant level is shown as either OK or LOW

STARTER STATUS— Indicates whether the flex load controller (FLC) request to start the engine was received by the ECU. Displays CRANK, OFF, or INHIBITED.

Press DOWN button to highlight desired sensor input.

Press SELECT button to display sensor input menu.

TEMPERATURES menu display includes

- COOLANT TEMP
- MANIFOLD AIR TEMP
- FUEL TEMP
- CAC TEMP

Temperatures values are displayed as either °C or °F.

PRESSURES menu display includes

- FUEL PRESSURE
- MANIFOLD AIR PRESSURE
- COOLANT PRESSURE

Pressure values are displayed as either kPa or psi.

Press BACK button to return to previous menu.

NM00125,00005D2-19-20110104

Display Unit—Main Menu—Diagnostics—Transmission Sensors

This menu displays data from all transmission sensors that provide input to the transmission control unit.

DIAGNOSTICS menu page 1 menu items on display include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button at DIAGNOSTICS menu to highlight TRANSMISSION SENSORS.

Press SELECT button to display the TRANSMISSION SENSORS menu page 1.

TRANSMISSION SENSORS menu page 1 items on display include:

- REQUESTED GEAR
- TRANS OIL TEMP (transmission oil temperature is displayed in °C or °F)
- INPUT SHAFT SPEED (input shaft speed is displayed in rpm)
- OUTPUT SHAFT SPEED (output shaft speed is displayed in rpm)
- OUTPUT SHAFT DIRECTION

Press DOWN button to highlight MORE, then press SELECT button to display TRANSMISSION SENSORS menu page 2.

TRANSMISSION SENSORS menu page 2 items on display include:

- INCHING PEDAL

- TOP OF CLUTCH
- BOTTOM OF CLUTCH
- AUTOSHIFT INSTALLED

Press BACK button to return to previous screen.

NOTE:

Values are displayed in either English or metric units, depending on which has been selected using the MONITOR SETTINGS—DISPLAY UNITS menu on the display unit. See Display Unit—Main Menu—Monitor Settings in this section.

NM00125,00005D3-19-20110105

Display Unit—Main Menu—Diagnostics—Hydraulic Sensors

This menu displays data from hydraulic system sensors that provide input to the flex load controller (FLC).

DIAGNOSTICS menu page 1 menu items on display include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button at diagnostics menu to highlight HYDRAULIC SENSORS.

Press SELECT button to display the hydraulic sensors screen.

HYDRAULIC SENSORS menu items on display include:

- FAN SPEED
- HYDRAULIC OIL TEMP (hydraulic oil temperature is displayed in °C or °F)
- HYD FAN COMMAND (displayed as rpm)
- 6WD LOOP OIL (if equipped)
- HYDRAULIC PUMP PRESSURE (if equipped)

Press BACK button to return to previous screen.

NOTE:

Values are displayed in either English or metric units, depending on which has been selected using the **MONITOR SETTINGS—DISPLAY UNITS** menu on the display unit. See **Display Unit—Main Menu—Monitor Settings** in this section.

NM00125,00005D4-19-20101221

Display Unit—Main Menu—Diagnostics—Switch Module

This screen allows the operator or technician to perform continuity checks on the switches in the sealed switch module.

DIAGNOSTICS menu page 1 menu items on display include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button at DIAGNOSTICS menu to highlight SWITCH MODULE.

Press SELECT button to display the SWITCH MODULE screen.

NOTE:

Functions associated with the sealed switch module are still active in this mode.

Press a switch on the sealed switch module. The corresponding icon on the screen changes to green to indicate switch continuity.

Press BACK button to return to previous screen.

NM00125,00005D5-19-20110104

Display Unit—Main Menu—Diagnostics—Machine Sensors

This menu displays data from various machine sensors that provide input to the flex load controller (FLC).

DIAGNOSTICS menu page 1 menu items on display include:

1. MACHINE ID
2. BATTERY MONITOR

3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button at DIAGNOSTICS menu to highlight MACHINE SENSORS.

Press SELECT button to display the MACHINE SENSORS menu.

MACHINE SENSORS menu items on display include:

- ARTICULATION ANGLE
- FUEL SENDER %
- STEERING ANGLE

Press BACK button to return to previous screen.

NM00125,00005D6-19-20101022

Display Unit—Main Menu—Diagnostics—Machine Switches

The MACHINE SWITCHES menu displays the current status of all machine switches hardwired to the flex load controller (FLC).

The submenus under the DIAGNOSTICS menu page 1 include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button to highlight MORE, then press SELECT button to display DIAGNOSTICS menu page 2.

DIAGNOSTICS menu page 2 menu items on display include:

8. MACHINE SWITCHES
9. JDLINK SYSTEM INFO

10. 6WD SENSORS

11.

NOTE:**Only Grade Pro machines will show submenus 11—14.**

CROSS SLOPE SENSORS

12. GRADE PRO CONTROLS

13. GRADE PRO SWITCHES

14. ARMREST SWITCHES

Press SELECT button to display the MACHINE SWITCHES menu to show current status of displayed switches.

MACHINE SWITCHES page 1 menu items on display include:

- PARK BRAKE PRESSURE
- BRAKE ACCUM CHARGE
- BRAKE LIGHT
- LEFT TURN SIGNAL
- RIGHT TURN SIGNAL
- HIGH BEAM
- DIFF LOCK

Press DOWN button at MACHINE SWITCHES menu to highlight MORE.

Press SELECT button to display more switches and their status (ON or OFF).

MACHINE SWITCHES page 2 menu items include:

- HYD OIL FILTER REST
- TRANS OIL FILTER REST
- AXLE OIL FILT REST
- 6WD MODE (6WD machines only)
- 6WD PRECISION MODE (6WD machines only)
- 6WD INCHING MODE (6WD machines only)

Press BACK button to return to previous screen.

Display Unit—Main Menu—Diagnostics—JDLINK System Info

The JDLINK SYSTEM INFO menu allows the operator to view specific information regarding Service ADVISOR™ Remote and JDLINK™ .

The submenus under the DIAGNOSTICS menu page 1 include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button to highlight MORE, then press SELECT button to display DIAGNOSTICS menu page 2.

DIAGNOSTICS menu page 2 menu items on display include:

8. MACHINE SWITCHES
9. JDLINK SYSTEM INFO
10. 6WD SENSORS

11.

NOTE:

Only Grade Pro machines will show submenus 11—14.

- CROSS SLOPE SENSORS
12. GRADE PRO CONTROLS
13. GRADE PRO SWITCHES
14. ARMREST SWITCHES

Press DOWN button to highlight JDLINK SYSTEM INFO menu.

Press SELECT button to display.

JDLINK SYSTEM INFO submenus include:

- **CELLULAR STRENGTH**— Displays cellular strength as a percentage.
- **CARRIER**— Displays cellular provider.
- **REGISTRATION**— Displays registration status of the JDLINK system as either REGISTERED, UNREGISTERED, PENDING or UNKNOWN.

- **LATITUDE**— Displays machine position in degrees of latitude.
- **LONGITUDE**— Displays machine position in degrees of longitude.
- **GPS ANTENNA**— Displays GPS antenna status as either OK, SHORT, OPEN, or UNKNOWN.
- **CELLULAR ANTENNA**— Displays cellular antenna version as either US or EU.

Service ADVISOR is a trademark of Deere & Company

JDLINK is a trademark of Deere & Company

NM00125,00006AC-19-20101201

Display Unit—Main Menu—Diagnostics—6WD Sensors—If Equipped

This menu displays data from 6WD sensors.

DIAGNOSTICS menu page 1 menu items on display include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button to highlight MORE.

Press SELECT button to display DIAGNOSTICS menu page 2.

DIAGNOSTICS menu page 2 menu items on display include:

8. MACHINE SWITCHES
9. JDLINK SYSTEM INFO
10. 6WD SENSORS

11.

NOTE:

Only Grade Pro machines will show submenus 11—14.

SENSORS

12. CONTROLS

Press DOWN button to highlight 6WD SENSORS, then press SELECT button to display 6WD SENSORS screen.

6WD SENSORS menu items on display include:

- L WHEEL SPEED
- R WHEEL SPEED
- L PUMP PRESSURE
- R PUMP PRESSURE
- 6WD LOOP OIL
- CHARGE PRESSURE

Press BACK button to return to previous screen.

NM00125,00006AD-19-20101201

Display Unit—Main Menu—Diagnostics—Sensors (Grade Pro Machines Only)

CROSS SLOPE SENSORS menu displays input values from Grade Pro system.

DIAGNOSTICS menu page 1 menu items on display include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button to highlight MORE, then press SELECT button to display DIAGNOSTICS menu page 2.

DIAGNOSTICS page 2 menu items on display include:

8. MACHINE SWITCHES
9. JDLINK SYSTEM INFO
10. 6WD SENSORS

11.

NOTE:

Grade Pro machines only will show submenus 11—14.

CROSS SLOPE SENSORS

12. GRADE PRO CONTROLS
13. GRADE PRO SWITCHES
14. ARMREST SWITCHES

Press DOWN button to highlight CROSS SLOPE SENSORS, then press SELECT button to display sensor screen.

CROSS SLOPE SENSORS menu items on display include:

- ROLL
- PITCH
- CIRCLE ROTATE
- MAINFALL

Values are displayed as either a percentage or degree.

Press BACK button to return to previous screen.

NM00125,00006AE-19-20101201

Display Unit—Main Menu—Diagnostics—Controls (Grade Pro Machines Only)

This menu displays data from the Grade Pro control inputs.

The submenus under the DIAGNOSTICS menu page 1 include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button to highlight MORE, then press SELECT button to display DIAGNOSTICS menu page 2.

DIAGNOSTICS page 2 menu items on display include:

8. MACHINE SWITCHES
9. JDLINK SYSTEM INFO
10. 6WD SENSORS

11.

NOTE:**Only Grade Pro machines will show submenus 11—14.**

CROSS SLOPE SENSORS

12. GRADE PRO CONTROLS

13. GRADE PRO SWITCHES

14. ARMREST SWITCHES

Press DOWN button to highlight GRADE PRO CONTROLS, then press SELECT button to display controls screen.

GRADE PRO CONTROLS menu items on display include:

- CONTROL LEVERS
- AUXILIARY FUNCTIONS

Control Levers: Shows direction and amount that each lever is moved.

Auxiliary Functions: Shows direction and amount that each function is moved.

NM00125,00006AF-19-20101201

Display Unit—Main Menu—Diagnostics—Switches (Grade Pro Machines Only)

This menu displays the status of switches in the Grade Pro system.

The submenus under the DIAGNOSTICS menu page 1 include:

1. MACHINE ID
2. BATTERY MONITOR
3. ENGINE SENSORS
4. TRANSMISSION SENSORS
5. HYDRAULIC SENSORS
6. SWITCH MODULE
7. MACHINE SENSORS

Press DOWN button to highlight MORE, then press SELECT button to display DIAGNOSTICS menu page 2.

DIAGNOSTICS page 2 menu items on display include:

- 8. MACHINE SWITCHES
- 9. JDLINK SYSTEM INFO
- 10. 6WD SENSORS

11.

NOTE:

Only Grade Pro machines will show submenus 11—14.

CROSS SLOPE SENSORS

- 12. GRADE PRO CONTROLS
- 13. GRADE PRO SWITCHES
- 14. ARMREST SWITCHES

Press DOWN button to highlight desired switch menu.

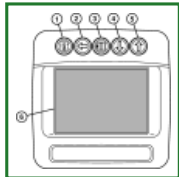
Press SELECT button to display highlighted menu.

The operator or technician can perform continuity checks on switches in the Grade Pro system.

Press BACK button to return to previous menu.

NM00125,00006B0-19-20101201

Display Unit—Main Menu—Security



TX1051892-UN: Display Unit



TX1051922-UN: Numeric Keypad

LEGEND:

1 - INFO Button

2 - BACK Button

3 - SELECT Button

4 - DOWN Button

5 - UP Button

6 - Display

7 - Numeric Keypad

8 - Enter Key

The security feature is designed to impede theft or unauthorized use of the machine by preventing the engine from starting until the operator correctly enters a valid security code. The system provides for one master owner personal identification number (PIN) and up to ten operator PINs.

PINs can be from 1—8 numeric characters in length. Leading zeros are recognized. For example, 1, 01, and 001 are each valid and unique PINs.

When security is enabled, the following occurs:

- When engine start switch is pressed, operator is prompted to enter a PIN on the sealed switch module. Valid PIN must be entered or engine will not start.
- When engine stop switch is pressed and engine shuts down, system automatically locks the vehicle controllers. Operator can restart engine within preset logout delay time. After delay time expires, PIN must be entered to start engine.

The machine owner can perform any of the following security system functions:

- Enable or disable security system.
- Change owner PIN.
- Manage and assign operator PINs.
- Manage and assign transport PIN.
- Change operator logout delay time.

The submenus under main menu that appear on display (6) include:

1. **CODES**
2. **SETTINGS**
3. **DIAGNOSTICS**
4. **SECURITY**
5. **EXHAUST FILTER**
MACHINE CONFIGURATION
6. **SOFTWARE DELIVERY**

7. **NOTE:**
Grade Pro machines only will show the seventh submenu.

MACHINE CONFIGURATION

Press DOWN button (4) at main menu to highlight SECURITY.

Press SELECT button (3) to activate the OWNER PIN screen.

Enter PIN using one of the following methods:

- Enter PIN on numeric keypad (7) on sealed switch module, then press enter key (8) to activate SECURITY menu.
- Enter PIN using buttons on display unit:
 - Press UP button (5) or DOWN button to start process of entering PIN.
 - Press UP button to increment number shown. If pressed when 9 is shown, display will wrap around to 0.
 - Press DOWN button to decrement number shown. If pressed when 0 is shown, display will wrap around to 9.
 - Press SELECT button to store current digit.
 - Continue entering remaining digits of PIN.
 - When PIN is correctly displayed, press BACK button (2) to enter PIN and activate SECURITY menu.

SECURITY menu items on display include:

- SECURITY (ON/OFF)
- CHANGE OWNER PIN
- MANAGE OPERATORS PIN
- MANAGE TRANSPORT PIN
- DELAYED OPERATOR LOGOUT

Press BACK button to return to previous screen.

NM00125,00005DC-19-20110104

Display Unit—Main Menu—Security—Security

Press DOWN button at MAIN MENU to highlight SECURITY.

With SECURITY highlighted, press SELECT button to turn security system ON or OFF.

Press BACK button to exit. If security system OFF mode was selected, display returns to MAIN MENU.

If security system ON mode was selected, warning screen appears. Press SELECT button to continue and enable security system.

Press BACK button to return to previous screen.

NM00125,00006B6-19-20101025

Display Unit—Main Menu—Security—Change Owner PIN

The machine owner personal identification number (PIN) can be changed at any time using the following procedure.

PINs can be from one to eight numeric characters in length. Leading zeros are acceptable and recognized.

NOTE:

The same PIN cannot be used as an owner PIN and an operator PIN.

Press DOWN button at MAIN MENU to highlight SECURITY, then press SELECT button.

OWNER LOGIN screen appears.

Enter current owner PIN on sealed switch module numeric keypad, then press enter key.

SECURITY menu appears.

Press DOWN button to highlight CHANGE OWNER PIN, then press SELECT button.

CURRENT OWNER PIN menu appears.

Enter current owner PIN on sealed switch module keypad, then press enter key. NEW OWNER PIN screen appears.

Enter new owner PIN on sealed switch module keypad, then press enter key. CONFIRM OWNER PIN screen appears.

Press enter key to confirm change or BACK button to exit without changing.

NM00125,00006B7-19-20110104

Display Unit—Main Menu—Security—Manage Operator PINs

The security system allows the owner to enter up to ten unique personal identification numbers (PINs) for operators. PINs can be added or deleted only by the owner.

Operator PINs can be from one to eight numeric characters. Leading zeros are acceptable and recognized.

NOTE:

The same PIN cannot be used as an owner PIN and an operator PIN.

Access the list of operator PINs as follows:

Press DOWN button at MAIN MENU to highlight SECURITY, then press SELECT button.

OWNER LOGIN screen appears.

Enter current owner PIN on sealed switch module numeric keypad, then press enter key.

SECURITY menu appears.

SECURITY menu items on display include:

- SECURITY (ON/OFF)
- CHANGE OWNER PIN
- MANAGE OPERATOR PINS
- MANAGE TRANSPORT PIN
- DELAYED OPERATOR LOGOUT

Press DOWN button to highlight MANAGE OPERATOR PINS, then press SELECT button.

OPERATOR PINS screen appears showing PINs for operators 1—5. Operator PINs 6—10 can be accessed by pressing DOWN button to highlight PINS 6—10, then pressing SELECT button.

Machine owner can clear operator PINs as follows:

Access list of operator PINs.

Press DOWN button to highlight desired operator PIN, then press SELECT button.

OPERATOR PIN UPDATE screen appears.

Press DOWN button to highlight CLEAR PIN, then press SELECT button.

CLEAR PIN screen appears.

Press SELECT button to clear PIN or press BACK button to return without clearing.

Machine owner can enter new operator PINs as follows:

Access list of operator PINs.

Press DOWN button to highlight next available unassigned operator PIN, then press SELECT button.

OPERATOR PIN UPDATE screen appears.

Press DOWN button to highlight ENTER PIN, then press SELECT button.

ENTER NEW PIN screen appears.

Enter new PIN on sealed switch module keypad, then press enter key.

Press BACK button to exit without change.

Display Unit—Main Menu—Security—Manage Transport PIN

The owner can assign and manage a temporary transport personal identification number (PIN) for use by maintenance personnel during service or while transporting machine.

When a transport PIN is assigned, owner also specifies a length of time from one to eight hours that the PIN is valid. This time is actual machine operating hours, which counts down only when machine is running.

The machine can be started any number of times using the transport PIN. Once the transport PIN time expires, the machine will continue to run until the engine stop switch is pressed. Thereafter, the engine will not restart unless a valid owner or operator PIN is entered.

If an owner or operator PIN is entered before transport PIN time expires, the time is reset to zero.

A valid transport PIN can be from one to eight numeric characters in length. Leading zeros are acceptable and recognized.

Access transport PIN management function as follows:

Press DOWN button at MAIN MENU to highlight SECURITY, then press SELECT button.

OWNER LOGIN screen appears.

Enter current owner PIN on sealed switch module numeric keypad, then press enter key.

SECURITY menu appears.

SECURITY menu items on display include:

- SECURITY (ON/OFF)
- CHANGE OWNER PIN
- MANAGE OPERATOR PINS
- MANAGE TRANSPORT PIN
- DELAYED OPERATOR LOGOUT

Press DOWN button to highlight MANAGE TRANSPORT PIN, then press SELECT button.

TRANSPORT PIN menu appears.

Press DOWN button to highlight desired action.

To clear transport PIN:

Press DOWN button to highlight CLEAR TRANSPORT PIN.

Press SELECT button to clear PIN.

PIN is cleared and verification message pops up on screen.

To change or enter new transport PIN:

Press DOWN button to highlight CHANGE TRANSPORT PIN.

Press SELECT button and CHANGE TRANSPORT PIN screen appears.

Enter new transport PIN on sealed switch module keypad, then press enter key or press BACK button to exit without change.

To set or change transport PIN time:

Press DOWN button at TRANSPORT PIN menu to highlight CHANGE TRANSPORT PIN TIME.

CHANGE TRANSPORT PIN TIME screen appears.

Press UP button to increase valid time or DOWN button to decrease time.

Press SELECT button to store desired PIN time.

NM00125,00006B9-19-20110104

Display Unit—Main Menu—Security—Delayed Operator Logout

This function is used to set the time interval allowed for logout after the machine is shut off. Once the logout time expires, the operator must enter a personal identification number (PIN) to restart the machine.

This feature simplifies the procedure and reduces the restart time when operator must periodically shut down machine for short wait times.

The delayed operator logout time can only be reset by owner.

To change delayed operator logout time:

Press DOWN button at main menu to highlight SECURITY, then press SELECT button.

OWNER LOGIN screen appears.

Enter current owner PIN on sealed switch module numeric keypad, then press enter key.

SECURITY menu appears.

SECURITY menu items on display include:

- SECURITY (ON/OFF)
- CHANGE OWNER PIN
- MANAGE OPERATOR PINS
- MANAGE TRANSPORT PIN
- DELAYED OPERATOR LOGOUT

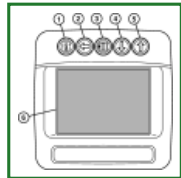
At SECURITY menu, press DOWN button to highlight DELAYED OPERATOR LOGOUT, then press SELECT button.

Press DOWN button to highlight desired delay time.

Press SELECT button to store new time.

NM00125,00006BA-19-20110104

Display Unit—Main Menu—Exhaust Filter



TX1051892-UN: Display Unit

LEGEND:

- | | | |
|-----------------|-------------------|---------------|
| 1 - INFO Button | 3 - SELECT Button | 5 - UP Button |
| 2 - BACK Button | 4 - DOWN Button | 6 - Display |

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

- LOW
- MODERATE
- HIGH
- VERY HIGH
- SERVICE

Auto cleaning is able to activate (if not disabled by the operator) when the exhaust filter restriction is anywhere between MODERATE and HIGH soot levels. Auto cleaning is no longer available if exhaust filter restriction reaches VERY HIGH or SERVICE soot levels.

Parked cleaning can only be initiated when the exhaust filter restriction reaches HIGH or VERY HIGH soot levels.

If exhaust filter restriction reaches SERVICE soot level, contact your authorized dealer.

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

The **EXHAUST FILTER** menu allows the operator to enable or disable auto filter cleaning. It also allows the operator to initiate a parked filter cleaning.

The submenus under MAIN MENU that appear on the display (6) include:

1. **CODES**
2. **SETTINGS**
3. **DIAGNOSTICS**
4. **SECURITY**
5. **EXHAUST FILTER**
6. **SOFTWARE DELIVERY**

7.

NOTE:

Only Grade Pro machines will show the seventh submenu.

MACHINE CONFIGURATION

Press DOWN button (4) at MAIN MENU to highlight EXHAUST FILTER.

Press SELECT button (3) to display EXHAUST FILTER menu.

EXHAUST FILTER menu items on display include:

FILTER SOOT LEVEL —Displays LOW, MODERATE, HIGH, VERY HIGH, or SERVICE to describe the soot level of restriction in the exhaust filter.

1. **AUTO CLEANING**
2. **PARKED CLEANING**

Press DOWN button to move to desired menu item.

Press SELECT button to activate chosen menu item.

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

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

Display Unit—Main Menu—Exhaust Filter—Auto Cleaning

**CAUTION:**

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

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

NOTE:

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

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

Auto cleaning is set from the factory to be enabled. If operating in conditions where it may be unsafe for elevated exhaust temperatures, auto cleaning can be disabled.

The **AUTO CLEANING** menu allows the operator to enable or disable the auto cleaning function for the exhaust filter.

At EXHAUST FILTER menu, press UP button or DOWN button to highlight AUTO CLEANING.

Press SELECT button to display AUTO CLEANING menu.

AUTO CLEANING menu items on display include:

- ENABLE
- DISABLED
- DURING CLEANING:
 - ELEVATED EXHAUST TEMPERATURE MAY EXIST
 - ELEVATED ENGINE IDLE SPEED MAY BE ACTIVE

Press UP or DOWN button to highlight desired function.

Press SELECT button to activate chosen function. Current function is active when a checkmark is displayed next to it.

Press BACK button to return to previous menu.

If auto cleaning is enabled, and operator chooses to disable, a pop-up will appear on the monitor for 3 seconds stating AUTO CLEANING DISABLED. The exhaust filter auto cleaning disabled indicator will also illuminate on the advanced display unit (ADU) and stay illuminated until operator enables auto cleaning again.

If filter restriction reaches the HIGH soot level while auto cleaning is disabled, a pop-up will appear on the monitor stating:

- EXHAUST FILTER RESTRICTED
PRESS SELECT TO ENABLE AUTO FILTER CLEANING

Pop-up remains on monitor until any button is pressed. If SELECT button is not pressed, pop-up will display again after 15 minutes.

If auto cleaning is disabled, and operator chooses to enable, a pop-up will appear on the monitor for 3 seconds stating AUTO CLEANING ENABLED. If filter restriction reaches the VERY HIGH soot level with auto cleaning enabled, a pop-up will appear on the monitor stating:

- EXHAUST FILTER RESTRICTED
ENGINE POWER LIMITED

PRESS SELECT FOR PARKED FILTER CLEANING

Pop-up remains on monitor until any button is pressed. If parked cleaning is not initiated the pop-up will return after 5 minutes and the CAUTION icon will display on monitor. If filter restrictions reaches the SERVICE level with auto cleaning enabled, a pop-up will appear on the monitor stating:

- EXHAUST FILTER RESTRICTED
ENGINE POWER LIMITED

CONTACT SERVICE REPRESENTATIVE FOR SERVICE FILTER CLEANING

Pop-up remains on monitor until any button is pressed and will return after 5 minutes. The flashing STOP icon and audible alarm will remain on until exhaust filter restriction is resolved.

NM00125,0000613-19-20101025

Display Unit—Main Menu—Exhaust Filter—Parked Cleaning



CAUTION:

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

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

IMPORTANT:

Avoid machine damage. Always park machine in a safe location and check for adequate fuel level before beginning exhaust filter parked cleaning.

For more information on exhaust filter cleaning. See Exhaust Filter. (Section 2-2.)

An exhaust filter parked cleaning can only be initiated if the filter restriction is at HIGH or VERY HIGH soot levels.

If a parked cleaning is initiated when the filter restriction is at LOW or MODERATE soot levels a pop-up will appear on the monitor stating EXHAUST FILTER CLEANING NOT REQUIRED. This message will display for 3 seconds, audible alarm will sound, and will return to EXHAUST FILTER menu.

If a parked cleaning is initiated when the filter restriction is at the SERVICE soot level, a pop-up will appear on the monitor stating SERVICE FILTER CLEANING REQUIRED. This message will display for 3 seconds, audible alarm will sound, and will return to EXHAUST FILTER menu. Contact your authorized dealer for exhaust filter cleaning at this soot level.

The **PARKED CLEANING** menu allows the operator to initiate a parked cleaning.

At EXHAUST FILTER menu, press UP button or DOWN button to highlight PARKED CLEANING.

Press SELECT button to display PARKED CLEANING menu.

PARKED CLEANING menu will first display:

- DO YOU WISH TO SHUTDOWN AFTER CLEANING?
- NO
- YES
- IF YES

MACHINE WILL SHUTDOWN AFTER CLEANING IS COMPLETE

To ensure that machine is in a safe state for parked cleaning, a monitor will display a checklist of conditions needed to continue. This screen will remain on until operator satisfies all conditions.

- HIGH EXHAUST TEMPERATURE WILL EXIST
- ELEVATED ENGINE IDLE SPEED WILL EXIST
- PARK BRAKE APPLIED
- ENGINE SPEED AT IDLE

Press SELECT button to start.

Press BACK button to exit.

If fuel level is below a predetermined level and a parked cleaning is initiated, a pop-up will appear stating:

- FUEL LEVEL LOW
- SELECT TO CONTINUE CLEANING
- BACK TO CANCEL CLEANING

NOTE:

Once parked cleaning is started, operator can go back and forth between the runtime screen and the menu screen by pressing the INFO button. All other monitor buttons will be inactive during the parked cleaning process until it is completed.

If SELECT button is pressed, the first stage of the parked cleaning process will be displayed to show preparation status:

- RELEASE PARK BRAKE OR INCREASE ENGINE SPEED TO CANCEL
PREPARING TO CLEAN EXHAUST FILTER

(bar is displayed and filled in as status progresses)

ESTIMATED TOTAL PERCENT COMPLETE XX%

MACHINE WILL SHUTDOWN AFTER CLEANING (only displays if auto shutdown is selected)

Once the first stage is complete, stage two of the parked cleaning process will be displayed to show cleaning progress:

- RELEASE PARK BRAKE, OR INCREASE ENGINE SPEED TO CANCEL
EXHAUST FILTER CLEANING IN PROGRESS

(bar is displayed and filled in as status progresses)

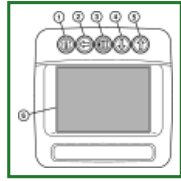
ESTIMATED TOTAL PERCENT COMPLETE XX%

MACHINE WILL SHUTDOWN AFTER CLEANING (only displays if auto shutdown is selected)

When cleaning is complete and auto shutdown is enabled, a full screen pop-up is displayed stating COMPLETE for 30 seconds before the machine shuts down, then the Auto Shutdown screen is shown until cancelled, or the machine turns off.

When cleaning is complete and auto shutdown is disabled, a full screen pop-up is displayed stating COMPLETE until operator presses SELECT button to confirm. Once SELECT button is pressed, monitor returns to runtime screen.

Display Unit—Main Menu—Software Delivery



TX1051892-UN: Display Unit

LEGEND:

- | | | |
|-----------------|-------------------|---------------|
| 1 - INFO Button | 3 - SELECT Button | 5 - UP Button |
| 2 - BACK Button | 4 - DOWN Button | 6 - Display |

The SOFTWARE DELIVERY menu allows for software updates to be downloaded remotely via JDLink™ cellular connection. Software updates are sent to the machine using Service ADVISOR™ remote (SAR).

A series of screens is used to prepare the machine and walk the operator or technician through the installation process. For more information on Service ADVISOR™ system, contact your authorized dealer.

NOTE:

SOFTWARE DELIVERY menu must be enabled by dealer. If menu has not been enabled, a pop-up will appear stating:

SOFTWARE DELIVERY HAS NOT BEEN ENABLED

SEE DEALER TO ENABLE

The submenus under MAIN MENU that appear on the display (6) include:

1. **CODES**
2. **SETTINGS**
3. **DIAGNOSTICS**
4. **SECURITY**
5. **EXHAUST FILTER**
6. **SOFTWARE DELIVERY**

7.

NOTE:

Only Grade Pro machines will show the seventh submenu.

MACHINE CONFIGURATION

Press DOWN (4) button at MAIN MENU to highlight SOFTWARE DELIVERY.

Press SELECT (3) button to display SOFTWARE DELIVERY menu.

SOFTWARE DELIVERY menu items on display include:

- SOFTWARE UPDATE

Press DOWN button to highlight SOFTWARE UPDATE.

Press SELECT button to display SOFTWARE UPDATE menu.

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Service ADVISOR is a trademark of Deere & Company

NM00125,0000678-19-20101221

Display Unit—Main Menu—Software Delivery—Software Update

The **SOFTWARE UPDATE** menu is for receiving Service ADVISOR™ Remote (SAR) software downloads and installations to the machine. Downloads can take place with the engine running and machine operating. However, installation of the software can only process if the engine is not running and park brake applied. If conditions exist that will not allow the download or installation to happen, screens will appear on the monitor advising what needs to be done in order to continue. For more information, contact your authorized John Deere dealer.

At SOFTWARE DELIVERY menu, press SELECT button to display SOFTWARE UPDATE menu.

NOTE:

To avoid delays, it will be helpful at this point to make sure engine is not running, park brake is applied, and the SOFTWARE TERMS AND CONDITIONS have been read before continuing. (Find SOFTWARE TERMS AND CONDITIONS at the beginning of this manual.)

Press SELECT again and the SOFTWARE UPDATE menu will display a series of screens depending on the status of the update and the status of the machine.

If update is already downloaded, the monitor will display the following screen:

DOWNLOAD COMPLETE

READY TO INSTALL

After 3 seconds, the monitor will then display a SOFTWARE LICENSE AGREEMENT screen stating:

PRESS SELECT TO ACCEPT THE TERMS AND CONDITIONS DEFINED IN THE OPERATOR'S MANUAL AND TO BEGIN LOADING THE NEW SOFTWARE UPDATE

Once SELECT is pressed, installation will take place if all conditions are acceptable. A warning screen will appear for 5 seconds stating:

WARNING**DO NOT PRESS STOP BUTTON ONCE SOFTWARE UPDATE HAS STARTED**

The following screen will then appear:

SOFTWARE INSTALLATION MAY TAKE 10 MINUTES**SCREEN MAY BE BLANK**

When completed, the monitor will display:

SOFTWARE INSTALLATION COMPLETED SUCCESSFULLY**PLEASE CYCLE POWER**

The machine is set at the factory to auto approve software downloads, but if the dealer or technician has changed this setting to notify operator before downloading, the following screen will appear:

NEW SOFTWARE AVAILABLE FOR DOWNLOAD

1. APPROVE DOWNLOAD
2. REJECT DOWNLOAD

Press UP or DOWN button to highlight desired function.

Press SELECT button to activate chosen function.

Press BACK button to return to previous menu.

If APPROVE DOWNLOAD is selected, a pop-up will appear on the monitor for 5 seconds stating:

SOFTWARE DOWNLOADING**NORMAL MACHINE OPERATION MAY CONTINUE**

(Monitor will go back to the runtime screen after the pop-up disappears and normal machine operation may continue while the software is being downloaded.)

If REJECT DOWNLOAD is selected, a pop-up will appear on the monitor for 5 seconds stating:

SOFTWARE DOWNLOAD REJECTED

(Monitor will go back to the runtime screen after the pop-up disappears and normal machine operation may continue.)

NOTE:

To get rejected software downloaded at some other time, dealer interaction will be necessary.

To change the setting back to auto approve software downloads, contact your authorized John Deere dealer.

If software download was sent when machine power was off, upon cycle start up and initial display check, an alarm will beep and runtime screen will have a pop-up displayed stating:

SOFTWARE DOWNLOAD IS AVAILABLE

“SELECT” TO DOWNLOAD

“BACK” TO ASK LATER

If software is ready to install upon cycle start up and initial display check, an alarm will beep and runtime screen will have a pop-up displayed stating:

SOFTWARE READY TO INSTALL

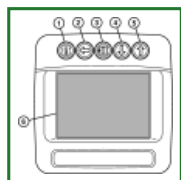
“SELECT” TO GO TO SOFTWARE UPDATE MENU

“BACK” TO ASK LATER

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OUT4001,00006BF-19-20101112

Display Unit—Main Menu—Machine Configuration (Grade Pro Machines Only)



TX1051892-UN: Display Unit

LEGEND:

1 - INFO Button

3 - SELECT Button

5 - UP Button

2 - BACK Button

4 - DOWN Button

6 - Display

This function is used to provide a method to recalibrate the sensors used for the cross slope system as well as the hydraulic valves. Calibrating is required to account for general machine wear and when service is performed on associated areas.

The submenus under MAIN MENU that appear on the display include:

1. **CODES**
2. **SETTINGS**
3. **DIAGNOSTICS**
4. **SECURITY**
5. **EXHAUST FILTER**
6. **SOFTWARE DELIVERY**

7.

NOTE:

Only Grade Pro machines will show the seventh submenu.

MACHINE CONFIGURATION—

At the MAIN MENU, press DOWN button to highlight MACHINE CONFIGURATION.

Press SELECT button to display the MACHINE CONFIGURATION menu.

MACHINE CONFIGURATION menu items on display include:

- **CROSS SLOPE SENSOR CAL**
- **VALVE CALS**
- **CONTROL LEVER SWITCHES**

Press DOWN button to move to desired menu item.

Press SELECT button to activate chosen menu item.

Press BACK button to return to previous screen.

NM00125,00005E2-19-20101202

Display Unit—Main Menu—Machine Configuration—Cross Slope Sensor Cal—Roll Cal (Grade Pro Machines Only)

Depending on the application, periodic calibration of the roll sensor will help the cross slope system operate properly. Always verify proper adjustment of the blade side shift wear inserts, blade circle and draft frame wear inserts, and blade lift cylinder sockets prior to calibrating.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight CROSS SLOPE SENSOR CAL.

Press SELECT button to display cross slope sensor cal menu.

The submenus under CROSS SLOPE SENSOR CAL menu display include:

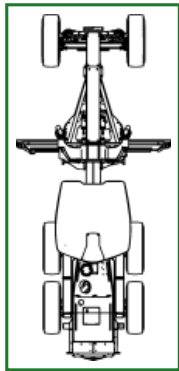
- ROLL CAL
- CIRCLE ROTATE CAL
- PITCH CAL
- ROLL AND PITCH CAL

Press DOWN button to highlight ROLL CAL.

Press SELECT button to display ROLL CAL screen.



T206413A-UN: Wheels in Vertical Position



TX1057443-UN: Draft Frame Centered Under Machine

For best results, calibration should be performed on a hard, flat surface. If a hard surface isn't available, blocks may be positioned under each end of the blade so a consistent surface is available to set the blade on. Care should be taken not to depress the blade into the ground while performing the calibration as inconsistent results will

occur.

To begin the calibration, align the front and rear frames so there is zero articulation angle.

Turn the front wheels so they are straight.

Set the wheel lean angle so there is zero wheel lean.

NOTE:

Some amount of camber exists on the front wheels. Matching the angle each wheel leans will result in zero wheel lean angle.

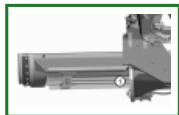
Position the blade side shift so that the blade is centered under the machine.

Pitch the blade all the way back.

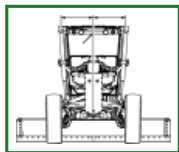
Raise all front and rear attachments off the ground.

Press SELECT.

Align the notch (1) located on the left rear of the draft frame with the outside surface of the left supporting arm that holds the blade.



TX1053063A-UN: Circle Rotate Alignment



TX1057530-UN: Blade 25 mm (1 in.) Off Ground



TX1057563A-UN: Blade Float Buttons

LEGEND:

1 - Notch

2 - Left Blade Float Button

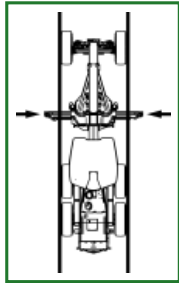
3 - Right Blade Float Button

Position the blade approximately 25 mm (1 in.) off of the ground. Use circle side shift lever to center the draft frame under the machine.

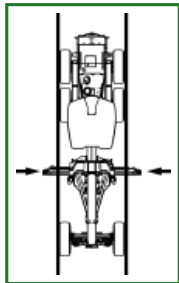
Press both blade float switch buttons (2 and 3) to float the blade to the ground.

Press SELECT.

Mark the ground at the following locations:



TX1057520-UN: View With Wheels Aligned



TX1057521-UN: Wheels Aligned-Machine Facing Opposite Direction

- At each end of the blade
- Along each wheel in the direction of travel

Press SELECT.

Raise the blade off the ground.

NOTE:

For best results, no adjustments should be made to the articulation angle, wheel lean angle, or any other function, except front steering. If repositioning of these functions is required to turn the machine around, care should be taken to reposition them as directed above before continuing the calibration.

Turn the machine around so it is facing the opposite direction. Align the front and rear wheels with the marks made in the previous steps. Position the machine so that the blade will be set on the ground in the same spot. Small adjustments of the blade side shift may be made as required to ensure that the ends of the blade are positioned in the same spot as the previous step.

Press SELECT.

Position the blade approximately 25 mm (1 in.) off of the ground.

Press both blade float switch buttons to float the blade to the ground.

Press SELECT again. Calibration process is complete.

Press BACK button to return to previous screen.

NM00125,0000794-19-20110103

Display Unit—Main Menu—Machine Configuration—Cross Slope Sensor Cal—Circle Rotate Cal (Grade Pro Machines Only)

The sensor used to detect the rotation of the blade can be calibrated by aligning the notch located on the left rear of the draft frame with the outside surface of the left supporting arm that holds the blade.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight CROSS SLOPE SENSOR CAL.

Press SELECT button to display CROSS SLOPE SENSOR CAL menu.

The submenus under CROSS SLOPE SENSOR CAL menu display include:

- ROLL CAL
- CIRCLE ROTATE CAL
- PITCH CAL
- ROLL AND PITCH CAL

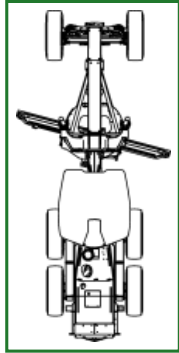
Press DOWN button to highlight CIRCLE ROTATE CAL.

Press SELECT button to display CIRCLE ROTATE CAL.

NOTE:

Use circle side shift lever to shift the draft frame to the right to allow better visibility of the alignment notch.

Start with the blade rotated approximately 15 degrees to the right as shown.



TX1057541-UN: Blade Rotated 15 Degrees To Right



TX1053063A-UN: Circle Rotate Alignment

LEGEND:

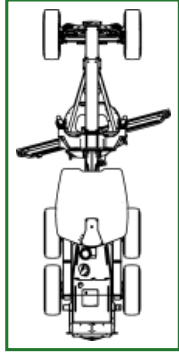
1 - Notch

Slowly rotate the blade back towards center until the notch (1) on the draft frame is aligned with the outside surface of the left supporting arm.

NOTE:

If the blade is rotated past the notch, reposition the blade at approximately 15 degrees to the right and try again.

Press SELECT.



TX1057540-UN: Blade Rotated 15 Degrees To Left

Position the blade so that it is rotated approximately 15 degrees to the left as shown.

Slowly rotate the blade back towards center until the notch on the draft frame is aligned with the outside surface of the left supporting arm.

NOTE:

If the blade is rotated past the notch, reposition the blade at approximately 15 degrees to the left and try again.

Press SELECT again. Calibration process is complete.

Press BACK button to return to previous screen.

NM00125,0000795-19-20101202

Display Unit—Main Menu—Machine Configuration—Cross Slope Sensor Cal—Pitch Cal (Grade Pro Machines Only)

The pitch calibration is used to calibrate both the pitch sensor and the mainfall sensor used in the cross slope system.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight CROSS SLOPE SENSOR CAL.

