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

If this product contains a gasoline engine:

⚠️ WARNING

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

The State of California requires the above two warnings.

Additional Proposition 65 Warnings can be found in this manual.

Worldwide Construction
And Forestry Division
LITHO IN U.S.A.
Introduction

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 authorized 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.

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.
U.S. AND CANADA EMISSION CONTROL WARRANTY STATEMENT

YOUR WARRANTY RIGHTS AND OBLIGATIONS

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

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

JOHN DEERE'S WARRANTY RESPONSIBILITY

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

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

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

EMISSION WARRANTY EXCLUSIONS

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

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

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

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

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

Emission_CI_EPA (18Dec09)
Introduction

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

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

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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

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

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Emission_CI EPA (18Dec09)
CARB Non-road Emissions Control Warranty Statement—Compression Ignition

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 2013 through 2015 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.

Continued on next page
JOHN DEERE'S WARRANTY RESPONSIBILITY:

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

**Air Induction System**
- Intake manifold
- Turbocharger
- Charge air cooler

**Fuel Metering system**
- Fuel injection system

**Exhaust Gas Recirculation**
- EGR valve

**Catalyst or Thermal Reactor Systems**
- Catalytic converter
- Exhaust manifold

**Emission control labels**
- Particulate Controls
  - Any device used to capture particulate emissions
  - Any device used in the regeneration of the capturing system
  - Enclosures and manifolding
  - Smoke Puff Limiters

**Positive Crankcase Ventilation (PCV) System**
- PCV valve
- Oil filler cap

**Advanced Oxides of Nitrogen (NOx) Controls**
- NOx absorbers and catalysts
- SCR systems and urea containers/dispensing systems
- Miscellaneous items used in Above Systems
- Electronic control units, sensors, actuators, wiring harnesses, hoses, connectors, clamps, fittings, gasket, mounting hardware

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

OWNER'S WARRANTY RESPONSIBILITIES:

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.

Emission_CI_CARB (19Sep12)
Introduction

**JOHN DEERE**

**CALIFORNIA EMISSIONS CONTROL WARRANT STATEMENT**
YOUR WARRANTY RIGHTS AND OBLIGATIONS

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Continued on next page
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  - EGR valve
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  - Catalytic converter
  - Exhaust manifold
- Emission control labels
  - Particulate Controls
    - Any device used to capture particulate emissions
    - Any device used in the regeneration of the capturing system
    - Enclosures and manifolding
    - Smoke Puff Limiters
  - Positive Crankcase Ventilation (PCV) System
    - PCV valve
    - Oil filler cap
- Advanced Oxides of Nitrogen (NOx) Controls
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Emissions regulations require the customer to bring the unit to an authorized servicing dealer when warranty service is required. As a result, John Deere is NOT liable for travel or mileage on emissions warranty service calls.

Emission_CI_CAR (19Sep12)
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.

**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)

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

1. **Seatbelt with Retractors.** Seatbelt retractors help keep belts clean and convenient to use.

2. **Window Guarding.** The stationary window with bars prevent contact with a moving boom.

3. **Rearview Mirrors.** Rearview mirrors offer the operator a view of activity behind him.

4. **Secondary Exit.** The front window provides a large exit path if the cab door is blocked in an emergency situation. The rear window is an alternate secondary exit, a secondary exit tool is also provided.

5. **Pilot Shutoff Lever.** A lever near the cab exit reminds the operator to deactivate hydraulic functions before leaving the machine.

6. **Steps.** Wide, slip-resistant steps make entry and exit easier. Steps also provide a place to clean shoes.

7. **Handholds.** Large, conveniently placed handholds make it easy to enter or exit the operator's station or service area.

8. **Swing Brake.** Swing brake engages automatically when the swing is not operated. Helps secure upperstructure when transporting the machine.

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

10. **Travel Alarm.** Alerts bystanders of forward or reverse machine movement.

11. **Engine Fan Guard.** A fan guard inside the engine compartment helps prevent contact with the hydraulically driven fan.

12. **Horn.** Standard horn is useful when driving or signaling co-workers.

13. **Cab with Heater, Defroster, and Air Conditioner.** 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. Air conditioner provides a comfortable, temperature-controlled working environment.
Recognize Safety Information

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

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

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

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

Follow Safety Instructions

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

Be sure all operators of this machine understand every safety message. Replace operator's manual and safety labels immediately if missing or damaged.

Operate Only If Qualified

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

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

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

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

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

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protection such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Avoid Unauthorized Machine Modifications

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

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

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

Add Cab Guarding for Special Uses

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

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

### 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.

### Stay Clear of Moving Parts
Entanglements in moving parts can cause serious injury.

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

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

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

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

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

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

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

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

This machine uses a high-pressure hydraulic system. Escaping oil under pressure can penetrate the skin causing serious injury.

Never search for leaks with your hands. Protect hands. Use a piece of cardboard to find location of escaping oil. Stop engine and relieve pressure before disconnecting lines or working on hydraulic system.

If hydraulic oil penetrates your skin, see a doctor immediately. Injected oil must be removed surgically within hours or gangrene may result. Contact a knowledgeable medical source or the Deere & Company Medical Department in Moline, Illinois, U.S.A.

Work In Ventilated Area

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

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

Prevent Fires

Handle Fuel Safely: Store flammable fluids away from fire hazards. Never refuel machine while smoking or when near sparks or flame.

Clean Machine Regularly: Keep trash, debris, grease and oil from accumulating in engine compartment, around fuel lines, hydraulic lines, exhaust components, and electrical wiring. Never store oily rags or flammable materials inside a machine compartment.

Maintain Hoses and Wiring: Replace hydraulic hoses immediately if they begin to leak, and clean up any oil spills. Examine electrical wiring and connectors frequently for damage.

Keep A Fire Extinguisher Available: Always keep a multipurpose fire extinguisher on or near the machine. Know how to use extinguisher properly.

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 may 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.
Prevent Battery Explosions
Battery gas can explode. Keep sparks, lighted matches, and open flame away from the top of battery.
Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.
Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).

Handle Chemical Products Safely
Exposure to hazardous chemicals can cause serious injury. Under certain conditions, lubricants, coolants, paints and adhesives used with this machine may be hazardous.
If uncertain about safe handling or use of these chemical products, contact your authorized dealer for a Material Safety Data Sheet (MSDS) or go to internet website http://www.jdmsds.com. The MSDS describes physical and health hazards, safe use procedures, and emergency response techniques for chemical substances. Follow MSDS recommendations to handle chemical products safely.

Dispose of Waste Properly
Improper disposal of waste can threaten the environment. Fuel, oils, coolants, filters and batteries used with this machine may be harmful if not disposed of properly.
Never pour waste onto the ground, down a drain, or into any water source.
Air conditioning refrigerants can damage the atmosphere. Government regulations may require using a certified service center to recover and recycle used refrigerants.
If uncertain about the safe disposal of waste, contact your local environmental or recycling center or your authorized dealer for more information.
Prepare for Emergencies

Be prepared if an emergency occurs or a fire starts.

Keep a first aid kit and fire extinguisher handy.

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

Use Steps and Handholds Correctly
Prevent falls by facing the machine when getting on and off. Maintain 3-point contact with steps and handrails. Never use machine controls as handholds.
Use extra care when mud, snow, or moisture present slippery conditions. Keep steps clean and free of grease or oil. Never jump when exiting machine. Never mount or dismount a moving machine.