Press SELECT button to display CROSS SLOPE SENSOR CAL menu.

The submenus under CROSS SLOPE SENSOR CAL menu display include:

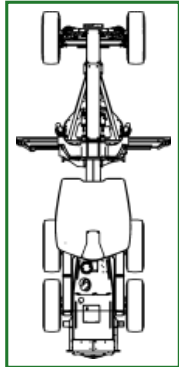
- ROLL CAL
- CIRCLE ROTATE CAL
- PITCH CAL
- ROLL AND PITCH CAL

Press DOWN button to highlight PITCH CAL.

Press SELECT button to display PITCH CAL screen.



T206413A-UN: Wheels in Vertical Position



TX1057443-UN: Top View

For best results calibration should be performed on a hard, flat surface.

To begin the calibration, align the front and rear frames so there is zero articulation angle.

Turn the front wheels so they are straight.

Set the wheel lean angle so there is zero wheel lean.

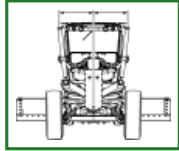
NOTE:

Note that some amount of camber exists on the front wheels. Matching the angle each wheel leans will result in zero wheel lean angle.

Raise all front and rear attachments off the ground.

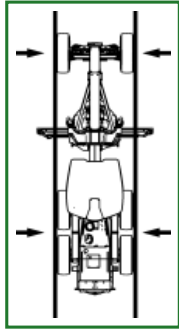
Press SELECT.

Position the blade all the way up, using circle side shift lever to center the draft frame under the machine to allow maximum raise of the draft frame.

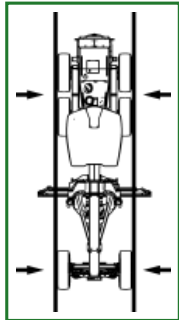


TX1057534-UN: Blade Raised

Press SELECT.



TX1057532-UN: Top View Forward



TX1057533-UN: Top View Backward

Mark the ground at the following locations:

- At the center of the front wheels
- At the center of the rear tandems
- Along each wheel in the direction of travel

Press SELECT.

NOTE:

For best results, no adjustments should be made to the articulation angle, wheel lean angle, or any other function, except the front wheels. If repositioning of these functions is required to turn the machine around, care should be taken to reposition them as directed above before continuing the calibration.

Turn the machine around so it is facing the opposite direction. Align the front wheels with the marks made for the center of the rear tandems and rear wheels with the marks made for the front wheels.

Press SELECT again. Calibration process is complete.

Press BACK button to return to previous screen.

NM00125,0000796-19-20101202

Display Unit—Main Menu—Machine Configuration—Cross Slope Sensor Cal—Roll and Pitch Cal (Grade Pro Machines Only)

Depending on the application, periodic calibration of the roll and pitch sensors will help the cross slope system operate properly. Always verify proper adjustment of the blade side shift wear inserts, blade circle and draft frame wear inserts, and blade lift cylinder sockets prior to calibrating. This process will also calibrate the mainfall sensor used in the cross slope system.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight CROSS SLOPE SENSOR CAL.

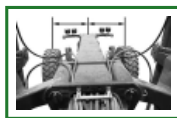
Press SELECT button to display CROSS SLOPE SENSOR CAL cal menu.

The submenus under CROSS SLOPE SENSOR CAL menu display include:

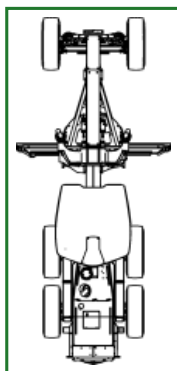
- ROLL CAL
- CIRCLE ROTATE CAL
- PITCH CAL
- ROLL AND PITCH CAL

Press DOWN button to highlight ROLL AND PITCH CAL.

Press SELECT button to display ROLL AND PITCH CAL screen.



T206413A-UN: Wheels in Vertical Position



TX1057443-UN: Top View

For best results, calibration should be performed on a hard, flat surface like a concrete pad. If a hard surface isn't available, blocks may be positioned under each end of the blade so a consistent surface is available to set the blade on. Care should be taken not to depress the blade into the ground while performing the calibration as inconsistent results will occur.

To begin the calibration, align the front and rear frames so there is zero articulation angle.

Turn the front wheels so they are straight.

Set the wheel lean angle so there is zero wheel lean (Note that some amount of camber exists on the front wheels. Matching the angle each wheel leans will result in zero wheel lean angle).

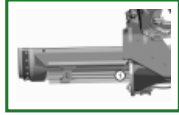
Position the blade side shift so that the blade is centered under the machine.

Pitch the blade all the way back.

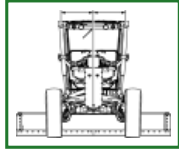
Raise all front and rear attachments off the ground.

Press SELECT.

Align the notch (1) located on the left rear of the draft frame with the outside surface of the left supporting arm that holds the blade.



TX1053063A-UN: Circle Rotate Alignment



TX1057530-UN: Blade 25 mm (1 in.) Off Ground



TX1057563A-UN: Blade Float Buttons

LEGEND:

1 - Notch

2 - Left Blade Float Button

3 - Right Blade Float Button

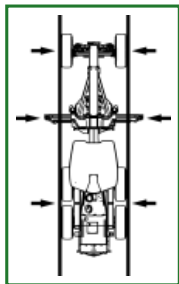
Press SELECT.

Position the blade approximately 25 mm (1 in.) off of the ground. Use circle side shift lever to center the draft frame under the machine.

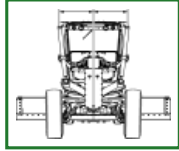
Press both blade float switch buttons (2 and 3) to float the blade to the ground.

Press SELECT.

Mark the ground at the following locations:



TX1057536-UN: Ground Marks



TX1057534-UN: Blade Raised

- Each end of the blade
- Along each wheel in the direction of travel
- At the center of the front wheels
- At the center of the rear tandems

Press SELECT.

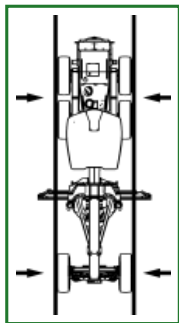
Position the blade all the way up, using circle side shift lever to center the draft frame under the machine to allow maximum raise of the draft frame.

Press SELECT.

NOTE:

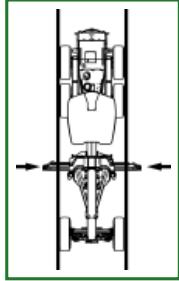
For best results, no adjustments should be made to the articulation angle, wheel lean angle, or any other function, except the front steering. If repositioning of these functions is required to turn the machine around, care should be taken to reposition them as directed above before continuing the calibration.

Turn the machine around so it is facing the opposite direction. Align the front wheels with the marks made for the center of the rear tandems and align the center of the rear tandems with the marks made for the front wheels.



TX1057533-UN: Top View Backward

Press SELECT.



TX1057521-UN: Wheels Aligned-Machine Facing Opposite Direction

Now, position the machine so that the blade will be set in the same spot on the ground. Small adjustments of the blade side shift may be made as required to ensure that the ends of the blade are positioned in the same spot as the blade was previously positioned.

Press SELECT.

Position the blade approximately 25 mm (1 in.) off of the ground.

Press blade float switch buttons to float the blade to the ground.

Press SELECT again. Calibration process is complete.

Press BACK button to return to previous screen.

NM00125,0000797-19-20110103

Display Unit—Main Menu—Machine Configuration—Valve Cals (Grade Pro Machines Only)

The finger tip controls on this machine can be recalibrated to correct for performance changes over time. This calibration procedure can be run on an individual hydraulic function and can be performed by the machine owner.

NOTE:

If valve section was replaced, new calibration data must be entered. Contact authorized John Deere Dealer.

The calibration should be run when the following changes are observed:

- Inconsistent response from function to function
- Change in the response of a function over time
- Replacing a hydraulic valve section or other hydraulic valve components

Failure to properly position function during calibration procedure will cause an incorrect calibration.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight VALVE CALS.

Press SELECT button to display VALVE CALS menu.

The submenus under VALVE CALS menu display include:

Screen 1

- ARTICULATION
- BLADE SIDE SHIFT
- CIRCLE ROTATE
- CIRCLE SIDE SHIFT
- LEFT BLADE LIFT
- RIGHT BLADE LIFT
- WHEEL LEAN
- MORE

Screen 2

- STEERING
- BLADE PITCH
- REAR AUX 1
- REAR AUX 2
- REAR AUX 3
- FRONT AUX 1
- FRONT AUX 2
- FRONT AUX 3

Press DOWN button to move to desired menu item.

Press SELECT button to activate chosen menu item.

Press BACK button to return to previous screen.

Display Unit—Main Menu—Machine Configuration—Valve Cals—Articulation (Grade Pro Machines Only)

The calibration should be run when the following changes are observed:

- Inconsistent response from function to function
- Change in the response of a function over time
- Replacing a hydraulic valve section or other hydraulic valve components

Failure to properly position function during calibration procedure will cause an incorrect calibration.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight VALVE CALS.

Press SELECT button to display VALVE CALS menu.

The submenus under VALVE CALS menu display include:

Screen 1

- ARTICULATION
- BLADE SIDE SHIFT
- CIRCLE ROTATE
- CIRCLE SIDE SHIFT
- LEFT BLADE LIFT
- RIGHT BLADE LIFT
- WHEEL LEAN
- MORE

Screen 2

- STEERING
- BLADE PITCH
- REAR AUX 1
- REAR AUX 2
- REAR AUX 3
- FRONT AUX 1
- FRONT AUX 2
- FRONT AUX 3

Press DOWN button to highlight ARTICULATION.

Press SELECT button to display ARTICULATION cal menu.

The following steps should be completed to calibrate the articulation valve:

1. Position the machine on a level surface with the gear selector in PARK.
2. Align the machine articulation angle to straight.
3. Stop engine.
4. Install the articulation locking pin. See Locking Machine Frame. (Section 3-2.)
5. Start machine.
6. The following conditions must be maintained throughout the calibration procedure:
 - Place the gear selector in PARK.
 - Enable the hydraulics on the sealed switch module and lower both armrests.
 - Turn off both cross slope and electronic grade control on the sealed switch module.
 - Set the engine speed to 1600 rpm +/- 100 rpm.
 - Warm up the hydraulic oil temperature to a minimum of 38°C (100°F). Cycle functions as required prior to beginning calibration to warm up hydraulic oil.
7. Select articulation from the hydraulic valve calibration menu.
8. Once all conditions have been satisfied, the calibration routine will proceed.

9.

NOTE:

Failure to position the machine so that it is fully articulated against the pin will cause an incorrect calibration. Move the control lever forward several times to ensure that the machine is fully articulated against the locking pin. Fully articulating against the stops (not using the locking pin) will not provide acceptable results.

When prompted to ARTICULATE ALL THE WAY TO THE LEFT, the articulation control lever should be moved forward, articulating the machine against the locking pin.

10. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence. To abort the calibration procedure, press BACK on the monitor.
11. When calibration is complete for the left side, the monitor will prompt to ARTICULATE ALL THE WAY TO THE RIGHT, the articulation control lever should be moved back, articulating the machine against the locking pin. Move the control lever back several times to ensure the machine is fully against the pin.

12. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence.
13. Wait for the calibration complete message. Calibration values are saved once the monitor displays CALIBRATION SUCCESSFUL.

NOTE:

If calibration fails, verify that the function is properly positioned and that no hydraulic function was actuated during the ramping sequence. If problem persists, contact your authorized dealer.

14. Turn off machine.
15. Remove articulation locking pin.

NM00125,0000799-19-20110104

Display Unit—Main Menu—Machine Configuration—Valve Cals—Blade Side Shift (Grade Pro Machines Only)

The calibration should be run when the following changes are observed:

- Inconsistent response from function to function
- Change in the response of a function over time
- Replacing a hydraulic valve section or other hydraulic valve components

Failure to properly position function during calibration procedure will cause an incorrect calibration.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight VALVE CALS.

Press SELECT button to display VALVE CALS menu.

The submenus under VALVE CALS menu display include:

Screen 1

- ARTICULATION
- BLADE SIDE SHIFT

- CIRCLE ROTATE
- CIRCLE SIDE SHIFT
- LEFT BLADE LIFT
- RIGHT BLADE LIFT
- WHEEL LEAN
- MORE

Screen 2

- STEERING
- BLADE PITCH
- REAR AUX 1
- REAR AUX 2
- REAR AUX 3
- FRONT AUX 1
- FRONT AUX 2
- FRONT AUX 3

Press DOWN button to highlight BLADE SIDE SHIFT.

Press SELECT button to display BLADE SIDE SHIFT cal menu.

The following steps should be completed to calibrate the blade side shift valve:

1. Position the machine on a level surface with the gear selector in PARK.
2. The following conditions must be maintained throughout the calibration procedure:
 - Place the gear selector in PARK.
 - Enable the hydraulics on the sealed switch module and lower both armrests.
 - Turn off both cross slope and electronic grade control on the sealed switch module.
 - Set the engine speed to 1600 rpm +/- 100 rpm.
 - Warm up the hydraulic oil temperature to a minimum of 38°C (100°F). Cycle functions as required prior to beginning calibration to warm up hydraulic oil.
3. Position the blade approximately 15 cm (6 inches) off the ground.
4. Select BLADE SIDE SHIFT from the hydraulic valve calibration menu.
5. Once all conditions have been satisfied, the calibration routine will proceed.

6.

NOTE:

Failure to position the blade so that the blade side shift cylinder is fully extended will cause an incorrect calibration. Move the control lever forward several times to ensure that the cylinder is fully extended.

When prompted to BLADE SIDE SHIFT ALL THE WAY TO THE LEFT, the blade side shift control lever should be moved forward to fully shift the blade to the left side.

7. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence. To abort the calibration procedure, press BACK on the monitor.
8. When calibration is complete for the left side, the monitor will prompt to BLADE SIDE SHIFT ALL THE WAY TO THE RIGHT. The blade side shift control lever should be moved back, shifting the blade to the right. Move the control lever back several times to ensure the cylinder is fully retracted.
9. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence.
10. Wait for the calibration complete message. Calibration values are saved once the monitor displays CALIBRATION SUCCESSFUL.

NOTE:

If calibration fails, verify that the function is properly positioned and that no hydraulic function was actuated during the ramping sequence. If problem persists, contact your authorized dealer.

NM00125,000079A-19-20110104

Display Unit—Main Menu—Machine Configuration—Valve Cals—Circle Rotate Cal (Grade Pro Machines Only)

The calibration should be run when the following changes are observed:

- Inconsistent response from function to function
- Change in the response of a function over time
- Replacing a hydraulic valve section or other hydraulic valve components

Failure to properly position function during calibration procedure will cause an incorrect calibration.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight VALVE CALS.

Press SELECT button to display valve cal menu.

The submenus under valve cal menu display include:

Screen 1

- ARTICULATION
- BLADE SIDE SHIFT
- CIRCLE ROTATE
- CIRCLE SIDE SHIFT
- LEFT BLADE LIFT
- RIGHT BLADE LIFT
- WHEEL LEAN
- MORE

Screen 2

- STEERING
- BLADE PITCH
- REAR AUX 1
- REAR AUX 2
- REAR AUX 3
- FRONT AUX 1
- FRONT AUX 2
- FRONT AUX 3

Press DOWN button to highlight CIRCLE ROTATE.

Press SELECT button to display CIRCLE ROTATE cal menu.

The following steps should be completed to calibrate the circle rotate valve:

1.

NOTE:

A stationary object such as a loading dock is required to calibrate the circle rotate function. During the calibration routine, the blade will be rotated at full power against the object. It is not acceptable to position the blade against any part of the motor grader or the ground. Shifting the blade will reduce the force applied by the blade against the object.

Position the machine on a level surface with the gear selector in PARK.

2. The following conditions must be maintained throughout the calibration procedure:

- Place the gear selector in PARK.

- Enable the hydraulics on the sealed switch module and lower both armrests.
 - Turn off both cross slope and electronic grade control on the sealed switch module.
 - Set the engine speed to 1600 rpm +/- 100 rpm.
 - Warm up the hydraulic oil temperature to a minimum of 38°C (100°F). Cycle functions as required prior to beginning calibration to warm up hydraulic oil.
3. Position the blade approximately 15 cm (6 inches) above the ground with the blade shifted to the right (the blade side shift control lever should be moved back, shifting the blade to the right.)
 4. Select CIRCLE ROTATE from the hydraulic valve calibration menu.
 5. Once all conditions have been satisfied, the calibration routine will proceed.
-

6.



TX1080239A-UN: Right End of Blade Against Loading Dock

When prompted to ROTATE RIGHT END OF THE BLADE AGAINST A STATIONARY OBJECT UNTIL BLADE STALLS, the circle rotate control lever should be moved forward to rotate the front of the blade on the right end against a stationary object such as a loading dock until the blade is stalled.

NOTE:

Failure to position the blade so that the circle is stalled will cause an incorrect calibration. Move the control lever forward several times to ensure that the circle is stalled.

7. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence. To abort the calibration procedure, press BACK on the monitor.
8. When calibration is complete for the right side, the monitor will prompt to ROTATE LEFT END OF THE BLADE AGAINST A STATIONARY OBJECT UNTIL BLADE STALLS. Position the blade so that it is shifted to the left (the blade side shift control lever should be moved forward, shifting the blade to the left.)

9.

NOTE:

If machine needs to be repositioned to place the blade against a stationary object during the calibration procedure, return the gear selector to the PARK position to resume the calibration procedure.

Position the machine with the front of the blade on the left end against a stationary object. Move the circle rotate control lever back several times to ensure that the circle is stalled.

10. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence.
11. Wait for the calibration complete message. Calibration values are saved once the monitor displays CALIBRATION SUCCESSFUL.

NOTE:

If calibration fails, verify that the function is properly positioned and that no hydraulic function was actuated during the ramping sequence. If problem persists, contact your authorized dealer.

NM00125,000079B-19-20110104

Display Unit—Main Menu—Machine Configuration—Valve Cals—Circle Side Shift Cal (Grade Pro Machines Only)

The calibration should be run when the following changes are observed:

- Inconsistent response from function to function
- Change in the response of a function over time
- Replacing a hydraulic valve section or other hydraulic valve components

Failure to properly position function during calibration procedure will cause an incorrect calibration.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight VALVE CALS.

Press SELECT button to display VALVE CALS menu.

The submenus under VALVE CALS menu display include:

Screen 1

- ARTICULATION
- BLADE SIDE SHIFT
- CIRCLE ROTATE
- CIRCLE SIDE SHIFT
- LEFT BLADE LIFT

- RIGHT BLADE LIFT
- WHEEL LEAN
- MORE

Screen 2

- STEERING
- BLADE PITCH
- REAR AUX 1
- REAR AUX 2
- REAR AUX 3
- FRONT AUX 1
- FRONT AUX 2
- FRONT AUX 3

Press DOWN button to highlight CIRCLE SIDE SHIFT.

Press SELECT button to display CIRCLE SIDE SHIFT cal menu.

The following steps should be completed to calibrate the circle side shift valve:

1.

NOTE:

A stationary object such as a loading dock is required to calibrate the circle rotate function. During the calibration routine, the blade will be rotated at full power against the object. It is not acceptable to position the blade against any part of the motor grader or the ground. Shifting the blade will reduce the force applied by the blade against the object.

Position the machine on a level surface with the gear selector in PARK.

2. The following conditions must be maintained throughout the calibration procedure:

- Place the gear selector in PARK.
- Enable the hydraulics on the sealed switch module and lower both armrests.
- Turn off both cross slope and electronic grade control on the sealed switch module.
- Set the engine speed to 1600 rpm +/- 100 rpm.
- Warm up the hydraulic oil temperature to a minimum of 38°C (100°F). Cycle functions as required prior to beginning calibration to warm up hydraulic oil.

3. Position the blade approximately 15 cm (6 inches) off the ground.

4. Select CIRCLE SIDE SHIFT from the hydraulic valve calibration menu.

5. Once all conditions have been satisfied, the calibration routine will proceed.

6.

NOTE:

The draft frame should be positioned so that the blade is approximately 15 cm (6 inches) above the ground to allow clearance between the draft frame and the saddle locking bar to allow the circle to be fully shifted. Failure to position the draft frame so that the circle side shift cylinder is fully retracted will cause an incorrect calibration. Move the control lever forward several times to ensure that the cylinder is fully retracted.

When prompted to CIRCLE SIDE SHIFT ALL THE WAY TO THE LEFT, the circle side shift control lever should be moved forward to fully shift the circle to the left side with the cylinder fully retracted.

7. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence. To abort the calibration procedure, press BACK on the monitor.
8. When calibration is complete for the left side, the monitor will prompt to CIRCLE SIDE SHIFT ALL THE WAY TO THE RIGHT. The circle side shift control lever should be moved back, shifting the circle to the right with the cylinder fully extended. Move the control lever back several times to ensure the cylinder is fully extended.
9. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence.
10. Wait for the calibration complete message. Calibration values are saved once the monitor displays CALIBRATION SUCCESSFUL.

NOTE:

If calibration fails, verify that the function is properly positioned and that no hydraulic function was actuated during the ramping sequence. If problem persists, contact your authorized dealer.

NM00125,000079D-19-20110104

Display Unit—Main Menu—Machine Configuration—Valve Cals—Left Blade Lift Cal (Grade Pro Machines Only)

The calibration should be run when the following changes are observed:

- Inconsistent response from function to function
- Change in the response of a function over time
- Replacing a hydraulic valve section or other hydraulic valve components

Failure to properly position function during calibration procedure will cause an incorrect calibration.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight VALVE CALS.

Press SELECT button to display VALVE CALS menu.

The submenus under VALVE CALS menu display include:

Screen 1

- ARTICULATION
- BLADE SIDE SHIFT
- CIRCLE ROTATE
- CIRCLE SIDE SHIFT
- LEFT BLADE LIFT
- RIGHT BLADE LIFT
- WHEEL LEAN
- MORE

Screen 2

- STEERING
- BLADE PITCH
- REAR AUX 1
- REAR AUX 2
- REAR AUX 3
- FRONT AUX 1
- FRONT AUX 2
- FRONT AUX 3

Press DOWN button to highlight LEFT BLADE LIFT.

Press SELECT button to display LEFT BLADE LIFT cal menu.

The following steps should be completed to calibrate the left blade lift valve:

1. Position the machine on a level surface with the gear selector in PARK.
2. The following conditions must be maintained throughout the calibration procedure:
 - Place the gear selector in PARK.
 - Enable the hydraulics on the sealed switch module and lower both armrests.

- Turn off both cross slope and electronic grade control on the sealed switch module.
 - Set the engine speed to 1600 +/- 100 rpm.
 - Warm up the hydraulic oil temperature to a minimum of 38°C (100°F). Cycle functions as required prior to beginning calibration to warm up hydraulic oil.
3. Place the blade in the left bank position. See Moving Blade to Bank Position. (Section 2-2.)
 4. Select LEFT BLADE LIFT from the hydraulic valve calibration menu.
 5. Once all conditions have been satisfied, the calibration routine will proceed.
-

6.

NOTE:

The blade should be fully off the ground during this step. Failure to position the blade so that the blade lift cylinder is fully extended will cause an incorrect calibration. Move the control lever forward several times to ensure that the cylinder is fully extended.



TX1064260A-UN: Saddle in Bank Position with Left Cylinder Fully Extended

When prompted to PLACE SADDLE IN LEFT BANK POSITION AND FULLY EXTEND LEFT BLADE LIFT CYLINDER, the left blade lift control lever should be moved forward to fully extend the left blade lift cylinder.

7. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence. To abort the calibration procedure, press BACK on the monitor.
-
8. When calibration is complete for extended cylinder, the monitor will prompt to FULLY RETRACT LEFT BLADE LIFT CYLINDER. The left blade lift control lever should be moved back, retracting the lift cylinder. Move the control lever back several times to ensure the cylinder is fully retracted.



TX1064261A-UN: Saddle in Bank Position with Left Cylinder Fully Retracted

9. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence.
10. Wait for the calibration complete message. Calibration values are saved once the monitor displays CALIBRATION SUCCESSFUL.

NOTE:

If calibration fails, verify that the function is properly positioned and that no hydraulic function was actuated during the ramping sequence. If problem persists, contact your authorized dealer.

NM00125,000079E-19-20110104

Display Unit—Main Menu—Machine Configuration—Valve Cals—Right Blade Lift Cal (Grade Pro Machines Only)

The calibration should be run when the following changes are observed:

- Inconsistent response from function to function
- Change in the response of a function over time
- Replacing a hydraulic valve section or other hydraulic valve components

Failure to properly position function during calibration procedure will cause an incorrect calibration.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight VALVE CALS.

Press SELECT button to display VALVE CALS menu.

The submenus under VALVE CALS menu display include:

Screen 1

- ARTICULATION
- BLADE SIDE SHIFT
- CIRCLE ROTATE
- CIRCLE SIDE SHIFT
- LEFT BLADE LIFT

- RIGHT BLADE LIFT
- WHEEL LEAN
- MORE

Screen 2

- STEERING
- BLADE PITCH
- REAR AUX 1
- REAR AUX 2
- REAR AUX 3
- FRONT AUX 1
- FRONT AUX 2
- FRONT AUX 3

Press DOWN button to highlight RIGHT BLADE LIFT.

Press SELECT button to display RIGHT BLADE LIFT cal menu.

The following steps should be completed to calibrate the right blade lift valve:

1. Position the machine on a level surface with the gear selector in PARK.
2. The following conditions must be maintained throughout the calibration procedure:
 - Place the gear selector in PARK.
 - Enable the hydraulics on the sealed switch module and lower both armrests.
 - Turn off both cross slope and electronic grade control on the sealed switch module.
 - Set the engine speed to 1600 rpm +/- 100 rpm.
 - Warm up the hydraulic oil temperature to a minimum of 38°C (100°F). Cycle functions as required prior to beginning calibration to warm up hydraulic oil.
3. Place the blade in the right bank position. See Moving Blade to Bank Position. (Section 2-2.)
4. Select RIGHT BLADE LIFT from the hydraulic valve calibration menu.
5. Once all conditions have been satisfied, the calibration routine will proceed.

-
6. **NOTE:**

The blade should be fully off the ground during this step. Failure to position the blade so that the blade lift cylinder is fully extended will cause an incorrect calibration. Move the control lever forward several times to ensure that the cylinder is fully extended.



TX1054526A-UN: Saddle in Bank Position with Right Cylinder Fully Extended

When prompted to PLACE SADDLE IN RIGHT BANK POSITION AND FULLY EXTEND RIGHT BLADE LIFT CYLINDER, the right blade lift control lever should be moved forward to fully extend the right blade lift cylinder.

7. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence. To abort the calibration procedure, press BACK on the monitor.
-
8. When calibration is complete for extended cylinder, the monitor will prompt to FULLY RETRACT RIGHT BLADE LIFT CYLINDER. The right blade lift control lever should be moved back, retracting the lift cylinder. Move the control lever back several times to ensure the cylinder is fully retracted.



TX1054525A-UN: Saddle in Bank Position with Right Cylinder Fully Retracted

9. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence.
10. Wait for the calibration complete message. Calibration values are saved once the monitor displays CALIBRATION SUCCESSFUL.

NOTE:

If calibration fails, verify that the function is properly positioned and that no hydraulic function was actuated during the ramping sequence. If problem persists, contact your authorized dealer.

Display Unit—Main Menu—Machine Configuration—Valve Cals—Wheel Lean Cal (Grade Pro Machines Only)

The calibration should be run when the following changes are observed:

- Inconsistent response from function to function
- Change in the response of a function over time
- Replacing a hydraulic valve section or other hydraulic valve components

Failure to properly position function during calibration procedure will cause an incorrect calibration.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight VALVE CALS.

Press SELECT button to display VALVE CALS menu.

The submenus under VALVE CALS menu display include:

Screen 1

- ARTICULATION
- BLADE SIDE SHIFT
- CIRCLE ROTATE
- CIRCLE SIDE SHIFT
- LEFT BLADE LIFT
- RIGHT BLADE LIFT
- WHEEL LEAN
- MORE

Screen 2

- STEERING
- BLADE PITCH
- REAR AUX 1
- REAR AUX 2
- REAR AUX 3
- FRONT AUX 1
- FRONT AUX 2

- FRONT AUX 3

Press DOWN button to highlight WHEEL LEAN.

Press SELECT button to display WHEEL LEAN cal menu.

The following steps should be completed to calibrate the wheel lean valve:

1. Position the machine on a level surface with the gear selector in PARK.
2. The following conditions must be maintained throughout the calibration procedure:
 - Place the gear selector in PARK.
 - Enable the hydraulics on the sealed switch module and lower both armrests.
 - Turn off both cross slope and electronic grade control on the sealed switch module.
 - Set the engine speed to 1600 rpm +/- 100 rpm.
 - Warm up the hydraulic oil temperature to a minimum of 38°C (100°F). Cycle functions as required prior to beginning calibration to warm up hydraulic oil.
3. Use the blade to raise the front wheels fully off the ground.
4. Select WHEEL LEAN from the hydraulic valve calibration menu.
5. Once all conditions have been satisfied, the calibration routine will proceed.

6.

NOTE:

The front wheels should be raised off the ground during the calibration procedure. Failure to position the wheels so that they are off the ground and the wheels are fully leaned to the left will cause an incorrect calibration. Move the control lever forward several times to ensure that the wheels are fully leaned to the left.

When prompted to WHEEL LEAN ALL THE WAY TO THE LEFT, the wheel lean control lever should be moved forward to lean the wheels to the left and fully extend the wheel lean cylinder.

7. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence. To abort the calibration procedure, press BACK on the monitor.
8. When calibration is complete for the left side, the monitor will prompt to WHEEL LEAN ALL THE WAY TO THE RIGHT. The wheel lean control lever should be moved back, leaning the wheels to the right and retracting the wheel lean cylinder. Move the control lever back several times to ensure the wheels are fully leaned to the right.
9. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence.

10. Wait for the calibration complete message. Calibration values are saved once the monitor displays CALIBRATION SUCCESSFUL.

NOTE:

If calibration fails, verify that the function is properly positioned and that no hydraulic function was actuated during the ramping sequence. If problem persists, contact your authorized dealer.

NM00125,00007A0-19-20110104

Display Unit—Main Menu—Machine Configuration—Valve Cals—Steering Cal (Grade Pro Machines Only)

The calibration should be run when the following changes are observed:

- Inconsistent response from function to function
- Change in the response of a function over time
- Replacing a hydraulic valve section or other hydraulic valve components

Failure to properly position function during calibration procedure will cause an incorrect calibration.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight VALVE CALS.

Press SELECT button to display VALVE CALS menu.

The submenus under VALVE CALS menu display include:

Screen 1

- ARTICULATION
- BLADE SIDE SHIFT
- CIRCLE ROTATE
- CIRCLE SIDE SHIFT
- LEFT BLADE LIFT
- RIGHT BLADE LIFT
- WHEEL LEAN
- MORE

Screen 2

- STEERING
- BLADE PITCH
- REAR AUX 1
- REAR AUX 2
- REAR AUX 3
- FRONT AUX 1
- FRONT AUX 2
- FRONT AUX 3

Press DOWN button to highlight MORE.

Press SELECT button to advance to Screen 2.

Press DOWN button to highlight STEERING.

Press SELECT button to display STEERING cal menu.

The following steps should be completed to calibrate the steering valve:

1. Position the machine on a level surface with the gear selector in PARK.
2. The following conditions must be maintained throughout the calibration procedure:
 - Place the gear selector in PARK.
 - Enable the hydraulics on the sealed switch module and lower both armrests.
 - Turn off both cross slope and electronic grade control on the sealed switch module.
 - Set the engine speed to 1600 rpm +/- 100 rpm.
 - Warm up the hydraulic oil temperature to a minimum of 38°C (100°F). Cycle functions as required prior to beginning calibration to warm up hydraulic oil.
3. Use the blade to raise the front wheels fully off the ground.
4. Select STEERING from the hydraulic valve calibration menu.
5. Once all conditions have been satisfied, the calibration routine will proceed.
6. When prompted to STEER ALL THE WAY TO THE LEFT, the steering control lever should be moved left or the steering wheel should be turned to the left to steer the wheels to the left against the steering stop.

7.

NOTE:

The front wheels should be raised off the ground during the calibration procedure. Failure to position the wheels so that they are off the ground and the wheels are fully steered to the left will cause an incorrect calibration. Move the control lever left several times to ensure that the wheels are fully steered against the steering stop.

Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence. To abort the calibration procedure, press BACK on the monitor.

8. When calibration is complete for the left side, the monitor will prompt to STEER ALL THE WAY TO THE RIGHT. The steering control lever should be moved right or the steering wheel should be turned to the right, steering the wheels to the right. Move the control lever right several times to ensure the wheels are fully steered to the right against the stops.
9. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence.
10. When calibration is complete for the left side, the monitor will prompt to STEER ALL THE WAY TO THE RIGHT.
11. Wait for the calibration complete message. Calibration values are saved once the monitor displays CALIBRATION SUCCESSFUL.

NOTE:

If calibration fails, verify that the function is properly positioned and that no hydraulic function was actuated during the ramping sequence. If problem persists, contact your authorized dealer.

NM00125,00007A1-19-20110104

Display Unit—Main Menu—Machine Configuration—Valve Cals—Blade Pitch Cal (Grade Pro Machines Only)

The calibration should be run when the following changes are observed:

- Inconsistent response from function to function
- Change in the response of a function over time
- Replacing a hydraulic valve section or other hydraulic valve components

Failure to properly position function during calibration procedure will cause an incorrect calibration.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight VALVE CALS.

Press SELECT button to display VALVE CALS menu.

The submenus under VALVE CALS menu display include:

Screen 1

- ARTICULATION
- BLADE SIDE SHIFT
- CIRCLE ROTATE
- CIRCLE SIDE SHIFT
- LEFT BLADE LIFT
- RIGHT BLADE LIFT
- WHEEL LEAN
- MORE

Screen 2

- STEERING
- BLADE PITCH
- REAR AUX 1
- REAR AUX 2
- REAR AUX 3
- FRONT AUX 1
- FRONT AUX 2
- FRONT AUX 3

Press DOWN button to highlight MORE.

Press SELECT button to advance to Screen 2.

Press DOWN button to highlight BLADE PITCH.

Press SELECT button to display BLADE PITCH cal menu.

The following steps should be completed to calibrate the blade pitch valve:

1. Position the machine on a level surface with the gear selector in PARK.
2. The following conditions must be maintained throughout the calibration procedure:
 - Place the gear selector in PARK.

- Enable the hydraulics on the sealed switch module and lower both armrests.
- Turn off both cross slope and electronic grade control on the sealed switch module.
- Set the engine speed to 1600 rpm +/- 100 rpm.
- Warm up the hydraulic oil temperature to a minimum of 38°C (100°F). Cycle functions as required prior to beginning calibration to warm up hydraulic oil.

3. Select BLADE PITCH from the hydraulic valve calibration menu.
4. Once all conditions have been satisfied, the calibration routine will proceed.

5.

NOTE:

The draft frame should be positioned so that the blade is approximately 15 cm (6 inches) above the ground to allow clearance between the blade and the ground to allow the blade to be fully pitched forward with the blade off of the ground. Failure to position the draft frame so that the blade is off the ground when the cylinder is fully extended will cause an incorrect calibration. Move the control lever forward several times to ensure that the cylinder is fully retracted.

When prompted to TILT BLADE ALL THE WAY FORWARD, the blade pitch control lever should be moved forward to tilt the blade forward and fully extend the blade pitch cylinder.

6. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence. To abort the calibration procedure, press BACK on the monitor.
7. When calibration is complete for forward, the monitor will prompt to TILT BLADE ALL THE WAY BACK. The blade pitch control lever should be moved back, tilting the blade back and fully retracting the blade pitch cylinder. Move the control lever back several times to ensure the blade is pitched back fully.
8. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence.
9. Wait for the calibration complete message. Calibration values are saved once the monitor displays CALIBRATION SUCCESSFUL.

NOTE:

If calibration fails, verify that the function is properly positioned and that no hydraulic function was actuated during the ramping sequence. If problem persists, contact your authorized dealer.

NM00125,00007A2-19-20110104

Display Unit—Main Menu—Machine Configuration—Valve Cals—Rear Aux 1, 2, 3 and Front Aux 1, 2, 3 Cal

(Grade Pro Machines Only)

The calibration should be run when the following changes are observed:

- Inconsistent response from function to function
- Change in the response of a function over time
- Replacing a hydraulic valve section or other hydraulic valve components

Failure to properly position function during calibration procedure will cause an incorrect calibration.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight VALVE CALS.

Press SELECT button to display VALVE CALS menu.

The submenus under VALVE CALS menu display include:

Screen 1

- ARTICULATION
- BLADE SIDE SHIFT
- CIRCLE ROTATE
- CIRCLE SIDE SHIFT
- LEFT BLADE LIFT
- RIGHT BLADE LIFT
- WHEEL LEAN
- MORE

Screen 2

- STEERING
- BLADE PITCH
- REAR AUX 1
- REAR AUX 2
- REAR AUX 3
- FRONT AUX 1
- FRONT AUX 2
- FRONT AUX 3

Press DOWN button to highlight MORE.

Press SELECT button to advance to Screen 2.

Press DOWN button to highlight REAR AUX 1.

Press SELECT button to display REAR AUX 1 cal menu.

NOTE:

For ripper and scarifier, it is required that the teeth are removed from the implement or moved to the storage position to allow the implement to fully travel without touching the ground.

The following steps should be completed to calibrate the rear aux 1, 2, 3 and front aux 1, 2, 3 valves:

1. Position the machine on a level surface with the gear selector in PARK.
2. The following conditions must be maintained throughout the calibration procedure:
 - Place the gear selector in PARK.
 - Enable the hydraulics on the sealed switch module and lower both armrests.
 - Turn off both cross slope and electronic grade control on the sealed switch module.
 - Set the engine speed to 1600+/-100 rpm.
 - Warm up the hydraulic oil temperature to a minimum of 38°C (100°F). Cycle functions as required prior to beginning calibration to warm up hydraulic oil.
3. Once all conditions have been satisfied, the calibration routine will proceed.

4.

NOTE:

For auxiliary functions, a means to drive the system to maximum pressure (function stalled) will need to be determined. For implements driven by cylinders, this should be done by fully extending or retracting the function – with the associated implement off the ground (no weight taken off the wheels). For implements driven by motors, this should be done by disconnecting the hoses from the hydraulic valve and plugging the work port.

Failure to properly position the function as defined will cause an incorrect calibration. Move the control lever in the direction indicated several times to ensure that the cylinder is fully extended or retracted, or any air is removed.

Due to the configurability of the auxiliary functions, please refer to the monitor for the appropriate direction to move the control levers or mini-joysticks to position the function being calibrated.

5. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence. To abort the calibration procedure, press BACK on the monitor.
6. When calibration is complete for the first direction, the monitor will prompt to reposition the function as required. Again, it is important that function is placed in a position that will drive the system to maximum pressure (stalled position). Move the control lever as directed on the monitor several times to ensure the cylinder is fully extended, retracted, or any air is removed.
7. Once the function is properly positioned press SELECT on the monitor to continue calibration. Do not actuate any hydraulic functions during the calibration ramping sequence.
8. Wait for the calibration complete message. Calibration values are saved once the monitor displays CALIBRATION SUCCESSFUL.

NOTE:

If calibration fails, verify that the function is properly positioned and that no hydraulic function was actuated during the ramping sequence. If problem persists, contact your authorized dealer.

9. Select the next desired auxiliary valve to calibrate from the valve calcs menu and repeat procedure.

NM00125,00007A3-19-20110104

Display Unit—Main Menu—Machine Configuration—Control Lever Switches

The CONTROL LEVER SWITCHES menu displays current status of Grade Pro switches.

The submenus under MACHINE CONFIGURATION menu display include:

- CROSS SLOPE SENSOR CAL
- VALVE CALS
- CONTROL LEVER SWITCHES

Press DOWN button to highlight CONTROL LEVER SWITCHES.

Press SELECT button to display highlighted menu.

The items on display under CONTROL LEVER SWITCHES menu include:

- CROSS SLOPE AUTO/MANUAL
- CROSS SLOPE INC/DEC
- GRADE CONTROL AUTO/MANUAL
- GRADE CONTROL INC/DEC
- RETURN TO STRAIGHT

ENABLE A SINGLE BEEP WHEN SWITCH IS PRESSED

Switch status is displayed as ON or OFF.

When a switch is pushed, with the CONTROL LEVER SWITCHES menu on display, an audible alarm will beep once and the status of switch will change to ON or OFF.

NM00125,000079C-19-20101221

Sealed Switch Module



TX1062108-UN: Sealed Switch Module

LEGEND:

1 - Engine Start Switch	7 - Lever Steering Switch (Grade Pro machines only)	12 - Cab Corner Work Light Switch—If Equipped	17 - Heated Side Mirrors Switch—If Equipped	22 - Automatic Differential Lock Switch
2 - Engine Stop Switch	8 - Cab Front Work Light Switch—If Equipped	13 - Cab Side Work Light Switch—If Equipped	18 - Rear Window Defog Switch	23 - Automatic Blade Control Switch (Grade Pro machines only)
3 - Beacon Light Switch—If Equipped	9 - Frame Work Light Switch—If Equipped	14 - Front Upper Washer Switch	19 - Front Lower Washer Switch—If Equipped	24 - Rear Window Washer Switch
4 - Hazard Light Switch	10 - Drive and Marker Light Switch	15 - Front Upper Wiper Switch	20 - Front Lower Wiper Switch—If Equipped	25 - Rear Window Wiper Switch
5 - Hydraulic Enable Switch (Grade Pro machines only)	11 - Not Used	16 - Air Conditioning/Defog Switch	21 - Autoshift Switch—If Equipped	

NM00125,00005F5-19-20110104

Switch Module Functions

Most switches on the module are equipped with light emitting diodes (LEDs) to serve as indicators of the current switch setting. Press switch momentarily to advance to next setting.

1—Engine Start Switch: This switch is used to start the engine and provide switched power for vehicle electronics:

- Press and release switch to energize the ignition and apply power to the control units and the display unit (left LED is ON).
- After display unit has initialized, press and hold switch to start engine. Both LEDs are on when engine is cranking. Left LED is on 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. If vehicle speed is greater than 0.5 km/h (0.3 mph), engine stops and ignition power remains on until vehicle speed reaches 0.5 km/h (0.3 mph) or less. To force ignition power off when vehicle speed is greater than 0.5 km/h (0.3 mph), press switch again or hold switch on first press.

3—Beacon Light Switch—If Equipped: Press and release switch to turn on beacon light (LED is on). Press and release switch to turn off beacon light (LED is off).

4—Hazard Light Switch: Press and release switch to turn on four-way flashers (LED is on). Press and release switch to turn off flashers (LED is off).

5—Hydraulic Enable Switch: Press and release switch to enable hydraulics (LED is on). Press and release switch to disable hydraulics (LED is off).

NOTE:

Both armrests must also be lowered to enable hydraulics.

Disabling hydraulics, disables lever steering.

6—Saddle Lock Pin Switch: Press and hold switch for 3 seconds until LED is illuminated on monitor to unlock saddle pin lock. Press and release switch until light goes out on monitor to lock and engage saddle lock pin.

7—Lever Steering Switch: Press and release switch to enable lever steering (LED is on). Press and release switch to disable lever steering (LED is off).

NOTE:

Hydraulic enable switch must be on to enable lever steering.

8—Cab Front Work Light Switch—If Equipped: Press and release switch to turn cab front work lights on (LED is on). Press and release switch to turn cab front work lights off (LED is off).

9—Frame Work Light Switch—If Equipped: Press and release switch to turn frame work lights on (LED is on). Press and release switch to turn frame work lights off (LED is off).

10—Drive and Marker Light Switch: This switch controls the drive and marker lights:

- Press and release switch to turn on marker lights (left LED is on).
- Press and release switch to turn on drive lights and marker lights (left LED is off, right LED is on).
- Press and release switch to turn lights off (LEDs are both off).

NOTE:

When marker or drive lights are turned on, the backlighting of the switch pad will turn on and the intensity of the lights will be decreased automatically for nighttime operation.

When a communication fault occurs between the switch pad and flex load controller (FLC) or a stuck button condition, the marker lights, drive lights, and backlighting turn on automatically.

NOTE:

Marker lights will turn on when any other work/drive light is activated.

11—Not Used

12—Cab Corner Work Light Switch—If Equipped: This switch controls the cab corner lights:

- Press and release switch to turn cab front corner lights on (left LED is on).
- Press and release switch to turn all cab corner lights on (left LED is off, middle LED is on).
- Press and release switch to turn cab right corner lights on (middle LED is off, right LED is on).
- Press and release switch to turn lights off (all LEDs are off).

13—Cab Side Work Light Switch—If Equipped: Press and release switch to turn right side work lights on (LED is on). Press and release switch to turn lights off (LED is off).

14—Front Upper Washer Switch: Press and hold switch to wash front window. Pressing switch will also activate low speed upper front wiper operation. After releasing washer switch, the wiper blade will swipe four times and automatically turn off.

15—Front Upper Wiper Switch: This switch controls the four speeds of the front upper wipers:

- Press and release switch for intermittent front upper wiper operation (left LED is on).
- Press and release switch for low speed front upper wiper operation (left LED is off, middle LED is on).
- Press and release switch for high speed front upper wiper operation (middle LED is off, right LED is on).
- Press and release switch to turn front upper wiper off (all LEDs are off).

16—Air Conditioning/DefogSwitch:

NOTE:

Engine must be running and blower fan speed switch must be on to operate air conditioner.

Press and release switch to turn on air conditioner (LED is on). Press and release switch to turn off air conditioner (LED is off).

17—Heated Side Mirrors Switch—If Equipped: This switch controls the heated mirrors:

- Press and release switch to energize heaters on the outside rear view mirrors (LED is on).
- Press and release switch to de-energize heaters (LED is off).

When energized, heaters remain on for 15 minutes, then shut off automatically. The heaters can be manually shut off at any time. If ignition power is turned off, heaters turn off and will not come on when ignition power is turned back on until switch is pressed again.

18—Rear Window Defog Switch: Press and release switch to defog rear window (LED is on). Press and release switch to turn defog off or defog will automatically turn off after 5 minutes (LED is off).

19—Front Lower Washer Switch—If Equipped: Press and hold switch to wash lower windshield. Pressing switch will also activate low speed lower front wiper operation. After releasing washer switch, the wiper blade will swipe four times and automatically turn off.

20—Front Lower Wiper Switch—If Equipped: This switch controls the four speeds of the front lower wipers:

- Press and release switch for intermittent front lower wiper operation (left LED is on).
- Press and release switch for low speed front lower wiper operation (left LED is off, middle LED is on).
- Press and release switch for high speed front lower wiper operation (middle LED is off, right LED is on).
- Press and release switch to turn front lower wiper off (all LEDs are off).

21—Autoshift Switch—If Equipped: Press and release switch to turn on autoshift (LED is on). The transmission is now in Auto mode. Autoshift is available in gears 5th through 8th in forward and reverse. Actual transmission gear range will be 4th gear to the current shift handle position. If the transmission gear selector is in 5th gear or higher, the transmission will shift between 4th gear and the current gear selector (shift handle) position, depending on engine speed, throttle position, and engine load.

Press and release switch to turn off autoshift (LED is off). The transmission is now in manual mode.

22—Automatic Differential Lock Switch: Press and release switch to turn on automatic differential lock system. (LED is on). The automatic differential lock system locks the rear axle so that the left and right wheels turn together when the machine is traveling straight in 1st through 4th gear.

Press and release switch to turn off automatic differential lock system (LED is off).

NOTE:

Differential lock is activated any time the manual differential lock switch is ON, regardless of whether the automatic differential lock system is enabled or not.

23—Automatic Blade Control Switch:

NOTE:

Cross slope is not functional if the saddle locking pin is unlocked or assigned outside of center position.

Cross slope provides a basic blade control system that will maintain a desired slope. Electronic grade control enables the use of an aftermarket grade control system.

This switch has three states:

- Press and release switch to enable the cross slope system (left LED is on).
- Press and release switch to enable an aftermarket electronic grade control system (left LED is off, right LED is on).
- Press and release switch to turn automatic blade control off (all LED's are off).

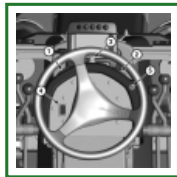
24—Rear Window Washer Switch: Press and hold switch to wash rear windshield. Pressing switch will also activate low speed rear wiper operation. After releasing washer switch, the wiper blade will swipe four times and automatically turn off.

25—Rear Window Wiper Switch: This switch controls the three speeds of the rear wiper:

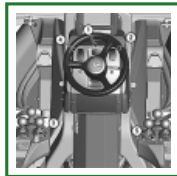
- Press and release switch for intermittent rear wiper operation (left LED is on).
- Press and release switch for low speed rear wiper operation (left LED is off, right LED is on).
- Press and release switch to turn rear wiper off (all LED's are off).

NM00125,00005F6-19-20210208

Front Console



TX1082807A-UN: Standard Machine Console



TX1082808A-UN: Grade Pro Machine Console

LEGEND:

1 - Turn Signal Switch

2 - High/Low Beam Switch

3 - Horn Switch

4 - Blade Impact Switch—if
equipped5 - Manual Differential Lock
Switch

- **Turn Signal Switch (1)**— Has three positions: LEFT, RIGHT, and CENTER. Pushing the switch to the LEFT positions activates the left side turn signal bulbs. Pushing the switch to the RIGHT position activates the right side turn signal bulbs. Returning the switch to the CENTER position will turn off the turn signal bulbs.
- **High/Low Beam Switch (2) (Grade Pro Machines)**— Has two positions: UP or DOWN. With the headlights activated, pushing the switch to the UP position will activate the high-beam headlights. Pushing the switch to the DOWN position will deactivate the high-beam headlights, leaving only the low-beam headlights on.

- **High/Low Beam Switch (Standard Machines)**— Has two positions: LEFT or RIGHT. With the headlights activated, pushing the switch to the LEFT position will activate the high-beam headlights. Pushing the switch to the RIGHT position will deactivate the high-beam headlights, leaving only the low-beam headlights on.
- **Horn Switch (3)**— Is a momentary contact switch. Push and hold the horn switch to activate the audible horn. Releasing the switch will deactivate the horn.
- **Blade Impact Switch (4)**— Has two positions, UP or DOWN. Push the switch to the UP position to engage the blade impact absorption system. This system prevents damage to machine parts by using hydraulic accumulators to cushion or dampen hydraulic load when the blade strikes an immovable object.
- **Manual Differential Lock Switch**— Has two positions: ON or OFF. When the switch is in the ON position, the manual differential lock is engaged. For more information see Using Differential Lock. (Section 2-2.)

NM00125,00005F7-19-20110513

Adjusting Front Console



T204752A-UN: Adjusting Front Console

LEGEND:

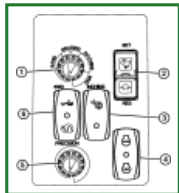
1 - Steering Wheel Up/Down Lever 2 - Console Forward/Backward Lever

Raise lever (1) to tilt steering wheel up or down. Lower lever to lock.

Push down on lever (2) to move console forward or backward. Release lever to lock.

OUT4001,000029F-19-20110103

Engine Speed Control and 6WD Switches



TX1082685-UN: Side Console Switch Panel

LEGEND:

- 1 - Aggressiveness Mode Dial 2 - Engine Speed Control Set Switch 3 - Inching Mode Switch 4 - Engine Speed Control Mode Switch 5 - Precision Mode Speed Dial
6 - 6WD/Precision Switch

For detailed operation of the engine speed controls: See Engine Speed Control Operation. (Section 2-2.)

-: Engine Speed Control Switch

Engine Speed Control Set Switch (2)	
Switch Position	Function
SET (rabbit)	Sets engine speed at desired level, or raises engine speed by 50 rpm increments
RES (turtle)	Resumes a previously selected engine speed, or lowers engine speed by 50 rpm increments

-: Engine speed

Engine Speed Control Mode Switch (4)	
Switch Position	Function
OFF	Only accelerator pedal can be used to control engine speed
AUTO	Automatic engine speed control enabled
MANUAL	Manual engine speed control enabled

For detailed operation of 6WD systems: See 6WD Operation—If Equipped. (Section 2-2.)

-: Aggressiveness Mode Dial

Aggressiveness Mode Dial (1)	
Dial Setting	Function When 6WD Operation is Active
Counterclockwise from center	Front wheel speed is less than rear wheel speed
Center	Front and rear wheel speeds are matched
Clockwise from center	Front wheel speed is greater than rear wheel speed

-: Inching mode switch

Inching Mode Switch (3)	
Switch Position	Function
OFF	Front wheel drive engagement occurs at the top of inching pedal travel

Inching Mode Switch (3)

INCHING	Front wheel drive engagement is controlled throughout entire inching pedal travel
---------	---

-: 6wd

6WD/Precision Switch (6)

Switch Position	Function
OFF	6WD operation disabled
6WD	6WD operation enabled
PRECISION	Precision mode is enabled

-: precision mode dial

Precision Mode Dial (5)

Dial Setting	Function
Full counterclockwise	Slowest ground speed for selected gear and engine speed
Full clockwise	Greatest ground speed for selected gear and engine speed

NM00125,000065A-19-20101201

Levers

NOTE:

All instructions in this operator's manual apply to machines with two-hand blade lift control levers unless otherwise specified.

Transmission Control and Park Brake Lever



TX1084452A-UN: Transmission Control and Park Brake Lever

LEGEND:

1 - Transmission Control and
Park Brake Lever

Park brake engages when the transmission control and park brake lever (1) is moved to position P.

NOTE:

Park brake is spring-applied and hydraulically released.

Control Levers—Two-Hand Blade Lift

Extra control levers may be added to both sides for optional equipment.



TX1053087A-UN: Standard Control Levers

LEGEND:

1 - Left Blade Lift

3 - Blade Pitch

5 - Circle Side Shift

7 - Wheel Lean

2 - Blade Side Shift

4 - Circle Rotation

6 - Articulation

8 - Right Blade Lift

NM00125,000071D-19-20101111

Levers—Grade Pro Machines Only

Transmission Control and Park Brake Lever



TX1057340A-UN: Transmission Control and Park Brake Lever

LEGEND:

1 - Transmission Control and
Park Brake Lever

Park brake engages when the transmission control and park brake lever (1) is moved to position P.

NOTE:

Park brake is spring-applied and hydraulically released.

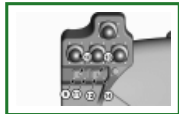
Control Levers—Two-Hand Blade Lift

NOTE:

Control levers shown here are the factory installed configurations. However, actual configuration may vary since the control levers can be reprogrammed. To reprogram the control levers and their function, see your authorized dealer.



TX1057322A-UN: Grade Pro Control Levers



TX1053088A-UN: Left Control Pod



TX1056853A-UN: Right Control Pod

LEGEND:

- | | | | | |
|---|---|----------------------|---|------------------------------------|
| 1 - Left Blade Lift | 4 - Circle Rotation | 7 - Wheel Lean | 11 - Front or Midmount Scarifier or Front Mount Blade Float (if equipped) | 13 - Right Blade Float |
| 2 - Blade Side Shift/Lever Steering | 5 - Circle Side Shift | 8 - Right Blade Lift | 12 - Rear Under Cab Auxiliary 2 (if equipped) | 14 - Ripper Float (if equipped) |
| 3 - Blade Pitch/Rear Ripper (if equipped) | 6 - Articulation/Front or Midmount Scarifier or Front Mount Blade (if equipped) | 9 - Not Used | 15 - Left Auxiliary Mini-Joystick | 16 - Right Auxiliary Mini-Joystick |
| | 10 - Left Blade Float | | | |

OUT4001,0000396-19-20100916

Levers—Grade Pro Machines Only

Transmission Control and Park Brake Lever



TX1084462A-UN: Transmission Control and Park Brake Lever

LEGEND:

1 - Transmission Control and Park Brake Lever

Park brake engages when the transmission control and park brake lever (1) is moved to position P.

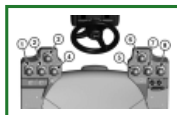
NOTE:

Park brake is spring-applied and hydraulically released.

Control Levers—Two-Hand Blade Lift

NOTE:

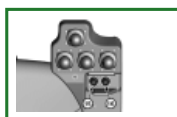
Control levers shown here are the factory installed configurations. However, actual configuration may vary since the control levers can be reprogrammed. To reprogram the control levers and their function, see your authorized dealer.



TX1057322A-UN: Grade Pro Control Levers



TX1053088A-UN: Left Control Pod



TX1056853A-UN: Right Control Pod

LEGEND:

1 - Left Blade Lift

2 - Blade Side Shift/Lever
Steering

3 - Blade Pitch/Rear Ripper—if
equipped

4 - Circle Rotation

5 - Circle Side Shift

6 - Articulation/Front or Midmount
Scarifier or Front Mount Blade—if
equipped

7 - Wheel Lean

8 - Right Blade Lift

9 - Not Used

10 - Left Blade Float

11 - Front or Midmount Scarifier
or Front Mount Blade Float—if
equipped

12 - Rear Under Cab Auxiliary 2
—if equipped

13 - Right Blade Float

14 - Ripper Float—if equipped

15 - Left Auxiliary Mini-Joystick

16 - Right Auxiliary Mini-Joystick

Pedals



T205681-UN: Pedals

LEGEND:

A - Inching Pedal

B - Brake

C - Accelerator Pedal

D - Decelerator Pedal (if equipped)

Push inching pedal (A) down to disengage clutch. Use this pedal for precise control.

Push down accelerator pedal (C) to increase engine speed.

The decelerator pedal (D) (if equipped) only functions when the auto/manual engine speed control is active and an engine speed higher than slow idle is set. The decelerator pedal allows the operator to decrease engine speed without canceling the auto/manual engine speed control setting. Push the decelerator pedal down to decrease engine speed to desired level or to slow idle. When pedal is released, engine speed will return to the previously set engine speed.

To stop machine, press brake pedal (B).

OUT4001,00002A6-19-20101103

Lights



TX1082879A-UN: Rear Lights



TX1082877A-UN: Front and Side Lights



TX1082878A-UN: Work Lights



TX1086061A-UN: Beacon Light

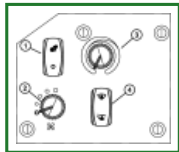
LEGEND:

1 - Rear Corner Cab Work Lights	4 - Reverse Lights	7 - High Beam Drive Lights	10 - Right Side Cab Work Lights	13 - Beacon Light—if equipped
2 - Rear Turn Signals	5 - Under Cab Work Lights (left side shown)	8 - Front Turn Signals	11 - Front Cab Work Lights	
3 - Tail Lights and Brake Lights	6 - Low Beam Drive Lights	9 - Mid Frame Work Lights (left side shown)	12 - Front Corner Cab Work Lights	

See Sealed Switch Module in this section for light switch locations.

NM00125.0000600-19-20110513

Heating and Fan Controls



TX1084453-UN: Heating and Fan Control Switches

LEGEND:

1 - Heated Seat Switch—if equipped	2 - Blower Speed Control Knob	3 - Temperature Control Knob	4 - Defog Switch
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Heating and fan controls are located on the rear of right side console.

- **Heated Seat Switch (1)—if equipped** Has two positions: ON and OFF. With ignition ON, push heated seat switch to the ON position to activate seat heaters.
- **Blower Speed Control Knob (2)**— Controls blower motor speed. Knob has four speed settings to vary the air flow from heater vents. Rotate blower speed control knob clockwise to increase blower motor speed. Rotate counterclockwise to decrease.
- **Temperature Control Knob (3)**— Adjusts air temperature coming from heater vents. To increase temperature rotate knob clockwise, to decrease, rotate knob counterclockwise.

- **Defog Switch (4)**— Has two positions: ON and OFF. Push switch to the ON position to direct air flow to front windshield for defogging or defrosting.

NM00125,0000601-19-20110513

Fire Extinguisher Location



TX1054962A-UN: Fire Extinguisher

LEGEND:

1 - Fire Extinguisher

NOTE:

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

This portable fire extinguisher (1) 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:

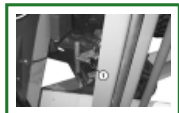
Avoid possible machine damage. Replace or recharge fire extinguisher after every use according to the manufacturer's instructions.

The designated location for the fire extinguisher is on the right rear column of the operator's station. Check gauge (if equipped) on fire extinguisher. If fire extinguisher is not fully charged, recharge or replace it according to the manufacturer's instructions.

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

NM00125,0000602-19-20101019

Opening Lower Front Windows



T204772A-UN: Window Latch

LEGEND:

1 - Latch

1. Pull latch (1) toward window to release latch.
2. Slowly push window forward.

OUT4001,00002A9-19-20100916

Opening Side Windows

1.



T207181A-UN: Side Window Latch

LEGEND:

1 - Latch (2 used)

- Squeeze both latches (1) and raise window.
2. Squeeze latches to lower window.
3. Ensure windows are securely latched at the end of the day's operation.

OUO1032,00015EB-19-20100916

Cab Door Release



T204771A-UN: Door Release Lever



T205699A-UN: Cab Door Release

LEGEND:

1 - Inside Cab Door Release Lever 2 - Outside Cab Door Release Lever

From inside cab, push inside cab door release lever (1) toward door to open door.

From ground level, push outside cab door release lever (2) toward front of machine to release door.

OUO1032,0001528-19-20100916

Adjusting Seat

TX1052444A-UN: Standard Seat

LEGEND:

1 - Height Adjustment Knob 3 - Ride Firmness Adjustment Lever 4 - Backrest Tilt Adjustment Lever 5 - Armrest Adjustment Knob 7 - Armrest Height Adjustment Cap Screw (2 used)

2 - Fore-Aft Adjustment Lever

**CAUTION:**

Avoid personal injury. Operator can lose control of machine and be injured if seat is loose. Be sure seat is properly locked in position before operating the machine.

To raise or lower seat height, press engine start switch once to energize ignition. Pull height adjustment knob (1) out to lower seat height. Push in on height adjustment knob to raise seat height.

Pull up on fore-aft adjustment lever (2) to move seat forward or backward. Release handle at desired position.

Move ride firmness adjustment lever (3) up or down to adjust firmness in ride.

While sitting in seat, lift backrest tilt adjustment lever (4) and allow cushion to angle forward or lean backward into desired position and release lever.

While sitting in seat, rotate armrest adjustment knob (5) to tilt armrest to desired position.

Rotate lumbar adjustment knob (6) forward or backward to adjust lumbar support.

Loosen armrest height adjustment cap screws (7) to adjust the armrest height.

OUT4001,00002AA-19-20100916

Adjusting Premium Seat—If Equipped



TX1052445A-UN: Premium Seat



TX1052509A-UN: Premium Seat Back View

LEGEND:

1 - Height Adjustment Knob
2 - Fore-Aft Adjustment Lever

3 - Ride Firmness Adjustment
Lever

4 - Backrest Tilt Adjustment
Lever

5 - Armrest Adjustment Knob
6 - Lumbar Adjustment Wheel

7 - Armrest Height Adjustment
Cap Screw (2 used)

Premium seat features a higher back and heated seat.



CAUTION:

Avoid personal injury. Operator can lose control of machine and be injured if seat is loose. Be sure seat is properly locked in position before operating the machine.

To raise or lower seat height, press engine start switch once to energize ignition. Pull height adjustment knob (1) out to lower seat height. Push in on height adjustment knob to raise seat height.

Pull up on fore-aft adjustment lever (2) to move seat forward or backward. Release handle at desired position.

Move ride firmness adjustment lever (3) up or down to adjust firmness in ride.

While sitting in seat, lift backrest tilt adjustment lever (4) and allow cushion to angle forward or lean backward into desired position and release lever.

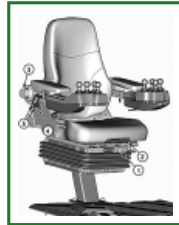
While sitting in seat, rotate armrest adjustment knob (5) to tilt armrest to desired position.

Rotate lumbar adjustment wheel (6) forward or backward to adjust lumbar support.

Loosen armrest height adjustment cap screws (7) to adjust the armrest height.

NM00125,0000741-19-20101119

Adjusting Premium Seat—Grade Pro Machines Only



TX1052446A-UN: Grade Pro Premium Seat

LEGEND:

1 - Height Adjustment Knob

2 - Fore-Aft Adjustment Lever

3 - Armrest Height Adjustment
Knob

4 - Control Pod Adjustment Lever

5 - Armrest Pad Adjustment
Lever (2 used)

Premium seat features a higher back and heated seat.



CAUTION:

Avoid personal injury. Operator can lose control of machine and be injured if seat is loose. Be sure seat is properly locked in position before operating the machine.

To raise or lower seat height, press engine start switch once to energize ignition. Pull height adjustment knob (1) out to lower seat height. Push in on height adjustment knob to raise seat height.

Pull up on fore-aft adjustment lever (2) to move seat forward or backward. Release handle at desired position.

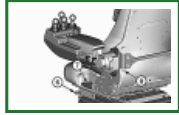
Rotate armrest height adjustment knob (3) to move armrest to desired comfort position. Repeat on opposite side.

Loosen control pod adjustment lever (4) to move control pod forward or backward to desired comfort position. Repeat on opposite side.

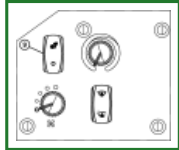
NOTE:

Ensure all pedals can be accessed without knees interfering with armrest controls.

Loosen armrest pad adjustment levers (5) to move armrest pad up and down to desired comfort position. Repeat on opposite side.



TX1052513A-UN: Grade Pro Premium Seat Back View



TX1084690-UN: Seat Heater Switch

LEGEND:

6 - Ride Firmness Adjustment
Lever

7 - Backrest Tilt Adjustment
Lever

8 - Lumbar Adjustment Wheel

9 - Seat Heater Switch

Move ride firmness adjustment lever (6) up or down to adjust firmness in ride.

While sitting in seat, lift backrest tilt adjustment lever (7) and allow cushion to angle forward or lean backward into desired position and release lever.

Rotate lumbar adjustment wheel (8) forward or backward to adjust lumbar support.

To activate heated seating, press engine start switch once to energize ignition. Press seat heater switch (9) on to warm seat.



TX1055403-UN: Armrest Adjustment

LEGEND:

3 - Armrest Height Adjustment
Knob

10 - Phillips Head Screw (5 used)
11 - Cover

12 - 30 mm Nut
13 - Outer Nut

14 - Height Range

IMPORTANT:

Avoid damage to armrest assembly. DO NOT loosen the outer nut (13) when attempting to adjust armrest lift tension, as doing so will cause the armrest assembly to come apart.

The armrest tension is set at the factory and should not normally require adjustment. However, should adjustment become necessary, follow these instructions:

1. Unscrew armrest height adjustment knob (3).
2. Remove Phillips head screws (10) and cover (11).
3. Turn 30 mm nut (12) to adjust armrest lift tension. Minimum tension should hold armrest elevated when raised within a 50—100 mm (2—4 in.) height range (14).

NM00125,0000742-19-20101116

12-Volt Auxiliary Power Outlet



TX1052488A-UN: Auxiliary Power Outlets

LEGEND:

1 - Auxiliary Power Outlet (2 used)

Two 12-volt auxiliary power outlets (1) have been provided for service or maintenance.

OUT4001,00002AE-19-20100916

Before Starting Work



T133556-UN: Reading Operator's Manual

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

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

OUT4001,00005EB-19-20130729

Inspect Machine Daily Before Starting

Safety and Protective Devices Checks

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

Clear all steps and walking surfaces.

Check fire extinguisher charge.

Check condition of guards, shields, roll-over protective structure (ROPS), covers, and seat belt.

Check for correct park brake operation.

Overall Machine Checks

Check fuel level.

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

Check for bent, broken, loose, or missing parts.

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

NM00125,0000620-19-20100924

Check Instruments Before Starting

Push and release engine start button on sealed switch module once to energize the ignition and apply power to the control units, sealed switch module, and advanced display unit (ADU). The following will occur:

Initialization:

- Audible alarm beeps twice.
- All warning lights on lower row of ADU illuminate for approximately 3 seconds.
- All LED lights on sealed switch module illuminate for approximately 3 seconds.

After 3 seconds:

- Function indicators that were engaged during previous machine shutdown will illuminate.
- All indicators on lower row of ADU go off except the STOP, park, and brake pressure warning lights.

If any indicators fail to illuminate during initialization, see your authorized dealer.

NM00125,000069D-19-20130912

Battery Disconnect Switch



TX1082410A-UN: Battery Disconnect Switch

LEGEND:

1 - Battery Disconnect Switch

IMPORTANT:

Always turn battery disconnect switch OFF before any maintenance or repair is performed on machine's electrical system or any welding work is performed. The battery disconnect switch should also be turned OFF if machine is left unattended. If switch is left ON for long periods, batteries may become discharged.

The battery disconnect switch (1) is used to isolate electrical power from batteries to machine. The battery disconnect switch has two positions: OFF and ON.

Move battery disconnect switch to ON position before starting engine. Turn battery disconnect switch to OFF position when servicing or storing machine.

NM00125,0000622-19-20101202

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. DO NOT exceed 500 hours of operation with John Deere Break-In Plus™ engine oil.

This machine is factory filled with John Deere Break-In Plus engine oil.

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.

IMPORTANT:

DO NOT add make-up oil until the oil level is BELOW the ADD mark on the dipstick. John Deere Break-In Plus oil should be used to make up any oil consumed during the break-in period. See John Deere Break-In Plus Engine Oil. (Section 3-1.)

If John Deere Break-In Plus Engine Oil is not available, use a 10W-30 diesel engine oil meeting one of the following during the initial 250 hours of operation:

- **API Service Category CJ-4**
- **ACEA Oil Sequence E9**
- **ACEA Oil Sequence E6**

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—Interim Tier 4 and Stage III B Engines. (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. (Section 4-3.)
5. Watch oil pressure gauge for pressure within specification.
6. Check belt for proper alignment and seating in pulley grooves.

Break-In Plus is a trademark of Deere & Company

OUT4001,00005FE-19-20150811

Starting the Engine



TS175-UN: Fasten Seat Belt



TX1084452A-UN: Standard Machine



TX1084462A-UN: Grade Pro Machine

LEGEND:

1 - Transmission Control and
Park Brake Lever

IMPORTANT:

Prior to starting engine, make sure all hydraulic functions are out of float position.

**CAUTION:**

Avoid possible injury or death from a runaway machine.

DO NOT crank engine by shorting across starter terminals. Machine will crank in gear if normal circuitry is bypassed.

NEVER start engine while standing on ground. Start engine only from operator's seat, with transmission in park.

Use of seat belt with the rollover protective structure is recommended under all circumstances.

1. Fasten seat belt.

2.

NOTE:

Transmission control and park brake lever engages park brake when moved to position P and disengages when lever is moved to neutral, forward, or reverse.

Move transmission control and park brake lever (1) to position P. Make sure park lock collar engages.

3. Sound the horn.

**CAUTION:**

Prevent possible foot injury. Do not depress brake pedal when starting engine. System pressure will cause pedal to come up rapidly.

IMPORTANT:

Prevent possible starter damage. Never operate starter motor for more than 30 seconds at a time. If engine fails to start, release engine start switch. Wait 1 minute, then try again.

After a false start, do not press and hold engine start switch again until engine stops, or starter may be damaged.

Engine will not start by towing or pushing. Permanent damage to transmission will result.

4.

NOTE:

Ignition power will automatically turn off if engine is not started within a defined period of time.

- **If security is enabled and a code has not been entered, the time is 5 minutes.**
- **Otherwise, ignition power will be removed after 60 minutes.**

Press and release engine start switch to energize the ignition and apply power to the control units and the display unit (left LED is ON). If security mode is enabled, enter security code on the sealed switch module. Then press and hold engine start switch to start engine.

5. The engine control unit (ECU) will automatically limit cranking to 30 seconds to protect the starter. After cranking for 30 seconds, wait 1 minute for starter to cool before repeating start procedure.

IMPORTANT:

Prevent machine damage. Never restrict or block air flow to cooling system for faster warm-up or for improved cold weather operation. Cooling system was designed to operate as is in any ambient temperature or operating condition.

Warming the Engine

NOTE:

If operating machine in cold weather conditions, engine idle speed may increase for two minutes to aid with engine warm-up.

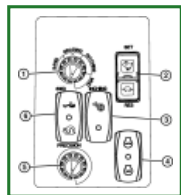
IMPORTANT:

Prevent machine damage. If hydraulic oil is cold, hydraulic functions move slowly. DO NOT attempt normal machine operation until hydraulic functions move at close-to-normal cycle times.

Operate functions slowly and avoid sudden movements until engine and hydraulic oils are thoroughly warmed. Operate a function by moving it a short distance in each direction. Continue operating the function, increasing the distance traveled in each cycle until full stroke is reached.

NM00125,0000624-19-20110104

Engine Speed Control Operation



TX1082685-UN: Side Console Switch Panel

LEGEND:

1 - Aggressiveness Mode Dial	2 - Engine Speed Control Set Switch	3 - Inching Mode Switch	4 - Engine Speed Control Mode Switch	5 - Precision Mode Speed Dial	6 - 6WD/Precision Switch
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When engine speed control mode switch (4) is in OFF position, the engine speed control set switch (2) is disabled. The accelerator pedal is then the only active engine speed control.

When engine speed control mode switch is in AUTO or MANUAL position, the engine speed control switch is enabled.

When engine speed control mode switch is in the AUTO position, pushing the accelerator pedal past the 85% position or pushing the brake pedal, will reduce engine speed to slow idle. Push and release engine speed control set switch to RES (turtle) position to resume previously set engine speed.

When engine speed control mode switch is in the MANUAL position, pushing the brake pedal or accelerator pedal past the 85% position has no effect on the set speed.

To Adjust Engine Speed with Engine Speed Control Switch—

Push engine speed control mode switch to AUTO or MANUAL position. Push and release engine speed control set switch to the SET (rabbit) position once. This will set engine speed and activate the ramp feature.

NOTE:

Deceleration pedal (if equipped) is active only when engine speed control mode switch is ON.

After engine speed is set, push and release engine speed control set switch to the SET (rabbit) position to increase engine speed 50 rpm per bump. Push and hold switch in the SET (rabbit) position to ramp up engine speed. Engine speed will increase until switch is released or engine speed reaches fast idle.

Push and release engine speed control set switch to the RES (turtle) position to decrease engine speed 50 rpm per bump. Push and hold switch in the RES (turtle) position to ramp down engine speed. Engine speed will decrease until switch is released or engine speed reaches slow idle.

To Set Engine Speed—

Push engine speed control mode switch to AUTO or MANUAL position. Using accelerator pedal to adjust engine speed to desired rpm, push engine speed control set switch to the SET (rabbit) position to set the desired engine speed.

NM00125,00005FC-19-20110103

Cold Weather Starting

The factory-installed starting fluid system automatically injects starting fluid if fuel temperature is below -3°C (27°F) and coolant temperature is below 40°C (104°F).

NOTE:

To shorten engine cranking times and improve starting at temperatures below 0°C (32°F) and/or altitudes above 1200 m (4000 ft), the following is recommended:

-: Cold Start Options

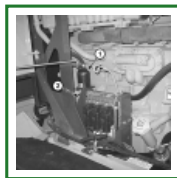
	Fall Cool Start	Pre-Winter Cold Start	Winter Cold Start	Arctic Cold Start
Temperature	49 to 0° C (120 to 32°F)	-1 to -18°C (31 to 0°F)	-19 to -25°C (-1 to -13°F)	-26 to -40°C (-14 to -40°F)
Diesel Fuel	No.2	No.1	No.1	No.1
Engine Oil	See Section 3-1	See Section 3-1	See Section 3-1	See Section 3-1
Transmission Oil	See Section 3-1	See Section 3-1	See Section 3-1	See Section 3-1
Hydraulic Oil	See Section 3-1	See Section 3-1	See Section 3-1	See Section 3-1
Hydraulic Pump Soft Start	Optional	Optional	Required	Required
Starting Fluid [If fuel temperature is above -3°C (27°F) or coolant temperature is above 40°C (104°F), the starting fluid system will not function.]	Optional	Required	Required	Required
Battery Size (CCA) [If air heater is used, large batteries must also be used.]	1000	1400	1400	1400
Coolant Heater	Optional	Optional	Required	Required

NOTE:

Use large batteries (1400 CCA) if starting below 0°C (32°F).

NM00125,0000625-19-20101018

Using Coolant Heater—If Equipped



TX1082409A-UN: Coolant Heater

LEGEND:

1 - Coolant Heater

2 - Coolant Heater Cord

**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 coolant heater (1) to electrical power.

Supply voltage for coolant heater is 110 V. Ensure the correct supply voltage is used.

Connect coolant heater cord (2) to electrical power 10 hours before starting engine.

NM00125,0000626-19-20101202

Using Hydraulic Pump Softstart Valve—If Equipped

Softstart valve automatically destrokes the main hydraulic pump during engine cranking. Press and release engine start switch to energize the ignition and apply power to the control units and the display unit (left LED is ON). Then press and hold engine start switch to start engine. After engine starts, hydraulic pump returns to system pressure.

OUT4001,00002B6-19-20081215

Check Instruments After Starting

Push and hold engine start switch to crank and start engine. The following will occur:

- Park brake indicator in the lower row of the ADU remains on.

IMPORTANT:

If any fault indicators remain on **IMMEDIATELY STOP THE ENGINE**. See your authorized dealer.

NOTE:

During cold weather operation, cold oil may cause transmission, hydraulic, and axle filter restriction indicators to illuminate temporarily.

- The pop-up “Fasten Seat Belts” appears for 3 seconds on monitor display.
- The monitor display shows gear selection (P), engine rpm, km/h (mph), and engine hours.
- Indicators on sealed switch module of functions that were engaged during last machine shutdown stay on.

Exhaust Filter

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

- **NATURAL**
- **AUTO**
- **PARKED**

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

- LOW
- MODERATE
- HIGH
- VERY HIGH
- SERVICE

To observe the current restriction status of the exhaust filter, an exhaust filter restriction level indicator is located in the upper left corner of the advanced display unit (ADU) for viewing at any time. The exhaust filter restriction level indicator shares the same space on the ADU with other indicators. Use the UP button on the ADU to toggle between readings. For more information, see Display Unit Functions. (Section 2-1.) The current restriction status can also be viewed by navigating to the exhaust filter menu on the ADU where filter soot level is displayed. For more information, see Display Unit—Main Menu—Exhaust Filter. (Section 2-1.)

Auto cleaning is able to activate (if not disabled by the operator) when the exhaust filter restriction is anywhere between MODERATE and HIGH soot levels. Auto cleaning is no longer available if exhaust filter restriction reaches VERY HIGH or SERVICE soot levels.

Parked cleaning can only be initiated when the exhaust filter restriction reaches HIGH or VERY HIGH soot level.

If exhaust filter restriction reaches SERVICE soot level, contact your authorized dealer.

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

NOTE:

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

Natural Cleaning

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

Auto Cleaning

CAUTION:

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

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

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

- DEFAULT TO CURRENT SELECTION
- DEFAULT TO ENABLED
- DEFAULT TO DISABLED

See your authorized dealer if a different default setting is preferred.

With auto cleaning enabled, exhaust filter cleaning is automatically performed as needed. No interaction from the operator is needed. When the system is actively performing an exhaust filter auto cleaning, an indicator will appear on the ADU. Machine operation can continue as normal during the auto cleaning process. When the exhaust filter auto cleaning process has completed its cycle, the cleaning indicator will automatically turn off.

NOTE:

Disabling exhaust filter auto cleaning is not preferred. Whenever possible, auto cleaning should be enabled to minimize soot buildup and increase machine uptime.

If operating in conditions where it may be unsafe for elevated exhaust temperatures, auto cleaning can be disabled using the ADU menu. If auto cleaning is disabled by the operator, a green exhaust filter auto cleaning disabled indicator will appear on the ADU. Indicator remains on until auto cleaning is enabled again.

If filter restriction reaches the HIGH soot level with auto cleaning disabled, a pop-up will appear on the monitor stating that auto cleaning needs to be enabled. For more information, see Display Unit—Main Menu—Exhaust Filter—Auto Cleaning. (Section 2-1.)

Parked Cleaning

CAUTION:

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

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

Avoid death or serious injury from machine movement. Do not leave running machine unattended during exhaust filter cleaning.

IMPORTANT:

Avoid machine damage. Always park machine in a safe location and check for adequate fuel level before beginning exhaust filter parked cleaning.

Parked cleaning is prompted by the ADU and initiated by the operator. It is most commonly initiated after extended operation with exhaust filter auto cleaning disabled or frequent engine shutdowns have occurred while the auto cleaning process was active.

During the cleaning process, the engine speed will be controlled automatically and the machine must remain parked to complete the procedure. Complete cleaning takes less than 45 minutes, but will vary based on several criteria including fuel type, oil type, duty cycle, and the number of previously aborted exhaust filter cleaning requests.

Parked cleaning is activated by accessing the ADU menu. The first parked cleaning menu offers a choice either to automatically shut down the machine after parked cleaning is complete, or not to shut down. For more information, see Display Unit—Main Menu—Exhaust Filter—Parked Cleaning. (Section 2-1.) Parked cleaning can only be initiated if the filter restriction is at HIGH or VERY HIGH soot level.

Machine needs to be in a predetermined safe state. This safe state includes two conditions:

- Park brake applied.
- Engine running at idle.

Parked cleaning occurs in two stages. The first stage is to prepare the exhaust filter by automatically raising exhaust filter temperature. Preparation status is displayed on the monitor. Once the exhaust filter temperature reaches a predetermined temperature, the cleaning process may begin.

The second stage is when the cleaning process begins and may result in exhaust filter temperatures exceeding 550°C (1022°F). Progress status is displayed on the monitor. The cleaning process will continue until one of the following conditions exist:

- Exhaust filter restriction lowered to predetermined level.
- 45 minutes has elapsed causing a timeout.
- Operator cancels the parked cleaning procedure by releasing park brake or increasing engine speed.
- Parked cleaning is aborted due to a fault.
- Engine runs out of fuel.
- Engine is shut off by operator (not recommended).

The exhaust filter cleaning indicator will appear on the ADU during a parked cleaning. When parked cleaning procedure is complete, engine will automatically return to low idle and turn off exhaust filter cleaning indicator. After this occurs, machine is ready to return to normal operation.

IMPORTANT:

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

Operator can choose to have the machine automatically shutdown when parked cleaning procedure is complete by selecting the auto shut down feature from the ADU. If auto shutdown is not enabled and machine is not returning to operation, allow sufficient idle time for engine and exhaust filter to cool before stopping engine.