Start Only From Operator’s Seat
Avoid unexpected machine movement. Before starting engine, sit in operator’s seat. Ensure park lock lever is in “lock” position.
Never attempt to start engine from the ground or tracks. Do not attempt to start engine by shorting across the starter solenoid terminals.

Use and Maintain Seat Belt
Use seat belt when operating machine. Remember to fasten seat belt when loading and unloading from trucks and during other uses.
Examine seat belt frequently. Be sure webbing is not cut or torn. Replace seat belt immediately if any part is damaged or does not function properly.
The complete seat belt assembly should be replaced every 3 years, regardless of appearance.

Prevent Unintended Machine Movement
Be careful not to accidentally actuate control levers when coworkers are present. Pull pilot shutoff lever to locked (UP) position during work interruptions. Pull pilot shutoff lever to locked (UP) position and stop engine before allowing anyone to approach machine.
Always lower work equipment to the ground and pull pilot shutoff lever to locked (UP) position before standing up or leaving the operator’s seat. Stop engine before exiting.
Avoid Work Site Hazards

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

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

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

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

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

Keep Riders Off Machine

Only allow operator on machine.

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

Riders may obstruct operator’s view or impair his ability to operate machine safely.
Avoid Backover Accidents
Before moving machine, be sure all persons are clear of both travel and swing paths. Turn around and look directly for best visibility. Use mirrors to assist in checking all around machine. Keep windows and mirrors clean, adjusted, and in good repair.

Be certain travel alarm is working properly.
Use a signal person when backing if view is obstructed or when in close quarters. Keep signal person in view at all times. Use prearranged hand signals to communicate.

Avoid Machine Tip Over
Use seat belt at all times.

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

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

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

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

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

Use Special Care When Lifting Objects
Never use this machine to lift people.

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

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

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

Always verify compatibility of attachments by contacting your authorized dealer. Adding unapproved attachments may affect machine stability or reliability and may create a hazard for others near the machine.

Ensure that a qualified person is involved in attachment installation. Add guards to machine if operator protection is required or recommended. Verify that all connections are secure and attachment responds properly to controls. Carefully read attachment manual and follow all instructions and warnings. In an area free of bystanders and obstructions, carefully operate attachment to learn its characteristics and range of motion.

Prevent Unintended Detonation of Explosive Devices

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

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

- Park machine on a level surface and lower equipment and attachments to the ground.
- Place pilot shutoff lever in “lock” position. Stop engine and remove key.
- Attach a “Do Not Operate” tag in an obvious place in the operator’s station.

Securely support machine or attachment before working under it.

- Do not support machine with boom, arm, or other hydraulically actuated attachments.
- Do not support machine with cinder blocks or wooden pieces that may crumble or crush.
- Do not support machine with a single jack or other devices that may slip out of place.

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

Service Cooling System Safely

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.

Remove Paint Before Welding or Heating

Hazardous fumes can be generated when paint is heated by welding or using a torch. Dust from sanding or grinding paint can also be hazardous.

Remove paint to at least 76 mm (3 in.) from area to be heated. Wear an approved respirator when sanding or grinding paint. If a solvent or paint stripper is used, wash area with soap and water. Remove solvent or paint stripper containers from work area and allow fumes to disperse at least 15 minutes before welding or heating.

Work outside or in a well-ventilated area. Dispose of waste, paint and solvents properly.
Make Welding Repairs Safely

**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.

Drive Metal Pins Safely

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

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

Replace missing or damaged safety signs. Use this operator’s manual for correct safety sign placement.

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

**WARNING**
- Avoid serious crushing injury from boom.
- Never place any part of body beyond window bars or frame. It could be crushed by the boom if boom control lever is accidentally bumped or otherwise engaged.
- Do not remove window bars. If window is missing or broken, replace immediately.

**CAUTION**
- Slow down before entering or leaving operator compartment.
- Do not enter the operator compartment of a moving machine.
- Keep chain of control.
- Slow down before entering or leaving operator compartment.
- Keep chain of control.
- Slow down before entering or leaving operator compartment.
- Keep chain of control.
- Slow down before entering or leaving operator compartment.
- Keep chain of control.

**DANGER**
- Serious injury or death can result from contact with moving parts.
- Never enter any part of your body through a door that is not fully closed.
- Be sure that all safety guards are in place and are held in place by all safety pins.

**CAUTION**
- Avoid injury from slip or fall. Do not use as a handhold. Window handle will move with the front window.

**CAUTION**
- To prevent injury from the front window falling, lock window in place with the lock pin.

**CAUTION**
- Pressurized. Do not open hot. Release internal pressure by pressing air breather button prior to removing reservoir cap.

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

**WARNING**
- Operator may swing or reverse machine. Stay clear.

**WARNING**
- Avoid rotating fan. Stop engine. Keep clear to avoid serious injury.
Safety Signs Installed in Cab—Hydraulic Coupler—If Equipped

**WARNING**

CLEARANCE HAZARD!
COUPLER MOUNTED AND SOME DIRECT MOUNTED ATTACHMENTS COULD POSSIBLY CONTACT CAB OR BOOM.
MAINTAIN CLEARANCE BETWEEN ATTACHMENT, CAB AND BOOM.

**WARNING**

CRUSH HAZARD!
Improperly locked attachment could release and cause serious injury or death.
Do not operate attachment when supplemental lock is primary locking device.
- Release supplemental lock by going to full curl before picking up the attachment.
- Engage supplemental lock by moving toggle switch to lock position and extending bucket cylinder and holding until locking plate wedges under attachment pin. Uncurl the bucket.
- Make sure locking plate is tight under attachment pin.
- Supplemental lock must be engaged before using the coupler.

**WARNING**

CRUSH HAZARD!
GROUND TEST REQUIRED!
BEFORE USING THE ATTACHMENT, PERFORM A GROUND TEST TO VERIFY IT IS PROPERLY LOCKED TO THE COUPLER.
PLACE ATTACHMENT FLAT ON THE GROUND. WHILE APPLYING SLIGHT DOWN PRESSURE, TRY TO UNCURL THE ATTACHMENT.
THE ATTACHMENT SHOULD STAY IN TIGHT CONTACT WITH THE COUPLER WITH LITTLE OR NO MOVEMENT.

**WARNING**

CRUSH HAZARD!
ATTACHMENT MAY DROP WITHOUT WARNING IF NOT PROPERLY ATTACHED.
CONSULT OWNERS MANUAL FOR PROPER INSTALLATION PROCEDURES.

**WARNING**

TO LOCK COUPLER:
1. Engage front hook on pin.
2. Rotate to full-curl position.
4. Continue to slowly uncurl coupler.

TO UNLOCK COUPLER:
1. Keep attachment close to ground.
2. Rotate coupler to full-curl position.
3. Move lock to unlock position.
4. Slowly uncurl coupler.

Attachment will release from hooks.

PN=31
Safety Signs Installed on Hydraulic Coupler—If Equipped

**WARNING**

**CLEARANCE HAZARD!**
COUPLER MOUNTED AND SOME DIRECT MOUNTED ATTACHMENTS COULD POSSIBLY CONTACT CAB ORBoom. MAINTAIN CLEARANCE BETWEEN ATTACHMENT, CAB AND BOOM.

**WARNING**

**CRUSH HAZARD!**
Improperly locked attachment could release and cause serious injury or death. Do not operate attachment when supplemental lock is primary locking device.
• Release supplemental lock by going to full curl before picking up the attachment.
• Engage supplemental lock by moving toggle switch to lock position and extending bucket cylinder and hoisting until locking plate wedges under attachment pin. Uncurl the bucket. Make sure locking plate is tight under attachment pin.
Supplemental lock must be engaged before using the coupler.

**WARNING**

**CRUSH HAZARD!**
GROUND TEST REQUIRED! BEFORE USING THE ATTACHMENT, PERFORM A GROUND TEST TO VERIFY IT IS PROPERLY LOCKED TO THE COUPLER. PLACE ATTACHMENT FLAT ON THE GROUND, WHILE APPLYING SLIGHT DOWN PRESSURE, TRY TO UNCUR THE ATTACHMENT. THE ATTACHMENT SHOULD STAY IN TIGHT CONTACT WITH THE COUPLER WITH LITTLE OR NO MOVEMENT.

TX1025651

Continued on next page
1. Install four warning decals to right window inside of cab next to electrical box.

2. Install warning decals (1) to both sides of hydraulic coupler as shown.
Pedals, Levers, and Panels

1—Left Pilot Control Lever (3 button lever optional) / Horn Button (bottom button on top of lever)
2—Left Travel Pedal
3—Left Travel Lever
4—Right Travel Lever
5—Right Travel Pedal
6—Attachment Pedal (optional)
7—Right Pilot Control Lever / Power Dig Button (bottom button on top of lever)
8—Monitor
9—Front Switch Panel
10—Key Switch
11—Air Conditioner Panel
12—Radio
13—Operator’s Seat
14—Cab Door Release Lever
15—Pilot Shutoff Lever
16—Rear Deck
17—Fuse Box
18—Lighter
19—Left Console
20—Hot and Cold Storage Compartment
21—Accessory Power Port
Front Switch Panel

1—Washer/Wiper Switch
2—Operating Lights Switch
3—Engine Speed Dial
4—Auto-Idle Switch
5—Power Mode Switch
6—Travel Mode Switch
7—Key Switch
Front Switch Panel Functions

NOTE: The wiper does not operate unless the upper front window is completely closed.

1. **Wiper Switch**: Wiper switch has several positions:
   - **OFF**: Wiper stops operating and is retracted.
   - **INT**: Wiper operates intermittently at the interval selected by the switch position.
   - **ON**: Wiper operates continuously

2. **Washer Switch**: Push and hold switch to squirt fluid on windshield. Do not hold down switch for more than 20 seconds.

3. **Engine Speed Dial**: Turn dial clockwise to increase engine speed or counterclockwise to decrease engine speed.

4. **Auto-Idle Switch**: With engine on, move auto-idle switch to A/I ON and the engine speed dial to above the auto-idle speed. Auto-idle indicator will appear on monitor default screen when auto-idle is on.
   - The engine will run at the engine speed dial setting for 4 seconds after turning key switch ON.
   - The auto-idle system will then slow the engine to auto-idle engine speed.

5. **Power Mode Switch**: Move switch to select engine speed mode.
   - **H/P (High Power) Mode**: Use H/P mode when more flow is desired for booming up or rolling in the arm in excavation work.
   - **P Mode**: Use P mode when general digging work is needed.
   - **E (Economy) Mode**: Use E mode to improve fuel efficiency and reduce noise level with a small difference in engine speed.

6. **Travel Mode Switch**: Turn switch to select fast or slow speed travel.

7. **Key Switch**: The key switch has 4 positions: OFF, ACC, ON, and START.

Rear Panel

1. **Accessory Power Port**: 12-volt, 5-amp electrical port provided for service and maintenance.

2. **Lighter**: For operator convenience. Can also be used as a electrical port for service and maintenance for 24-volt appliances.

   1—Accessory Power Port  2—Lighter
Horn

Horn button (1) is located on top of left control lever.

1—Horn Button

Power Dig Button

Press and hold down power dig button (1) on top of right pilot control lever for an 8 second increase in hydraulic power. Release button to reset power dig function.

Power dig is automatically activated when the following conditions are met:

- Boom Up
- No Arm In
- High Delivery Pressure

1—Power Dig Button

Pilot Shutoff Lever

The pilot shutoff lever (1) shuts off hydraulic pilot pressure to all pilot control valves. When pilot shutoff lever is in locked (UP) position, the machine will not move if a lever or pedal is accidentally moved. Engine will not start with pilot shutoff lever in the unlocked (DOWN) position.

Always pull pilot shutoff lever to locked position when you stop the engine or leave the operator’s station.

Push pilot shutoff lever forward to unlocked position to operate machine.

1—Pilot Shutoff Lever
Travel Alarm and Travel Alarm Cancel Switch

IMPORTANT: If alarm is not operating during normal transport, or if alarm sounds when engine is running and machine is stationary see your authorized dealer.

The travel alarm sounds when a travel pedal or lever is activated and will continue as long as the tracks are moving. When travel motion stops, the travel alarm switch is reset.

After the initial 13 second alarm, alarm can be silenced by depressing the right half of the travel alarm cancel switch (1).

1—Travel Alarm Cancel Switch

Seat Heater Switch—If Equipped

Use switch to turn seat heater ON or OFF.

When seat heater is ON, it will automatically cycle between 10° C and 20° C (50° F and 68° F).
Reversing Cooling Fan Switch—If Equipped

The reversing cooling fan switch has 3 positions:

- **AUTO**: Every 60 minutes the radiator cooling fan will automatically reverse direction for 15 seconds without intervention from the operator.
- **OFF**: Fan resumes normal operation.
- **MANUAL**: Fan will reverse direction for 15 seconds when right portion of switch is pressed.

**NOTE**: The reversing fan function shall not be reactivated within one minute of its last completion (this time includes “Automatic” cycle).
**Operation—Operator's Station**

### Cab Heater and Air Conditioner Operation

1. **Blower Fan Speed Buttons:** Press blower fan speed buttons to select desired blower fan speed. Selected fan speed will be displayed on the monitor display.

2. **Monitor Display:** Displays blower fan speed, selected air vent, and temperature setting.

3. **A/C Button:** Air conditioner will turn on when A/C button is pressed and fan display of the blower button is on. A/C indicator will also light.

4. **AUTO A/C Button:** Press AUTO button to turn AUTO and A/C indicators on. Air flow-in temperature at the vent, blower speed, vent locations, and fresh air port are automatically controlled.

5. **Blower and A/C OFF Button:** Press OFF button to turn blower and A/C off. When blower OFF button is pressed, the blower and the air conditioner will turn off. The blower will turn on if one of the blower buttons is pressed whether the air conditioner button is turned on or off.

6. **Temperature Control Buttons:** Press buttons to set temperature from Full-Cool (FC) to Full-Heat (FH). FC and/or FH will display on the monitor display.

7. **Recirculating Mode Button:** Press recirculating mode button to close fresh air vent and circulate air already in cab. Press button again to turn off indicator and open fresh air suction port.

8. **Fresh Air Mode Button:** Press fresh air mode button to route outside air into the cab. Indicator will also light. Press button again to turn off indicator light and close fresh air suction port.

9. **Mode Button:** Press to select the air vent. Selected air vent is displayed on the monitor display.

### Defroster Operation

1. **Press AUTO button.** Temperature controlled air blows out.