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

Ash Removal

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

NM00125,0000629-19-20150421

Service ADVISOR™ Remote (SAR) Software Delivery Process

Theory of Operation

Service ADVISOR™ is a diagnostic tool used by John Deere dealers to perform diagnostics as well as updates to machine settings and software. Dealers can access diagnostic trouble codes and diagnostic addresses, create readings and recordings, and program controllers. This technology consists of both software and hardware. Technicians attend a minimum of 8 hours of training to become certified in utilizing this tool.

Service ADVISOR Remote (SAR) is a function of Service ADVISOR. It allows the dealer technician to connect to a SAR-enabled machine via the JDLINK™ network to remotely access diagnostic trouble code information and record diagnostic data, as well as program controllers.

Similar to software (payload) updates in the computer industry, SAR enables John Deere to remotely deliver updated software via the JDLINK hardware onboard. Remote programming gives John Deere the ability to update software to enhance the performance of the machine. This capability can be used to reprogram most machine controllers. The user actively participates with the dealer in this process by both downloading the software update and installing the software update.

NOTE:

Some vehicle controllers may not be compatible for SAR reprogramming.

For more information about Service ADVISOR Remote, consult an authorized John Deere dealer.

Vehicle Reprogramming

NOTE:

Factory setting is set to always accept software downloads. To change this setting, consult an authorized John Deere dealer to either be prompted for software updates or deny all software updates.

Normal machine operation can continue during the software download process.

Customer will be notified by John Deere or a John Deere dealer of pending software updates with appropriate installation instructions via letter or phone.

Customer will determine the appropriate time and place to install the new software on the machine via the machine monitor. For more information, see Standard Display Monitor—Main Menu—Software Delivery—Software Update. (Section 2-2.)

Once the customer initiates delivery and installation of the software, SAR will start and manage the installation of the new payload to the appropriate machine controllers.

NOTE:

Software download speed capability depends on JDLink cellular coverage.

Service ADVISOR is a trademark of Deere & Company

JDLink is a trademark of Deere & Company

OUT4001,00006C4-19-20160122

Stopping the Engine

Engine shutdown can be initiated by either the operator or the system.

The system can initiate shutdown only if the auto shutdown feature is enabled. To initiate auto shutdown see Display Unit—Main Menu—Machine Settings—Auto Shutdown. (Section 2-1.)

The operator initiated shutdown is called the delayed shutdown.

Delayed Shutdown— To initiate a delayed shutdown:

1. Push and release ignition OFF/engine STOP switch on the sealed switch module.

- 2.

NOTE:

If no machine calibrations are active and the park brake is applied, the system will immediately enter delayed shutdown mode.

The system enters delayed shutdown mode as follows:

- A pop-up will display confirming the delayed shutdown and will show a countdown timer.
- When the countdown reaches zero, the engine stops and the ignition turns OFF.

The length of the delayed shut down is calculated by the engine controller based on machine usage. The maximum countdown time is 2 minutes.

- 3.

IMPORTANT:

Prevent engine damage. Do not bypass delayed shutdown mode unless absolutely necessary. Calculated countdown time allows turbocharger and engine components to cool down before shutdown.

To cancel or bypass delayed shutdown mode:

- Hold the STOP button for 1 second or press it a second time to request an immediate shutdown.
- Push the START button.
- Shift the transmission into any gear.

Automatic Shutdown— Automatic shutdown feature turns off ignition power and shuts down the engine after the machine has been idle for a preset period of time.

Automatic shutdown can be disabled or set to activate after a predetermined time.

To enable/disable or adjust automatic shutdown time, see Display Unit—Main Menu—Machine Settings—Auto Shutdown. (Section 2-1.)

Conditions that must be met for auto shutdown to occur are:

- Transmission is in neutral or park
- Accelerator pedal is not pressed
- Vehicle speed is less than 0.5 km/h (0.31 mph)
- Engine coolant temperature is greater than a minimum value
- No calibrations are currently active

NM00125,000062A-19-20110104

Secondary Steering—If Equipped



TX1053208-UN: Secondary Steering Indicator

LEGEND:

1 - STOP Indicator

2 - Secondary Steering Indicator

IMPORTANT:

Stop machine as soon as possible after secondary steering indicator (2) appears and audible alarm comes on. **THE SECONDARY STEERING SYSTEM IS NOT INTENDED FOR CONTINUOUS USE.**

NOTE:

Secondary steering is activated automatically and immediately at the loss of main hydraulic system pressure. There is no need to activate or reset the system at any time.

STOP indicator (1) flashes, secondary steering indicator comes on and an audible alarm sounds when secondary steering system is activated. This indicates low hydraulic pressure resulting from mechanical malfunction. A hydraulic accumulator actuates to provide temporary emergency steering.

OUT4001,00002BB-19-20090218

Emergency Stopping

1. Reduce engine speed to slow idle. Sequentially downshift to 1st gear.
2. Apply service brake. A stored energy accumulator will provide limited use of service brakes.
3. Depress inching pedal.
4. Move transmission control and park brake lever to position P. Make sure park lock collar engages.
5. Lower all equipment to ground if engine is running.

NOTE:

The park brake is self adjusting, there is no procedure for adjusting park brake.

TX,25,DX741-19-20090109

Operation On A Grade

**CAUTION:**

Prevent possible injury from unexpected machine movement. **DO NOT COAST** (shifting transmission to neutral or depressing inching pedal) while on a grade. Engine braking will be lost.

OUT4001,0000386-19-20081219

Transmission Control and Park Brake Lever Operation



TX1084452A-UN: Standard Machine



TX1084462A-UN: Grade Pro Machine

LEGEND:

1 - Transmission Control and
Park Brake Lever

**CAUTION:**

Prevent possible injury from unexpected machine movement. Always put transmission control lever in park position P before leaving operator's seat.

Before moving transmission control lever to neutral, forward, or reverse, be sure service brake is operational.

IMPORTANT:

To prevent transmission damage, never coast downhill with transmission in neutral or with inching pedal depressed. This can cause over-speeding of transmission parts.

NOTE:

Transmission control and park brake lever (1) engages park brake when moved to the position P and disengages when lever is moved to neutral, forward, or reverse.

Move transmission control and park brake lever to position P before starting engine or leaving the operator's seat. Make sure park lock collar engages.

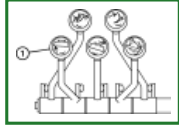
It is not necessary to use inching pedal when shifting gears. Transmission will sense operating conditions and modify gear changes accordingly.

To release brake, pull safety lock collar on lever up and move transmission control lever to neutral, forward, or reverse.

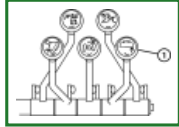
NM00125,000071F-19-20101119

Hydraulic Control Lever Operation

Blade Lift Levers



T205639-UN: Left Side Controls



T205640-UN: Right Side Controls

LEGEND:

1 - Blade Lift Lever

Pull blade lift levers (1) back to raise blade.

Push levers forward to lower blade.

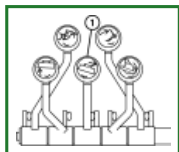
Push levers all the way forward into detent position for blade float.

Release blade float manually by pulling back on levers.

Blade float allows the blade to "float" over hard and uneven surfaces.

Use blade float in these ways:

- To remove snow from hard or frozen surfaces.
- To move loose material on a hard-packed surface.
- To match a hard surface with loose material. (Float only the blade end contacting hard surface.)

Blade Side Shift Lever

T205641-UN: Left Side Controls

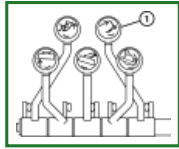
LEGEND:

1 - Blade Side Shift Lever

Pull blade side shift lever (1) back to shift blade right.

Push lever forward to shift blade left.

Blade Pitch Lever



T205642-UN: Left Side Controls

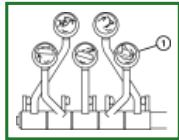
LEGEND:

1 - Blade Pitch Lever

Pull blade pitch lever (1) back to pitch blade to the rear.

Push lever forward to pitch blade forward.

Circle Rotate Lever



T205643-UN: Left Side Controls

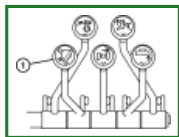
LEGEND:

1 - Circle Rotate Lever

Pull circle rotate lever (1) back to rotate circle clockwise.

Push lever forward to rotate circle counterclockwise.

Circle Side Shift Lever



T205644-UN: Right Side Controls

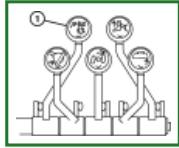
LEGEND:

1 - Circle Side Shift Lever

Pull circle side shift lever (1) back to shift circle right.

Push lever forward to shift circle left.

Articulation Lever



T205645-UN: Right Side Controls

LEGEND:

1 - Articulation Lever

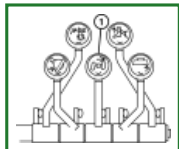
Pull articulation lever (1) back to steer machine right.

Push lever forward to steer machine left.

Use articulation lever:

- To place rear wheels on solid ground while offset front wheels are on wet or unstable ground.
- With wheel lean to make short turn.
- With hydrostatic front wheel drive as needed.

Wheel Lean Lever



T205646-UN: Right Side Controls



T206413A-UN: Wheels in Vertical Position

LEGEND:

1 - Wheel Lean Lever

Pull wheel lean lever (1) back to lean wheels right.

Push lever forward to lean wheels left.

Lean wheels:

- Toward the windrow when making a heavy cut.
- To make a shorter turn.

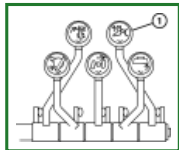
After using machine in Wheel Lean position, return front wheels to vertical position (equal distance from dog house to center of front tires).

Midmount Scarifier Lever—If Equipped, Front Mount Scarifier Lever—If Equipped, or Front Mount Blade Lever—If Equipped

IMPORTANT:

Avoid machine damage. Do not turn machine with scarifier engaged in material.

It is possible to contact midmount scarifier components to draft frame. Prevent possible damage to midmount scarifier (if equipped). Do not force the draft frame or moldboard into any part of the midmount scarifier. Stop the machine immediately if the moldboard locks up with the midmount scarifier.



T205647-UN: Right Side Controls

LEGEND:

1 - Scarifier/Blade Lever

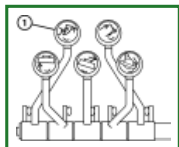
If machine is equipped with either a midmount scarifier, front scarifier, or front mounted blade, pull scarifier/blade lever (1) back to raise attachment.

Push lever forward to lower attachment.

Push lever all the way forward into detent position to put attachment in “float” position.

Release “float” manually by pulling back on lever.

Operating Rear Ripper—If Equipped



T205648-UN: Left Side Controls

LEGEND:

1 - Ripper Lever

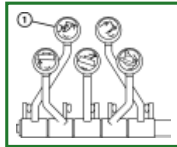
IMPORTANT:**Avoid machine damage. Do not turn machine with ripper engaged in material.**

Pull ripper lever (1) back to raise attachment.

Push lever forward to lower attachment.

Push lever all the way forward into detent position to put attachment in "float" position.

Release "float" manually by pulling back on lever.

Operating Auxiliary Control Lever—If Equipped

T205648-UN: Left Side Controls

LEGEND:

1 - Auxiliary Control Lever

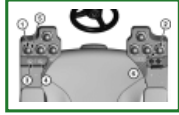
Push forward or pull back on auxiliary control lever (1) to operate attachment.

OUT4001,000038C-19-20090115

Hydraulic Control Lever Operation—Grade Pro Machines Only**NOTE:****Control lever functions shown here are the factory installed configurations. However, actual configuration may vary since the control levers can be reprogrammed. To reprogram the control levers and their function, see your authorized dealer.**

Hydraulic enable switch must be turned ON and both armrests lowered to activate hydraulic functions.

Blade Lift Levers



TX1057326A-UN: Blade Lift Levers

LEGEND:

1 - Left Blade Lift Lever	3 - Left Blade Float Button	5 - Left Blade Auto Button
2 - Right Blade Lift Lever	4 - Right Blade Float Button	6 - Right Blade Auto Button

Pull left blade lift lever (1) and right blade lift lever (2) back to raise blade.

Push blade lift levers forward to lower blade.

For left blade float, press left blade float button (3) on.

For right blade float, press right blade float button (4) on.

Release blade float by pressing each button off or moving the associated lever.

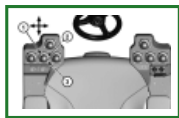
Blade float allows the blade to "float" over hard and uneven surfaces.

Use blade float in these ways:

- To remove snow from hard or frozen surfaces.
- To move loose material on a hard-packed surface.
- To match a hard surface with loose material. (Float only the blade end contacting hard surface.)

The left and right blade auto buttons (5 and 6) are used with automatic blade control (either the cross slope system or the aftermarket electronic grade control).

Blade Side Shift Lever/Lever Steering



TX1057329A-UN: Blade Side Shift Lever/Lever Steering

LEGEND:

1 - Blade Side Shift Lever/Steering Lever	2 - Left Increment Button	3 - Left Decrement Button
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This lever is a 2-axis lever. Forward/back operates the blade side shift and left/right operates the steering functions.

Pull blade side shift lever (1) back to shift blade right.

Push blade side shift lever forward to shift blade left.

NOTE:

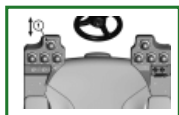
The lever steering switch and hydraulic enable switch must both be ON for lever steering to work. See Switch Module Functions. (Section 2-1.)

Move steering lever (1) to the left to steer left.

Move steering lever to the right to steer right.

When automatic blade control is enabled, pressing the left increment button (2) or left decrement button (3) will adjust the desired slope.

Blade Pitch Lever



TX1057331A-UN: Blade Pitch Lever

LEGEND:

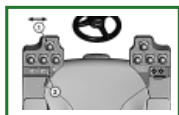
1 - Blade Pitch Lever

This lever is a 2-axis lever. Forward/back operates the blade pitch.

Pull blade pitch lever (1) back to pitch blade to the rear.

Push blade pitch lever forward to pitch blade forward.

Operating Rear Ripper—If Equipped



TX1056855A-UN: Ripper Lever—If Equipped

LEGEND:

1 - Ripper Lever

2 - Ripper Float Button

IMPORTANT:

Avoid machine damage. Do not turn machine with ripper engaged in material.

This lever is a 2-axis lever. If machine is equipped with a rear ripper, left/right axis operates the raising and lowering of the ripper.

Move ripper lever (1) left to lower ripper.

Move ripper lever right to raise ripper.

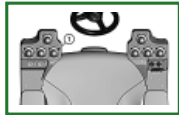
NOTE:

Ripper float button is on the right 3-switch panel on left control pod.

For ripper float, press ripper float button (2) to turn on.

Release ripper float by pressing button again to turn off or moving the associated lever.

Circle Rotate Lever



TX1057332A-UN: Circle Rotate Lever

LEGEND:

1 - Circle Rotate Lever

Pull circle rotate lever (1) back to rotate circle clockwise.

Push circle rotate lever forward to rotate circle counterclockwise.

NOTE:

If equipped with cross slope, cross slope settings will be mirrored after completion of blade flip.

If equipped with blade flip, pull circle rotate lever back quickly twice to activate blade flip clockwise.

If equipped with blade flip, push circle rotate lever forward quickly twice to activate blade flip counterclockwise.

Circle Side Shift Lever



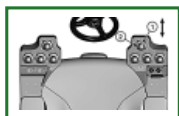
TX1057333A-UN: Circle Side Shift Lever

LEGEND:

1 - Circle Side Shift Lever

Pull circle side shift lever (1) back to shift circle right.

Push circle side shift lever forward to shift circle left.

Articulation Lever

TX1057334A-UN: Articulation Lever

LEGEND:

1 - Articulation Lever

2 - Return-to-Straight Button

This lever is a 2-axis lever. Forward/back operates the articulation.

Pull articulation lever (1) back to steer machine right.

Push articulation lever forward to steer machine left.

Use articulation lever:

- To place rear wheels on solid ground while offset front wheels are on wet or unstable ground.
- With wheel lean to make short turn.
- With hydrostatic front wheel drive as needed.

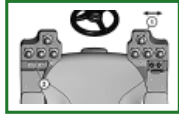
Pushing the return-to-straight button (2) will cause the machine to automatically align the front and rear frames.

Midmount Scarifier Lever—If Equipped, Front Mount Scarifier Lever—If Equipped, or Front Mount Blade Lever—If Equipped

IMPORTANT:

Avoid machine damage. Do not turn machine with scarifier engaged in material.

It is possible to contact midmount scarifier components to draft frame. Prevent possible damage to midmount scarifier (if equipped). Do not force the draft frame or moldboard into any part of the midmount scarifier. Stop the machine immediately if the moldboard locks up with the midmount scarifier.



TX1056854A-UN: Scarifier Lever—If Equipped

LEGEND:

1 - Scarifier/Blade Lever 2 - Scarifier/Blade Float Button

This lever is a 2-axis lever. If machine is equipped with either a midmount scarifier, front scarifier, or front mounted blade, left/right axis operates the raising and lowering of the attachment.

Move scarifier/blade lever (1) left to raise attachment.

Move scarifier/blade lever right to lower attachment.

NOTE:

Scarifier/Blade float button (2) is on the left 3-switch panel on left control pod.

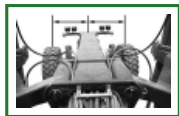
For scarifier/blade float, press scarifier/blade float button to turn on.

Release scarifier/blade float by pressing button again to turn off or moving the associated lever.

Wheel Lean Lever



TX1057335A-UN: Wheel Lean Lever



T206413A-UN: Wheels in Vertical Position

LEGEND:

1 - Wheel Lean Lever 2 - Right Increment Button 3 - Right Decrement Button

Pull wheel lean lever (1) back to lean wheels right.

Push wheel lean lever forward to lean wheels left.

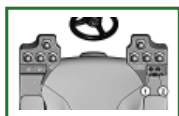
Lean wheels:

- Toward the windrow when making a heavy cut.
- To make a shorter turn.

After using machine in wheel lean position, return front wheels to vertical position (equal distance from dog house to center of front tires).

When automatic blade control is enabled, pressing the right increment button (2) or right decrement button (3) will adjust the desired slope.

Operating Auxiliary Mini-Joysticks—If Equipped



TX1057338A-UN: Auxiliary Mini-Joysticks

LEGEND:

1 - Left Auxiliary Mini-Joystick 2 - Right Auxiliary Mini-Joystick

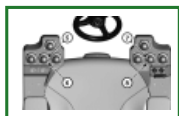
Move left auxiliary mini-joystick (1) or right auxiliary mini-joystick (2) to operate attachment.

NM00125,00007D6-19-20210209

Cross Slope Control System Operation—Grade Pro Machines Only



TX1057574-UN: Monitor View with Cross Slope



TX1057591A-UN: Increment and Decrement Buttons

LEGEND:

1 - Automatic Blade Control Indicator

2 - INFO Button

4 - Desired Slope Indicator

6 - Left Decrement Button

8 - Right Decrement Button

3 - Cross Slope Angle Indicator

5 - Left Increment Button

7 - Right Increment Button

The cross slope control system is designed to control the slope of the blade cutting edge. The operator selects the desired slope using buttons conveniently located on the control levers. After selecting a desired slope, the operator chooses which side of the blade the cross slope system will automatically control. The system uses sensors mounted on the machine to calculate the current slope of the blade and determines if the blade slope needs to be adjusted up or down to maintain the operator's desired slope. The operator manually controls the elevation of the blade as the cross slope system maintains the slope of the cut. The slope can be adjusted any time using increment and decrement buttons. The direction of the slope can be easily swapped at the end of the pass.

To activate the cross slope system:

1. Select cross slope by pressing the automatic blade control button on the sealed switch module once (left LED is on).
2. The automatic blade control indicator (1) will illuminate indicating that cross slope is enabled. The monitor screen will change to the cross slope display mode. Use the INFO button (2) to manually cycle between the cross slope screen, the normal display screen, and the rear camera (if equipped).
3. Select the desired slope by pressing either the left or right increment or decrement buttons (5, 6, 7, and 8) located on the blade side shift and wheel lean control lever knobs. The cross slope angle indicator (3) will slope to the right or left indicating the direction of the desired slope. The desired slope indicator (4) will show the value of the operator's desired slope.

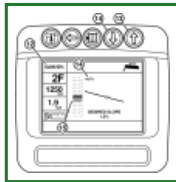
NOTE:

Pressing the left increment button will increase the slope of the left side of the blade, pressing the left decrement button will decrease the slope of the left side of the blade. Pressing the left increment button is equivalent to pressing the right decrement button.

4.



TX1057590A-UN: Blade Auto Buttons



TX1057584-UN: Cross Slope Monitor View

LEGEND:

9 - Left Blade Auto Button

11 - AUTO Display

13 - UP Button

15 - Grade Indicator Light Bars

10 - Right Blade Auto Button

12 - GAIN Display

14 - DOWN Button

To have the left side automatically controlled, press the left blade auto button (9) found on the left blade lift lever. To have the right side automatically controlled, press the right blade auto button (10) found on the right blade lift lever. The word "AUTO" (11) will be displayed on the side that is being automatically controlled.

NOTE:

Pressing the auto button on the side that is currently in automatic mode a second time will turn automatic control off. Pressing the auto button on the opposite side will transfer automatic control to that side.

5. If the left side is being automatically controlled, then use the right blade lift lever to manually control the depth of cut, the left lift cylinder will be automatically adjusted to maintain the desired slope. The left blade lift lever can be used to temporarily override the automatic system if required. (e.g., to lift the blade up to clear a manhole cover)
6. To change the direction of the desired slope ("mirror" the slope setting), momentarily press both the increment and decrement buttons at the same time.

While the cross slope screen is being displayed, the GAIN (12) percentage or sensitivity of the cross slope system can be adjusted using the UP (13) and DOWN (14) buttons on the monitor. In rough grading applications, a higher GAIN setting will allow the blade to react more quickly to changes in material and ground conditions. In fine grading applications, a lower GAIN setting will cause the blade to react slower resulting in smoother corrections.

The grade indicator light bars (15) provide an indication of how close the desired slope is being maintained.

NM00125,00007D7-19-20110104

Blade Stow Operation—If Equipped (Grade Pro Machines Only)

BLADE STOW operation automatically moves the blade to home or stow position. Stow position is used for machine transportation, and home position is used for grading applications.

BLADE STOW option uses cylinder position sensors to automatically move the blade to home or stow position.

Use the machine preset or auxiliary function switch to activate BLADE STOW option. For more information, see Main Menu—Automation Setup. (Section 2-3.)

For stow position, the circle side shifts to the left and lift cylinders level the blade. The blade rotates, pitches all the way back, and side shifts to match the tire width and place blade heel on the left side of machine.

Conditions that must be met for blade stow feature to get activated are:

- Saddle pin in the center position.
- Circle rotate angle within the boundary set by machine damage avoidance.

GS11409,0000431-19-20210207

Using Differential Lock



TX1053053A-UN: Standard Machine



TX1057339A-UN: Grade Pro Machine

LEGEND:

1 - Differential Lock Switch

NOTE:

Use differential lock when conditions require maximum traction.

The differential lock can be engaged manually or automatically.

Manual Differential Lock

To engage manual differential lock, move differential lock switch (1) to ON position. The differential lock icon on the monitor display will come on. For information on the differential lock icon, see Advanced Display Unit (ADU) in Section 2-1.

If auto differential lock is enabled, engaging manual differential lock overrides auto differential lock mode.

IMPORTANT:

Prevent damage to machine. Disengage differential lock when operating on dry concrete or asphalt surfaces.

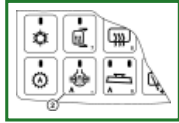
NOTE:

Manual differential lock can be engaged or disengaged when machine is moving or stopped.

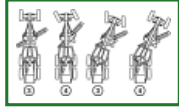
To disengage differential lock, move differential lock switch to OFF position. The differential lock icon on the monitor display will turn off.

- Disengage differential lock when operating on dry concrete or asphalt surfaces.
- Disengage differential lock to make shorter turns and reduce tire wear.

Auto Differential Lock



TX1082734-UN: Automatic Differential Lock Switch



TX1082735-UN: Effect of Steering and Articulation on Auto Differential Lock Engagement

LEGEND:

2 - Automatic Differential Lock Switch 3 - Differential Lock Engaged 4 - Differential Lock Disengaged

NOTE:

Auto differential lock can be enabled or disabled when machine is moving or stopped.

NOTE:

For information on the differential lock icon, see Advanced Display Unit (ADU) in Section 2-1.

The differential lock will engage and the differential lock icon on the monitor display will come on only when ALL of the following conditions are met:

- Automatic differential lock switch (2) on the sealed switch module is pushed and released (switch LED on).
- Transmission in neutral or in gears 1, 2, 3, or 4 (forward or reverse).
- Combined angles of front wheels and articulation frames are less than 10 degrees, unless machine is in crab steer. Item (3) in illustration shows two examples of machine steering that allows the differential lock to engage.

NOTE:

When auto differential lock is engaged, the differential lock icon on the monitor display will appear with an “A” at the lower left side of the icon, indicating auto differential lock is active.

NOTE:

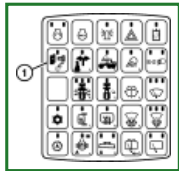
Engaging manual differential lock when auto differential lock is enabled will override the auto differential lock.

The differential lock will disengage and the differential lock icon on the monitor display will turn off when any of the following occur:

- Automatic differential lock switch (2) pushed and released (again) (switch LED off).
- Transmission shifted to 5th gear or higher (forward or reverse).
- Combined angles of front wheels and articulation frames are more than 10 degrees (except when in crab steer). Item (4) in illustration shows two examples of machine steering that can cause the differential lock to disengage.

OUC1010,000167A-19-20110104

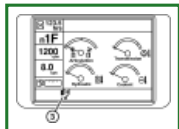
Disengaging and Engaging Saddle Lock Pin



TX1053284-UN: Saddle Lock Pin Switch



T204773A-UN: Lift Arm Indicator



TX1053290-UN: Saddle Lock Pin Indicator

LEGEND:

1 - Saddle Lock Pin Switch

2 - Lift Arm Indicator

3 - Saddle Lock Pin Indicator

1. Center circle and blade under machine. Lower blade to ground.
2. On standard machines, move blade lift levers to the float position.

On Grade Pro machines, push blade float switch located on the left arm rest.

3.  **CAUTION:**

Prevent possible injury from unexpected component movement. Do not unlock saddle lock pin unless blade is on ground or blade will drop suddenly.

Push and hold saddle lock pin switch (1) for approximately 3 seconds. After 3 seconds saddle lock pin unlocks, LED on sealed switch module illuminates, and saddle lock indicator pin indicator (3) illuminates.

4. Move lift arm to the desired position. Check position on lift arm indicator (2).

NOTE:

If locking pin does not engage, shift circle slightly to align lock pin with locking hole.

5. Push and hold saddle lock pin switch to lock. When lock pin is engaged, LED on sealed switch module shuts off and saddle lock pin indicator on monitor shuts off.

NM00125,0000793-19-20110104

Moving Blade to Bank Position



TX1054526A-UN: Movement of Blade to Bank Position



TX1054525A-UN: Blade—Right Bank Position Shown



CAUTION:

Prevent possible injury from blade movement. Clear people away from grader before moving blade to bank position.

IMPORTANT:

Prevent possible machine damage. If machine is equipped with a midmount scarifier, pay attention to avoid contact between the draft frame and midmount scarifier when moving blade to bank position.

NOTE:

These instructions are for moving blade to right bank position. Use opposite functions to move blade to left bank position.

1. Position the circle slightly to right of center.
2. Shift blade to the right.
3. Lower blade to the ground.
4. Move blade lift levers to float position.
5. Disengage saddle lock pin.
6. Retract left lift cylinder and circle side shift cylinder, and extend right lift cylinder to rotate lift arms.
7. Align lift arm indicator with desired locking position and engage locking pin.
8. Using lift cylinders and circle side shift cylinder, lift blade off ground 100—125 mm (4—5 in.).
9. Rotate blade counterclockwise to put right end of blade forward.
10. Retract right lift cylinder. Extend left lift cylinder. Rotate circle. Adjust circle side shift cylinder and pitch, and sideshift blade to obtain desired blade position.
11. Follow steps in reverse order to move blade out of bank position.

OUT4001,00002C1-19-20090211

6WD Operation—If Equipped

The 6WD system allows the operator to control front wheel drive engagement and speed to adjust for various operating conditions.

The 6WD controls consist of:

- 6WD/Precision switch (6).
- 6WD inching mode switch (3).
- Aggressiveness mode dial (1).

To engage 6WD, the following must occur:

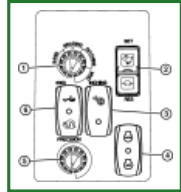
- **For Machines With 6.8 L Engine Only:**
Transmission in gears 1—4 forward or reverse.

- **For Machines With 9.0 L Engine Only:**

Transmission in gears 1—7 forward or reverse.

- 6WD and precision switch in the 6WD position.

When engaged, the grader icon will appear on the monitor.



TX1082685-UN: Side Console Switch Panel

LEGEND:

1 - Aggressiveness Mode Dial

3 - Inching Mode Switch

4 - Engine Speed Auto/Manual
Switch

5 - Precision Mode Speed Dial

2 - Engine Speed Control Switch

6 - 6WD/Precision Switch

To disengage 6WD, push the 6WD/Precision toggle switch to OFF (middle) position or select transmission gear 8.

Aggressiveness Mode— Aggressiveness mode dial (1) changes the speed of the front wheels in relation to the tandem wheels as shown in the following table:

-: Aggressiveness Mode Switch

Aggressiveness Mode Dial Operation	
Setting	Function
Counterclockwise from center	Front wheel speed is less than rear wheel speed
Center	Front and rear wheel speed matched
Clockwise from center	Front wheel speed greater than rear wheel speed

IMPORTANT:

Prevent machine damage. Do not drive machine on pavement or high traction areas with the aggressiveness dial in full clockwise position. Overheating of hydraulic oil and tire scrub can occur.

Full counterclockwise position is least aggressive. Turn dial counterclockwise from center when high traction conditions exist.

Full clockwise position is most aggressive. Turn dial clockwise from center when low traction conditions exist or when load on machine blade is greatest.

Inching Mode— 6WD inching mode allows the operator to control front wheel drive engagement in relation to the inching pedal position. When inching mode is activated, the rotation speed of front and tandem wheels match throughout full inching pedal travel. When inching mode is deactivated and 6WD mode is active, tandem wheel engagement is controlled throughout entire pedal travel. Front wheels engage only at the top of inching pedal travel (pedal released).

To engage inching mode:

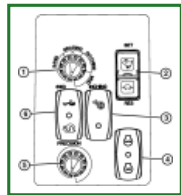
- Transmission must be in gears 1—3.
- 6WD/Precision switch is in the forward (6WD mode) position.
- 6WD inching mode switch is in the forward (ON) position.

Inching mode will disengage if any of the following occur:

- Transmission is shifted into gears 4—8.
- Inching mode switch is moved to the OFF position.

NM00125,00005F9-19-20180608

Precision Mode Operation—If Equipped



TX1082685-UN: Side Console Switch Panel

LEGEND:

- | | | | |
|---------------------------------|-------------------------|-------------------------------------|-------------------------------|
| 1 - Aggressiveness Mode Dial | 3 - Inching Mode Switch | 4 - Engine Speed Auto/Manual Switch | 5 - Precision Mode Speed Dial |
| 2 - Engine Speed Control Switch | | | 6 - 6WD/Precision Switch |

Precision mode allows the machine to operate at slower speeds than can be achieved by using the transmission. The system accomplishes this by using only the front wheels to move the machine.

When precision mode is engaged, ground speed is infinitely variable between 0.40 km/h (0.25 mph) and 7.65 km/h (4.75 mph) based on engine rpm, gear shift lever position, and precision mode speed dial (5). The precision mode speed dial divides each forward gear 1—3 into 15 separate speed increments. The desired precision speed control range can be selected at any time, including on-the-fly adjustment to obtain the desired speed.

To initiate precision mode, ensure that the transmission is in a gear 1—3 forward and push 6WD/Precision switch to the precision mode position. The precision mode indicator will display on the monitor when engaged. See Advanced Display Unit Functions. (Section 2-1.)

During operation, the machine will disable precision mode if any of the following occur:

- 6WD/Precision switch is placed in middle (OFF) or forward (ON) position.
- The transmission selected gear is 4th or higher.
- The transmission is shifted into any reverse gear.

NM00125,0000697-19-20120124

Operating Grade Pro System—If Equipped



TX1122270-UN: Sealed Switch Module (SSM)



TX1122271A-UN: Grade Pro Display Unit



TX1122381A-UN: Grade Pro System Display

LEGEND:

1 - Automatic Blade Control Switch

2 - Grade Pro System Display Unit ON Button

3 - Grade Pro System Display Unit OFF Button

4 - Reference Guide Icon

5 - Grade Pro System Icon

Only machines equipped with Grade Pro may utilize the Grade Pro system. For proper operation of Grade Pro system, see system's reference guide.

When Grade Pro system is enabled, machine will direct blade based on commands received from Grade Pro system.

NOTE:

Grade Pro display unit can be activated without enabling Grade Pro system.

Activating Grade Pro System Display Unit: Press and release Grade Pro display unit ON button (2).

Switching OFF Grade Pro System Display Unit: Press and release Grade Pro display unit OFF button (3).

Accessing Grade Pro Reference Guide

1. Activate Grade Pro system.

2.

NOTE:

If menu bar is not visible, press the icon located in the upper right corner of Grade Pro display unit screen.

Press **File** on Grade Pro display unit menu bar.

3. Select **Exit 3DMC** from dropdown menu to close program.

4.

NOTE:

Reference guide icon has the label 7010-0911 directly underneath the icon.

Double-click the reference guide icon (4) to open reference guide.

Closing Grade Pro Reference Guide

1. Press the **X** button in the upper right corner of the reference guide window.

2.

NOTE:

Grade Pro system icon has the label 3DMC directly underneath the icon.

Double-click the Grade Pro system icon (5) to activate Grade Pro system screen.

NOTE:

Grade Pro system must be enabled to guide blade based on commands from Grade Pro system.

Enabling Grade Pro System:

1. Enable hydraulics. See Switch Module Functions. (Section 2-1.)

2. Activate Grade Pro system display unit.

3. Press and release automatic blade control switch (1) until:

- Right LED above automatic blade control switch is illuminated and
- auto-blade indicator is illuminated on advanced display unit (ADU).

See Display Unit Functions. (Section 2-1.)

ER93822,000018E-19-20120927

Parking the Machine



TX1084452A-UN: Standard Machine



TX1084462A-UN: Grade Pro Machine

LEGEND:

1 - Transmission Control and
Park Brake Lever

Before leaving the operator's seat, perform the following procedure:

1. Stop machine on a level surface.
2. Lower all equipment to the ground.

3.

NOTE:

Transmission control and park brake lever (1) engages park brake when moved to position P and disengages when lever is moved to neutral, forward, or reverse.

Move transmission control and park brake lever to position P. Make sure park lock collar engages.

4.

IMPORTANT:

Turbocharger may be damaged if engine is not properly shut down. See Stopping the Engine. (Section 2-2.)

Push the ignition OFF/engine STOP switch to initiate engine shutdown.

5. If machine is to be parked overnight, turn battery disconnect switch to OFF. Lock cab door, fuel cap, and compartments.

If storing longer than overnight, see Prepare Machine for Storage. (Section 4-4.)

NM00125,0000636-19-20101202

Transmission—Limp Home

Limp Home is the continued operation of the transmission when one of the eight solenoids fails to operate properly. It is used for the purpose of returning home to repair the machine or when the transmission detects a failure on one of its other required inputs.

To engage gears, shift to neutral and back into gear. If that gear does not operate, shift to neutral and try the nearest gear below. Not all gears will operate and the highest operable gear is 4th in this condition.

OUT4001,0000371-19-20090305

Transmission Operation

The transmission control unit manages operation of the transmission.

Event Based Shifting

Event Based Shifting (EBS) is part of the transmission control unit software that adjusts how a gear is engaged in the transmission. When the operator selects a gear, the transmission control unit follows a standard shift logic (clutch protection, speed matching, downshift inhibit, inching pedal, shuttle shifting, and autoshift—see following description for each.) After a gear is determined by the shift logic, the engagement of that gear is governed by the EBS portion of the software. The EBS software may “feather” a clutch to provide a smooth soft shift, such as during transport, or may provide a rapid firm shift to maintain momentum when the machine is under load. EBS is designed to provide optimum shift quality. The transmission control unit uses the sensors on the transmission along with information from other controllers and sensors via the CAN to aid in this operation. Transmission shift duration and timing may vary based on these inputs.

Clutch Protection

The transmission control unit is programmed to detect clutch slippage caused by extended use of the inching pedal.

If the inching pedal is depressed slightly for an extended period of time, directional clutch slippage may cause excessive heat and wear. To prevent this, the transmission control unit will shift the transmission to next lowest gear and cool the over-slipped clutch. During this cooling period, the operator will not be able to shift to a higher gear. Lower gears can be selected.

Engine Stall Prevention

Engine stall prevention is a feature that automatically downshifts the transmission to neutral, preventing an engine stall. Engine stall prevention is achieved by constantly monitoring engine operating conditions. When the machine is under load, the system will shift to neutral, as required, to prevent the engine from stalling. When stall prevention activates, the monitor will display a message indicating that engine stall prevention is active, and will instruct the operator to return the gear selector to the neutral position. When the message is displayed, the gear selector must be moved to the neutral position before an operating gear can be selected.

Speed Matching

Whenever a shift is made from neutral while the machine is moving, transmission control unit monitors engine and transmission output speeds to match a gear that would have smoothest engagement without over speeding the engine. If gear selected by operator is lower than the matched gear range, transmission control unit shifts to speed-matched gear until engine speed and transmission output speed are in range to shift to selected gear. Speed matching happens during normal neutral-to-gear shifts, autoshifting, and shuttle shifting.

Down Shift Inhibit

The transmission control unit is programmed to allow a smooth transition if a large downshift is made, such as from 6th to 2nd gear. After the gear selector is moved, the transmission control unit immediately downshifts the transmission one gear. Once rated rpm is reached, the transmission control unit will shift to the next lowest gear. It will continue to control shifts in this manner until it reaches gear selected by operator.

Inching Pedal

If the inching pedal is NOT used and the gear selector is moved from neutral, or from one gear to another in the same or either direction, the transmission will select the appropriate gears to provide the smoothest shift path to reach the selected gear. If the inching pedal is used and the gear selector is moved from neutral to any gear, or from one gear to another gear in the same direction, the transmission will shift directly to the selected gear.

Shuttle Shifting

A shuttle shift is a shift to a gear in the opposite direction in which the machine is traveling. The transmission control unit only allows a change in direction if the machine is traveling less than 5 mph. If a shuttle shift is made when machine is moving too fast, the transmission control unit will down shift to that gear using downshift inhibit. (See previous explanation of Down Shift Inhibit.) Once the machine has slowed to less the 5 mph, the transmission control unit will shift to the currently selected gear based on the use of the inching pedal. (See previous explanation of Inching Pedal.)

Skip Shifting

Skip shifting is when the transmission control unit uses one or more intermediate gears to get to a higher gear as commanded by the gear shift lever. When a gear is selected which is higher than what is engaged, the transmission control unit will evaluate the difference in gear selection and determine what gears are necessary to bring the machine up to speed to engage the selected gear. If the machine were in 1st, and 7th were selected, the transmission control unit may engage 3rd, 5th, 6th, and then 7th. This allows the machine to achieve proper ground speed in the desired gear without stalling the engine.

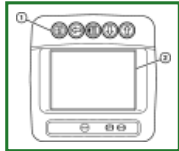
Autoshift—If Equipped

Autoshift is a feature that allows the transmission to automatically shift gears 4th through 8th when the gear shift lever is in 5th or higher. Autoshifting is enabled by pressing the autoshift button on the sealed switch module. Autoshift uses operator inputs of engine speed (accelerator pedal or engine speed control set point), gear shift lever position, and inching pedal position. Autoshift also uses machine inputs of percent throttle and percent engine load at current speed. Autoshift will only shift as high as

the gear selected by the operator. If 6th gear is selected, autoshift will only shift through gears 4th—6th. If 8th gear is selected, autoshift will shift through gears 4th—8th. The lowest gear available in autoshift mode is 4th, unless otherwise commanded by the gear shift lever (lever manually moved below 4th gear). Autoshift is not available in gears 1st—3rd.

NM00125,00007D3-19-20110513

Rear Camera—If Equipped



TX1046161-UN: Camera Display

LEGEND:

1 - INFO Button

2 - Display



CAUTION:

This camera is designed to supplement other safety practices and is not intended to be the sole method of collision avoidance. Always be alert and aware of the surroundings when operating this machine to avoid possible injury or death to operator or others.

Rear Camera— Rear camera has three selectable modes:

- **Off—** Camera system is off until the mode is changed.
- **Manual—** Rear camera activates only when INFO button (1) is pressed.
- **Reverse—** Rear camera activates whenever transmission is placed in reverse or button is pressed.

Camera stays on until machine direction of travel changes

When camera activates by any of the three methods, display (2) changes to rear camera view. Display returns to previous screen when INFO button (1) is pressed again when in manual mode or transmission is moved out of reverse when in reverse mode.

Mode is selected by accessing the SETTINGS page on the display unit. See Display Unit—Main Menu—Settings. (Section 2-1.)

NM00125,0000639-19-20100924

Tire Changing Tip

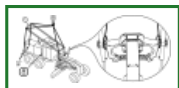
Changing tandem tires: The heel of the blade must be no closer than 1 m (3 ft) to tandem tires on side of machine with flat tire.