2. **Press temperature control buttons to set temperature.**

3. **Press fresh air vent button to select fresh air circulation mode.**

4. **Press mode button to select the front vents or the front and rear vents.**

5. **Adjust the louvers on front vent and defroster vent to control air flow direction.**

6. **Press temperature control buttons and blower buttons to adjust cab temperature.**

7. **Press A/C button on if windows become clouded or if dehumidifying is required.**
Selecting Display Between Celsius and Fahrenheit

1. While depressing both (3) A/C and mode (9), turn the key switch ON.
2. The LCD will display “Sd” for approximately 5 seconds.
3. After display “Sd” is deleted, all LED will come on.
4. After all LED come ON, repeat to press the blower switch (1) four times.
5. Sequentially, press the A/C (3) and blower (1) switches at the same time.
6. Then, the selection mode between Celsius and Fahrenheit starts.
   Each time the fresh air mode switch (8) is pressed, the display is shifted between Celsius and Fahrenheit.
   When Celsius is displayed, the LED displays “C.”
   When Fahrenheit is displayed, the LED displays “F.”
   Select preferred setting.
7. After selection is complete, end by turning the key switch OFF.
   The LED will display in the selected mode when the machine is operated the next time.

<table>
<thead>
<tr>
<th>Display on LCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Celsius (°C)</td>
</tr>
<tr>
<td>Fahrenheit (°F)</td>
</tr>
</tbody>
</table>

Operating the AM/FM Radio

Press power button (1) to turn radio on, and repeatedly press one of tuning buttons (5) until desired station is reached. To preset a station, select the desired station using tuning buttons. Press and hold one of the station preset buttons (4) for more than 2 seconds until an electronic tone is heard. The frequency of the preset station will be indicated on digital display (7).

Setting The Clock

**NOTE:** In order to set the clock, the power switch must be on, and the digital display (7) must be in the time display mode.

Press and hold the reset button labeled RST (8) until the time is flashing.
Press the time set button labeled M (8) to set the correct minute.
Press the time set button labeled H (8) to set the correct hour.
Press and hold the reset button to set time.
Secondary Exit Tool

IMPORTANT: FOR SECONDARY EXIT. Use tool (1) to break window. Always keep tool in machine.

1—Secondary Exit Tool

Opening Upper Front (Secondary Exit) Window

NOTE: The wiper cannot operate with the upper front window open. The washer can operate with the upper front window open.

1. Slide the lock pin (1) inward, then down into notch.
2. Pull the lock release bar (2) toward operator.
3. While holding the lower handle on the window, pull window up and back as far as it can go.

CAUTION: Prevent possible injury from window closing. Always lock the pin in the cab frame boss hole.

4. Slide the lock pin (1) into the cab frame boss hole and rotate downward into the lock position.


Removing and Storing the Lower Front Window

NOTE: Upper front window must be raised before lower front window can be removed.

1. While pulling in on window, raise window to remove.
2. Store window in rear storage area of cab. Install in protectors (1-4) as shown.

**NOTE:** In cold weather some operators may choose to work with the top glass open and the bottom glass in place. This provides excellent visibility and tends to hold the heat being circulated around the operator’s feet.

![Diagram showing window protectors](image)

- 1— Protector
- 2— Protector
- 3— Protector
- 4— Protector

---

**Opening Cab Door Window**

To open cab window, pinch latch (1) and slide rear pane forward.

![Diagram showing window latch](image)

- 1— Latch
Opening and Closing the Polycarbonate Type Roof Exit Cover

Opening:
1. Move lock levers (1) toward center of roof exit.
2. Push on handle (2) to open roof exit cover.

Closing:
Hold handle and pull window down until levers lock in position.

IMPORTANT: Replace the polycarbonate type roof with a new one every 5 years, even if undamaged. In case it was remarkably damaged or has received severe shock loads, replace it even if it has been not in use for 5 years.

When cleaning the polycarbonate type roof, use a neutral detergent. If acidic or alkaline detergent is used, the polycarbonate type roof may become discolored or crack.

Keep organic solvent away from polycarbonate type roof. Failure to do so may cause the polycarbonate type roof to become discolored or crack.

Adjusting the Mechanical Suspension Seat

Push down lever (1) while sitting on seat to adjust seat to desired angle. Release lever.

Pull up handle (2) to unlock seat. Slide seat to desired distance from control levers. Release handle.

Turn knob (3) to adjust seat to weight of operator.

Squeeze ball (4) to add air for lumbar firmness. Press button next to ball to release air.

Pull up lever (5) to release backrest lock. Move backrest to desired position. Release lever.

Pull headrest (6) upward or push downward to desired height. Move headrest to desired angle.

Pull up on armrest (7) to move armrest out of way when exiting.

Turn dial (8) to adjust angle of armrest.

Rotate handle (9) toward operator. Slide entire seat and controls to desired distance from travel pedals. Release handle.

1—Seat Angle Adjustment
2—Seat Fore-Aft Adjustment Handle
3—Weight Adjustment Knob
4—Lumbar Adjustment Ball
5—Backrest Adjustment
6—Headrest Height And Angle
7—Armrest
8—Armrest Dial
9—Seat Console Adjustment Handle
Adjusting the Air Suspension Seat—If Equipped

Push down lever (1) while sitting on seat to adjust seat to desired angle. Release lever.

Pull up handle (2) to unlock seat. Slide seat to desired distance from control levers. Release handle.

Pull button (3) to decrease seat firmness. With key switch in the ON position, press and hold button to increase seat firmness.

Squeeze ball (4) to add air for lumbar firmness. Press button next to ball to release air.

Pull up lever (5) to release backrest lock. Move backrest to desired position. Release lever.

Pull headrest (6) upward or push downward to desired height. Move headrest to desired angle.

Pull up on armrest (7) to move armrest out of way when exiting.

Turn dial (8) to adjust angle of armrest.

Rotate handle (9) toward operator. Slide entire seat and controls to desired distance from travel pedals. Release handle.

1—Seat Angle Adjustment
2—Seat Fore-Aft Adjustment Handle
3—Firmness Adjustment Button
4—Lumbar Adjustment Ball
5—Backrest Adjustment

6—Headrest Height And Angle
7—Armrest
8—Armrest Dial
9—Seat Console Adjustment Handle

Adjusting Pilot Control Lever Console Height

CAUTION: Avoid possible crushing injury from console unexpectedly dropping. Before loosening the holding bolts, support the console.

1. Ensure engine is off and pilot shutoff lever is in the LOCK position.
2. Remove left and right console holding bolts (1).
3. Loosen bolt (2), and adjust the pilot control lever console height relative to the cab floor.
4. Tighten bolt (2), and reinstall holding bolts (1).

Specification

<table>
<thead>
<tr>
<th>Bolts—Torque</th>
<th>49 N·m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>36.1 lb-ft</td>
</tr>
</tbody>
</table>

1—Holding Bolts
2—Bolt
Operation—Monitor Operation

1—Button 1
2—Button 2
3—Button 3
4—Button 4
5—Button 5
6—Button 6 / Return to Default Screen Button
7—Button 7 / F1 Function Button
8—Button 8 / F2 Function Button
9—Button 9 / F3 Function Button
10—Button 0 / F4 Function Button
11—Select Button
12—Back Button
13—Menu Button
14—Hour Meter Button
15—Alarm Indicator Light
16—Coolant Temperature Gauge
17—Work Mode Indicator
18—Auto-Idle Indicator
19—Auxiliary Indicator
20—Auxiliary Indicator
21—Auxiliary Indicator
22—Engine Preheat Indicator
23—F1 Function Button Indicator
24—Hour Meter
25—F2 Function Button Indicator
26—Fuel Gauge
27—F3 Function Button Indicator
28—F4 Function Button Indicator
29—Fuel Rate Display
30—Clock
Monitor Functions

1. **Button 1:** Press button to key in the number 1, or use as instructed depending on current screen.

2. **Button 2:** Press button to key in the number 2, or use as instructed depending on current screen.

3. **Button 3:** Press button to key in the number 3, or use as instructed depending on current screen.

4. **Button 4:** Press button to key in the number 4, or use as instructed depending on current screen.

5. **Button 5:** Press button to key in the number 5, or use as instructed depending on current screen.

6. **Button 6 / Return to Default Screen Button:** Press button to key in the number 6 / Press button to return to the default screen.

7. **Button 7 / F1 Function Button:** Press button to key in the number 7 / Press button to select the desired preset optional function from any screen.

8. **Button 8 / F2 Function Button:** Press button to key in the number 8 / Press button to select the desired preset optional function from any screen.

9. **Button 9 / F3 Function Button:** Press button to key in the number 9 / Press button to select the desired preset optional function from any screen.

10. **Button 0 / F4 Function Button:** Press button to key in the number 0 / Press button to select the desired preset optional function from any screen.

11. **Select Button:** Use button as instructed depending on current screen.

12. **Back Button:** Use button as instructed depending on current screen.

13. **Menu Button:** Press button to display main menu from any screen.

14. **Hour Meter Button:** Without key inserted or with key switch OFF, press and hold button to display default screen and hour meter.

15. **Alarm Indicator Light:** Lights when an abnormality has occurred.

16. **Coolant Temperature Gauge:**

   **IMPORTANT:** If needle points to “RED” zone, idle engine to bring back to “BLUE” zone before stopping engine. If needle continues to rise, stop engine.

17. **Work Mode Indicator:** The icon for the current attachment being used displays.

18. **Auto-Idle Indicator:** When selecting auto-idle from the front switch panel, the auto idle icon displays.

19. **Auxiliary Indicator:** Optional auxiliary data icon displays.

20. **Auxiliary Indicator:** Optional auxiliary data icon displays.

21. **Auxiliary Indicator:** Optional auxiliary data icon displays.

22. **Engine Preheat Indicator:**

   **IMPORTANT:** Prevent engine damage. Do not use ether in machines equipped with the preheat option.

23. **F1 Function Button Indicator:** Optional indicator icon is displayed.

24. **Hour Meter:** Total machine operation hours counted since the machine started working are displayed in the unit of hour (h). One digit after the decimal point indicates tenths of an hour (6 minutes).

25. **F2 Function Button Indicator:** Optional indicator icon is displayed.

26. **Fuel Gauge:** Fuel machine before needle reaches “E”.

27. **F3 Function Button Indicator:** Optional indicator icon is displayed.

28. **F4 Function Button Indicator:** Optional indicator icon is displayed.

29. **Fuel Rate Display:** Fuel consumption is displayed.

30. **Clock:** Indicates present time.
Monitor Start-Up

IMPORTANT: Start the engine after the default screen is displayed.

When the key switch is turned to the ON position, the system starting screen displays for about 2 seconds. The default screen will then be displayed.
Main Menu

Press the menu button (13) to display the main menu screen.

13— Menu Button

Time Set Menu

Press menu button (13) on the default screen to display the main menu screen. Choose the Time Set menu by pressing button (1) or (2) under the arrow icons on the screen, then press the select button (11).

Time Adjustment:

1. On the time set screen, press button (1) or (2) to navigate to the setting you want to change.
2. Use buttons (3) or (4) to decrease or increase the chosen setting.
3. Navigate to each setting until all desired changes are made.
4. Once desired settings are reached, navigate to the apply setting icon (15).
5. Press the select button (11) to apply the new settings. The message “Data is being applied.” will display on the screen.

1— Button 1
2— Button 2
3— Button 3
4— Button 4
11— Select Button
13— Menu Button
15— Apply Settings Icon
Selecting an Attachment From Default Screen

1. When the default screen appears, push button F1 (7) to display the work mode screen.

2. On the work mode screen, push a button located under an attachment to be used in order to select the attachment.

   NOTE: When the Digging mode is selected, the default screen will reappear.

3. On the attachment specification screen, confirm if specification of the installed attachment agrees with that displayed on the screen.

   NOTE: Pushing the back button (12), displays previous screen.

4. Push the select button (11), and the default screen appears.

   7—F1  
   11— Select Button  
   12— Back Button
Selecting an Attachment From Main Menu

1. When the default screen appears, push the menu button (13) to display main menu.

2. Select work mode from main menu by using buttons (1) and (2). Push select button (11). The work mode screen appears.

3. Push the button located under an attachment to be used in order to select the attachment.

   NOTE: When the Digging mode is selected, the default screen will reappear.

4. On the attachment specification screen, confirm if specification of the installed attachment agrees with that displayed on the screen. In this example, the Crusher 1 attachment was selected

   NOTE: Pushing the back button (12), displays previous screen.

5. Push the select button (11), and the default screen appears.

   1— Button 1
   2— Button 2
   11— Select Button
   12— Back Button
   13— Menu Button
Attachment Specification Screen

1—Maximum Pump Flow Rate
2—Maximum Engine Speed
3—Accumulator Control
   Solenoid Valve: OFF
4—Accumulator Control
   Solenoid Valve: ON
5—Secondary Relief Selector
   Control Solenoid Valve: ON
6—Secondary Relief Selector
   Control Solenoid Valve: OFF
7—Three Way Valve Control
   Solenoid Valve: OFF
8—Auxiliary Flow Combining
   Solenoid Valve: OFF

NOTE: Breaker 3 attachment specification screen not shown
### Pump 2 Flow Rate Adjustment

1. When the default screen displays, push the menu button (13) to display the main menu.

2. Select Attachment Adjustment from the main menu by using buttons (1) or (2).

   **NOTE:** When the Digging Mode is selected, adjustments cannot be made.

3. Push the select button (11) to display the Attachment Adjustment screen. In this example, the Breaker 1 attachment is selected.

4. Adjust flow rate of Pump 2 by using buttons (1) or (2).

   Pushing button (1) will decrease flow rate of pump 2, and pushing button (2) will increase the flow rate of pump 2.

   1— Button 1  
   2— Button 2  
   11— Select Button  
   13— Menu Button
Displaying Operating Conditions

1. When the default screen appears, push the menu button (13) to display the main menu.
2. Select Operating Conditions from the main menu by using buttons (1) or (2).
3. Push the select button (11) to display the operating conditions screen.

NOTE: To return to the previous screen without resetting the data, use the back button (12).

4. If resetting the operating conditions is desired, push the select button (11). The reset data confirmation screen appears.
5. Push the select button (11) to confirm resetting of data.

1— Button 1  
2— Button 2  
11— Select Button  
12— Back Button  
13— Menu Button
Maintenance Settings

1. When the default screen appears, push the menu button (13) to display the main menu.

2. Select Maintenance Settings from the main menu by using buttons (1) and (2).

3. Push the select button (11) to display the maintenance settings screen.

   1— Button 1  
   2— Button 2  
   3— Button 3  
   4— Button 4  
   11— Select Button  
   12— Back Button  
   13— Menu Button

4. Select an item to be set from among the list of maintenance settings by using buttons (1) or (2). In this example, engine oil was selected.
5. Push the select button to display the interval ON/OFF settings screen.

**Maintenance Information Display ON/OFF**

1. Select ON or OFF for maintenance information display by using buttons (1) or (2). Push the select button.
   - ON: When it is time to perform maintenance on the selected item, an information message is displayed on the screen.
   - OFF: No information message is displayed.
2. In order to apply setting, push the back button (12) to return to the default screen.