Side shift circle toward side of machine with flat tire and lower blade to raise machine.

Securely support machine.

TX,35,FF759-19-19930412

Lifting The Machine



TX1055145-UN: Lifting Points

LEGEND:

1 - Standard ISO Shipping
Container Lifting Device

Lifting the Machine

1.



CAUTION:

Prevent possible injury from unexpected machine movement. Clear all bystanders from lifting area.

Park the machine next to the crane.

2. Engage park brake.

3.

IMPORTANT:

Install the articulation locking pin prior to lifting machine.

Install articulation locking pin.

4.

IMPORTANT:

To prevent damage to hoods or saddle, a nylon sling is recommended. Use proper rated slings for lifting.

Do not put slings over or against hydraulic lines or hoses.

NOTE:

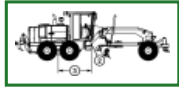
The machine lifting points are indicated on machine.

Attach nylon slings to standard ISO shipping container lifting device (1) and the machine. Slings will have to be uneven for a level lift.

5.

NOTE:

Dimensions listed are for the most common attachment configuration. If there are different attachments installed, the weight and center of gravity dimension may vary.



TX1055171-UN: Center of Gravity Location

LEGEND:

2 - Center Of Gravity Location 3 - Center Of Gravity Dimension

Attach the standard ISO shipping container lifting device to the crane. Lifting hook should be parallel to the center of gravity location (2).

Item	Measurement	Specification
Center of Gravity Dimension (3)	670G and 670GP	1829 mm 72 in.
	672G and 672GP	1930 mm 76 in.

6. Raise the crane until all the play in slings is removed.

7.

IMPORTANT:

Avoid machine damage. The crane must be able to carry total machine weight. See specific maximum operating weight in Miscellaneous—Specifications. (Section 4-6.)

Lift machine and move slowly to prevent excessive swinging of machine.

8. Lower the crane until slings can be removed from the machine.

9. Remove slings from machine.

10. Raise the crane with standard ISO shipping container lifting device and slings attached and move it away from machine.

11. Chock all wheels.
12. Secure machine to the trailer of transporting vehicle with chains.

OUT4001,0000394-19-20090205

Loading Machine on a Trailer

NOTE:

An over-width permit may be required to transport machine. Verify height of machine and trailer before transporting.

Item	Measurement	Specification
Transport Height—Standard Cab or Canopy	Height	3.18 m 10 ft 5.0 in.
Transport Height—Full-Height Cab	Height	3.40 m 11 ft 2 in.

1. Keep trailer bed clean. Put chocks against truck wheels.
2. Use a ramp or loading dock. Ramps must be strong enough, have a low angle, and correct height. Load and unload machine on a level surface.
3. Fasten seat belt before starting engine.
4. Make sure door is securely latched while loading and unloading.

5.

NOTE:

When driving the machine onto other transportation vehicle, do not install the articulation locking pin until the machine is secured.

If machine is being lifted onto the transportation vehicle, install the articulation locking pin first. See [Lifting The Machine](#) in this section.

Drive machine onto ramps slowly. Centerline of machine should be over the centerline of the trailer.

6.



TX1084452A-UN: Standard Machine



TX1084462A-UN: Grade Pro Machine

LEGEND:

1 - Transmission Control and
Park Brake Lever

Before leaving operator's seat:

- a. Lower all equipment onto blocks or trailer bed. Blade must not extend beyond truck bed and must be parallel to machine.

b.

NOTE:

Transmission control and park brake lever engages park brake when moved to position P and disengages when lever is moved to neutral, forward, or reverse.

Move transmission control and park brake lever (1) to position P. Make sure park lock collar engages.

c.

IMPORTANT:

Turbocharger may be damaged if engine is not properly shut down.

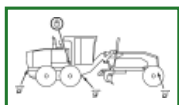
Run engine at slow idle with no load for 2 minutes.

- d. Press engine stop switch.

7.

**CAUTION:**

Avoid sudden movement and machine damage. Install the articulation locking pin.



TX1055146-UN: Right Side Shown

Place blocks at front and rear of tires.

8.

IMPORTANT:
Do not put chains over or against hydraulic lines or hoses.

Fasten to trailer with chains or cables with appropriate load binder at the following points:

- Front frame tie-down point
- Mid-frame tie-down point (located under cab)
- Rear frame tie-down points—2 places

NM00125,0000720-19-20110103

Towing Procedure

If the engine is not running or transmission system is non-functional, the park brake is ON.

IMPORTANT:

Avoid transmission damage. Engine cannot be started by towing.

Tow machine off-road to the nearest location where repair work can be done. Limit tow to 460 m (500 yd) maximum.

Never tow machine faster than 3.2 km/hr (2 mph).

Haul the machine if it must be moved further than 460 m (500 yd).

1.



CAUTION:

Prevent possible injury from unexpected machine movement. Place blocks at front and rear of tires to prevent machine from rolling.

Do not allow an operator on the machine being towed unless the operator can control the steering and brakes.

Place blocks at front and rear of tires.

2. Connect the towed and towing machines together.

3.



CAUTION:

Prevent possible injury from unexpected machine movement. Operator and bystanders must stay out of path of machine when releasing the park brake.

Release park brake with engine operable. (If the engine is inoperable, proceed to step 4.)

If the engine and transmission hydraulic system are operable, place transmission control and park brake lever into neutral N position to release park brake.

Tow with the engine running.

- Press and release engine start switch to energize the ignition and apply power to the control units and the display unit (left LED is ON).

NOTE:

Ignition power will automatically turn off if engine is not started within a defined period of time.

- **If security is enabled and a code has not been entered, the time is 5 minutes.**
- **Otherwise, ignition power will be removed after 60 minutes.**

- Place transmission control and park brake lever in neutral position.

-



TX1086142A-UN: Quick Coupler Location

LEGEND:

- 1 - Quick Coupler

Connect hand operated pump to quick coupler (1).

-
-

IMPORTANT:

Avoid park brake damage. Do not pump pressure up to more than 4137 kPa (41.1 bar) (600 psi).

Pump hand-operated pump until park brake releases. Pressure must be monitored to ensure park brake remains released.

Item	Measurement	Specification
Park Brake	Release Pressure	1379 kPa 13.8 bar 200 psi

Item	Measurement	Specification
Park Brake	Maximum Release Pressure	4137 kPa 41.4 bar 600 psi

8. Tow machine slowly.
9. To engage park brake, open valve in hand-operated pump to relieve pressure.

NM00125,00007C7-19-20101221

Diesel Fuel

Consult your local fuel distributor for properties of the diesel fuel available in your 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 that meets EN 590, ASTM D975, or EN 15940 is acceptable for use at all percentage mixture levels.

Required Fuel Properties

In all cases, the fuel shall meet the following properties:

Cetane number of 40 minimum. Cetane number greater than 47 is preferred, especially for temperatures below -20°C (-4°F) or elevations above 1675 m (5500 ft.).

Cloud Point should be below the expected lowest ambient temperature or **Cold Filter Plugging Point** (CFPP) should be a maximum 10°C (18°F) below the fuel cloud point.


Fuel lubricity should pass a maximum scar diameter of 0.52 mm as measured by ASTM D6079 or ISO 12156-1. A maximum scar diameter of 0.45 mm is preferred.

Diesel fuel quality and sulfur content must comply with all existing emissions regulations for the area in which the engine operates. DO NOT use diesel fuel with sulfur content greater than 10 000 mg/kg (10 000 ppm).

Materials such as copper, lead, zinc, tin, brass and bronze should be avoided in fuel handling, distribution and storage equipment as these metals can catalyze fuel oxidation reactions which can lead to fuel system deposits and plugged fuel filters.

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.

 **CAUTION:**

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

Sulfur Content for Interim Tier 4, Final Tier 4, Stage III B, Stage IV, and Stage V Engines Above 560 kW

- Use ONLY diesel fuel with a maximum of 500 mg/kg (500 ppm) sulfur content.

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

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

Sulfur Content for Tier 3 and Stage III A Engines

- Use of diesel fuel with sulfur content less than 1000 mg/kg (1000 ppm) is RECOMMENDED.
- Use of diesel fuel with sulfur content 1000—2000 mg/kg (1000—2000 ppm) REDUCES the oil and filter change interval.
- BEFORE using diesel fuel with sulfur content greater than 2000 mg/kg (2000 ppm), contact your John Deere dealer.

Sulfur Content for 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. [See DX,ENOIL12,OEM, DX,ENOIL12,T2,STD, or DX,ENOIL12,T2,EXT for more information on Engine Oil and Filter Service Intervals.]
- BEFORE using diesel fuel with sulfur content greater than 5000 mg/kg (5000 ppm), contact your 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.

DX,FUEL1-19-20221101

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.

TX,FUEL,SPECS-19-20201026

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,FUEL5-19-20140207

Handling and Storing Diesel Fuel



CAUTION:

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 practicable 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.

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 and prevent water condensation. Contact your fuel supplier for recommendations.

JR74534,0000253-19-20100408

Biodiesel Fuel

Biodiesel is a fuel 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/regulations may encourage or prohibit the use of biofuels. Operators should consult with appropriate governmental authorities prior to using biofuels.

US/Canada

While 5% blends are preferred (B5), biodiesel concentrations up to a 20% blend (B20) in petroleum diesel fuel can be used in all John Deere engines. Biodiesel blends up to B20 can be used ONLY if the biodiesel (100% biodiesel or B100) meets ASTM D6751 (US), EN 14214 (EU), or equivalent specification. Expect a 2% reduction in power and a 3% reduction in fuel economy when using B20.

Biodiesel concentrations above B20 may harm the engine's emission control systems and should not be used in the US and Canada. Risks may include, but not be limited to, more frequent exhaust filter parked cleanings, soot accumulation, and increased intervals for ash removal.

Biodiesel users in the U.S. are strongly encouraged to purchase biodiesel blends from a BQ9000 Certified Marketer and sourced from a BQ9000 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>.

Other regions

John Deere engines can operate on biodiesel blends below and above B20 (up to 100% biodiesel). Operate at levels above B20 ONLY if the biodiesel meets the EN 14214 specification (primarily available in Europe). Engines operating on biodiesel blends above B20 may not fully comply with 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 approved fuel conditioners containing detergent/dispersant additives are required.

Biodiesel Use Requirements

The petroleum diesel portion of all biodiesel blends must meet the requirements of ASTM D975 (US) or EN 590 (EU) commercial standard.

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.

John Deere approved fuel conditioners containing detergent/dispersant additives are required when using B20 blends and recommended when using lower biodiesel blends. 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.

Biodiesel Use Recommendations

When using biodiesel blends up to B20 the following must be considered:

- Cold weather flow degradation
- Stability and storage issues (moisture absorption, oxidation, microbial growth)
- Possible filter restriction and plugging (usually a problem when first switching to biodiesel on used engines)

Request a certificate of analysis from an authorized fuel distributor to ensure that the fuel is compliant with the specifications provided in this Operator's Manual.

Consult an authorized John Deere dealer for approved fuel conditioners to improve storage and performance with biodiesel fuels.

The following must also be considered when using biodiesel blends above B20:

- Possible coking and/or blocked injector nozzles, resulting in power loss and engine misfire if John Deere approved fuel conditioners containing detergent/dispersant additives are not used
- Possible crankcase oil dilution, requiring more frequent oil changes
- Possible lacquering and/or seizure of internal components
- Possible formation of sludge and sediments
- Possible thermal oxidation of fuel at elevated temperatures
- Possible compatibility issues with other materials (including copper, lead, zinc, tin, brass, and bronze) used in fuel handling equipment
- Possible reduction in water separator efficiency
- Possible damage to paint if exposed to biodiesel

IMPORTANT:

Raw pressed vegetable oils are NOT acceptable for use as fuel in any concentration in John Deere engines. The use could cause engine failure.

OUT4001,0000671-19-20160125

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,FUEL6-19-20180113

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 below 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 will begin to form in the fuel and this wax causes fuel filters to plug. **Pour point** is the lowest temperature at which movement of the fuel is observed.

NOTE:

On an 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 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) 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). In colder weather, engines operating with biodiesel may have more frequent parked cleanings, soot accumulation, and increased intervals for ash removal from the exhaust filter.

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.

VD76477,0000525-19-20110330

John Deere Break-In Plus™ Engine Oil

New engines are filled at the factory with either John Deere Break-In™ or Break-In Plus™ Engine Oil. During the break-in period, add John Deere Break-In or Break-In Plus Engine Oil, respectively, as needed to maintain the specified oil level.

Operate the engine under various conditions, particularly heavy loads with minimal idling, to help seat engine components properly.

Change the oil and filter at 250 hours maximum for Break-In Oil or 500 hours maximum for Break-In Plus Oil during the initial operation of a new or rebuilt engine.

After engine overhaul, fill the engine with either John Deere Break-In or Break-In Plus Engine Oil.

If John Deere Break-In or Break-In Plus Engine Oil is not available, use a 10W-30 diesel engine oil meeting one of the following during the first 250 hours of operation:

- API Service Classification CE
- API Service Classification CD
- API Service Classification CC
- ACEA Oil Sequence E2
- ACEA Oil Sequence E1

IMPORTANT:

Do not use Plus-50™ II, Plus-50, or engine oils meeting any of the following for the initial break-in of a new or rebuilt engine:

-: Oils

API CJ-4	ACEA E9
API CI-4 PLUS	ACEA E7
API CI-4	ACEA E6
API CH-4	ACEA E5
API CG-4	ACEA E4
API CF-4	ACEA E3
API CF-2	
API CF	

These oils will not allow the engine to break in properly.

John Deere Break-In Plus Engine Oil can be used for all John Deere diesel engines at all emission certification levels.

After the break-in period, use John Deere Plus-50 II, John Deere Plus-50, or other diesel engine oil as recommended in this manual.

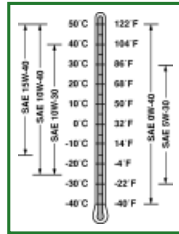
Break-In is a trademark of Deere & Company.

Break-In Plus is a trademark of Deere & Company

Plus-50 is a trademark of Deere & Company.

OUT4001,000067D-19-20110331

Diesel Engine Oil—Interim Tier 4 and Stage III B Engines



TX1114353-UN: Oil Viscosities for Air Temperature Ranges

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 an authorized 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 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.

IMPORTANT:

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

Plus-50 is a trademark of Deere & Company

VD76477,00004E6-19-20160125

Engine Oil and Filter Service Intervals — Interim Tier 4, Final Tier 4, Stage IIIB, Stage IV, and Stage V Engines

Failure to follow applicable oil standards and drain intervals can result in severe engine damage that might not be covered under warranty. Warranties, including the emissions warranty, are not conditioned on the use of John Deere oils, parts, or service.

Recommended oil and filter service intervals are based on a combination of oil pan capacity, type of engine oil and filter used, and sulfur content of the diesel fuel. Actual service intervals also depend on operation and maintenance practices.

Approved Oil Types:

- John Deere Plus-50™ II
- “Other Oils” include API CK-4, API CJ-4, ACEA E9, and ACEA E6

Use oil analysis to evaluate the condition of the oil and to aid in selection of the proper oil and filter service interval. Contact your John Deere dealer or other qualified service provider for more information on engine oil analysis.

Change the oil and oil filter at least once every 12 months even if the hours of operation are fewer than the otherwise recommended service interval.

Diesel fuel sulfur content affects engine oil and filter service intervals. Higher fuel sulfur levels reduce oil and filter service intervals.

Use of diesel fuel with sulfur content less than 15 mg/kg (15 ppm) is **REQUIRED**.

Engine operation at high altitude decreases oil change intervals. See Diesel Engine Oil Service Interval for Operation at High Altitude for additional information.

NOTE:

The 500 hour extended oil and filter change interval is only allowed if all of the following conditions are met:

- Use of diesel fuel with sulfur content less than 15 mg/kg (15 ppm)
- Use of John Deere Plus-50™ II oil
- Use of an approved John Deere oil filter

-: Interim Tier 4, Final Tier 4, Stage IIIB, and Stage IV Service Intervals

Engine Oil and Filter Service Intervals	
John Deere Plus-50™ II	500 hours
Other Oils	250 hours
Oil analysis may extend the service interval of “Other Oils” to a maximum not to exceed the interval of Plus-50™ II oils. Oil analysis means taking a series of oil samples at 50-hour increments beyond the normal service interval until either the data indicates the end of useful oil life or the maximum service interval of John Deere Plus-50 II oils is reached.	

IMPORTANT:

To avoid engine damage:

- Reduce oil and filter service intervals by 50% when using biodiesel blends greater than B20. Oil analysis may allow longer service intervals.

- **Use only approved oil types.**

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DX,ENOIL15,IT4,120toMAX-19-20180113

Hydraulic Oil



TX1180348-UN: Oil Viscosities for Ambient Temperature Ranges

Use oil viscosity based on the expected air temperature range during the period between oil changes.

IMPORTANT:

Avoid machine damage. Do not mix fluids of different type or brand. Do not mix zinc-free and zinc-based fluids. Mixing fluids can result in additive fall-out and lubricant degradation. Zinc-free oils are not approved for use.

4000 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 Plus¹

2000 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 Arctic¹

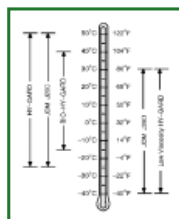
¹ Fluid is not available in the United States or Canada.

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Hydrau-Gard is a trademark of Deere & Company

MB60223,000003D-19-20190701

Transmission, Axle, Tandem Drive, Circle Gear Case, and 6WD Hubs Oil—If Equipped



TS1660-UN: Oil Viscosities for Ambient Temperature Ranges

Use oil viscosity based on the expected air temperature range during the period between oil changes.

The following oils are preferred:

- John Deere Hy-Gard™
- John Deere Low Viscosity Hy-Gard™

Other oils may be used if they meet one of the following:

- John Deere Standard JDM J20C
- John Deere Standard JDM J20D

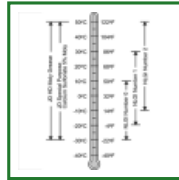
Use the following oil when a biodegradable fluid is required:

- John Deere Bio-Hy-Gard™

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Bio-Hy-Gard is a trademark of Deere & Company

Grease with Molybdenum Disulfide



RG30201-UN: Greases for Air Temperature Ranges

Use grease based on NLGI consistency numbers and the expected air temperature range during the service interval.

John Deere HD Moly Grease is preferred.

Also recommended for wet or extreme conditions:

JD Special Purpose Calcium Sulfonate 5% Moly Grease

Other greases may be used if they meet the following:

- NLGI Performance Classification GC-LB with 3% to 5% molybdenum disulfide
- ISO-L-X-BDHB 2 (per ISO 6743-9) or DIN KPF 2 N-10 (per DIN 51825) Lithium Complex, Non-Synthetic Base Oil (100 to 220 mm²/s @40°C) with 3% to 5% molybdenum disulfide

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.

DX,GREA4-19-20180113

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-19-20180113

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-19-19960318

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-19-20110411

Diesel Engine Coolant (engine with 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 Pre-Mix	Freeze Protection Limit
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 the following specification:

- Pre-mix coolant meeting ASTM D6210 requirements
- 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

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:

- Provides cylinder liner cavitation protection according to either the John Deere Cavitation Test Method or a fleet study run at or above 60% load capacity
- 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. [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 II is reached.]

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.

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DX,COOL3-19-20200825

Drain Intervals for Diesel Engine Coolant

Drain and flush the cooling system and refill with fresh coolant at the indicated interval, which varies with the coolant used.

John Deere COOL-GARD™ II Premix, COOL-GARD II PG Premix and COOL-GARD II Concentrate are maintenance free coolants for up to six years or 6000 hours of operation, provided that the cooling system is topped off using only John Deere COOL-GARD II Premix or COOL-GARD II PG Premix.

Test the coolant condition annually with Coolant Test Strips designed for use with John Deere COOL-GARD II coolants. If the test strip chart indicates that additive is required, add John Deere COOL-GARD II Coolant Extender as directed.

If John Deere COOL-GARD™ II Premix, COOL-GARD II PG Premix, or COOL-GARD II Concentrate is used, but the coolant is not tested OR additives are not replenished by adding John Deere COOL-GARD II Coolant Extender, the drain interval is four years or 4000 hours of operation. This drain interval only applies to COOL-GARD II coolants that have been maintained within a 40—60% mixture of concentrate with quality water.

If a coolant other than COOL-GARD II, or COOL-GARD II PG is used, reduce the drain interval to two years or 2000 hours of operation.

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DX,COOL11-19-20110414

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. 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.

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DX,COOL16-19-20130515

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,COOL4-19-20110414

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,COOL6-19-20200217

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.

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:

-: Water 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.

-: Freeze protection

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.

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DX,COOL17-19-20110420

Testing Diesel Engine Coolant

Maintaining adequate concentrations of glycol and inhibiting additives in the coolant is critical to protect the engine and cooling system against freezing, corrosion, and cylinder liner erosion and pitting.

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

Coolant Test Strips

Coolant test strips are available from your John Deere dealer. These test strips provide a simple, effective method to check the freeze point and additive levels of your engine coolant.

When Using John Deere COOL-GARD II

John Deere COOL-GARD II Premix™, COOL-GARD II PG Premix and COOL-GARD II Concentrate are maintenance free coolants for up to six years or 6000 hours of operation, provided that the cooling system is topped off using only John Deere COOL-GARD II Premix or COOL-GARD II PG premix. Test the coolant condition annually with coolant test strips designed for use with John Deere COOL-GARD II coolants. If the test strip chart indicates that additive is required, add John Deere COOL-GARD II Coolant Extender as directed.

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

When Using Nitrite-Containing Coolants

Compare the test strip results to the supplemental coolant additive (SCA) chart to determine the amount of inhibiting additives in your coolant and whether more John Deere Liquid Coolant Conditioner should be added.

Add only the recommended concentration of John Deere Liquid Coolant Conditioner. DO NOT add more than the recommended amount.

Coolant Analysis

For a more thorough evaluation of your coolant, perform a coolant analysis. The coolant analysis can provide critical data such as freezing point, antifreeze level, pH, alkalinity, nitrite content (cavitation control additive), molybdate content (rust inhibitor additive), silicate content, corrosion metals, and visual assessment.

Contact your John Deere dealer for more information on coolant analysis.

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DX,COOL9-19-20110411

Disposing of Coolant



TS1133-UN: Recycle Waste

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.

TX,COOL,DISP-19-20201026

Service Your Machine at Specified Intervals



TX1085968A-UN: Periodic Maintenance Chart Location

LEGEND:

1 - Periodic Maintenance Chart

Service your machine at intervals shown on the periodic maintenance chart (1) and on the following pages. These services include:

- Lubricating
- Cleaning
- Inspecting
- Service checks
- Service adjustments

The periodic maintenance chart is located inside the left-front service door.

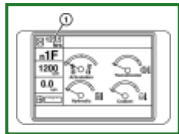
Service items at multiples of the original requirement. For example, at 500 hours, also service those items, if applicable, listed under 250 hours, 100 hours, 50 hours, and 10 hours or daily.

NeverGrease™ pin joints **do not** require lubrication. This machine is equipped with a number of NeverGrease pin joints, however there are several joints that still need manual lubrication. See periodic maintenance chart on machine or Service Intervals in this section for specific lubrication points and intervals.

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NM00125,000069B-19-20101220

Check the Hour Meter Regularly



TX1053399-UN: Hour Meter

LEGEND:

1 - Hour Meter

NOTE:

Hour meter, odometer, exhaust filter restriction indicator, and ambient temperature readings share the same space on the display. Press UP or DOWN button on display unit to toggle between these items.

The hour meter (1) shows accumulated machine hours to nearest 1/10 of an hour. Hours are accumulated only when engine is running. Display defaults to show hour meter when ignition is first energized.

Intervals on the periodic maintenance chart are for operating in normal conditions. If you operate your machine in difficult conditions, you should service it at shorter intervals.

NM00125,00007CB-19-20101221

Fuel Tank



CAUTION:

Prevent possible injury from fire. Handle fuel carefully. If the engine is hot or running, **DO NOT** fill the fuel tank. **DO NOT** smoke while you fill fuel tank or work on fuel system.

To avoid condensation, fill the fuel tank at the end of each day's operation. Shut off engine before filling.

Item	Measurement	Specification
Fuel Tank	Capacity	416.4 L 110 gal

OUT4001,00002DE-19-20100823

Prepare Machine for Maintenance



TX1082410A-UN: Battery Disconnect Switch

LEGEND:

1 - Battery Disconnect Switch

Before performing maintenance procedures given in the following sections and before leaving the operator's seat, perform the following steps unless another position is specified in the procedure.

1. Park machine on a level surface.
2. Lower all equipment to the ground.

3.

NOTE:

Transmission control and park brake lever engages park brake when moved to position P and disengages when lever is moved to neutral, forward, or reverse.

Move transmission control and park brake lever to position P. Make sure park lock collar engages.

4.

IMPORTANT:**Turbocharger and engine components may be damaged if engine is not properly shut down. See Stopping the Engine. (Section 2-2.)**

Press engine stop switch.

5. Turn battery disconnect switch (1) to OFF.

NM00125,00006BB-19-20101028

Locking Machine Frame

1.

**CAUTION:****Prevent possible injury from unexpected machine movement. Install articulation lock pin into both frames before working in frame pivot area.**

TX1053386A-UN: Stored Position—Left Side of Machine



TX105356A-UN: Locked Machine Frame

LEGEND:

1 - Articulation Locking Pin

2 - Spring Clip Pin

Align machine frames.

2. Remove spring clip pin (2) from articulation locking pin (1).

3. Remove articulation locking pin from stored position.

4. Install spring clip pin back into articulation locking pin.

5. Starting from above the frame holes, install articulation locking pin into frame holes.

When all maintenance is complete, remove and store articulation locking pin.

To remove and store articulation locking pin:

1. Remove spring clip pin from articulation locking pin.
2. If articulation locking pin does not readily fall through frame holes, gently articulate machine until articulation locking pin falls to surface below.
3. Install articulation locking pin in stored position. Secure with spring clip pin.

OUT4001,00002E0-19-20090203

Service Doors



TX1085969A-UN: Front Service Door—Left-Side Shown

LEGEND:

1 - Slot

2 - Locked-Open Position

3 - Guide Rod

Front service doors have one hold-open position.

Door can be propped open at 90 degrees using the guide rod (3).

- Open door 90 degrees.
- Guide rod will slide down slot (1) in service door.
- Position guide rod in the locked-open position (2) to hold door open.

To close door:

- Move guide rod out of the locked-open position.
- Push door closed until latch is engaged.

Rear service doors have one hold-open position.



TX1083232A-UN: Rear Service Door—Left-Side Shown

LEGEND:

1 - Guide Rod

2 - Locked-Open Position

3 - Slot

Rear door is opened as follows:

- Open door approximately 120 degrees.
- Guide rod (1) will slide down slot (3).
- Position guide rod in the locked-open position (2).

To close door:

- Move guide rod out of the locked-open position.
- Push door closed until latch is engaged.

NM00125,000069C-19-20101220

Fluid Analysis Program Test Kits and 3-Way Coolant Test Kit



TX1003513A-UN: Fluid Analysis Kits

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.

TX,ANALYSIS-19-20110120

Service Intervals

-: Maintenance and Repair Record

Model: G-Series Motor Graders		PIN/Serial Number:	
Hour Meter Reading:			
SERVICE INTERVALS			
Service your 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, 100 hours, 50 hours and 10 hours or daily.			
FLUID SAMPLING			
Take fluid samples from each system as indicated on this form. The manufacturer of the fluid analysis kits will provide maintenance recommendations based upon the results of the fluid analysis and the operating information you supply. Regular fluid sampling extends the operational life of your machine.			
As Required			
<input type="checkbox"/> Clean debris from coolers (radiator, hydraulic oil cooler, charge air cooler, fuel cooler, air conditioner condenser)	<input type="checkbox"/> Drain primary fuel filter and water separator		
<input type="checkbox"/> Clean battery terminals and tighten clamps	<input type="checkbox"/> Drain auxiliary fuel filter and water separator—if equipped		
<input type="checkbox"/> Clean or replace cab fresh air and cab recirculation filters	<input type="checkbox"/> Replace fast fill fuel breather filter—if equipped		
<input type="checkbox"/> Lubricate circle pinion	<input type="checkbox"/> Clean engine air intake primary filter		
<input type="checkbox"/> Inspect and adjust tire pressure	<input type="checkbox"/> Calibrate Grade Pro hydraulic valves—if equipped		
<input type="checkbox"/> Adjust wear insert clearance of blade circle and draft frame wear inserts	<input type="checkbox"/> Check and clean rear camera—if equipped		
<input type="checkbox"/> Adjust or replace blade lift cylinder sockets	<input type="checkbox"/> Calibrate transmission control unit		
<input type="checkbox"/> Adjust or replace blade side shift wear inserts	<input type="checkbox"/> Calibrate 6WD controller—if equipped		
<input type="checkbox"/> Lubricate saddle locking pin holes	<input type="checkbox"/> Calibrate cross slope sensors—if equipped		
<input type="checkbox"/> Replace starting fluid cylinder—if equipped	<input type="checkbox"/> Drain water and sediment from fuel tank sump		
<input type="checkbox"/> Inspect belts	<input type="checkbox"/> Service exhaust filter		
<input type="checkbox"/> Add coolant extender as indicated by COOL-GARD™ II test strips			

Every 10 Hours or Daily	
<input type="checkbox"/> Check hydraulic tank oil level	<input type="checkbox"/> Check engine oil level
<input type="checkbox"/> Check transmission oil level	<input type="checkbox"/> Check engine coolant surge tank level
Every 50 Hours	
<input type="checkbox"/> Lubricate frame hinge pivots	<input type="checkbox"/> Lubricate front axle steering pins
<input type="checkbox"/> Lubricate draft frame ball	<input type="checkbox"/> Lubricate tie rod ends
<input type="checkbox"/> Lubricate front mounted scarifier/dozer—if equipped	<input type="checkbox"/> Lubricate steering cylinders
<input type="checkbox"/> Lubricate Balderson™ style front lift group—if equipped	<input type="checkbox"/> Lubricate midmount scarifier—if equipped
<input type="checkbox"/> Lubricate front axle oscillation pin	<input type="checkbox"/> Lubricate lift cylinders
<input type="checkbox"/> Lubricate front axle lean pivot casting pins	<input type="checkbox"/> Lubricate circle side shift cylinders
<input type="checkbox"/> Lubricate front axle lean bar pivot	<input type="checkbox"/> Lubricate saddle locking pin
Initial Service - 250 Hours¹	
<input type="checkbox"/> Replace axle housing oil filter	<input type="checkbox"/> Calibrate transmission control unit
<input type="checkbox"/> Replace transmission oil filter	
¹ Perform initial service once after the first 250 hours of operation.	
Every 250 Hours	
<input type="checkbox"/> Check battery electrolyte level	<input type="checkbox"/> Check 6WD oil level—if equipped
<input type="checkbox"/> Check air conditioner receiver-dryer moisture indicator	<input type="checkbox"/> Take engine oil sample
<input type="checkbox"/> Check axle housing oil level	
Every 500 Hours	
<input type="checkbox"/> Change engine oil and filter (quick service)—if equipped	<input type="checkbox"/> Replace fuel tank breather
<input type="checkbox"/> Change engine oil and filter	<input type="checkbox"/> Replace fast fill fuel breather filter—if equipped
<input type="checkbox"/> Lubricate tandem pivots	<input type="checkbox"/> Take transmission oil sample

<input type="checkbox"/> Check circle gear case oil level	<input type="checkbox"/> Take axle oil sample
<input type="checkbox"/> Check brake action and recharge brake accumulator (if necessary)	<input type="checkbox"/> Take tandem oil sample
<input type="checkbox"/> Check tandem oil level	<input type="checkbox"/> Take hydraulic oil sample
<input type="checkbox"/> Replace final fuel filter	<input type="checkbox"/> Take 6WD hub oil sample—if equipped
<input type="checkbox"/> Replace primary fuel filter and water separator	<input type="checkbox"/> Take diesel fuel sample
<input type="checkbox"/> Replace auxiliary fuel filter and water separator—if equipped	<input type="checkbox"/> Take engine coolant sample
Every 1000 Hours	
<input type="checkbox"/> Change 6WD oil—if equipped	<input type="checkbox"/> Replace engine air intake filters
<input type="checkbox"/> Clean, pack, and adjust front wheel bearings	<input type="checkbox"/> Check coolant
<input type="checkbox"/> Check air intake hoses for cracks or loose connections	<input type="checkbox"/> Replace in-line fuel strainer
Every 2000 Hours	
<input type="checkbox"/> Clean transmission pump inlet screen	<input type="checkbox"/> Clean engine crankcase ventilation tube
<input type="checkbox"/> Change transmission oil (quick service)—if equipped	<input type="checkbox"/> Replace axle housing oil filter
<input type="checkbox"/> Change transmission oil	<input type="checkbox"/> Replace hydraulic oil filter
<input type="checkbox"/> Change axle housing oil	<input type="checkbox"/> Adjust engine valve lash
<input type="checkbox"/> Replace rear axle and hydraulic tank breathers	<input type="checkbox"/> Replace transmission oil filter
<input type="checkbox"/> Change circle gear case oil	<input type="checkbox"/> Calibrate transmission control unit
Every 4000 Hours	
<input type="checkbox"/> Change hydraulic tank oil	<input type="checkbox"/> Change hydraulic tank oil (quick service)—if equipped
<input type="checkbox"/> Change tandem oil	
Every 6000 Hours	
<input type="checkbox"/> Drain, flush, and refill cooling system (quick service)—if equipped	<input type="checkbox"/> Drain, flush, and refill cooling system

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Required Parts

:- Maintenance and Repair Record

Ensure machine performance and availability; use only genuine John Deere parts. Verify part numbers are current and that any associated parts are also on hand, i.e. filter O-rings.									
Description	Part Number	Initial Service - 250 Hours ¹	Every 250 Hours	Every 500 Hours	Every 1000 Hours	Every 2000 Hours	Every 4000 Hours	Every 5000 Hours	Every 6000 Hours
Engine Oil Filter	RE521420			1	1	1	1	1	1
Transmission Oil Filter	AT335492	1				1	1		1
Axle Housing Oil Filter	AT335492	1				1	1		1
Primary Fuel Filter	RE539465			1	1	1	1	1	1
Final Fuel Filter	RE533910			1	1	1	1	1	1
Auxiliary Fuel Filter and Water Separator—If Equipped	AT365869			1	1	1	1	1	1
Fast Fill Fuel Breather Filter—If Equipped	T225008			1	1	1	1	1	1
Fuel Tank Breather	H216169			1	1	1	1	1	1
Primary Air Filter	AT175223				1	1	1	1	1
Secondary Air Filter	AT175224				1	1	1	1	1
In-Line Fuel Strainer	AT223493				1	1	1	1	1
Hydraulic Oil Filter	AT367840					1	1		1
Rear Axle Breather	AT101565					1	1		1
Hydraulic Tank Breather	AT101565					1	1		1
Engine Rocker Arm Cover Gasket	R526607					1	1		1
Diesel Particulate Filter (component of exhaust filter)	RE541834	As Required							
Cab Fresh Air Filter	AT191102	As Required							

Ensure machine performance and availability; use only genuine John Deere parts. Verify part numbers are current and that any associated parts are also on hand, i.e. filter O-rings.

Description	Part Number	Initial	Every	Every	Every	Every	Every	Every	Every
		Service - 250 Hours ¹	250 Hours	500 Hours	1000 Hours	2000 Hours	4000 Hours	5000 Hours	6000 Hours
Cab Recirculation Air Filter	AT307501	As Required							
Plus-50™ II Engine Oil	TY26674 ²			27.0 L (7.1 gal)	27.0 L (7.1 gal)	27.0 L (7.1 gal)	27.0 L (7.1 gal)	27.0 L (7.1 gal)	27.0 L (7.1 gal)
Torq-Gard™ Hydraulic Oil	TY25287 ²						60.5 L (16.0 gal)		
6WD Hub Oil—If Equipped (each)	TY6354 ²				7.2 L (2.0 gal)	7.2 L (2.0 gal)	7.2 L (2.0 gal)	7.2 L (2.0 gal)	7.2 L (2.0 gal)
Hy-Gard™ Transmission, Axle, Circle Gear Case, and Tandems Oil	TY6354 ²					72.1 L (19.5 gal)	208.5 L (55.1 gal)		72.1 L (19.5 gal)
COOL-GARD™ II Pre-Mix	TY26575								58.0 L (15.3 gal)
Coolant Extender	TY26603	As Required							
Fluid Analysis Kits:³									
Diesel Engine Oil	AT346594		1	1	1	1	1	1	1
Transmission Oil	AT346594			1	1	1	1	1	1
Axle Oil	AT346594			1	1	1	1	1	1
Tandem Oil	AT346594			2	2	2	2	2	2
Hydraulic Oil	AT346594			1	1	1	1	1	1
6WD Hub Oil—If Equipped	AT346594			2	2	2	2	2	2
Diesel Fuel	AT180344			1	1	1	1	1	1

Ensure machine performance and availability; use only genuine John Deere parts. Verify part numbers are current and that any associated parts are also on hand, i.e. filter O-rings.

Description	Part Number	Initial Service - 250 Hours ¹	Every 250 Hours	Every 500 Hours	Every 1000 Hours	Every 2000 Hours	Every 4000 Hours	Every 5000 Hours	Every 6000 Hours
Engine Coolant	TY26873			1	1	1	1	1	1
COOL-GARD™ II Test Strips	TY26605				1	1	1	1	1

¹Perform initial service once after the first 250 hours of operation.
²For recommended oil type and oil viscosities based on operating temperatures, see Maintenance—Machine. (Section 3-1.)
³Based on fluid analysis results, intervals may need to be adjusted for your operating conditions. Consult your local John Deere dealer.

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Torq-Gard is a trademark of Deere & Company
Hy-Gard is a trademark of Deere & Company
COOL-GARD is a trademark of Deere & Company

KH31969,0000031-19-20121022

Service Exhaust Filter



TX1083247A-UN: Exhaust Filter Location

LEGEND:

1 - Exhaust Filter

⚠ CAUTION:
 Under federal, state, and/or local laws or regulations, exhaust filter ash may be classified as a hazardous waste. Hazardous waste must be disposed of in accordance with all applicable federal, state and local laws or regulations governing hazardous waste disposal. Only a qualified service provider should remove ash from the exhaust filter. See your authorized dealer for exhaust filter ash handling and disposal.

The exhaust filter (1) is designed to retain residual ash, which is a noncombustible result of additives used in crankcase lubrication oils and fuel. As ash levels rise, the capacity for soot storage is reduced. Engine performance can be reduced due to increased exhaust system back pressure. The residual ash must be removed from the filter. Ash removal is performed by removing the exhaust filter from machine and having it cleaned by specialized equipment or replacing the exhaust filter.

Do **NOT** attempt to remove exhaust filter from machine. **Contact your authorized dealer to remove exhaust filter for ash removal or replacement.**

Failure to follow the approved ash removal methods may violate U.S. federal, state and local hazardous waste laws, along with damage to the exhaust filter resulting in potential denial of the emissions warranty.

NM00125,000069A-19-20101018

Cleaning Radiator, Charge Air Cooler, Hydraulic Oil Cooler, Transmission and Differential Oil Cooler, Fuel Cooler, and Air Conditioner Condenser

IMPORTANT:

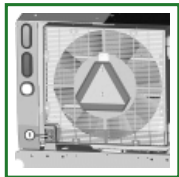
Dirt and debris may accumulate on coolers during normal operation. Excessive debris buildup can restrict air flow to cooling system and cause engine to overheat.

If necessary, clean dirt and debris from coolers to maximize cooling system performance.

NOTE:

If operating in dusty conditions, it may be necessary to increase hydraulic fan reversal frequency to minimize debris buildup on coolers. See **Display Unit—Main Menu—Machine Settings—Reverse Fan Cycle. (Section 2-1.)**

1.



TX1083170A-UN: Fan Door

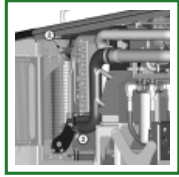
LEGEND:

1 - Cap Screw (2 used)

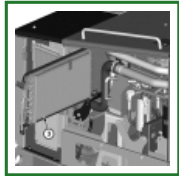
Remove cap screws (1) and open fan door.

2. Open right and left service doors.

3.



TX1083171A-UN: Air Conditioner Condenser Mounting



TX1083172A-UN: Air Conditioner Condenser Access

LEGEND:

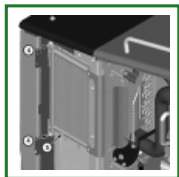
2 - Cap Screw (2 used)

3 - Air Conditioner Condenser

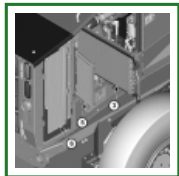
Remove cap screws (2) securing air conditioner condenser (3).

4. Pull condenser out from machine until it contacts the stops.

5.



TX1083173A-UN: Fuel Cooler Mounting



TX1083174A-UN: Right Side Coolers

LEGEND:

3 - Air Conditioner Condenser 4 - Cap Screw

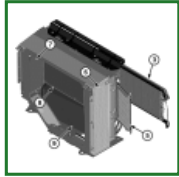
5 - Fuel Cooler

6 - Hydraulic Oil Cooler

Remove cap screws (4) securing fuel cooler (5).

6. Swing fuel cooler away from machine.

7.