**Change Interval Settings**

**IMPORTANT:** Change interval can only be set when maintenance information display is set to ON.

1. Navigate to the item Change interval by using buttons (1) or (2).
2. Set hour for change interval by using buttons (3) or (4).
3. Navigate to Remaining Hours by using buttons (1) or (2) and push the select button (11).
   
   **NOTE:** To return to the previous screen without adjusting remaining hours to change interval, push the back button (12).

4. The message “Adjust remaining hours to new change interval. OK?” displays. Push the select button to confirm change.

**Resetting Data**
1. If data is to be reset, push button (5) on the interval ON/OFF settings screen. The message “Reset Data. OK?” displays.

   **NOTE:** To return to the previous screen without resetting the data, use the back button (12).

2. Push the select button (11) to confirm resetting the data.

   The value of the remaining hours is reset to that of the change interval. Previous change date/hour is updated with current date and time.

### Screen Display When Scheduled Maintenance is Due

**NOTE:** The scheduled maintenance screen will only be displayed if the Maintenance Information Display is set to ON. (See Maintenance Settings in this section)

#### One Maintenance Item Due

1. Turn the key to the ON position, the system starting screen will appear.

2. When a change interval has expired for a maintenance item, the maintenance information screen will display for 3 to 10 seconds. While the maintenance information screen is displayed, press the select button (11) to reset the maintenance item.

   **NOTE:** If the maintenance item is not reset or the back button (12), the default screen will appear after 3 to 10 seconds.

   - **1—Button 1**
   - **2—Button 2**
   - **11—Select Button**
   - **12—Back Button**

---

2-2-12

PN=57
3. The maintenance item reset screen will display with the message "Reset Data. OK?". Push the select button (11) to confirm reset or the back button (12) to return to the previous screen without resetting. When data is reset, the value of the remaining hours is reset to that of the Change interval. Previous change date/hour is updated with the current date and time.

**Two or More Maintenance Items Due**

1. Turn the key to the ON position, the system starting screen will appear.

2. When the change intervals have expired for two or more maintenance items, the scheduled maintenance screen will display for 3 to 10 seconds. While the scheduled maintenance screen is displayed, use button (1) or (2) to navigate to the maintenance item that is to be reset. Then press the select button (11) to view the maintenance information screen.

   **NOTE:** If the maintenance item is not reset or the back button (12) pressed, the default screen will appear after 3 to 10 seconds.

3. While the maintenance information screen is displayed, press the select button (11) to reset the maintenance item.

4. The maintenance item reset screen will display with the message "Reset Data. OK?". Push the select button (11) to confirm reset or the back button (12) to return to the previous screen without resetting. When data is reset, the value of the remaining hours is reset to that of the Change interval. Previous change date/hour is updated with the current date and time.
Fuel Rate Display/No Display

1. From the default screen, push the menu button (13) to display the main menu.

2. Select Fuel Rate Display/No Display from the main menu using buttons (1) or (2).

3. Push the select button (11) to display the fuel rate display/no display screen.

4. Push the select button to toggle between Fuel Rate Display ON and OFF.

NOTE: If Fuel Rate Display ON is selected, the fuel rate will display on the default screen under the fuel gauge needle.

5. Push the back button (12) to apply desired setting and return to the default screen.

1— Button 1  
2— Button 2  
11— Select Button  
12— Back Button  
13— Menu Button
Language Settings

1. When the default screen appears, press the menu button (13) to display the main menu.

2. Select Language from the main menu by using buttons (1) or (2), then push the select button (11) to display the language settings screen.

3. Choose the desired language by using buttons (1) or (2), then push the select button to apply.

4. Push the return to default screen button (6) to display the default screen, or push the back button (12) to display the previous screen.

<table>
<thead>
<tr>
<th>Language</th>
<th>Screen Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>English</td>
</tr>
<tr>
<td>Spanish</td>
<td>Español</td>
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</table>
Alarm Occurrence Screen

In case any abnormality occurs, the alarm indicators (1) are displayed on the default screen.

Push the button on the monitor located under an alarm indicator to view the alarm indication screen and the corrective action necessary.

1—Alarm Indicators

Engine Overheat Alarm

Engine coolant temperature has abnormally increased. Stop operation. Run the engine at slow idle speed or lower the coolant temperature.

Engine Warning Alarm

Engine or engine related parts are abnormal. Consult your authorized dealer.
**Engine Oil Pressure Alarm**

Engine oil pressure has decreased. Immediately stop engine. Check engine oil system and oil level.

---

**Alternator Alarm**

Electrical system is abnormal. Consult your authorized dealer.

---

**Remaining Fuel Alarm**

Fuel level is low. Refill fuel tank as soon as possible.

---

**Hydraulic Oil Filter Alarm—If Equipped**

Hydraulic oil filter is clogged. Replace filter.

---
Air Filter Clogged Alarm
Air filter elements are clogged. Clean or replace air filter elements.

Work Mode Alarm
Work Mode system is abnormal. Consult your authorized dealer.

Pilot Shutoff Lever Alarm
Pilot shutoff lever system is abnormal. Consult your authorized dealer.
Coolant Temperature Sensor Error Display
When the coolant temperature sensor is faulty or if the harness between the coolant temperature sensor and monitor unit is broken, the coolant temperature sensor error display (2) is displayed on the coolant temperature gauge.

Fuel Sensor Error Display
When the fuel sensor is faulty or if the harness between the fuel sensor and monitor unit is broken, the fuel sensor error display (3) is displayed on the fuel gauge.

2—Coolant Temperature Sensor Error Display  3—Fuel Sensor Error Display
Before Starting Work

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

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

Operator's Daily Machine Check 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 condition of guards, shields, and covers.

Overall Machine Checks
Check for worn or frayed electrical wires and loose or corroded connections.
Inspect machine for bent, broken, or loose parts.
Check for loose or missing hardware.
Check for oil leaks, missing or loose hose clamps, kinked hoses, and lines or hoses that rub against each other or other parts.

1—Check Pedal And Lever Movement/Clean Out Cab Debris
2—Check Hydraulic Oil Level
3—Check Surge Tank Level
4—Check Engine Oil Level
5—Check/Clean Radiator And Oil Cooler Outer Fins
Engine Break-In Period

IMPORTANT: To avoid engine damage it is critical to observe the engine break-in period. Extra care during the first 250 hours of operation will result in more satisfactory long-term engine performance and life. DO NOT exceed 250 hours of operation with break-in 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. Check engine oil level more frequently during the engine break-in period.

IMPORTANT: DO NOT add make-up oil until the oil level is BELOW the ADD mark on the dipstick. John Deere Break-In™ Engine Oil should be used to make up any oil consumed during the break-in period.

3. Change oil and oil filter after first 250 hours (maximum). Fill crankcase with the normal seasonal viscosity grade oil. See Maintenance—Machine. (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 Troubleshooting. (Section 4-3.)

5. Watch oil pressure gauge for pressure within specification.

6. Check serpentine belt for proper alignment and seating in pulley grooves.

Starting Engine

Before Starting the Engine

Turn key switch to ON position. Wait for “System Starting” screen to disappear before starting machine.

NOTE: The pilot shutoff lever must be in the locked (UP) position to start machine.

Starting the Engine
1. Move engine speed dial (1) to slow idle position.

2. Sound horn to alert persons nearby.

   IMPORTANT: Prevent starter damage. Never operate starter for more than 20 seconds at a time. If engine fails to start, return key switch to OFF. Wait for about 2 minutes, then try again. After a false start, DO NOT turn key switch until engine stops.

3. Turn key switch to START. Release key; switch will return to ON position.

After Starting Check

   IMPORTANT: Prevent possible damage to engine. If alarm indicators do not go out after starting engine, IMMEDIATELY STOP THE ENGINE. Find and correct the problem.

After the engine is started, check that the alarm indicators no longer display.

Check that the alternator alarm indicator (1) is no longer displayed.

Check that the engine oil pressure alarm indicator (2) is no longer displayed.

If the alarm indicators continue to be displayed, stop the engine immediately. Find and correct the problem.

Warming The Engine

1. Run engine at 1/3 speed for 30 seconds. Do not run engine at fast or slow idle. Do not accelerate rapidly during warm-up.

2. Operate machine at less-than-normal loads and speeds until engine is at normal operating temperature.
Cold Weather Start Aid

The machine is equipped with a coolant heater as a standard feature. Starting fluid is required when ambient temperature is below 0°C (32°F).

Using Starting Fluid

⚠️ 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.

IMPORTANT: Prevent damage to engine. Use starting aid if necessary when temperatures are below 0°C (32°F) and only when engine is COLD.

1. Turn key switch clockwise to “Start” position.

IMPORTANT: Excess starting fluid could damage engine; push ether start aid switch only when engine is cold and cranking. Starting aid fluid is being injected into engine as long as you push and hold switch.

2. After one or two revolutions of engine crankshaft, push and hold ether start aid switch (1) for short intervals. Crank engine for 20 seconds maximum, then allow 2 minutes between cranking periods.

Replacing Start Aid Can

1. Remove clamp (1) from container.
2. Turn container (2) counterclockwise to remove the start aid can.
3. Install new container by turning clockwise into starting valve.

Operating Machine Without Start Aid Container Installed

If no starting fluid is needed, remove container and install dust cap.

1—Clamp 2—Container
Cold Weather Warm-Up

**CAUTION:** Prevent possible injury from unexpected machine movement. 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.

In extremely cold conditions, an extended warm-up period will be necessary.

Avoid sudden operation of all functions until the engine and hydraulic oil are thoroughly warm.

1. If temperature is below 0° Celsius, engine will start at 1400 rpm. Engine will maintain 1400 rpm until hydraulic temperature reaches 2° Celsius or 15 minutes, whichever comes first.
2. Run engine at 1/2 speed for 5 minutes. Do not run at fast or slow idle.

**CAUTION:** Prevent possible injury from unexpected machine movement. Clear the area of all persons before running your machine through the warm-up procedure. If machine is inside a building, warm the travel circuit first and move the machine to a clear area outside. Cold oil will cause machine functions to respond slowly.

3. Actuate travel and swing functions slowly, initially moving only short distances.
4. Operate boom, arm, and bucket functions by moving cylinders a short distance each direction for the first time.
5. Continue cycling cylinders by increasing the travel each cycle until full stroke is obtained.
6. Swing upperstructure so boom is perpendicular to tracks.

**CAUTION:** Prevent possible injury from machine sliding backwards. Keep angle between boom and arm 90—110°.

7. Keeping the angle between boom and arm 90—110°, fully actuate bucket close function (cylinder extend) and lower bucket to raise track off ground.

**IMPORTANT:** Holding function actuated for more than 10 seconds can cause damage from hot spots in the control valve.

8. While rotating raised track in forward direction, actuate bucket curl function (cylinder extend) for 10 seconds and release for 5 seconds for a period of 2-1/2 minutes.
9. Repeat procedure with track rotating in reverse direction.
10. Lower machine to ground.
11. Repeat steps 6—10 on opposite track.
12. Operate all hydraulic functions to distribute warm oil in all cylinders, motors, and lines.
13. If hydraulic functions still move slowly, repeat steps 7 and 8.
Travel Pedals and Levers

CAUTION: Prevent possible injury from unexpected machine movement. Keep bystanders clear of machine when traveling.

Keep bystanders clear of machine when traveling.

The instructions below apply when the travel motors (4) are to the rear of the machine. If the travel motors are to the front of the machine, the machine moves OPPOSITE to the direction described.

FORWARD TRAVEL: Push down on front (1) of both pedals or push both levers forward (1).

REVERSE TRAVEL: Push down on rear (2) of both pedals or pull both levers rearward (2).

NEUTRAL POSITION (3): Travel brakes will automatically stop and hold the machine.

RIGHT TURN: Push down on front of left pedal or push left lever forward.

LEFT TURN: Push down on front of right pedal or push right lever forward.

SHORT TURN (COUNTER-ROTATE): Push down the front of one pedal and the rear of the other or push one lever forward and pull the other rearward.

CAUTION: Prevent possible injury from machine tipping. Operate control pedals or levers slowly when traveling down a slope.

TRAVELING DOWN A SLOPE: Operate control pedals or levers slowly when traveling down a slope.

COLD WEATHER OPERATION: Travel pedal and lever dampers are provided for smooth control. In extremely cold weather, pedal or lever effort will increase. Operate pedals or levers several times with pilot shutoff lever in locked position.
Locking the Hydraulic Coupler to the Attachment

⚠️ CAUTION: Make sure hydraulic coupler is attached correctly to attachment. The supplemental lock can be engaged with the attachment in an incorrect lock position. A visual check is required each time the lock operation is performed. Failure to do so could result in serious injury or death.

⚠️ CAUTION: Attaching the bucket in a reverse orientation on the hydraulic coupler is not recommended. When installed in the reverse orientation, the bucket or the lift hook interferes with the arm of the excavator when the bucket is in full curl position by extending the bucket cylinder. This is an inherent part of the design of the original equipment. Since the hydraulic coupler interacts with the arm at full curl position to unlock the supplemental lock, the hydraulic coupler will NOT operate properly when the bucket is attached in reverse orientation.

NOTE: A safety buzzer will sound to alert personnel the lock/unlock function has been activated.

1. Engage front hook (1) on pin (2). Toggle switch on control box should be in UNLOCK position.

NOTE: The hydraulic coupler must be held over relief in order to lock/unlock the hydraulic coupler cylinder.

2. Rotate to full-curl position. Move toggle switch to LOCK position. Hold in full-curl position for 5 seconds.

3. Slowly uncurl hydraulic coupler. Visually verify supplemental lock contacts locking plate. Visually verify lock plate is behind attachment pin. Toggle switch on the control box should be in the LOCK position.

NOTE: Do not operate attachment when the supplemental lock is used as the primary locking device. Doing so could result in hydraulic coupler failure.

4. Continue to slowly uncurl hydraulic coupler. Verify attachment is properly locked. Toggle switch on the control box should be in LOCK position.
Unlocking the Hydraulic Coupler From the Attachment

1. Keep attachment close to ground. Toggle switch should be in LOCK position.

   NOTE: The hydraulic coupler must be held over relief in order to unlock the hydraulic coupler cylinder.

2. Rotate hydraulic coupler to full-curl position to release supplemental lock. Toggle switch should be in LOCK position.

   NOTE: A safety buzzer will sound to alert personnel the unlock function has been activated.


4. Slowly uncurl hydraulic coupler. Front hook (1) will release from pin (2). Toggle switch should be in UNLOCK position.

   1—Front Hook 2—Pin
Control Lever Pattern Operation

⚠️ CAUTION: Never place any part of body beyond window frame to avoid serious crushing injury from boom. Boom could lower if the control lever is accidentally bumped or otherwise engaged. Immediately replace a missing or broken window.

⚠️ CAUTION: Prevent injury from unexpected control lever function. Be aware of the control lever pattern used on the machine before operating.

The machine comes equipped from the factory with the excavator control lever pattern. A label with both the excavator and backhoe control lever patterns comes installed on the right cab window.