TX1083175A-UN: Cooling Package

LEGEND:

3 - Air Conditioner Condenser

6 - Hydraulic Oil Cooler

7 - Transmission and Differential
Oil Cooler

8 - Radiator

9 - Charge Air Cooler

Inspect radiator (8), transmission and differential oil cooler (7), hydraulic oil cooler (6), charge air cooler (9), fuel cooler, and air conditioner condenser for the following:

- Dirt or debris accumulation.
- Damaged or bent cooling fins.
- External leaks.
- Loose or damaged mounting hardware.

8. Repair or replace coolers as necessary.

9. If dirt or debris is present, clean them as follows:

- **Light dirt buildup**— Clean all by blowing air through the fins. Do not exceed 621 kPa (6 bar) (90 psi). Blow air straight through fins to avoid bending them.
- **Excessive dirt buildup**— Clean all using a high pressure washer with soap and water. Do not exceed 2000 kPa (20 bar) (290 psi). Direct water straight through fins to avoid bending them.

10.

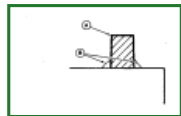
IMPORTANT:

Prevent machine damage. Never restrict or block air flow to cooling system for faster warmup or for improved cold weather operation. Cooling system was designed to operate as is in any ambient temperature or operating condition.

Return fuel cooler and air conditioner condenser to normal operating position and install cap screws.

11. Close fan door and install cap screws.

Clean and Tighten Battery Terminals



T6758AA-UN: Battery Terminal

LEGEND:

A - Terminal

B - Lubricating Grease

1.



CAUTION:

Battery gas can explode. Keep sparks and flames away from batteries. Always remove grounded (-) battery clamp first and replace it last.

Disconnect battery clamps, grounded clamp first.

2. Clean terminal (A) and clamp with a stiff brush.
3. Apply lubricating grease (B) where battery terminal meets top of battery case to prevent grease from escaping.
4. Install and tighten clamps, grounded clamp last.

TX,55,FF765-19-20161130

Cleaning or Replacing Cab Fresh Air and Recirculation Filter

1.



TX1050175A-UN: Air Filter Assembly Cover



TX1050176A-UN: Air Filters

LEGEND:

1 - Screw

2 - Air Filter Assembly Cover

3 - Fresh Air Filter

4 - Recirculation Filter

Loosen screw (1).

2. Pull air filter assembly cover (2) forward to remove from mounting slots.
3. Squeeze clip and remove fresh air filter (3) or recirculation filter (4).

4.

**CAUTION:**

Prevent possible injury from flying debris. Reduce compressed air to less than 210 kpa (2.1 bar) (30 psi) when using for cleaning purposes. Clear area of bystanders, guard against flying debris, and wear personal protection equipment including eye protection.

Clean filter in one of three ways:

- Tap filter on a flat surface with the dirty side down.
- Use compressed air opposite to normal air flow.
- Wash filter in warm, soapy water. Flush the filter and let it dry before using the air conditioner.

5. If necessary, replace filters.
6. Install filter(s) and cover.
7. Tighten screw.

OUT4001,00002EC-19-20081213

Lubricate Circle Pinion

1.



T205702A-UN: Circle Pinion

LEGEND:

1 - Circle Pinion and Teeth

Clean dirt and old grease from the circle and pinion teeth (1).

2. Apply grease to the circle and pinion teeth. See Grease. (Section 3-1.)

OUO1032,0001514-19-20081218

Checking Tire Pressure



TS211-UN: Tire Pressure Safety



T87502-UN: Tire Pressure Gauge

**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 reinflating the tire. Damage to the rim and tire may have developed. Call your authorized dealer or a qualified repair service 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 you 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 you do not have the proper equipment and experience to perform the job. Have it done by your authorized dealer or a qualified repair service.

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 in front or rear of tire when air is being added to tire.

NOTE:

1. Tire shipping pressure may not be the same as tire operating pressure. You may change tire pressure to suit working conditions according to tire manufacturer's recommendations.

2. All tire pressures measured in psi at ambient temperature. Adjust front and rear tires according to load and desired 6WD aggressiveness—if equipped.

3. Chart loads are for individual tires; divide front axle weight by 2 and rear axle weight by 4 to determine tire load.

:- Front Pushblock & Rear Ripper Configuration

RECOMMENDED TIRE INFLATION PRESSURES				
	Front Pushblock & Rear Ripper Configuration			
	670G		672G	
	Front	Rear	Front	Rear
Typical Weight Per Tire	2758 kg 6080 lb.	3399 kg 7493 lb.	3005 kg 6625 lb.	3480 kg 7673 lb.
Bias Ply 14 x 24	214 kPa 2.14 bar 31 psi	303 kPa 3.03 bar 44 psi	248 kPa 2.48 bar 36 psi	317 kPa 3.17 bar 46 psi
Bias Ply 17.5 x 25	193 kPa 1.93 bar 28 psi	283 kPa 2.83 bar 41 psi	228 kPa 2.28 bar 33 psi	290 kPa 2.90 bar 42 psi
Radial 14R24	269 kPa 2.69 bar 39 psi	352 kPa 3.52 bar 51 psi	303 kPa 3.03 bar 44 psi	359 kPa 3.59 bar 52 psi

Radial 17.5R25	214 kPa	276 kPa	241 kPa	290 kPa
	2.14 bar	2.76 bar	2.41 bar	2.90 bar
	31 psi	40 psi	35 psi	42 psi

-: Mid-Scarifier & Rear Counterweight Configuration

RECOMMENDED TIRE INFLATION PRESSURES				
	Mid-Scarifier & Rear Counterweight Configuration			
	670G		672G	
	Front	Rear	Front	Rear
Typical Weight Per Tire	2825 kg 6227 lb.	3299 kg 7274 lb.	3071 kg 6771 lb.	3381 kg 7453 lb.
Bias Ply 14 x 24	228 kPa 2.28 bar 33 psi	290 kPa 2.90 bar 42 psi	262 kPa 2.62 bar 38 psi	303 kPa 3.03 bar 44 psi
Bias Ply 17.5 x 25	207 kPa 2.07 bar 30 psi	269 kPa 2.69 bar 39 psi	234 kPa 2.34 bar 34 psi	276 kPa 2.76 bar 40 psi
Radial 14R24	276 kPa 2.76 bar 40 psi	338 kPa 3.38 bar 49 psi	310 kPa 3.10 bar 45 psi	345 kPa 3.45 bar 50 psi
Radial 17.5R25	221 kPa 2.21 bar 32 psi	269 kPa 2.69 bar 39 psi	248 kPa 2.48 bar 36 psi	276 kPa 2.76 bar 40 psi

Checking Blade Circle and Draft Frame Wear Inserts



T107801-UN: 6 Points Total

LEGEND:

A - Blade Circle and Draft Frame
Wear Insert

Check blade circle and draft frame wear inserts (A) for wear and excessive play.

If there is excessive play or wear, see your authorized dealer.

OUO1032,0001539-19-20081203

Checking Blade Lift Cylinder Sockets



TX1052123A-UN: Blade Lift Cylinder Sockets

LEGEND:

1 - Blade Lift Cylinder Socket (2
used)

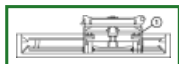
Check blade lift cylinder sockets (1) for wear and excessive play.

Socket should move with hand pressure.

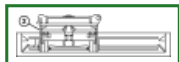
If there is excessive play or wear, see Checking and Adjusting Cylinder Ball and Socket Clearances. (Section 4-1.)

OUT4001,0000355-19-20081218

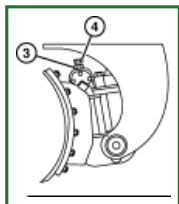
Blade Side Shift Wear Insert Adjustment



TX1052085-UN: Figure 1



TX1052086-UN: Figure 2



TX1052087-UN: Cap screw and jam nut

LEGEND:

1 - Right Side Of Tilt Frame

2 - Left Side Of Tilt Frame

3 - Jam Nut

4 - Cap Screw

Blade Side Shift Wear Insert Adjustment Procedure

1. To adjust right side of tilt frame (1), slide moldboard fully to the left. (See Figure 1.)
2. To adjust left side of tilt frame (2), slide moldboard fully to the right. (See Figure 2.)
3. Raise moldboard slightly off the ground and pitch moldboard back fully.
4. Loosen jam nut (3).
5. Tighten cap screw (4).
6. Back out cap screw 1/4 turn.
7. While holding cap screw in place, tighten jam nut.
8. Perform for all four adjustment points.

OUT4001,0000357-19-20090205

Lubricate Saddle Locking Pin Holes



TX1052627A-UN: Saddle Locking Pin Holes—7 Points Total

1. Lower blade to ground.
2. Grease all exposed saddle locking pin holes from pin side of locking bar.
3. Disengage lock pin and rotate saddle position to expose remaining holes.
4. Grease remaining holes. See Grease. (Section 3-1.)
5. Engage saddle locking pin.

OUT4001,0000356-19-20081218

Replace Starting Fluid Cylinder—If Equipped



TX1082490A-UN: Ether Start Cylinder

LEGEND:

1 - Clamp

2 - Ether Starting Fluid Cylinder

To access the ether starting fluid cylinder (2), open right-side service doors. The cylinder is mounted in the top right corner of engine compartment.



CAUTION:

Prevent possible injury from exploding container. Starting fluid is highly flammable. Keep container away from heat, sparks, and open flame. Contents are pressurized. DO NOT puncture or incinerate container. Remove container from machine if engine does not need starting fluid.

1. Loosen hose clamp (1).
2. Turn ether starting fluid cylinder counterclockwise to remove.
3. Remove safety cap from new container.
4. Turn container clockwise in starting aid base to install.
5. Tighten hose clamp.

Inspecting Accessory Belt and Belt Tensioner Spring



TX1052533A-UN: Belt Panel

LEGEND:

1 - Cap Screw and Washer (right- side shown) 2 - Cover

Belt drive systems equipped with automatic (spring) belt tensioner (3) cannot be adjusted or repaired. The automatic belt tensioner is designed to maintain proper belt tension over the life of the belt.

A belt tension gauge will not give an accurate measure of the belt tension when automatic spring tensioner is used.

The following procedure will check belt and belt tensioner operation:

1. With engine shields in place, set park brake and put transmission in park position.
2. Start engine and run at fast idle.

Accessory belt must not emit a loud squealing sound at slow idle, high idle, or rapid acceleration. If belt produces a squealing sound under any of these conditions, shut off engine and proceed to step 4. If belt does not produce a squealing sound, proceed to next step.

3. Turn on air conditioning and headlights (high beam). If accessory drive produces a squealing sound under any of these conditions, shut off engine and proceed to step 4. If belt does not produce a squealing sound, belt is OK.
 4. **Accessory Belt and Belt Tensioner Inspection:** Articulate machine.
 5. Remove six cap screws and washers (1) and remove cover (2).
-

6.



TX1082811A-UN: Accessory Belt Routing

LEGEND:

3 - Automatic Belt Tensioner

Visually inspect belt for wear, cracks, or fraying.

7. If the belt does not show any signs of excessive wear, and the belt drive squealed loudly during the performance of steps 2 and 3, inspect belt tensioner (3).
8. Using a 1/2" breaker bar, slowly release tension from belt by rotating belt tensioner away from belt. Continue rotating until belt tensioner stop is contacted. Slowly return belt tensioner back to belt tensioned position. If the tensioner exhibited excessive "roughness" or hesitancy during removal from or return to belt tensioned position, replace belt tensioner.
9. Install cover using cap screws and washers.
10. Perform steps 2 and 3 to verify proper belt tensioner operation.

NM00125,000067F-19-20101202

Draining Fuel Tank Sump



TX1083261A-UN: Rear Access Panel



TX1084001A-UN: Fuel Tank Drain Plug

LEGEND:

1 - Cap Screw (2 used)

2 - Rear Access Panel

3 - Fuel Tank Drain Plug

1. Remove cap screws (1) securing rear access panel (2) to machine frame.

2. Remove rear access panel from underneath machine.
3. Slowly remove fuel tank drain plug (3) to drain water and sediment into a suitable container. Dispose of waste properly.
4. After all sediment and water have been drained install drain plug in fuel tank.
5. Install rear access panel and cap screws.

NM00125,000070A-19-20101102

Draining Primary Fuel Filter and Water Separator



TX1082927A-UN: Primary Fuel Filter and Water Separator

LEGEND:

1 - Primary Fuel Filter and Water Separator
2 - Drain Valve

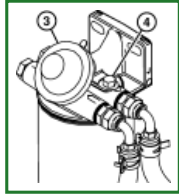
1. To access primary fuel filter and water separator (1), open right-side service doors and drop down panel.
2. Place a suitable container under drain valve (2).
3. Open drain valve on the bottom of primary fuel filter and water separator until it begins to drain.
4. Allow water separator to drain for several seconds or until water and sediments have been removed. Dispose of waste properly.
5. Close fuel filter and water separator drain valve.
6. Bleed the fuel system. See Bleeding the Fuel System. (Section 4-1.)

NM00125,0000695-19-20101202

Draining Auxiliary Fuel Filter and Water Separator—If Equipped



TX1082925A-UN: Auxiliary Fuel Filter and Water Separator



TX1082997-UN: Auxiliary Filter Housing

LEGEND:

1 - Auxiliary Fuel Filter and Water Separator

2 - Drain Valve

3 - Hand Pump

4 - Bleed Screw

1. To access auxiliary fuel filter and water separator (1), open right-side service doors and drop down panel.
2. Place a suitable container under drain valve (2).
3. Open drain valve on the bottom of auxiliary fuel filter and water separator until it begins to drain.
4. Allow water separator to drain for several seconds or until water and sediments have been removed. Dispose of waste properly.
5. Close fuel filter and water separator drain valve.
6. Open bleed screw (4) and operate hand pump (3) to bleed air from the auxiliary filter.
7. Bleed the fuel system. See Bleeding the Fuel System. (Section 4-1.)

NM00125,0000696-19-20101202

Replace Fast Fill Fuel Breather Filter—If Equipped

See Replace Fast Fill Fuel Breather Filter—If Equipped. (Section 38.)

NOTE:

During normal operating conditions, the fast fill fuel breather filter should be changed every 500 hours. If operating in dusty conditions, check filter more often and replace as required.

NM00125,0000711-19-20101108

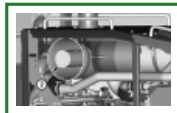
Cleaning Engine Air Intake Filter Element



T102338-UN: Air Intake Filter Restriction Indicator



TX1082567A-UN: Primary Filter Element



TX1082566A-UN: Secondary Filter Element

LEGEND:

1 - Primary Filter Element

2 - Secondary Filter Element

If engine air filter restriction indicator comes on when engine is running, it may be necessary to clean the primary filter element.

1. Remove air cleaner cover.
2. Remove primary filter element (1).

3.

IMPORTANT:

Do not clean secondary filter element (2); damage to the element could result. This item is not serviceable and must be replaced if dirty.

Tap primary filter element with the palm of your hand, NOT ON A HARD SURFACE.

4.

**CAUTION:**

Prevent possible injury from flying debris. Reduce compressed air to less than 210 kPa (2.1 bar) (30 psi) when using for cleaning purposes. Clear area of bystanders, guard against flying debris, and wear personal protection equipment including eye protection.



T47764-UN: Clean Dusty Primary Element

If this does not remove dust, use compressed air under 210 kPa (2.1 bar) (30 psi).

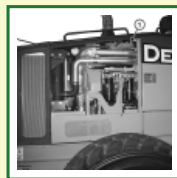
5. Direct air up and down the pleats from inside to outside. Be careful not to break the element pleats.
6. Install primary filter element in filter housing.
7. Install cover.
8. Start engine and run at fast idle. Check monitor to see if engine air filter restriction indicator comes on.
9. If compressed air does not properly remove dust, air filter elements must be replaced. See Replacing Engine Air Intake Cleaner Elements. (Section 3-9.)

NM00125,000065C-19-20110103

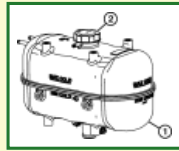
Check Coolant

**CAUTION:**

TS281-UN: Pressurized Fluids



TX1082880A-UN: Surge Tank Location



TX1082883-UN: Engine Coolant Surge Tank

LEGEND:

1 - Engine Coolant Surge Tank 2 - Surge Tank Filler Cap

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 necessary.

1. To access surge tank filler cap (2), unlock and open panel on hood directly above engine coolant surge tank (1).
2. Remove surge tank filler cap and test coolant solution. Use the following kit to check coolant.

- **3-Way Heavy Duty Coolant Test Kit**

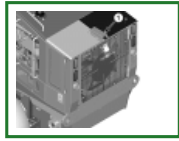
Coolant test strips provide an effective method to check freeze point and additive levels of engine coolant. See your authorized dealer for 3-Way Heavy Duty Coolant Test Kit and follow instructions on kit.

3. Add John Deere COOL-GARD II Coolant Extender as necessary. Follow instructions on container for amount.

Item	Measurement	Specification
Cooling System	Capacity	58 L 15.3 gal

4. Install surge tank filler cap.

Check Rear Camera—If Equipped



TX1082882A-UN: Rear Camera Location

LEGEND:

1 - Rear Camera

NOTE:

Inspect rear camera system daily to verify proper operation. Inspect system more frequently as required due to operating or environmental conditions that could affect performance.

While performing operational checks given below, use mirrors or turn head to verify object distances. If system is not working properly objects on camera screen could appear closer or farther than actual distance.

1. Inspect rear camera (1) lens for any accumulation of dirt, mud, snow, ice, or debris.

2.  **CAUTION:**

Avoid personal injury. DO NOT climb on machine when inspecting or cleaning rear camera lens.

Clean lens as necessary using a power washer or water hose.

3. Perform operational check of camera in each mode as follows:

a. Set camera to MANUAL mode. See Display Unit—Main Menu—Machine Settings—Camera Mode. (Section 2-1.)

b. Press INFO button on display unit and verify that image from camera is displayed.

c. Select REVERSE mode.

d. Shift transmission into first gear reverse (1R). Verify that image from camera is displayed.

4. If inspection of camera shows a performance problem, see your authorized John Deere dealer.

Transmission Control Unit Calibration



TX1084714A-UN: Transmission Control Unit Calibration Connectors

LEGEND:

1 - Transmission Run Mode Connector (X49) 2 - Transmission Calibrate Mode Connector (X50) 3 - Transmission Run/Calibrate Mode Connector (X51)

NOTE:

Calibration procedure should take approximately 10 minutes to complete when machine is warmed up. The machine needs to have a transmission oil temperature of 10°C (50°F) or greater before automatic calibration will begin.

This procedure calibrates the transmission control unit with the transmission clutches. Recalibrate upon notice of degraded shift quality, after performing major repair on transmission, after replacing solenoids or sensors, after changing transmission oil, or after replacing transmission control unit.

1. Position machine with all wheels on the ground.
2. Check for any diagnostic trouble codes (DTCs). See your authorized dealer to correct all DTCs before attempting to run calibration.
3. Move transmission control and park brake lever to position P. Make sure park lock collar engages. Shut engine off.
4. Remove rear interior panel from cab to access calibration connectors.
5. Disconnect the transmission run mode connector (1) from the transmission run/calibrate mode connector (3). Connect transmission calibrate mode connector (2) to transmission run/calibrate mode connector.

NOTE:

If a DTC is generated during calibration, the procedure will be terminated. Calibration procedure will have to be restarted from the beginning. Exit calibration and see your authorized dealer to correct all DTCs before attempting to run calibration again.

6. The advanced display unit (ADU) will give instructions and show the progress of the transmission calibration. The ADU and transmission calibration will proceed to the next step when the criteria is met for the current step.
7. Start machine. The park brake indicator light will be illuminated. Adjust the engine speed to specification.

Item	Measurement	Specification
Engine	Speed	1580—1620 rpm

8. Move transmission control and park brake lever to any forward gear position 1-8. The park brake indicator light will flash, indicating that the park brake is still engaged.

NOTE:

When transmission oil temperature is low or outside ambient temperature is low, the transmission may take several minutes to warm up.

9. The transmission oil temperature must be above 10°C (50°F) to start calibration. When transmission oil temperature is between 10°C (50°F) and 39°C (102°F), the transmission control unit will operate the transmission to warm the oil up to 39°C (102°F), at which time calibration will run.

10.

NOTE:

Do not depress the inching pedal at any time during the calibration procedure. When the inching pedal is depressed, the transmission control unit will abort the calibration procedure. Calibration procedure will have to be restarted from the beginning.

Automatic calibration has begun when CALIBRATING PLEASE WAIT appears on the ADU.

11. Calibration of directional and speed clutch hold levels—the ADU will show the progress while calibrating each clutch.
- CLUTCH 1 HOLD
 - CLUTCH 2 HOLD
 - CLUTCH 3 HOLD
 - CLUTCH 4 HOLD
 - CLUTCH A HOLD
 - CLUTCH B HOLD
 - CLUTCH C HOLD
 - CLUTCH D HOLD
12. Calibration of directional and speed clutch fast fills—the ADU will show the progress while calibrating the fast fill levels.
- CLUTCH 1 FILL
 - CLUTCH 2 FILL
 - CLUTCH 3 FILL
 - CLUTCH 4 FILL
 - CLUTCH A FILL
 - CLUTCH B FILL
 - CLUTCH C FILL
 - CLUTCH D FILL

13. RATIO CHECK—the ADU could show the progress while performing the ratio check but it will happen fast and may not show on the ADU at all.
14. CALIBRATING—during the final step, the transmission control unit will use the information gathered during the calibration process to determine new clutch engagement points.
15. The ADU will show CALIBRATION SUCCESSFUL when the calibration process is finished.
16. Move transmission control and park brake lever to position P. Make sure park lock collar engages.
17. Slowly return the engine speed to slow idle.

18.

NOTE:

If machine is turned OFF before calibration is complete, machine will revert back to pre-calibration settings.

Turn machine OFF.

19. If calibration is successful, disconnect the transmission calibrate mode connector from the transmission run/calibrate mode connector. Connect the transmission run mode connector to transmission run/calibrate mode connector.
20. Install rear interior panel.

NM00125,000073F-19-20110105

6WD Controller Calibration—If Equipped



TX1084716A-UN: 6WD Calibration Connectors

LEGEND:

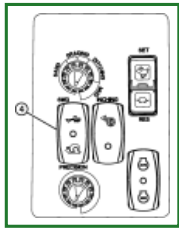
1 - 6WD Run Mode Connector (X88)	2 - 6WD Run/Calibrate Mode Connector (X86)	3 - 6WD Calibrate Mode Connector (X87)
----------------------------------	--	--

This procedure calibrates the 6WD controller with 6WD pumps and motors to determine correct front wheel speed in each gear. Recalibrate upon notice of degraded 6WD performance.

NOTE:

Calibration procedure will take approximately 15 minutes once hydraulic oil temperature is over 25°C (77°F).

1. Position machine with all wheels on the ground.
 2. Check for any diagnostic trouble codes (DTCs). See your authorized dealer to correct all DTCs before attempting to run calibration.
 3. Move transmission control and park brake lever to position P. Make sure park lock collar engages. Shut engine off.
 4. Remove rear interior panel from cab to access calibration connectors.
 5. Disconnect 6WD run mode connector (1) from the 6WD run/calibrate mode connector (2). Connect 6WD calibrate mode connector (3) to 6WD run/calibrate mode connector.
-
6. Press 6WD toggle switch (4) to OFF. Toggle switch has three positions: forward position (6WD mode ON), middle position (OFF), and back position (precision mode).



TX1084717-UN: 6WD Toggle Switch

LEGEND:

4 - 6WD Toggle Switch

7. Start machine.

NOTE:

If a DTC is generated during calibration, the procedure will be terminated. Calibration procedure will have to be restarted from the beginning. Exit calibration and see your authorized dealer to correct all DTCs before attempting to run calibration again.

8. The advanced display unit (ADU) will give instructions and show the progress of the 6WD calibration. The ADU and 6WD calibration will proceed to the next step when the criteria is met for the current step.
9. Press 6WD toggle switch to ON. Indicator light will illuminate.

NOTE:

Do not depress the inching pedal at any time during the calibration procedure.

10. Adjust engine speed to specification.

Item	Measurement	Specification
Engine	Speed	2150 rpm

11. Warm machine up until hydraulic oil temperature is at or above specification:

- Run engine at fast idle.
- Cycle hydraulic functions. (e.g. Cycle the circle rotate function back and forth while holding the blade pitch function at max travel.)
- Observe hydraulic oil temperature on the ADU.

Item	Measurement	Specification
Hydraulic Oil	Temperature	25°C 77°F

12. 6WD calibration will automatically start once hydraulic fluid is at the correct temperature. Automatic calibration has begun when CALIBRATING PLEASE WAIT appears on the ADU.

NOTE:

672G and 672GP only have 6WD in gears 1—4. Therefore, only gears 1—4 will be calibrated.

13. The machine will automatically calibrate all gears starting with forward gears and going in order 1—4, then doing reverse gears in order 1—4. All forward gears will be calibrated before reverse gears are calibrated. The calibration step being performed and the gear being calibrated will be displayed on the ADU. When NEXT GEAR is displayed, the next gear in order will be calibrated.

- CALIBRATION THRESHOLD ACTIVE is displayed once when calibrating forward gears and once when calibrating reverse gears.
- CALIBRATION 6WD GEAR SETUP is displayed once per gear.
- CALIBRATION GEAR RAMP UP is displayed once per gear.
- CALIBRATION GEAR ACTIVE is displayed once per gear.
- CALIBRATION NEXT GEAR is displayed once per gear.
- CALIBRATION STORED is displayed when the calibration is being stored in the 6WD controller.
- CALIBRATION SUCCESSFUL is displayed when calibration is successful.
- CALIBRATION ERROR is displayed when there is an error in calibration.
- CALIBRATION FAILED is displayed along with a message to review active DTCs.

NOTE:

All DTCs must be corrected before successful calibration can be obtained. Exit calibration and see your authorized dealer to correct all DTCs before attempting to run calibration again. Engine must be turned OFF in order to restart calibration.

14. The ADU will show CALIBRATION SUCCESSFUL when the calibration process is finished. If calibration is not successful, DTCs will be displayed on ADU.
15. Slowly return the engine speed to slow idle.

16.

NOTE:

If machine is turned OFF before calibration is complete, machine will revert back to pre-calibration settings.

Turn machine OFF.

17. If calibration is successful, disconnect the 6WD calibrate mode connector (X87) from the 6WD run/calibrate mode connector (X86). Connect the 6WD run mode connector (X88) to 6WD run/calibrate mode connector (X86).
18. Install rear interior panel.

NM00125,0000740-19-20101122

Calibrate Cross Slope Sensors—If Equipped

Depending on the application, periodic calibration of the cross slope sensors will help to increase the accuracy of the cross slope system. Calibration of the cross slope sensors should be run under the following conditions:

- Cutting edge wear
- Service was performed that required one of the sensors to be removed and reinstalled
- System is no longer cutting the correct desired slope

For calibration procedures of all cross slope sensors, see Display Unit—Main Menu—Machine Configuration—Cross Slope Sensor Cal (Grade Pro Machines Only) menus. (Section 2-1.)

LB82152,0000589-19-20100915

Calibrate Hydraulic Valves—If Equipped

Calibration of the hydraulic valves should be run when the following changes are observed:

- Inconsistent response from function to function
- Change in the response of a function over time
- Replacing a hydraulic valve section or other hydraulic valve components

For calibration procedures of all hydraulic valves, see Display Unit—Main Menu—Machine Configuration—Valve Cals (Grade Pro Machines Only) menus. (Section 2-1.)

LB82152,000058A-19-20100914

Checking Hydraulic Tank Oil Level



TX1082606A-UN: Sight Glass and Hydraulic Fill Cap

LEGEND:

1 - Sight Glass

2 - Hydraulic Fill Cap

IMPORTANT:

Prevent possible machine damage. Do not operate engine without oil in the hydraulic system.

1. Park machine on a level surface.

2.

NOTE:

Make sure to lower all equipment to the ground while engine is running using the power down position—not the float position. Floating the equipment to the ground will result in a false hydraulic oil level reading on the sight glass because cavitation may occur in the cylinders.

Lower all equipment to the ground and roll blade back completely.

3. Front wheels must be straight up (no wheel lean). Front and back of machine must be aligned.

4. Stop the engine and wait 10 minutes for oil level to stabilize.

5. Check sight glass (1). Oil level must be in the cold oil range.

6. If necessary, remove hydraulic fill cap (2) and add oil. For recommended oil, see Maintenance—Machine. (Section 3-1.)

7. If the hydraulic oil level is overfilled, drain excess oil. See Change Hydraulic Oil. (Section 3-11.)

8. Install fill cap.

NM00125,000065F-19-20101025

Checking Transmission Oil Level



TX1082809A-UN: Engine Left Side View

LEGEND:

1 - Transmission Oil Dipstick

IMPORTANT:

Prevent possible machine damage. DO NOT operate engine without oil in the transmission system.

Do not overfill transmission with oil.

1. Machine must be on a level surface with all equipment on the ground and engine off.

NOTE:

Preferred procedure is to check with cold oil before starting engine.

If machine has been running, shut engine off and wait at least 20 minutes for oil level to stabilize.

2. Oil level should be in crosshatched area of transmission oil dipstick (1). Do not overfill—transmission may overheat.
3. If necessary, add oil. For recommended oil, see Maintenance—Machine. (Section 3-1.)

NM00125,0000660-19-20101117

Checking Engine Oil Level



TX1082757A-UN: Engine Oil Dipstick and Filler Cap (Quick Service Option Shown)

LEGEND:

1 - Engine Oil Filler Cap

2 - Engine Oil Dipstick

IMPORTANT:

Operating engine with low oil level can cause internal engine damage. DO NOT operate the engine when oil level is below the ADD mark on dipstick.

The most accurate oil level reading is obtained when the engine is cold, before starting the engine for the day's operation.

1. Park machine on a level surface.
2. Move transmission control and park brake lever to position P. Make sure park lock collar engages.
3. Remove engine oil dipstick (2) to check oil level.
 - a. **BEFORE ENGINE START:** The engine is full when oil level is in the cross hatched area. It is acceptable to run the engine when the oil level is above the ADD mark.
 - b. **AFTER WARMING ENGINE:** Stop engine and allow 10 minutes for oil level to stabilize in oil pan. Ten minutes after shutdown, the engine oil level must be above the ADD mark on the dipstick.
4. If necessary, remove engine oil filler cap (1), and add oil. For recommended oil, see Maintenance—Machine. (Section 3-1.)

NM00125,0000661-19-20101203

Checking Engine Coolant Surge Tank Level

CAUTION:

TS281-UN: Pressurized Fluids



TX1082880A-UN: Surge Tank Location



TX1082883-UN: Engine Coolant Surge Tank

LEGEND:

1 - Engine Coolant Surge Tank 2 - Surge Tank Filler Cap

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:

Avoid system damage. Do not fill past the MAX COLD mark.

With the engine cold, coolant level must be above the MIN COLD mark on the engine coolant surge tank (1).

If the coolant is below the MIN COLD mark, remove surge tank filler cap (2) and add coolant to surge tank. Install filler cap.

If the surge tank is empty, check for leaks and repair as necessary. Add coolant to surge tank. For recommended coolant, see Maintenance—Machine. (Section 3-1.)

NM00125,0000662-19-20130314

Lubricate Frame Hinge Pivots



TX1051518A-UN: Frame Hinge Pivots—2 Grease Points

Lubricate frame hinge pivots until grease escapes from joints. See Grease. (Section 3-1.)

OUT4001,0000327-19-20081118

Lubricate Draft Frame Ball

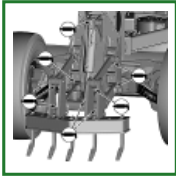


TX1051831A-UN: Draft Frame Ball—1 Grease Point

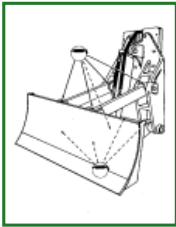
Lubricate draft frame ball until grease escapes from hole on opposite side of joint. See Grease. (Section 3-1.)

OUT4001,0000329-19-20081105

Lubricate Front Mounted Scarifier or Dozer Blade—If Equipped



TX1051946A-UN: Front Mounted Scarifier—10 Grease Points



T6238A11-UN: Dozer Blade—10 Grease Points

Lubricate scarifier or dozer blade until grease escapes at joints. See Grease. (Section 3-1.)

OUT4001,0000333-19-20081202

Lubricate Balderson™ Style Front Lift Group—If Equipped



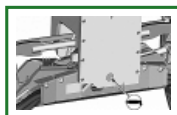
TX1051943A-UN: Balderson™ Style Front Lift Group—10 Grease Points

Lubricate Balderson™ style front lift group until grease escapes at joints. See Grease. (Section 3-1.)

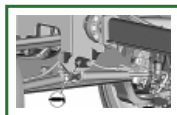
Balderson is a trademark of Caterpillar Inc.

OUT4001,0000335-19-20100827

Lubricate Front Axle Oscillation Pin



TX1052303A-UN: Front Axle Oscillation Pin (Front View)



TX1051976A-UN: Front Axle Oscillation Pin (Rear View)

Lubricate front axle oscillation pin (2 grease points total) until grease escapes at joint. See Grease. (Section 3-1.)

OUT4001,000032A-19-20081218

Lubricate Front Axle Lean Pivot Casting Pins



TX1052328A-UN: Front Axle Lean Pivot Casting Pins—4 Grease Points

Lubricate front axle lean pivot casting pins on right side of machine until grease escapes at joint. See Grease. (Section 3-1.)

Lubricate Front Axle Lean Bar Pivot



TX1051978A-UN: **Without 6WD** —2 Grease Points Total—1 Per Side



T206299A-UN: **With 6WD** —2 Grease Points Total—1 Per Side

Lubricate front axle lean bar pivot until grease escapes at joint. See Grease. (Section 3-1.)

OUT4001,000032C-19-20081121

Lubricate Front Axle Steering Pins



TX1052120A-UN: **Without 6WD** —4 Grease Points Total—2 Per Side



T204808A-UN: **With 6WD** —4 Grease Points Total—2 Per Side

Lubricate front axle steering pins until grease escapes at joint. See Grease. (Section 3-1.)

OUT4001,000032D-19-20081202

Lubricate Tie Rod Ends



TX1052121A-UN: **Without 6WD** —2 Grease Points Total—1 Per Side



T204809A-UN: **With 6WD** —2 Grease Points Total—1 Per Side

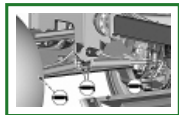
Lubricate tie rod ends until grease escapes at joint. See Grease. (Section 3-1.)

OUT4001,000032E-19-20081202

Lubricate Steering Cylinders



TX1052122A-UN: **Without 6WD** —Steering Cylinders—4 Grease Points



TX1052352A-UN: **With 6WD** —Steering Cylinders—4 Grease Points

Lubricate steering cylinders until grease escapes at joint. See Grease. (Section 3-1.)

OUT4001,000032F-19-20081202

Lubricate Midmount Scarifier—If Equipped



TX1051924A-UN: Four Grease Points Total—2 Per Side

Lubricate midmount scarifier until grease escapes at joints. See Grease. (Section 3-1.)

OUT4001,0000330-19-20090211

Lubricate Lift Cylinders



TX1051838A-UN: Lift Cylinders—2 Grease Points

Lubricate lift cylinders until grease escapes at joints. See Grease. (Section 3-1.)

OUT4001,0000328-19-20081105

Lubricate Circle Side Shift Cylinder



TX1051857A-UN: Circle Side Shift Cylinder—2 Grease Points

Lubricate circle side shift cylinder until grease escapes at joints. See Grease. (Section 3-1.)

OUT4001,0000331-19-20081125

Lubricate Saddle Locking Pin



TX1052267A-UN: Saddle Locking Pin—1 Grease Point

Lubricate saddle locking pin until grease escapes at joint. See Grease. (Section 3-1.)

OUT4001,0000332-19-20081121

Replacing Axle Housing Oil Filter



TX1082960A-UN: Axle Housing Oil Filter Location

LEGEND:

1 - Axle Housing Oil Filter

1. Park machine on a level surface.
2. Lower all equipment to the ground. Stop the engine.
3. To access axle housing oil filter (1), open right-side service doors.
4. Clean all dirt and debris from filter and filter head before removal.
5. Place a suitable container underneath filter.
6. Turn axle oil filter counterclockwise to remove.
7. Clean filter mounting surface.
8. Apply thin film of oil to gasket of new filter.
9. Add approximately 1.9 L (2.0 qt) of oil to filter. For recommended oil, see Maintenance—Machine. (Section 3-1.)
10. Turn filter clockwise by hand until gasket touches mounting surface.

11. Tighten 1/2—3/4 turn more.
12. Start engine and run for 2 minutes.
13. Stop engine. Check for leaks around filter. Tighten filter only enough to stop leaks.
14. Check oil level and add oil if necessary. See Checking Axle Housing Oil Level. (Section 3-7.)

NM00125,000067D-19-20210208

Replacing Transmission Oil Filter



TX1082958A-UN: Transmission Oil Filter Location

LEGEND:

1 - Transmission Oil Filter

1. Park machine on a level surface.
2. Lower all equipment to the ground. Stop the engine.
3. To access transmission oil filter (1), open right-side service doors.
4. Clean all dirt and debris from filter and filter head before removal.
5. Place a suitable container underneath filter.
6. Turn transmission oil filter counterclockwise to remove.
7. Clean filter mounting surface.
8. Apply thin film of oil to gasket of filter.
9. Add approximately 1.9 L (2.0 qt) of oil to filter. For recommended oil, see Maintenance—Machine. (Section 3-1.)
10. Turn filter clockwise by hand until gasket touches mounting surface.
11. Tighten 1/2—3/4 turn more.

12. Start engine and run for 2 minutes.
13. Stop engine. Check for leaks around filter. Tighten filter only enough to stop leaks.
14. Check oil level and add oil if necessary. See Checking Transmission Oil Level. (Section 3-4.)

NM00125,000067C-19-20210208

Transmission Control Unit Calibration

Perform transmission control unit calibration procedure. See Transmission Control Unit Calibration in Maintenance—As Required. (Section 3-3.)

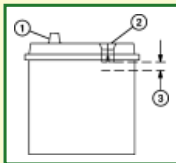
NM00125,00007D8-19-20110105

Check Battery Electrolyte Level

⚠ CAUTION:



TS203-UN: Avoid Acid Burns



TX1019136-UN: Battery Terminal, Fill Hole, and Fill Level

LEGEND:

1 - Battery Terminal

2 - Fill Tube

3 - Electrolyte Level Range

Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

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

ALWAYS remove grounded (-) battery clamp first and replace it last.

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

Avoid the hazard by:

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

If you spill acid on yourself:

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

If acid is swallowed:

1. **Do not induce vomiting.**
2. **Drink large amounts of water or milk, but do not exceed 1.9 L (2 quarts).**
3. **Get medical attention immediately.**

NOTE:

If operating in warm climates, battery water levels should be checked daily.

1. Remove battery box cover.

- 2.

IMPORTANT:

If water is added to batteries during freezing weather, batteries must be charged after water is added to prevent batteries from freezing. Charge battery using a battery charger or by running the engine.

Fill each cell to within specified range with distilled water. Do not overfill.

Checking Receiver-Dryer Moisture Indicator



TX1082810A-UN: Engine Left Side View

LEGEND:

1 - Receiver-Dryer Moisture Indicator 2 - Receiver-Dryer

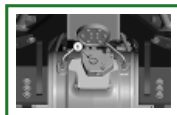
IMPORTANT:

Prevent possible compressor damage. If receiver-dryer moisture indicator color is pink, dryer is saturated and should be changed within the next 100 machine hours to prevent further buildup of moisture in the refrigerant.

1. Open left side service doors.
2. Inspect receiver-dryer moisture indicator (1), and note indicator color.
 - **Pink**— Receiver-dryer desiccant is saturated with moisture. See your authorized dealer within 100 machine hours to replace the receiver dryer.
 - **Blue**— Receiver-dryer desiccant moisture level is within operating range. Normal system use can continue.

NM00125,000067E-19-20101217

Checking Axle Housing Oil Level



TX1052707A-UN: Fill Hole Plug

LEGEND:

1 - Fill Hole Plug

1. Park machine on a level surface.
2. Lower all equipment to the ground.

3. Stop the engine.
4. Use wheel chocks to prevent machine movement.
5. Remove fill hole plug (1). Oil must be to bottom of hole.
6. If necessary, add oil at fill hole. For recommended oil, see Maintenance—Machine. (Section 3-1.)
7. Install plug.

OUT4001,00002F9-19-20081208

Checking 6WD Hub Oil Level—If Equipped



TX1053406A-UN: Check Wheel Hub Oil Level

LEGEND:

1 - Access Hole

2 - Drain Plug

1. Raise front wheels off ground.
2. Hand rotate wheel until check/fill plug is aligned with access hole (1) and drain plug (2) is at the 6 o'clock position.
3. Slowly release check/fill plug. If hub is full, oil will start to drain from hole. If oil does not drain from hole, slowly add oil to the check/fill hole until oil is level with the bottom of the check/fill hole. For recommended oil, see Maintenance—Machine. (Section 3-1.)

OUT4001,0000384-19-20110914

Take Engine Oil Sample

See your authorized dealer.

OUT4001,000039B-19-20120314

Changing Engine Oil (Quick Service)—If Equipped



TX1082757A-UN: Engine Oil Fill Cap and Dipstick



TX1083402A-UN: Engine Oil Quick Service Port

LEGEND:

1 - Fill Cap

2 - Dipstick

3 - Engine Oil Port

1. Run engine to warm oil. Stop the engine.

- 2.

NOTE:

Engine oil fill cap must be removed to vent system.

Remove fill cap (1).

3. Attach quick service hose to engine oil port (3).

4. Withdraw oil. Dispose of oil properly.

5. Refill with oil at port. For recommended oil, see Maintenance—Machine. (Section 3-1.)

Item	Measurement	Specification
Engine Oil	Capacity	27.0 L 7.1 gal

6. Remove hose.

7. Install fill cap.

- 8.

IMPORTANT:

Engine oil pressure indicator must come on immediately when engine is started. If oil pressure light does not go off, shut down machine immediately and find cause for low oil pressure.

Start engine and run at slow idle.

9.

NOTE:

Wait 10 minutes after machine shutdown to check oil level. Ten minutes after shutdown the engine oil level must be above the ADD mark.

Stop the engine. Check oil level on dipstick (2).

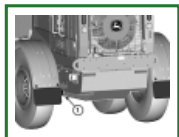
KH31969,0000032-19-20110706

Changing Engine Oil and Replacing Filter

IMPORTANT:

If fuel sulphur content exceeds 0.5 percent, change engine oil at half the normal interval.

1.



TX1082719A-UN: Engine Oil Drain Hose



TX1082718A-UN: Engine Oil Filter

LEGEND:

1 - Drain Hose

2 - Oil Filter

Run engine to warm oil. Stop the engine.

2. Place suitable container under engine oil drain hose (1).
3. Open drain valve on oil pan. Allow oil to drain into container. Dispose of waste oil properly.

4. Turn oil filter (2) counterclockwise to remove.
 5. Clean mounting surface. Apply thin film of oil to gasket of new filter.
 6. Install new filter. Turn filter clockwise by hand until gasket touches mounting surface.
 7. Turn the filter 1/2—3/4 turn more.
 8. Turn drain valve clockwise to close.
-

9.



TX1082756A-UN: Engine Oil Fill Cap and Dipstick

LEGEND:

3 - Fill Cap

4 - Dipstick

Remove fill cap (3).

10. Fill engine with oil. For recommended oil, see Maintenance—Machine. (Section 3-1.)

Item	Measurement	Specification
Engine Oil	Capacity	27.0 L 7.1 gal

11. Install fill cap.

12.

IMPORTANT:

Engine oil pressure indicator must come on immediately when engine is started. If oil pressure light does not go off, shut down machine immediately and find cause for low oil pressure.

Start engine and run at slow idle.

13.

NOTE:

Wait 10 minutes after machine shutdown to check oil level. Ten minutes after shutdown the engine oil level must be above the ADD mark.

Stop the engine. Check oil level on dipstick (4).

14. Check for any leakage at filter. Tighten filter just enough to stop leakage.

KH31969,0000033-19-20110706

Lubricate Tandem Pivots

IMPORTANT:

Prevent possible component damage. Greasing tandem pivots too frequently can cause pivots to malfunction.

NOTE:

If tandem pivots are over-greased, they will appear to be leaking.



TX1086056A-UN: Tandem Grease Fitting Location

LEGEND:

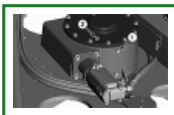
1 - Grease Fitting

Lubricate tandem pivots slowly with grease until grease escapes at joint or out of hole on front of tandem pivot. See Grease. (Section 3-1.)

Clean up excess grease around entire tandem pivot.

NM00125,000066F-19-20150326

Checking Circle Gear Case Oil Level



TX1052727A-UN: Circle Gear Case

LEGEND:

1 - Check Plug

2 - Filler Plug

1. Park machine on a level surface.
2. Stop the engine.
3. Lower all equipment to the ground.
4. Position draft frame so circle gear case is level.
5. Remove check plug (1). Oil must be to bottom of hole.
6. If necessary, remove filler plug (2). Add oil. For recommended oil, see Maintenance—Machine. (Section 3-1.)
7. Install plugs.

OUT4001,0000359-19-20100712

Checking Brake Accumulator



TX1053137-UN: Brake Pressure Indicator

1.

NOTE:

Transmission control and park brake lever engages park brake when moved to position P and disengages when lever is moved to neutral, forward, or reverse.

Move transmission control and park brake lever to position P. Make sure park lock collar engages.

2. Run engine for 1 minute to fully charge accumulator. Stop engine.
3. Press and release engine start switch to energize the ignition and apply power to the control units and the display unit (left LED is ON). Wait for display check sequence to complete.
4. To test pressure circuit:
 - Press brake pedal for 3 applications.
 - If the brake pressure indicator does not come on, pressure circuit is good.
 - If the brake pressure indicator does come on during the first 3 applications, Do Not Operate machine and see your authorized dealer.

5. To test the electrical circuit:

- Keep applying brake pedal until light does come on.
- If the brake pressure indicator does come on, electrical circuit is good.
- If the light does not come on after 25 applications, Do Not Operate machine and see your authorized dealer.

OUT4001,0000370-19-20090109

Checking Tandem Oil Level



TX1052711A-UN: Tandem Oil Level



XJ1257569A-UN: Tandem Breather Cap

LEGEND:

1 - Oil Level Plug

2 - Inspection Plate (2 used)

3 - Tandem Breather Cap

6 - Cap Screw(24 used)

1. Park machine on a level surface.
2. Lower all equipment to the ground.
3. Stop the engine.
4. Remove oil level plug (1) on each side of machine. Oil must be level with the bottom of plug hole in each housing.
5. Remove tandem platforms on both sides of machine.
6. On each side of machine, thoroughly clean area around one of the inspection plates (2). Remove inspection plate and add oil if necessary. For recommended oil, see Maintenance—Machine. (Section 3-1.)
7. Install inspection plates, cap screws (6), and oil level plugs. Apply 242 Loctite® Threadlocker (medium strength) to threads of cap screws and tighten to specification.

Item	Measurement	Specification
Tandem Housing Cover Cap Screw	Torque	47 N·m 35 lb·ft

8.

NOTE:

Breather is at rear inside access plate of each tandem.

Turn cap (3) on top of breather to make sure cap moves freely. A plugged breather may cause leakage.

9. Install tandem platforms.

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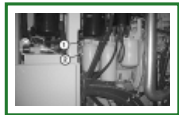
OUT4001,0000358-19-20180531

Replacing Final Fuel Filter

1.

IMPORTANT:

Do not prefill fuel filters. Debris in unfiltered fuel will damage fuel system components.



TX1083441A-UN: Final Fuel Filter

LEGEND:

1 - Filter Header

2 - Final Fuel Filter

Open right-side service doors and drop down-panel to access final fuel filter (2).

2. Thoroughly clean final fuel filter header assembly and surrounding area.
3. Turn final filter counterclockwise to remove.
4. Inspect final filter header (1) sealing surface. Clean as required.
5. Place new final fuel filter packing on filter.
6. Place thin film of fuel on packing.

7. Install filter clockwise into header. Tighten until snug with header.
8. Tighten filter 1/2 to 3/4 turn further.
9. Bleed fuel system. See Bleeding the Fuel System. (Section 4-1.)

NM00125,0000672-19-20101202

Replacing Primary Fuel Filter and Water Separator

1.

IMPORTANT:

Do not prefill fuel filters. Debris in unfiltered fuel will damage fuel system components.



TX1083451A-UN: Primary Fuel Filter

LEGEND:

1 - Primary Fuel Filter and
Water Separator

2 - Drain Valve

3 - Filter Header

4 - Water Sensor Wiring

- Open right-side service doors and drop-down panel to access primary fuel filter and water separator (1).
2. Thoroughly clean primary fuel filter header assembly and surrounding area.
 3. Disconnect water sensor wiring (4) from primary fuel filter and water separator.
 4. Place suitable container under drain valve (2).
 5. Open drain valve and drain fuel. Dispose of waste properly.
 6. Turn primary fuel filter and water separator counterclockwise to remove.
 7. Once primary fuel filter and water separator canister is removed, pull element down to remove from primary fuel filter header (3).
 8. Inspect header and canister sealing surfaces. Clean as required.
 9. Place new packing on filter canister.

10. Place thin film of fuel on packing.
11. Place new element into canister with tangs on bottom.
12. Install canister clockwise into header. Tighten until canister lip just mates with header lip.

Item	Measurement	Specification
Minimum Filter Canister to Header	Torque	13.6 N·m 120 lb-in.

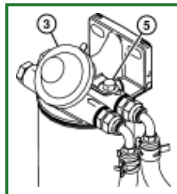
13. Connect water sensor wiring.
14. Bleed fuel system. See Bleeding the Fuel System. (Section 4-1.)

NM00125,0000673-19-20101202

Replacing Auxiliary Fuel Filter and Water Separator—If Equipped



TX1083701A-UN: Auxiliary Fuel Filter and Water Separator



TX1084238-UN: Auxiliary Filter Housing

LEGEND:

1 - Auxiliary Fuel Filter and Water Separator

2 - Drain Valve

3 - Hand Pump

4 - Bowl

5 - Bleed Screw

IMPORTANT:

For John Deere Tier 4 engines: Do not prefill fuel filters. Debris in unfiltered fuel will damage fuel system components.

1. Open right-side service doors and drop down panel to access auxiliary fuel filter and water separator (1).
2. Thoroughly clean auxiliary fuel filter header assembly and surrounding area.
3. Place suitable container under drain valve hose.
4. Open drain valve (2) and drain fuel. Dispose of waste properly.
5. Close drain valve and remove bowl (4) from filter (1). Clean and dry bowl.
6. Remove filter and replace with new filter.
7. Install bowl.
8. Open bleed screw (5) and operate hand pump (3) to bleed air from the auxiliary filter.
9. Close and tighten bleed screw.
10. Operate engine and check for leaks.
11. Tighten filter element and bowl only enough to stop leaks.

NM00125,0000674-19-20101202

Replace Fast Fill Fuel Breather Filter—If Equipped



TX1082605A-UN: Fast Fill Fuel Breather Filter

LEGEND:

1 - Fast Fill Fuel Breather Filter

NOTE:

During normal operating conditions, the fast fill fuel breather filter should be changed every 500 hours. If operating in dusty conditions, check filter more often and replace as required.

The fast fill fuel breather system allows for rapid refueling of the machine. The system is designed to fill at rates up to 570 L/m (150 gpm).

The fast fill fuel breather filter (1) is located on the left rear of the machine mounted to the cooling system support.

1. Open left-side service doors.
2. Remove breather filter from machine.
3. Install and tighten new breather filter.

NM00125,0000675-19-20110103

Replace Fuel Tank Breather

IMPORTANT:

Improper fuel tank ventilation could result in fuel tank collapse, replace the fuel tank breather every 500 hours.

To replace the fuel tank breather, see Checking Fuel Tank Vent Hose. (Section 4-1.)

NM00125,00007C4-19-20101213

Take Fluid Samples

See your authorized dealer for taking the following fluid samples:

- Hydraulic Oil
- Transmission Oil
- Axle Oil
- Tandem Oil
- 6WD Hub Oil (if equipped)
- Coolant
- Diesel Fuel

NM00125,0000676-19-20101005

Changing 6WD Hub Oil—If Equipped



TX1053406A-UN: Replace Wheel Hub Oil

LEGEND:

1 - Access Hole

2 - Fill/Drain Plug

1. Raise front wheels off ground.
2. Hand rotate wheel until check plug is aligned with access hole (1) and fill/drain plug (2) is at the 6 o'clock position. Place suitable container under fill/drain plug.
3. Remove both plugs.
4. Drain oil. Dispose of waste properly.
5. Rotate tire until check plug is aligned with access hole and fill/drain plug is at the 12 o'clock position.
6. Add oil to the fill/drain plug until oil starts to drain from check plug.

Item	Measurement	Specification
6WD Hubs (each)	Capacity	7.2 L 2.0 gal

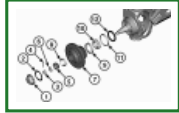
7. Install plugs.

NM00125,0000787-19-20101130

Adjusting Front Wheel Bearings—Standard Axle Only



TX1052738A-UN: Front Wheel Bearing



TX1052740A-UN: Front Wheel Bearing Exploded View

LEGEND:

1 - Hub Cap	4 - Cotter Pin	7 - Hub	10 - Bearing Cone
2 - Gasket	5 - Bearing Cone	8 - Bearing Cup	11 - Oil Seal Cup
3 - Slotted Nut	6 - Retainer Washer	9 - Bearing Cup	12 - Oil Seal

- Place blocks under front axle to support machine while adjusting front wheel bearings.
- Remove wheel. Remove hub cap (1) and gasket (2).
- Remove cotter pin (4) and slotted nut (3).
- Remove retainer washer (6) and bearing cone (5).
- Remove hub (7).
- Remove bearing cone (10), oil seal cup (11), and oil seal (12).
- Clean all parts. Replace worn or damaged parts.
- Pack bearing cones with grease. See Grease. (Section 3-1.)
- Assemble bearing cone, oil seal cup, and oil seal into hub.
- Place hub on axle. Install bearing cone (5) and retainer washer.
- Apply lubricant to threads.
- Install slotted nut. Tighten nut to specification while turning front wheel hub to seat bearings. Loosen nut to the nearest alignment of slot with hole in shaft. Install cotter pin.

Item	Measurement	Specification
Slotted Nut	Torque	95 N·m 70 lb-ft

- Install hub cap and gasket.

14. Install wheel.

NOTE:

If you operate the machine often in wet or muddy conditions, clean and pack bearings as necessary.

OUT4001,0000352-19-20081213

Checking Engine Air Intake Hoses

Check hoses for cracks or damage.

Tighten clamps.

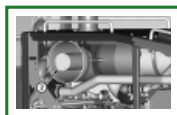
Replace as necessary.

OUT4001,0000302-19-20081028

Replacing Engine Air Intake Cleaner Elements



TX1082567A-UN: Primary Air Filter Element



TX1082566A-UN: Secondary Air Filter Element

LEGEND:

1 - Primary Air Filter Element 2 - Secondary Air Filter Element

1. Remove air filter housing cover.
2. Remove primary air filter element (1).
3. Remove secondary air filter element (2).
4. Clean all dust and debris from inside of element housing.

5. Install new elements. Make sure secondary element is centered in housing with correct end facing out.
6. Install air filter housing cover.

NM00125,0000677-19-20110103

Check Coolant

See Check Coolant. (Section 3-3.)

OUT4001,0000365-19-20140728

Replacing In-Line Fuel Strainer



TX1086054A-UN: In-Line Fuel Strainer

LEGEND:

1 - Clamp (2 used)

2 - In-Line Fuel Strainer

3 - Cap Screw

IMPORTANT:

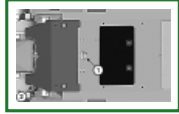
Note installation of in-line fuel strainer (2). Strainer is marked with direction of fuel flow. Improper installation could reduce fuel flow and filtration.

1. Open right-side service doors.
2. Remove cap screw (3).
3. Loosen clamps (1) and slide away from in-line fuel strainer (2).
4. Remove the strainer from fuel lines noting the direction of fuel flow.
5. Install new strainer in fuel lines.
6. Slide clamps toward strainer to secure fuel lines.

7. Install cap screw to secure bracket and strainer in place.

NM00125,000065E-19-20101220

Changing Transmission Oil and Cleaning Transmission Pump Inlet Screen



TX1052766A-UN: View Shown From Under Machine



TX1052767A-UN: Transmission Pump Inlet Screen

LEGEND:

- | | | |
|------------------------|------------------------|------------------|
| 1 - Drain Plug | 3 - Cap Screw (2 Used) | 5 - Inlet Screen |
| 2 - Front Access Plate | 4 - O-Ring | 6 - Tube |

1. Run the engine to allow transmission oil to reach operating temperature.
2. Stop the engine.
3. Place a suitable container underneath transmission.
4. Remove drain plug (1). Allow oil to drain into a container. Dispose of waste oil properly.
5. While oil is draining, change transmission oil filter. See Replacing Transmission Oil Filter in this section.

6.



CAUTION:

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

Remove front access plate (2).

Item	Measurement	Specification
Front Access Plate	Weight	25 kg 55 lb.

7. Remove cap screws (3).
8. Remove tube (6).
9. Remove O-ring (4).
10. Remove inlet screen (5) and clean with solvent.
11. Install inlet screen with new O-ring.
12. Install tube. Tighten cap screws to specification.

Item	Measurement	Specification
Cap Screw	Torque	25 N·m 18 lb-ft

13.



TX1083001A-UN: Transmission Dipstick and Fill Tube

LEGEND:

1 - Transmission Dipstick/Fill
Cap

Install transmission case drain plug.

14. Remove transmission dipstick/fill cap (7) from oil fill tube.
15. Fill transmission with oil at oil fill tube. For recommended oil, see Maintenance—Machine. (Section 3-1.)

Item	Measurement	Specification
Transmission Oil, Including Filter	Capacity	28.4 L 7.5 gal

16. Install dipstick/fill cap.
17. Run engine for 1 minute. Stop engine. Wait 10 minutes for oil level to stabilize.

18. Check oil level on dipstick. Oil level should be in crosshatched area of transmission dipstick. Do not overfill—transmission may overheat.

NM00125,0000691-19-20101217

Changing Transmission Oil (Quick Service)—If Equipped



TX1083000A-UN: Transmission Quick Service

LEGEND:

1 - Dipstick/Fill Cap

2 - Transmission Oil Port

1. Run engine and allow transmission oil to reach operating temperature.
2. Stop the engine.

3.

NOTE:

Dipstick must be removed from fill tube to allow system to vent.

Remove dipstick/fill cap (1).

4. Attach quick service hose to transmission oil port (2).
5. Withdraw oil. Dispose of waste oil properly.
6. Refill with oil at port. For recommended oil, see Maintenance—Machine. (Section 3-1.)

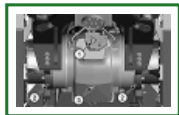
Item	Measurement	Specification
Transmission Oil, Including Filter	Capacity	28.4 L 7.5 gal

7. Remove hose.
8. Install dipstick/fill cap.
9. Run engine for 1 minute. Stop engine. Wait 10 minutes for oil to level to stabilize.
10. Check oil level on dipstick.

- Oil level should be in crosshatched area of transmission dipstick. Do not overfill—transmission may overheat.

NM00125,0000692-19-20101025

Changing Axle Housing Oil



TX1052757A-UN: Axle Housing

LEGEND:

1 - Check Plug

2 - Drain Plug (2 used)

3 - Drain Plug

- Start engine and run to warm oil to operating temperature.
- Park machine on a level surface.
- Stop engine.
- Remove drain plugs (2 and 3) from bottom of axle housing. Allow oil to drain into a suitable container. Dispose of waste oil properly.
- Install drain plugs.
- Remove check plug (1).
- Add oil at check plug hole until it is level with the bottom of the hole. For recommended oil, see Maintenance—Machine. (Section 3-1.)

Item	Measurement	Specification
Axle Housing Oil	Capacity	38.0 L 10 gal

Wait 5 minutes to allow oil to flow into left and right final drives and check level.

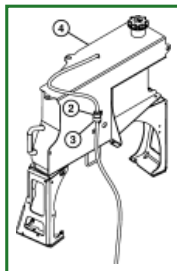
- Add additional oil until oil remains level with the bottom of the check plug hole.

NM00125,0000786-19-20101130

Replacing Rear Axle Breather Filter and Hydraulic Tank Breather Filter



TX1086053A-UN: Axle Breather Filter Location



TX1082998-UN: Hydraulic Tank Breather Filter Location

LEGEND:

1 - Rear Axle Breather Filter

2 - Hydraulic Tank Breather Filter

3 - Clamp

4 - Hydraulic Tank

Rear Axle Breather Filter

1. To access rear axle breather filter (1) open left-side service doors.
2. The filter is located inside left engine frame near engine control unit (ECU).
3. Remove clamp securing filter to engine frame.
4. Remove filter from breather hose and replace with a new filter.
5. Install clamp and filter to engine frame.

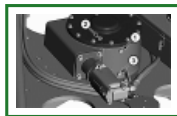
Hydraulic Breather Filter

1. To access hydraulic tank breather filter (2) open right-side service doors.
2. The filter is mounted to front side of hydraulic oil tank (4).
3. Remove clamp (3) securing filter to hydraulic tank.

4. Remove filter from breather hose and replace with a new filter.
5. Install clamp and filter to hydraulic oil tank.

NM00125,0000693-19-20101220

Changing Circle Gear Case Oil



TX1052728A-UN: Circle Gear Case

LEGEND:

1 - Check Plug

2 - Fill Plug

3 - Drain Plug

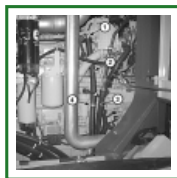
1. Park machine on a level surface.
2. Level draft frame before performing service.
3. Remove plugs (1—3).
4. Allow oil to drain into a suitable container. Dispose of waste oil properly.
5. Install the lower drain plug (3).
6. Add oil through fill plug (2) hole until oil level is even with the bottom of the check plug (1) hole. For recommended oil, see Maintenance—Machine. (Section 3-1.) Oil

Item	Measurement	Specification
Gear Case Oil	Capacity	5.7 L 1.5 gal

7. Install fill plug and check plug.

NM00125,0000680-19-20101008

Cleaning Engine Crankcase Ventilation Tube



TX1083003A-UN: Crankcase Ventilation Tube Location

LEGEND:

1 - Hose Clamp

2 - Engine Crankcase Ventilation
Tube

3 - Cap Screw

4 - Clamp

1. Remove cap screw (3) and clamp (4).
2. Loosen hose clamp (1) and remove engine crankcase ventilation tube (2) from engine.
3. Inspect ventilation tube for dirt and debris.

IMPORTANT:

Restrictions in the ventilation tube can cause sludge to form in crankcase. This can lead to clogging of oil passages, filters, and screens, resulting in serious engine damage.

4. Clean ventilation tube with solvent and compressed air if restricted.

NOTE:

Clean the ventilation tube at shorter intervals if operating machine in dusty conditions.

5. Install ventilation tube to engine and tighten hose clamp.
6. Install clamp and cap screw to secure ventilation tube to engine.

Replacing Axle Housing Oil Filter



TX1082960A-UN: Axle Housing Oil Filter Location

LEGEND:

1 - Axle Housing Oil Filter

1. Lower all equipment to the ground.
2. Stop the engine.
3. To access axle housing oil filter (1) open right-side service doors.
4. Place a suitable container underneath filter.
5. Clean all dirt and debris from filter housing before removal.
6. Turn axle housing oil filter counterclockwise to remove.
7. Replace filter element.
8. Clean the mounting surface of filter housing.
9. Apply thin film of oil to gasket of canister.
10. Add approximately 1.9 L (2.0 qt) of oil to filter. For recommended oil, see Maintenance—Machine. (Section 3-1.)
11. Install new filter element and canister. Turn canister clockwise by hand until gasket touches mounting surface.
12. Tighten 1/2—3/4 turn more.
13. Start engine and run for 2 minutes.
14. Stop engine. Check for leaks around filter. Tighten filter only enough to stop leaks.
15. Check oil level and add oil if necessary. See Checking Axle Housing Oil Level. (Section 3-7.)

Replacing Hydraulic Oil Filter



TX1082959A-UN: Hydraulic Oil Filter Location

LEGEND:

1 - Hydraulic Oil Filter

1. Lower all equipment to the ground.
2. Stop the engine.
3. To access hydraulic oil filter (1), open right-side service doors.
4. Place a suitable container underneath filter.
5. Clean all dirt and debris from filter housing before removal.
6. Turn hydraulic oil filter counterclockwise to remove.
7. Replace filter element.
8. Clean the mounting surface of filter housing.
9. Apply thin film of oil to gasket of canister.
10. Add approximately 1.9 L (2.0 qt) of oil to filter. For recommended oil, see Maintenance—Machine. (Section 3-1.)
11. Install new filter element and canister. Turn canister clockwise by hand until gasket touches mounting surface.
12. Tighten 1/2—3/4 turn more.
13. Start engine and run for 2 minutes.
14. Stop engine. Check for leaks around filter. Tighten filter only enough to stop leaks.
15. Check oil level and add oil if necessary. See Checking Hydraulic Oil Tank Level. (Section 3-4.)

Adjusting Engine Valve Clearance (Lash)

See your authorized dealer.

TX03679,00017DD-19-20081106

Replacing Transmission Oil Filter



TX1082958A-UN: Transmission Oil Filter Location

LEGEND:

1 - Transmission Oil Filter

1. Lower all equipment to the ground.
2. Stop the engine.
3. To access transmission oil filter (1) open right-side service doors.
4. Place a suitable container underneath filter.
5. Clean all dirt and debris from filter housing before removal.
6. Turn transmission oil filter counterclockwise to remove.
7. Replace filter element.
8. Clean the mounting surface of filter housing.
9. Apply thin film of oil to gasket of canister.
10. Add approximately 1.9 L (2 qt) of oil to filter. For recommended oil, see Maintenance—Machine. (Section 3-1.)
11. Install new filter element and canister. Turn canister clockwise by hand until gasket touches mounting surface.
12. Tighten 1/2—3/4 turn more.
13. Start engine and run for 2 minutes.

14. Stop engine. Check for leaks around filter. Tighten filter only enough to stop leaks.
15. Check oil level and add oil if necessary. See Checking Transmission Oil Level. (Section 3-4.)

NM00125,0000690-19-20101202

Transmission Control Unit Calibration

NOTE:

Run calibration **AFTER** transmission oil is changed.

Perform transmission control unit calibration procedure. See Transmission Control Unit Calibration in Maintenance—As Required. (Section 3-3.)

NM00125,00007D9-19-20110105

Changing Hydraulic Tank Oil



TX1083261A-UN: Rear Access Panel

LEGEND:

1 - Cap Screw (2 used) 2 - Rear Access Panel

1. Park machine on a level surface.

- 2.

NOTE:

Make sure to lower all equipment to the ground while engine is running using the power down position—not the float position. Floating the equipment to the ground will result in a false hydraulic oil level reading on the sight glass, because cavitation may occur in the cylinders.

Lower all equipment to the ground and roll blade back completely.

3. Wheels must be straight up. Front and back of machine must be aligned.
 4. Stop the engine.
 5. Remove cap screws (1) and remove rear access panel (2) underneath machine.
-

6.



TX1083263A-UN: Hydraulic Tank Drain Hose

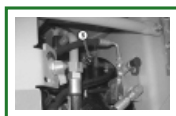
LEGEND:

3 - Plug

4 - Hydraulic Tank Drain Hose

Remove plug (3) from end of hydraulic tank drain hose (4).

7.



TX1083266A-UN: Hydraulic Tank Drain Valve

LEGEND:

5 - Hydraulic Tank Drain Valve

Turn hydraulic tank drain valve (5) counterclockwise to open. Drain oil into a suitable container. Dispose of waste oil properly.

8. While oil is draining, replace hydraulic oil filter. See Replacing Hydraulic Oil Filter. (Section 3-10.)
9. Close hydraulic tank drain valve and install drain plug in drain hose.
10. Install rear access panel underneath machine.
11. Remove hydraulic fill cap and fill tank with oil. For recommended oil, see Maintenance—Machine. (Section 3-1.)

Item	Measurement	Specification
Hydraulic Tank Oil	Capacity	60.5 L 16.0 gal

12. Start engine and run for 2 minutes.
13. Operate all control functions.

14.

NOTE:

Make sure to lower all equipment to the ground while engine is running using the power down position—not the float position. Floating the equipment to the ground will result in a false hydraulic oil level reading on the sight glass, because cavitation may occur in the cylinders.

Lower all equipment to the ground and roll blade back completely.

15. Stop the engine.
-

- 16.



TX1083265A-UN: Sight Glass

LEGEND:

6 - Sight Glass

Check sight glass (1). Oil must be in cold oil range.

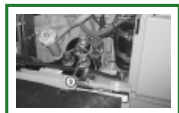
17. If necessary, add more oil.

NM00125,00006B3-19-20101213

Changing Hydraulic Tank Oil (Quick Service)—If Equipped



TX1083289A-UN: Sight Glass and Hydraulic Fill Cap



TX1083290A-UN: Hydraulic Oil Port

LEGEND:

1 - Sight Glass

2 - Hydraulic Oil Fill Cap

3 - Hydraulic Oil Port

1. Park machine on a level surface.

2.

NOTE:

Make sure to lower all equipment to the ground while engine is running using the power down position—not the float position. Floating the equipment to the ground will result in a false hydraulic oil level reading on the sight glass, because cavitation may occur in the cylinders.

Lower all equipment to the ground and roll blade back completely.

3. Wheels must be straight up. Front and back of machine must be aligned.

4. Stop the engine.

5.

NOTE:

Hydraulic oil fill cap must be removed to vent system.

Remove hydraulic oil fill cap (2).

6. Attach quick service hose to hydraulic oil port (3).

7. Withdraw oil. Dispose of waste oil properly.

8. Refill with oil at port. For recommended oil, see Maintenance—Machine. (Section 3-1.)

Item	Measurement	Specification
Hydraulic Tank Oil	Capacity	60.5 L 16.0 gal

9. Remove hose.

10. Install hydraulic oil fill cap.

11. Start engine and run for 2 minutes.

12. Operate all control functions.

13.

NOTE:

Make sure to lower all equipment to the ground while engine is running using the power down position—not the float position. Floating the equipment to the ground will result in a false hydraulic oil level reading on the sight glass, because cavitation may occur in the cylinders.

Lower all equipment to the ground and roll blade back completely.

14. Stop engine. Wait 10 minutes for oil to drain down.
15. Check oil level on sight glass (1). Oil must be in cold oil range.
16. If necessary, add more oil.

NM00125,00006B4-19-20110915

Changing Tandem Oil



TX1083307A-UN: View Shown From Rear Underside of Machine

LEGEND:

1 - Drain Plug (2 used)

1. Park machine on a level surface.
 2. Lower all equipment to the ground.
 3. Stop the engine.
 4. Remove drain plugs (1) from front of right housing and rear of left housing. Allow oil to drain into a suitable container. Dispose of waste oil properly.
-

5.



TX1083306A-UN: Tandem Platform Removal

LEGEND:

2 - Cap Screw (8 used)

3 - Tandem Platform (4 used)

Remove cap screws (2) and remove tandem platforms (3) on both sides of machine.

6.



TX1083305A-UN: Tandem

LEGEND:

4 - Inspection Plate (4 used) 5 - Oil Level Plug (2 used) 6 - Breather (2 used)

On each side of machine, thoroughly clean area around one of the inspection plates (4) and remove.

7. Flush each tandem housing with diesel fuel. Install drain plugs.

8. Remove oil level plug (5) on each side of tandem housings and add oil until level with bottom of plug hole in each housing. For recommended oil, see Maintenance—Machine. (Section 3-1.)

Item	Measurement	Specification
Tandem Housing	Capacity—(each)	74.0 L 19.5 gal

9. Install inspection plates and oil level plugs.

10. Turn cap on top of breather (6) on each tandem to make sure cap moves freely. A plugged breather may cause oil leakage.

11. Install tandem platforms.

NM00125,00006B5-19-20101130

Drain, Flush, and Refill Cooling System



TS281-UN: Service Cooling System Safely



TX1083210A-UN: Surge Tank Access Panel and Filler Cap

LEGEND:

1 - Surge Tank Access Panel 2 - Surge Tank Filler Cap

NOTE:**If not using JD COOL-GARD™ II (even for top-off) or not conducting 1000 hour coolant test strip checks, change interval must be reduced.**

Every 6000 hours, drain and flush cooling system using commercial products, replace thermostats, and refill with new coolant.

Drain and Flush Cooling System:

1.

**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.

Open surge tank access panel (1). Release pressure and then remove surge tank filler cap (2).

2. Open right rear service door.

3.

NOTE:**Coolant drain hose (3) is supplied on machine.**

TX1083215A-UN: Coolant Drain Hose



TX1083216A-UN: Radiator Drain Valve



TX1086055A-UN: Coolant Hose Drain Valve Location

LEGEND:

- 3 - Coolant Drain Hose 4 - Radiator Drain Valve 5 - Coolant Hose Drain Valve

Turn radiator drain valve (4) and coolant hose drain valve (5) counterclockwise to open. Allow coolant to drain into suitable container. Close drain valve. Dispose of used coolant properly.

4.

IMPORTANT:

Avoid engine damage from over-diluted coolant. Drain engine block after flushing procedure to remove excess water.

Flush system using a commercial product. Drain engine block after flushing procedure.



CAUTION:

Fill Cooling System:



TS281-UN: Service Cooling System Safely

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.

1. Fill surge tank to between MIN and MAX COLD marks. For recommended coolant, see Maintenance—Machine. (Section 3-1.)

Item	Measurement	Specification
Cooling System	Capacity	58.0 L 15.3 gal

2. Install surge tank filler cap.
3. With all heater valves open, operate engine 15—30 minutes to purge air from the engine block.
4. Shut off engine and add more coolant to the surge tank.
5. Start engine and run until engine is at normal operating temperature.
6. Stop engine and check coolant level on surge tank. If coolant level is below MIN COLD, remove surge tank filler cap and add more coolant.

HOT WEATHER above 35°C (95°F): Antifreeze reduces cooling system efficiency. When maximum cooling system efficiency is required, completely drain and flush system.

IMPORTANT:

Use only permanent-type low silicate, ethylene glycol base antifreeze in coolant solution. Other types of antifreeze may damage cylinder seals.

FREEZING TEMPERATURES: Fill with permanent-type low silicate, ethylene glycol antifreeze (without stop-leak additive) and clean, soft water.

NOTE:

All machines are shipped from the factory with a mixture for protection to -37°C (-34°F). Adjust mixture accordingly to provide freeze protection for your machine.

COOL-GARD is a trademark of Deere & Company

NM00125,00006B1-19-20130314

Drain, Flush, and Refill Cooling System (Quick Service)—If Equipped

NOTE:

If not using JD COOL-GARD™ II (even for top-off) or not conducting 1000 hour coolant test strip checks, change interval must be reduced.



TS281-UN: Service Cooling System Safely



TX1083242A-UN: Surge Tank Filler Cap



TX1083249A-UN: Coolant Port

LEGEND:

1 - Surge Tank Filler Cap 2 - Coolant Port

1.

⚠ CAUTION:
Prevent possible injury from hot spraying fluids. Shut off engine. Remove filler cap only when cool enough to touch with bare hands. Slowly loosen cap to relieve pressure before removing completely.

NOTE:
Surge tank filler cap must be removed to vent cooling system.

Release pressure and then remove surge tank filler cap (1).

2. Attach quick service hose to coolant port (2).
3. Withdraw coolant. Dispose of coolant properly.
4. Flush system using a commercial product.
5. Refill with coolant at port. For recommended coolant, see Maintenance—Machine. (Section 3-1.)

Item	Measurement	Specification
Cooling System	Capacity	58.0 L 15.3 gal

6. Remove hose.
7. Install surge tank filler cap.
8. With all heater valves open, operate engine 15—30 minutes to purge air from the engine block.
9. Shut off engine and add more coolant to the surge tank.
10. Start engine and run until engine is at normal operating temperature.

11.

**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.

Stop engine and check coolant level on surge tank. If coolant level is below MIN COLD, remove surge tank filler cap and add more coolant.

HOT WEATHER above 35°C (95°F): Antifreeze reduces cooling system efficiency. When maximum cooling system efficiency is required, completely drain and flush system.

IMPORTANT:

Use only permanent-type low silicate, ethylene glycol base antifreeze in coolant solution. Other types of antifreeze may damage cylinder seals.

FREEZING TEMPERATURES: Fill with permanent-type low silicate, ethylene glycol antifreeze (without stop-leak additive) and clean, soft water.

NOTE:

All machines are shipped from the factory with a mixture for protection to -37°C (-34°F). Adjust mixture accordingly to provide freeze protection for your machine.

COOL-GARD is a trademark of Deere & Company

NM00125,00006B2-19-20130314

Bleeding Service Brake



TX1082564A-UN: Service Brake Bleed Screw (left side shown)

LEGEND:

1 - Service Brake Bleed Screw

NOTE:

Bleed both left and right service brakes whenever components are removed or repaired on the service brake system.

Service brake bleed screw (1) is located on the top of both left-side and right-side brake housings. It can be accessed by opening the left and right service doors.

1. Place a clear plastic tube on bleed screw opening and route to a suitable container.
2. Open brake bleed screw and apply brake pedal several times.
3. When oil flowing through the plastic tube is free of air bubbles, close brake bleed screw.
4. Repeat steps 1—3 to opposite-side service brake. Dispose of waste oil properly.

NM00125,000063E-19-20110103

Bleeding the Fuel System

IMPORTANT:

For John Deere Interim Tier 4/Stage III B engines: Do not prefill fuel filters. Debris in unfiltered fuel will damage fuel system components.

NOTE:

This procedure should be performed if any of the following occur:

- Fuel filter change
- Fuel system service
- Engine has run out of fuel

Air can enter the fuel system when fuel filters are changed, machine has run out of fuel, or service is performed. Air in the fuel system can prevent engine from starting and cause rough idle.

Prime and bleed fuel system as follows:

1.



TX1052875-UN: Sealed Switch Module

LEGEND:

1 - Engine Start Switch

2 - Engine Stop Switch

Press and release engine start switch (1) to energize ignition system and electric fuel pump. Let pump run for 60 seconds to prime fuel system.

2. After 60 seconds press the engine start switch again to start engine.

NOTE:

If engine does not start, press engine stop switch (2) and repeat procedure.

3. Run engine for 5 minutes at slow idle.

NM00125,000063F-19-20110104

Checking Fuel Tank Vent Hose

IMPORTANT:

Improper fuel tank ventilation could result in fuel tank collapse.



TX1082696A-UN: Fuel Tank Breather Location

LEGEND:

1 - Clamp

2 - Fuel Tank Breather

1. Remove clamp (1).
2. Remove fuel tank breather (2). Check hose for debris or blockage. If clogged, clean or replace.
3. Install breather and clamp.

NM00125,0000640-19-20101213

Cleaning Cab Drains



TX1053218A-UN: Cab and Condensation Drains

LEGEND:

1 - Cab Drain (4 used)

2 - Condensation Drain

Drain water or dust from cab floor by squeezing cab drains (1).

Inspect condensation drain (2) and surrounding area for dust or debris.

OUT4001,0000314-19-20081028

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,DH2537-19-20200813

Handling, Checking, and Servicing Batteries Carefully**⚠ CAUTION:**

TS204-UN: Exploding Battery Gas



TS203-UN: Battery Electrolyte



T85402-UN: Battery and Coolant Tester

Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

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

Always remove grounded (-) battery clamp first, and replace it last.

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

Avoid the hazard by:

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

If you spill acid on yourself:

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

If acid is swallowed:

- 1. Do not induce vomiting.**
- 2. Drink large amounts of water or milk, but do not exceed 1.9 L (2 qts.).**
- 3. Get medical attention immediately.**

WARNING: Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. **Wash hands after handling.**

If electrolyte spills on the floor, use one of the following mixtures to neutralize the acid: 0.5 kg (1 lb.) baking soda in 4 L (1 gal.) water, or 0.47 L (1 pt.) household ammonia in 4 L (1 gal.) water.

IMPORTANT:

Do not overfill the battery cells.

Check the specific gravity of electrolyte in each battery cell.

See your authorized dealer for JT05460 SERVICEGARD™ battery and coolant tester. Follow directions included with the tester.

A fully charged battery will have a corrected specific gravity reading of 1.260. If the reading is below 1.200, charge the battery.

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,OUO1021,185-19-20200304

Using Booster Batteries—24 Volt System



TS204-UN: Battery Explosions

**CAUTION:**

An explosive gas is produced while batteries are in use or being charged. Keep flames or sparks away from the battery area. Make sure that the batteries are charged in a well-ventilated area.

Before boost starting, machine must be properly shut down and secured to prevent unexpected machine movement when engine starts.

IMPORTANT:

The machine electrical system is a 24 V negative (-) ground. Connect two 12 V booster batteries together in series as shown for 24 volts.

1.



TX1014128-UN: Booster Batteries To Starter Lug



TX1082491A-UN: Starter Lug

LEGEND:

1 - Positive Cable

2 - Booster Batteries

3 - Negative Cable

4 - Lug on Starter

Connect one end of positive cable (1) to lug on starter (4).

2. Connect opposite end of positive cable to positive terminal of booster batteries (2).
3. Connect one end of negative cable (3) to negative terminal of booster batteries.
4. Connect opposite end of negative cable to machine frame as far away from machine batteries as possible.
5. Start engine.
6. Immediately after starting engine, disconnect end of negative cable from machine frame first.
7. Disconnect other end of negative cable from negative terminal of booster batteries.
8. Disconnect positive cable from booster batteries and lug on starter.

NM00125,0000644-19-20101019

Using Battery Charger

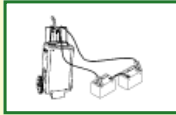
**CAUTION:**



TS204-UN: Battery Safety



TX1038674-UN: 12 V Battery Charger Connection



TX1038676-UN: 24 V Battery Charger Connection

Prevent possible injury from exploding battery. Charging a frozen battery may cause it to explode. Warm battery to 16 °C (60 °F) before charging. Turn off charger before connecting or disconnecting.

IMPORTANT:

Disconnect battery ground (—) cable or turn battery disconnect switch to OFF before charging batteries in the machine to prevent damage to electrical components.

A battery charger can be used as a booster to start engine.

Ventilate the area where batteries are being charged.

Check electrolyte level in batteries. If low, add distilled water as needed. See Check Battery Electrolyte Level. (Section 3-7.)

Measure the open circuit voltage of each battery. If voltage is greater than 10.0 volts, charge battery using standard charging procedure. If voltage is less than 10.0 volts, battery is considered to be deeply discharged. Use deep discharge recovery procedure.

IMPORTANT:

If constant current charging is the only available option, contact battery manufacturer for the correct procedure.

Standard Charging Procedure. Constant voltage charging is the preferred method for charging lead acid batteries. When using a 12 V charger, charge at a constant voltage of 14.00—14.50 volts using a charger with a minimum current availability of 20 amps for 6 hours. When using a 24 V charger, charge at a constant voltage of 28.0—29.0 volts

Deep Discharge Recovery Procedure. When using a 12 V charger, recharge battery with charger set at constant voltage of 14.00—14.50 volts with the maximum available current set to 5 amps. When using a 24 V charger, set output to a constant voltage of 28.0—29.0 volts. This is the safest method of recovery but may take 36 hours or more to fully recharge the battery.

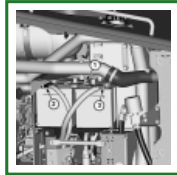
NOTE:

Initially, the battery may appear as if it is not accepting the charge due to the sulfation barrier that builds up within a deeply discharged battery. After approximately 20 minutes, the current should begin to flow.

Stop or cut back charging rate if battery case feels hot or is venting electrolyte. Battery temperature must not exceed 52 °C (125 °F).

OUT4001,0000387-19-20090113

Removing and Replacing Batteries



TX1082697A-UN: Battery Location

LEGEND:

1 - Nut 2 - Negative (-) Battery Cable 3 - Positive (+) Battery Cable

Machine has two 12-volt batteries with negative (-) ground.

For cold weather operation below 0°C (32°F), use batteries that meet specifications below.

Item	Measurement	Specification
Battery	Cold Cranking Amps	1400
	Minutes Reserve Capacity	440

For operating temperatures above 0°C (32°F), use batteries that meet specifications below.

Item	Measurement	Specification
Battery	Cold Cranking Amps	1000
	Minutes Reserve Capacity	320

1. Turn battery disconnect switch to the OFF position. See Battery Disconnect Switch. (Section 2-2.)

2. Disconnect negative (-) battery cable (2).
3. Disconnect positive (+) battery cable (3).
4. Remove battery cable connecting batteries in series.
5. Remove nut (1) and hold-down bracket.
6. Slide batteries out of compartment.
7. Install new batteries in compartment using hold-down bracket and nut.
8. Install battery cable connecting batteries in series.
9. Connect positive (+) battery cable.
10. Connect negative (-) battery cable
11. Turn battery disconnect switch to the ON position.
12. Start engine. After bulb check, verify that low battery voltage indicator on ADU does not appear.

NM00125,0000646-19-20101019

JDLink™ Machine Monitoring System (MMS)—If Equipped

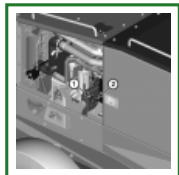
JDLink™ is an equipment monitoring and information delivery system. JDLink™ automatically collects and manages information about where and how construction and forestry equipment is being used, as well as critical machine health data and service status.

For more information, see an authorized John Deere dealer or visit www.deere.com (browse to Construction, Services and Support, JDLink™).

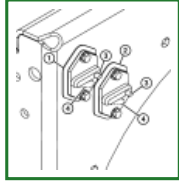
JDLink is a trademark of Deere & Company

VD76477,0001541-19-20150326

Circuit Breakers



TX1085133A-UN: Circuit Breaker Location



TX1085134-UN: Circuit Breakers

LEGEND:

1 - Circuit Breaker F3 (120-Amp) 2 - Circuit Breaker F1 (120-Amp) 3 - Circuit Breaker TEST Button 4 - Circuit Breaker RESET Lever

To access the circuit breakers, open the right-side service doors. The circuit breakers are mounted to the hydraulic tank support.

Circuit breaker F3 (1) is the main over-current protection for the flex load controller (FLC).

Circuit breaker F1 (2) is the main over-current protection for the machine cab.

NOTE:

If a circuit breaker is tripped during normal operation, repair the faulty circuit before attempting to reset the circuit breaker.

Circuit breakers can be manually tested as follows:

1. Push the circuit breaker TEST switch (3).
2. The RESET lever (4) will pop-out and power will be removed from the circuit.
3. Push the RESET lever back in place to reset the circuit breaker.

NM00125,0000784-19-20101222

Replacing Fuses



TX1052596A-UN: Fuse Cover



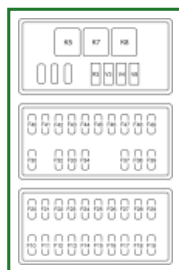
TX1082513A-UN: Fuse and Relay Boxes

LEGEND:

- 1 - Fuse Cover
- 2 - Top Fuse/Relay Box
- 3 - Middle Fuse Box
- 4 - Bottom Fuse Box

The fuse panel is located behind the seat on the left-hand side. Turn latch and open fuse cover (1). There are three fuse boxes located here:

- Top Fuse/Relay Box
- Middle Fuse Box
- Bottom Fuse Box



TX1085405-UN: Fuse and Relay Locations

LEGEND:

F10 - SSM, FLC Unswitched Power 10-Amp Fuse	F15 - Converter Input Unswitched Power 25-Amp Fuse	F20 - Alternator Excitation Switched Power 5-Amp Fuse	F25 - 6WD Switched Power 10-Amp Fuse	F29 - Converter Input, Air/Heated Seat Switched Power 10-Amp Fuse
F11 - Dome, Engine Compartment Light Unswitched Power 10-Amp Fuse	F16 - Monitor, Horn, Service ADVISOR™ Unswitched Power 10-Amp Fuse	F21 - Fuel Heater Switched Power (if equipped) 10-Amp Fuse	F26 - Rear Defog Switched Power 15-Amp Fuse	F30 - JDLINK™ Switched Power 5-Amp Fuse
F12 - TCU, 6WD Unswitched Power 5-Amp Fuse	F17 - HVC, AVC Unswitched Power 10-Amp Fuse	F22 - Soft Start Switched Power 10-Amp Fuse	F27 - Front (Lower/Upper), Rear Wiper Switched Power 10-Amp Fuse	F32 - Accessory Switched Power 10-Amp Fuse
F13 - Accessory Unswitched Power 10-Amp Fuse	F18 - JDLINK™ Unswitched Power 10-Amp Fuse	F23 - ECU, Engine Speed Control Switched Power 5-Amp Fuse	F28 - Monitor, Turn Signal, High Beam, Diff Lock (standard machines) Switched Power 10-Amp Fuse	F33 - Bus Fan Switched Power 10-Amp Fuse
F14 - Beacon Light Unswitched Power 10-Amp Fuse	F19 - Dosing Pump Unswitched Power 10-Amp Fuse	F24 - TCU, Shifter Switched Power 10-Amp Fuse		F34 - HVAC System Switched Power 20-Amp Fuse

F37 - Control Levers, Differential Lock (Grade Pro machines) Switched Power 5-Amp Fuse	F40 - IGC Unswitched Power 10-Amp Fuse	F44 - Low Pressure Fuel Pump Switched Power 10-Amp Fuse	F47 - Camera, Bottom Power Port 12V Switched Power 15-Amp Fuse	K7 - Beacon Relay
F38 - HVC Switched Power 10-Amp Fuse	F41 - IGC Unswitched Power 10-Amp Fuse	F45 - Radio Memory 12V Unswitched Power 10-Amp Fuse	F48 - Accessory 12V Switched Power 25-Amp Fuse	K8 - Rear Defog Relay
F39 - AVC Switched Power 10-Amp Fuse	F42 - IGC Unswitched Power 10-Amp Fuse	F46 - Radio, Top Power Port 12V Switched Power 15-Amp Fuse	F49 - JDLink™ Unswitched Ground 5-Amp Fuse	R3 - Not Used
	F43 - IGC Switched Power 10-Amp Fuse		K5 - Soft Start Relay	V3 - Not Used
				V4 - Ignition Relay #1 Diode
				V8 - Ignition Relay #2 Diode

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NM00125,0000648-19-20110106

Fuse (Blade-Type) Color Codes

-: Fuse (Blade-Type) Color Codes

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

NM00125,0000649-19-20100927

Welding On Machine

1.

 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.

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.

2.

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.

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.

TX,WOM-19-20200706

Welding Near Electronic Control Units



TS953-UN: Welding Graphic

1.

IMPORTANT:**Do not jump-start engines with arc welding equipment. Currents and voltages are too high and may cause permanent damage.**

Disconnect the negative (-) battery cable(s).

2. Disconnect the positive (+) battery cable(s).
3. Connect the positive and negative cables together. Do not attach to vehicle frame.
4. Clear or move any wiring harness sections away from welding area.
5. Connect welder ground close to welding point and away from control units.
6. After welding, reverse Steps 1—5.

DX,WW,ECU02-19-20090814

Keep Electronic Control Unit Connectors Clean

1.

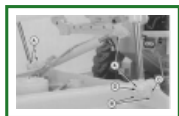
IMPORTANT:**Do not open control unit and do not clean with a high-pressure spray. Moisture, dirt, and other contaminants may cause permanent damage.**

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,ECU04-19-20090611

Checking and Adjusting Cylinder Ball and Socket Clearances



T6164BL-UN: Cylinder Ball and Socket

LEGEND:

A - Assembly

B - Cap Screw

C - Cap

D - Shim

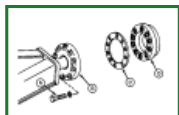
1. Lower blade to ground. Check each ball and socket assembly (A).
2. Move cylinder without load. Ball should move freely.
3. Check for excessive looseness.

Item	Measurement	Specification
Cylinder Ball and Socket	Maximum Clearance	0.76 mm 0.030 in.

4. To adjust clearance, remove cap screws (B) and cap (C).
5. Remove shims (D), as necessary.
6. Install cap and cap screws.

TX,90,DH1273-19-20171013

Checking Draft Ball Pivot Clearance



T107587-UN: Draft Ball Pivot

LEGEND:

A - Cap Screw and Washer (10 used)

B - Retainer

C - Shim

D - Retainer

1. Lower blade to ground.

2. Move machine back and forth slightly.
3. Check for excessive looseness [more than 1.5 mm (0.059 in.)].

4.

**CAUTION:**

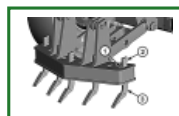
Prevent injury from unexpected component movement. Put support under front of draft frame before making adjustment.

To adjust clearance, remove cap screws and washers (A), separate retainer halves (B and D) and remove shims (C) as required.

5. Install cap screws.
6. With the draft ball fully bottomed in the pivot, assembled retainer halves should turn with hand pressure.

TX,90,DX795-19-20130711

Replacing Front and Midmount Scarifier Shank



TX1053354A-UN: Scarifier Shank

LEGEND:

1 - J-Hook

2 - Position (3 used)

3 - Shank

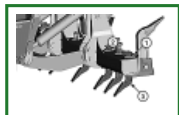
1. Lift shank (3) to relieve pressure.
2. Pull J-hook (1) up to remove.
3. Move front scarifier shanks forward and drop down to remove.
4. Move midmount scarifier shanks rearward and drop down to remove.

NOTE:

New shanks can be adjusted to three positions (2). For heavy work, move shanks up and set J-hook.

OUT4001,000037B-19-20170412

Replacing Rear Scarifier Shank



TX1053105A-UN: Rear Scarifier Shank

LEGEND:

1 - T-Hook

2 - Position (3 used)

3 - Shank

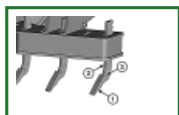
1. Lift shank (3) to relieve pressure.
2. Pull T-hook (1) up to remove.
3. Pull shank rearward and drop down.

NOTE:

New shanks can be adjusted to three positions (2). For heavy work, move shanks up and set T-hook.

OUT4001,000037C-19-20170412

Replacing Front, Midmount, and Rear Scarifier Teeth



TX1053106A-UN: Scarifier Tooth Replacement

LEGEND:

1 - Tooth

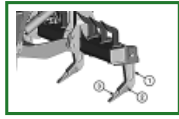
2 - Shank

3 - Depression

1. Pry tooth (1) away from shank (2).
2. Slide new tooth onto shank.
3. Hammer end of new tooth into depression (3) on each side of the shank.

OUT4001,000037D-19-20170412

Replacing Ripper Teeth



TX1053107A-UN: Ripper Tooth Replacement

LEGEND:

1 - Shank

2 - Pin

3 - Tooth

1. Drive out pin (2).
2. Drive tooth (3) from shank (1).
3. Install new tooth and pin.

OUT4001,000037E-19-20170412

Fluid Sampling Test Ports



TX1082488A-UN: Fluid Sampling Ports



TX1082489A-UN: Engine Oil Sample Port

LEGEND:

1 - Transmission Oil Sample Port

2 - Hydraulic Oil Sample Port

3 - Axle Oil Sample Port

4 - Coolant Sample Port

5 - Engine Oil Sample Port

To access the fluid sampling test ports, open right-side service doors.

NM00125,0000651-19-20101202

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,FF1225-19-19930315

Unified Inch Bolt and Screw Torque Values



TS1671-UN: Unified Inch Bolt and Screw

-: Unified Inch Bolt and Screw Torque Values

Bolt or Screw Size	SAE Grade 1 [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.]		SAE Grade 2 [Grade 2 applies for hex cap screws (not hex bolts) up to 6 in (152 mm) long.]				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2					
	Hex Head [Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.]	Flange Head [Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.]	Hex Head [Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.]	Flange Head [Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.]	Hex Head [Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.]	Flange Head [Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.]	Hex Head [Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.]	Flange Head [Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.]	Hex Head [Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.]	Flange Head [Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.]	Hex Head [Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.]	Flange Head [Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.]	Hex Head [Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.]	Flange Head [Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.]	Hex Head [Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.]	Flange Head [Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.]
	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.

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

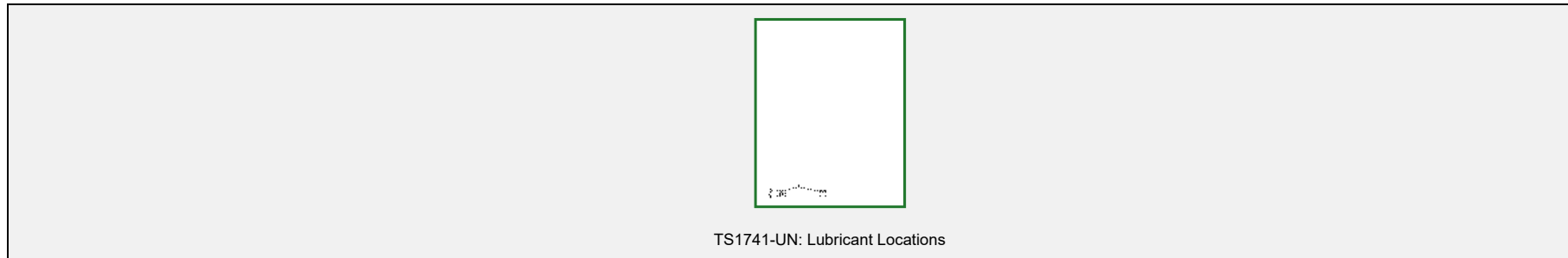
The nominal torque values listed are for general use only with the assumed wrenching accuracy of 20%, such as a manual torque wrench.

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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.



DX,TORQ2-19-20220509

Operational Checkout

This procedure is used to check operation of the machine. It is designed so you can do a walk-around inspection, check machine operation, and perform specific checks from the operators seat.

Complete visual checks (oil levels, oil condition, external leaks, loose hardware, linkage, wiring, etc.) before performing operational checkout.

Most checks will require machine systems to be at normal operating temperatures and a level area with adequate space to operate machine. Some checks may require varied surfaces.

No special tools are necessary to perform the operational checkout.

If no problem is found, go to next check. If problem is indicated, an additional check or repair procedure will be suggested.

The monitor can be used to perform diagnostic and operational checks. The monitor can display engine speed, pressures, and diagnostic trouble codes (DTC).

Diagnostic Trouble Code Check

[Launch](#)[Close](#)[Expand](#) [List](#)[Collapse](#) [List](#)

1 Display and Clear Trouble Codes

Action:

Always check for diagnostic trouble codes and correct them before performing the operational checkout.

Check for active and stored diagnostic trouble codes (DTCs) using the advanced display unit (ADU). See Display Unit—Main Menu—Codes. (Section 2-1.)

LOOK: Are diagnostic trouble codes present?

Record of Actual Results:

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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-19-20110120

Engine

Symptom	Problem	Solution
Engine Will Not Crank	Weak battery	Replace battery.
	Corroded or loose battery connections	Clean battery terminals and connections.
	Battery disconnect switch malfunction	Repair or replace switch as required. See your authorized dealer.
	Starter solenoid malfunction	Replace solenoid. See your authorized dealer.
	Starter malfunction	Replace starter. See your authorized dealer.
	Start circuit malfunction	Check wiring, fuses, and relays. See your authorized dealer.
	Engine is seized	Check by rotating engine by hand. See your authorized dealer.
Engine Cranks/Won't Start	Fuel quality and quantity	If quality is poor, replace fuel with proper fuel. If quantity is low, fill fuel tank.

Symptom	Problem	Solution
	Oil viscosity	Check for correct oil viscosity.
	Restricted or plugged air filters	Clean air filter, replace if necessary. See Cleaning Engine Air Intake Filter Element. (Section 3-3.)
	Restricted or plugged fuel filters	Replace fuel filters. See Replacing Auxiliary Fuel Filter and Water Separator—If Equipped, see Replacing Primary Fuel Filter—Water Separator, and see Replacing Final Fuel Filter. (Section 3-8.)
	Electronic control system problem or basic engine problem	See your authorized dealer.
Engine Misfires/Runs Irregularly	Fuel quality and quantity	If quality is poor, replace fuel with proper fuel. If quantity is low, fill fuel tank.
	Restricted or plugged air filters	Clean air filter, replace if necessary. See Cleaning Engine Air Intake Filter Element. (Section 3-3.)
	Restricted or plugged fuel filters	Replace fuel filters. See Replacing Auxiliary Fuel Filter and Water Separator—If Equipped, see Replacing Primary Fuel Filter—Water Separator, and see Replacing Final Fuel Filter. (Section 3-8.)
	Engine accessories cycling on and off	Check engine accessories, such as air conditioner, cycling on and off.
	Electronic interference	Check for improperly installed radios, etc.
	Electronic control system problem or basic engine problem	See your authorized dealer.
Engine Does Not Develop Full Power	Restricted or plugged air filters	Clean air filter, replace if necessary. See Cleaning Engine Air Intake Filter Element. (Section 3-3.)
	Restricted or plugged fuel filters	Replace fuel filters. See Replace Primary Fuel Filter and Replace Final Fuel Filter. (Section 3-8.)
	Fuel quality and quantity	If quality is poor, replace fuel with proper fuel. If quantity is low, fill fuel tank.

Symptom	Problem	Solution
	Electronic control system problem or basic engine problem	See your authorized dealer.
Engine Emits Excessive White Exhaust Smoke	Low engine coolant temperature	Warm engine coolant. NOTE: For temperatures below -20°C (-4°F), it may take up to 2 minutes for white exhaust smoke to clear.
Engine Emits Excessive Black or Gray Smoke	Engine overloaded	Reduce load on engine.
	Fuel quality and quantity	If quality is poor, replace fuel with proper fuel. If quantity is low, fill fuel tank.
	Restricted or plugged air filters	Clean air filter, replace if necessary. See Cleaning Engine Air Intake Filter Element. (Section 3-3.)
	Electronic control system problem or basic engine problem	See your authorized dealer.
	Exhaust filter is cracked or damaged	See your authorized dealer.
Engine Idles Poorly	Fuel quality and quantity	If quality is poor, replace fuel with proper fuel. If quantity is low, fill fuel tank.
	Air leak on suction side of air intake system	Check hose and pipe connections for tightness; repair as required.
	Electronic control system problem or basic engine problem	See your authorized dealer.
Excessive Fuel Consumption	Engine overloaded	Reduce load.

Symptom	Problem	Solution
	Restricted or plugged air filters	Clean air filter, replace if necessary. See Cleaning Engine Air Intake Filter Element. (Section 3-3.)
	Improper type of fuel	Use proper type of fuel. See Diesel Fuel. (Section 3-1.)
	Poor fuel quality	Drain fuel and replace with quality fuel of the proper grade. See Diesel Fuel. (Section 3-1.)
	Leaks in fuel supply system	Locate source of leak and repair as needed. See your authorized dealer if necessary.
	Fuel delivery system malfunction	See your authorized dealer.
Engine Overheats	Engine overloaded	Reduce load.
	Low coolant level	Fill surge tank to proper level. Check radiator and hoses for loose connections or leaks. See Checking Engine Coolant Surge Tank Level. (Section 3-4.)
	Faulty radiator cap	Replace cap.
	Low engine oil level	Check engine oil level. Add engine oil as required. See Checking Engine Oil Level. (Section 3-4.)
	Incorrect grade of fuel	Use correct grade of fuel. See Diesel Fuel. (Section 3-1.)
	Defective temperature sensor	See your authorized dealer.

AA95137,0002B08-19-20100927

Battery

NOTE:

If any other problems are encountered which require special tools or machine knowledge to correct, see your authorized dealer.

Symptom	Problem	Solution
Battery Using Too Much Water	Shorted battery cell	Check battery state of charge.
	High ambient temperature	Add distilled water.
	Cracked battery case	Check battery hold-down clamps. Replace battery.
Cracked Battery Case	Battery hold-down clamp too tight, too loose or missing	Install new battery. Install hold-down clamps correctly.
	Frozen battery	Keep electrolyte at correct level and battery fully charged during cold weather.
Low Battery Output	Low water level	See Battery Using Too Much Water and Cracked Battery Case symptoms.
	Dirty or wet battery top, causing discharge	Clean battery top. Recharge battery.
	Corroded or loose battery cable ends	Clean and tighten cable end clamps. Recharge battery.
	Broken or loose battery posts	Wiggle posts by hand. If posts are loose or will turn, replace battery.
	Loose belt or worn pulleys	Inspect belt or pulley. Adjust or replace as necessary.

CED,OUOE003,1015-19-20081219

Hydrostatic Front Wheel Drive

NOTE:

If any other problems are encountered which require special tools or machine knowledge to correct, see your authorized dealer.

Symptom	Problem	Solution
No Front Wheel Motion	6WD On/Off switch not ON	Turn 6WD switch ON.

Symptom	Problem	Solution
Wheel Surging in Air	Low hydraulic fluid	Check reservoir.
	Air in hydraulic fluid	Check reservoir.
Wheel Surging on Ground	Uneven tire pressure	Check pressure.
	Aggressiveness Mode Dial Set Too High	Adjust to lower setting.
Front Wheels Too Aggressive or Surge	Tire size or condition of rear tires compared to front tires (front tire larger size or rear tires worn)	Match tire sizes.
	Aggressiveness mode switch set too high	Adjust lower.

CED,OUOE003,1016-19-20081217

Transmission- and Hydraulic-Related

NOTE:

If any other problems are encountered which require special tools or machine knowledge to correct, see your authorized dealer.

Symptom	Problem	Solution
Transmission Overfills with Oil	Check hydraulic pump shaft seal	Repair pump or seal.
Transmission Slippage	Low oil level	Check and add oil.
Machine Lacks Power or Moves Slowly	Air cleaner filter restricted, indicator light on	Clean or change filter.
Machine Will Not Move in Any Gear and Park Brake Light Indicator Is On (no load put on engine when shifted into gear)	Low transmission oil level	Adjust to correct level.
	Extremely cold oil	Warm oil.

Symptom	Problem	Solution
	Transmission control and park brake lever	Replace park brake switch.
Transmission System Overheats	Transmission overfilled with oil	Check oil level. Correct.
	Low air flow through oil cooler	Inspect radiator and oil cooler for debris. Check fan to ensure fan installed correctly. Check shroud and baffles to ensure baffles are in correct position.
	Oil cooler plugged	Clean core.
	Pinched line to cooler	Inspect line. Repair.
	Extended high-speed operation in 8th gear brings transmission temperature indicator on	Inspect and clean cooling system. See Cleaning Radiator, Oil Cooler, Charge Air Cooler, and Fuel Cooler. (Section 3-3.)
Excessive Transmission Noise (under load or no load)	Transmission oil level low	Adjust to correct level.
Machine Makes Excessive Noise When Moving	Transmission oil level low	Adjust to correct level.
Excessive Machine Vibration	Engine mounting hardware loose or missing	Repair or replace.
Erratic Transmission Oil Pressure	Low oil level	Add oil to proper level.
Oil Leakage from Transmission Breather	Transmission overfilled with oil	Check oil level. Correct.
	Air leak in transmission pump suction tube: O-ring on suction tube malfunctioned or suction tube fitting loose	Inspect and replace O-ring as necessary and tighten fittings.
Filter or Filter Oil Lines Blow Out	Hoses bend too sharp	Reroute hoses.

Symptom	Problem	Solution
	Hose malfunction	Replace hose.
	Malfunction of filter bypass valve	Replace oil filter head.
	System plumbing incorrect	Correct plumbing.
	Filter O-ring malfunction	Replace filter.

OUT4001,000035F-19-20081219

Park Brake

NOTE:

If any other problems are encountered which require special tools or machine knowledge to correct, see your authorized dealer.

Symptom	Problem	Solution
Park Brake Engages while Machine Is Moving	Transmission oil level low	Inspect oil level and fill.

CED,OUOE003,1018-19-20011114

Differential

NOTE:

If any other problems are encountered which require special tools or machine knowledge to correct, see your authorized dealer.

Symptom	Problem	Solution
No Differential Lock Operation	Fuse blown	Inspect and replace fuse F28.
	Differential lock relay	Replace relay.
Excessive Differential and/or Axle Noise	Low oil level in differential	Check oil. Remove drain plug and inspect for metal particles in differential case.

Hydraulic System

NOTE:

If any other problems are encountered which require special tools or machine knowledge to correct, see your authorized dealer.

Symptom	Problem	Solution
Hydraulic System Overheats	Low oil level	Check and add oil.
	Restricted oil cooler air flow	Check air flow.
	Wrong oil (viscosity too low)	Verify type of oil. Change oil.
	Restriction in hydraulic line	Inspect lines for kinks and dents. Check for internal restrictions by feeling for excessive heat.
No Hydraulic Functions	Low oil level	Check, correct oil level.
	Softstart stuck closed	See your authorized dealer.
	Torsional isolator failure	Check hydraulic oil pressure.
Slow Hydraulic Functions	Low oil level	Check oil level.
	Slow engine speed	Check fast idle/slow idle.
	Cold oil	Warm oil up to operating temperature by operating hydraulic functions.
	Wrong oil viscosity	Use correct oil. Verify type of oil. Change oil.
	Air in oil	Inspect and change oil.

Symptom	Problem	Solution
Hydraulic Function (or pump) Makes "Chattering" Noise	Low oil level (pump cavitation)	Check and add oil.
Excessive Pump Noise	Low oil level	Check and add oil.

OUT4001,000035D-19-20081219

Steering System

NOTE:

If any other problems are encountered which require special tools or machine knowledge to correct, see your authorized dealer.

Symptom	Problem	Solution
Slow or Hard Steering	Air in system	Check oil level.
	Damaged (bent) steering lines	Check and replace.
Erratic ("spongy") Steering	Air in system	Check oil level. Check for cavitation in charge system.
Steering Wheel "Locks" Up	Debris in gerotor section	Disassemble and inspect. Flush.

CED,OUOE003,1021-19-20081219

Service Brake

NOTE:

If any other problems are encountered which require special tools or machine knowledge to correct, see your authorized dealer.

Symptom	Problem	Solution
Poor or No Brakes (steering and hydraulic system operation normal)	Leakage in brake piston seal	Check for an overfilled differential. Remove differential check plug. Apply brakes and check for leakage from check plug.

Symptom	Problem	Solution
Brakes Drag	Brake pedal not returning properly	Check pedal stop adjustment. Inspect pedal pivots and return spring.
Brakes Chatter or Noisy	Air in brake system	Bleed brakes.
Delay in Braking	Air in brake system	Bleed brakes.

CED,OUOE003,1022-19-20081219

Air Conditioning Electrical

NOTE:

If any other problems are encountered which require special tools or machine knowledge to correct, see your authorized dealer.

Symptom	Problem	Solution
Air Conditioning System Does Not Operate	Air conditioner/heater blower fuse	Replace fuse F34.
Air Conditioner Does Not Cool Interior of Cab	Fresh air filter restricted	Clean or replace filter.
	Condenser fins restricted with debris	Clean condenser fins.
	Recirculating air filter restricted	Clean or replace filter.
	Compressor belt loose	Check for proper belt tension.
	Refrigerant hose kinked, pinched or collapsed	Reroute or re-index hoses. Replace collapsed hoses.
	Heater or evaporator core fins restricted with dirt or dust	Clean heater or evaporator core fins.
	Warm outside air leaking into cab	Inspect, repair or replace door and window seals.

Symptom	Problem	Solution
	Heater valve remaining open	Inspect, repair, adjust or replace heater valve or cable.
Interior Windows Continue to Fog	Fresh air filter restricted	Clean or replace filter
	Air conditioning system off	Put air conditioner//heater ON/OFF switch to A/C position.

OUT4001,0000361-19-20081203

Heater System

NOTE:

If any other problems are encountered which require special tools or machine knowledge to correct, see your authorized dealer.

Symptom	Problem	Solution
Heater System Does Not Operate	Air conditioner/heater blower fuse	Replace fuse F34.
Heater Does Not Warm Interior of Cab	Fresh air filter restricted	Clean or replace filter.
	Recirculating air filter restricted	Clean or replace filter.
	Heater hose kinked, pinched or collapsed	Reroute or re-index hoses. Replace collapsed hoses.
	Heater coil fins clogged with dirt or dust	Clean heater fins.
	Heater valve remaining closed	Inspect, repair, adjust or replace heater valve or cable.
Interior Windows Continue to Fog	Fresh air filter restricted	Clean or replace filter.
	Air conditioner system off	Put air conditioner/heater ON/OFF switch in air conditioning position.

OUT4001,0000362-19-20081203

Software Update

Symptom	Problem	Solution
Service ADVISOR™ Remote (SAR) Updates Not Operating Properly	Software updates not operating properly	Follow screen instructions on the display monitor. If problem persists, see an authorized John Deere dealer.

Service ADVISOR is a trademark of Deere & Company

OUT4001,00006CA-19-20150519

Prepare Machine for Storage



T5813AM-UN: Clean Machine

1.

IMPORTANT:

Avoid machine damage, do not use biodiesel during machine storage. When using biodiesel blends, switch to petroleum diesel for long term storage.

IMPORTANT:

Avoid damage to hydraulic cylinder seals and rods. High pressure washing of cylinder seal areas can force moisture and debris past seals, causing damage to seals and rod. Use low pressure wash to clean cylinder seal areas.

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 build up due to condensation.

NOTE:

For blends up to and including B20, it is recommended that biodiesel be used within three 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 your 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. Install new parts, if necessary, to avoid needless delays later.

3.

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 30 days minimum after receipt of machine before cleaning parts or machine with high pressure. Use low pressure wash operations until 30 days have elapsed.

Wash the machine. [Use low pressure wash operations (less than 1379 kPa (13.8 bar) (200 psi) until 30 days after receipt of machine.] Paint areas to prevent rust. Replace decals, where needed.

4. Fill fuel tank, to prevent condensation.

5. Ensure tires are properly inflated.

6. Park machine on a hard surface to prevent tires from freezing to ground.

7.

IMPORTANT:

LPS 3® Rust Inhibitor can destroy painted finish. DO NOT spray LPS 3 Rust Inhibitor on painted surfaces.

Retract all hydraulic cylinders if possible. If not, coat exposed cylinder rods with LPS 3 Rust Inhibitor.

8. Apply grease at all lubrication fittings.

9. Remove batteries or disconnect terminals from batteries.

10. Store machine in a dry, protected place.

11.

IMPORTANT:

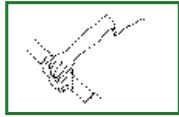
Prevent possible machine damage from unauthorized persons operating machine. Attach a DO NOT OPERATE tag to steering wheel.

Put a DO NOT OPERATE tag on the steering wheel.

12. Close all vent louvers in the cab.

13. Lock all covers and doors.

Monthly Storage Procedure



T6191AA-UN: Clean Cylinder Rods



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.

3.

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: Check Oil on Dipstick

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 fails to start or runs poorly after starting, change fuel filter(s). Bleed fuel system.
12. Operate all controls, levers, seat adjustments, etc.

13.



CAUTION:

Prevent possible injury from unexpected machine movement. Clear the area of all persons before running machine through the operation procedure.

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. Turn key switch to OFF.
15. Apply LPS 3 Rust Inhibitor to exposed cylinder rod areas.

LPS 3 Rust Inhibitor is a trademark of Illinois Tool Works.

VD76477,00016A3-19-20140224

Record Product Identification Number (PIN)



TX1082411A-UN: PIN Plate Location



TX1082292-UN: 17 Digit PIN Plate



TX1082394-UN: 13 Digit PIN Plate

LEGEND:

1 - PIN Plate

2 - 17 Digit PIN

3 - 13 Digit PIN

-: Product Identification Number

Purchase Date

-: Product Identification Number

Product Identification Number (PIN) (1)

NOTE:

Be sure to record ALL characters of the Product Identification Number.

NM00125,0000657-19-20100929

Record Engine Serial Number



TX1082494A-UN: Left Side View of Engine

LEGEND:

1 - Engine Serial Number Plate

To access engine serial number plate (1), open left side service doors.

-: Engine Serial Number

Engine Serial Number (1)

NM00125,0000658-19-20101005

Record Transmission Serial Number

-: Transmission Serial Number

Transmission Serial Number

OUT4001,0000385-19-20081219

Located on middle front side of housing.

Record Hydraulic Pump Serial Number

-: Hydraulic Pump Serial Number

Hydraulic Pump Serial Number

T82,120,C6-19-19910911

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-19-20190117

Keep Machines Secure

1. Install vandal-proof devices.
2. When machine is in storage:
 - Lower equipment to the ground

- Set wheels to widest position to make loading more difficult
 - Remove batteries
3. When parking indoors, put large equipment in front of exits and lock your storage buildings.
 4. When parking outdoors, store in a well-lighted and fenced area.
 5. Make note of suspicious activity and report any thefts immediately to law enforcement agencies.
 6. Notify your John Deere dealer of any losses.

OUT4001,0000381-19-20081217

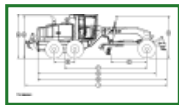
Engine Specifications

Item	Measurement	Specification
Interim Tier IV/Stage III B Engine		
John Deere PowerTech™ PSX 6090HDW16	Type	4-Stroke Cycle, Turbocharged, Charged Air Cooled
	Bore and Stroke	118 x 136 mm 4.66 x 5.35 in.
	Cylinders	6
	Displacement	9.0 L 548 cu in.
	Net Peak Torque @ 900 rpm	1098 N·m 810 lb-ft
	Cooling Fan	Hydraulic Driven, Variable Speed Fan Drive
	Electrical system	24 Volt
	Batteries (2) 12 volt	440 Minutes Reserve Capacity

PowerTech is a trademark of Deere & Company

NM00125,0000656-19-20101203

Machine Specifications



TX1085961-UN: Machine Dimensions

LEGEND:

A - Height-to-Top of Cab

C - Height-to-Top of Blade Lift

E - Bladebase

G - Overall Length

I - Overall Length with Scarifier

B - Height-to-Top of Exhaust

Cylinders

F - Wheelbase

H - Overall Length with Scarifier

and Ripper

D - Tandem Axle Spacing

NOTE:

Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with SAE standards. Except where otherwise noted, these specifications are based on a machine with 14-24, 12-PR G2 tires, 3.66 m x 610 mm x 22 mm (12 ft x 24 in x .88 in) moldboard with 152 mm x 16 mm (6 in x 5/8 in) cutting edges, and standard equipment. Weights include lubricants, coolants, full fuel tank and 79 kg (175 lb) operator.

Item	Measurement	Specification
A—Height-to-Top of Standard Cab	Distance	3.18 m 10 ft 5.0 in.
A—Height-to-Top of Full-Height Cab	Distance	3.40 m 11 ft 2 in.
B—Height-to-Top of Exhaust	Distance	3.13 m 10 ft 3 in.
C—Height-to-Top of Blade Lift Cylinders	Distance	3.05 m 10 ft 0 in.
D—Tandem Axle Spacing	Distance	1.54 m 5 ft 1 in.
E—Bladebase	Length	2.57 m 8 ft 5 in.
F—Wheelbase	Length	6.16 m 20 ft 3 in.
G—Machine	Overall Length	8.88 m 29 ft 2 in.
H—Machine with Scarifier	Overall Length	9.69 m 31 ft 9 in.
I—Machine with Scarifier and Ripper	Overall Length	10.59 m 34 ft 9 in.

NOTE:

Excessive weight may wear power train parts faster than normal and could affect the warranty. Check your warranty.

Item	Measurement	Specification
670G and 670GP SAE Operating Weights with Standard Equipment		
Front	Weight	4178 kg 9210 lb

Item	Measurement	Specification
Rear	Weight	11 798 kg 26 010 lb
Total	Weight	15 976 kg 35 220 lb
670G and 670GP Typical Operating Weights with Front Push Block and Ripper		
Front [Maximum front axle weight and maximum rear axle weight are not permissible on the same machine as maximum total machine weight will be exceeded. Check with tire manufacturer for recommended maximums for tire specifications.]	Weight	5507 kg 12 140 lb
Rear [Maximum front axle weight and maximum rear axle weight are not permissible on the same machine as maximum total machine weight will be exceeded. Check with tire manufacturer for recommended maximums for tire specifications.]	Weight	13 698 kg 30 200 lb
Total [Maximum front axle weight and maximum rear axle weight are not permissible on the same machine as maximum total machine weight will be exceeded. Check with tire manufacturer for recommended maximums for tire specifications.]	Weight	19 205 kg 42 340 lb
Maximum Operating Weight—Total	Weight	21 228 kg 46 800 lb

NOTE:

Excessive weight may wear power train parts faster than normal and could affect the warranty. Check your warranty.

Item	Measurement	Specification
672G and 672GP SAE Operating Weights with Standard Equipment		
Front	Weight	4781 kg 10 540 lb
Rear	Weight	12 215 kg 26 930 lb
Total	Weight	16 966 kg 37 470 lb
672G and 672GP Typical Operating Weights with Front Push Block and Ripper		
Front [Maximum front axle weight and maximum rear axle weight are not permissible on the same machine as maximum total machine weight will be exceeded. Check with tire manufacturer for recommended maximums for tire specifications.]	Weight	6001 kg 13 230 lb
Rear [Maximum front axle weight and maximum rear axle weight are not permissible on the same machine as maximum total machine weight will be exceeded. Check with tire manufacturer for recommended maximums for tire specifications.]	Weight	13 975 kg 30 810 lb
Total [Maximum front axle weight and maximum rear axle weight are not permissible on the same machine as maximum total machine weight will be exceeded. Check with tire manufacturer for recommended maximums for tire specifications.]	Weight	19 976 kg 44 040 lb
Maximum Operating Weight—Total	Weight	21 228 kg 46 800 lb

670G and 670GP:

Item	Measurement	Specification
Net Engine Power		
Gear 1	Net Engine Power	116 kW 155 hp
Gear 2	Net Engine Power	119 kW 160 hp
Gear 3	Net Engine Power	127 kW 170 hp
Gear 4	Net Engine Power	138 kW 185 hp
Gear 5	Net Engine Power	142 kW 190 hp
Gears 6—8	Net Engine Power	145 kW 195 hp

672G and 672GP:

Item	Measurement	Specification
Net Engine Power		
Gear 1 (6WD On)	Net Engine Power	127 kW 170 hp
Gear 2 (6WD On)	Net Engine Power	130 kW 175 hp
Gear 3 (6WD On)	Net Engine Power	134 kW 180 hp
Gear 4 (6WD On)	Net Engine Power	142 kW 190 hp
Gear 5	Net Engine Power	142 kW 190 hp
Gears 6—8	Net Engine Power	145 kW 195 hp

Item	Measurement	Specification
670G, 670GP, 672G, and 672GP Forward Travel Speeds with No Tire Slip @ 2100 rpm with 14.0-R24 Tires:		
Shift Lever Position 1	Speed	4.0 km/h 2.5 mph
Shift Lever Position 2	Speed	5.6 km/h 3.5 mph

Item	Measurement	Specification
Shift Lever Position 3	Speed	7.7 km/h 4.8 mph
Shift Lever Position 4	Speed	10.9 km/h 6.8 mph
Shift Lever Position 5	Speed	16.4 km/h 10.2 mph
Shift Lever Position 6	Speed	23.2 km/h 14.4 mph
Shift Lever Position 7	Speed	32.3 km/h 20.1 mph
Shift Lever Position 8	Speed	45.5 km/h 28.3 mph

NM00125,0000655-19-20101222

Drain and Refill Capacities

Item	Measurement	Specification
Fuel Tank	Capacity	416.4 L 110 gal
Cooling System	Capacity	58 L 15.3 gal
Engine Oil, including filter	Capacity	27 L 7.1 gal
Transmission, including filter	Capacity	28.4 L 7.5 gal
Axle Housing	Capacity	38.0 L 10 gal
Hydraulic Reservoir	Capacity	60.5 L 16 gal
Tandem Housings	Capacity (each)	74 L 19.5 gal
Circle Gear Case	Capacity	5.7 L 1.5 gal
6WD Hubs—672G and 672GP	Capacity (each)	7.2 L 2 gal

KH31969,0000034-19-20110706