Check the pattern on the labels, and then carefully operate the machine to verify the pattern.

See Control Lever Pattern Conversion in this section.

NOTE: A Control Pattern Selector Kit is available, that when installed, changes the control lever pattern using a mechanical valve.

Control levers return to neutral when released. Functions will stop and remain positioned. Also the parking brake for swing and travel will engage.

1— Arm Out
2— Arm In
3— Swing Left
4— Swing Right
5— Boom Down
6— Boom Up
7— Bucket Load
8— Bucket Dump
Control Lever Pattern Conversion

1. Lower bucket to the ground.
2. Stop the engine. Remove the key from switch.

**CAUTION:** High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. Push the pressure release button on the hydraulic tank cover to relieve air pressure. 

3. Push the pressure release button on the hydraulic tank cover to relieve air pressure. See Check Hydraulic Oil Level. (Section 3-4.)

4. Remove panel on top of machine to access pilot signal manifold.

**NOTE:** DO NOT use manufacturer’s hose tags or markings on hose ends to identify hoses for this conversion procedure. The conversion must be done on the side of pilot signal manifold that is connected to the pilot control valves.

5. Disconnect and connect hoses on the pilot control valves side of the pilot signal manifold as follows:
   - Switch hose to Port A (A) with hose to Port D (D).
   - Switch hose to Port B (B) with hose to Port C (C).

Port designations (letters) are on the pilot signal manifold next to the ports.

A control pattern selector kit is available. When installed, it changes the control lever pattern using a mechanical valve.
Operating in Water and Mud

Be careful not to operate the machine in water or mud above the upper deck surface of the undercarriage, causing the swing bearing and rotary manifold to be submerged.

If the swing bearing and rotary manifold are submerged, remove cover from underneath center of machine. Remove drain plug (1) to drain water and mud. Clean swing gear area. Install plug and cover. Grease swing gear and swing bearing.

1—Drain Plug

Driving Up a Steep or Slippery Slope

**CAUTION:** Prevent possible injury from machine roll-over. Use this technique only on a short slope. Machine depends on support of boom/arm/bucket during entire procedure until machine reaches top of slope. Repositioning the bucket during this procedure is NOT recommended. DO NOT swing upperstructure during this procedure. DO NOT reposition bucket during this procedure.

1. Wear seat belt.
2. Position undercarriage so travel motors will be on uphill end of machine.
3. Push bucket into the ground.
4. When boom is on uphill end of machine; pull machine using boom and arm cylinder to help travel motors. When boom is on downhill end of machine; push machine using boom and arm cylinder to help travel motors.

Lifting

**CAUTION:** Lifting requires special care. Observe these rules when lifting with the machine:

- Never use machine to lift people
- Do not exceed lift capacity limits
- Keep everyone clear of raised loads
- Never attach sling or chain to bucket teeth
- Use tether lines to guide loads
- Use hand signals to communicate with others

1. Use proper rigging to attach and stabilize loads.
2. Without bucket loop: Curl bucket and retract arm. Fasten sling or chain to bucket pivot pin.
   With bucket loop: Curl bucket and retract arm. Fasten sling or chain to bucket loop.
3. Check stability by carefully doing a trial lift:
   - Raise load just off of ground
   - Swing load all the way to one side
   - Move load slowly away from machine
   - Lower load immediately if machine is not stable
Lower Boom With Engine Stopped

When an engine stops during operation, the boom cannot be lowered using the pilot controller because there is no pilot pressure oil to move the boom valve spool.

⚠️ CAUTION: Prevent possible injury from unexpected machine movement. Clear all persons from the area before lowering the boom with the engine stopped.

1. Lift control valve access door.

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

IMPORTANT: Never loosen screw more than two turns as screw may come off.

2. Loosen nut (1). Loosen boom manual lower screw (2) 1/2 turn. The boom will start to lower. The boom lowering speed can be somewhat adjusted by loosening screw more.

3. After the bucket is lowered to the ground, tighten screw, then nut to specifications below.

**Specification**

- Hex Key Wrench—Size: 4 mm
- Screw—Torque: 6.9 N·m (5.0 lb-ft)
- Nut (1)—Torque: 13.0 N·m (9.4 lb-ft)

1—Nut 2—Boom Manual Lower Screw

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**TX1000642**

Control Valve—Right Side Shown
Parking the Machine

IMPORTANT: During freezing weather, prevent damage to undercarriage components from frozen mud and dirt. Machine must be parked on a solid level surface to prevent tracks freezing in the ground.

1. Park machine on a solid level surface.
   During freezing weather, clean mud and dirt from tracks, rollers and track frames. Clean the steps and walkways after parking the machine.
   If tracks are frozen in the ground, slowly raise the machine using boom to free the tracks. Move machine carefully.

2. Lower equipment to the ground.

3. Turn auto-idle switch OFF.

4. Run engine with engine rpm dial at 1/3 position without load for 2 minutes.

5. Turn engine rpm dial to slow idle position.

6. Turn key switch to OFF. Remove key from switch.

7. Pull pilot shut-off lever to locked position.

IMPORTANT: Prevent cab electrical component damage from bad weather. Windows, roof vent, and cab door must be closed to prevent enter of rain.

8. Close windows, roof vent, and cab door.

9. Lock all access doors and compartments.

IMPORTANT: Turbocharger can be damaged if procedure to shut down engine is not done properly.
Loading and Unloading for Transport

CAUTION: Use extra care to prevent tipover or unexpected movement when loading and unloading machine for transport. Observe these rules when loading and unloading machine:

- Always wear seat belt.
- Locate trailer on a level and stable surface. Chock trailer wheels.
- Use loading ramps. Keep ramps at a low angle and firmly attached to trailer.
- Turn auto-idle/auto acceleration switch to OFF. Use low speed operating modes and move machine carefully.

1. When loading machine, use bucket for support with angle (1) of arm to boom at 90°.

IMPORTANT: Prevent machine or trailer damage. DO NOT allow machine or bucket to impact trailer.

2. Position machine on trailer as shown. Fasten each corner of machine to trailer at four designated tie down areas (2).

3. When unloading machine, use bucket for support with angle of arm to boom at 90°.

1— 90° Arm To Boom 2— Tie Down Decal (4 used)
Towing Machine

**CAUTION:** Prevent possible injury from unexpected machine movement. Block both tracks when disconnecting travel gear cases. When travel gear cases are disconnected, machine has no brakes and can move. The machine will roll free on a slope or while being towed.

1. Block tracks.
2. Drain oil from each travel gear case.
3. Remove cover from each gear case.
4. Remove sun gear (1) from each gear case.
5. Install cover. Fill gear case with oil.

Lifting the Machine

**CAUTION:** Prevent possible injury from unexpected machine movement when lifting the machine. Check lifting capacity of crane before lifting the excavator. Lift load only as high as necessary.

Keep all people clear of raised load.

**NOTE:** Refer to decals on machine for correct lift points (1). There are 2 lift points on each side of the undercarriage.

**Specification**

<table>
<thead>
<tr>
<th>350DLC — Approximate Weight</th>
<th>Approximate Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 049 kg</td>
<td>77 269 lb</td>
</tr>
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</table>
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 or ASTM D975 is acceptable for use at all percentage mixture levels.

Required Fuel Properties

In all cases, the fuel shall meet the following properties:

- **Cetane number of 43 minimum.** Cetane number greater than 47 is preferred, especially for temperatures below −20°C (−4°F) or elevations above 1500 m (5000 ft.).
- **Cold Filter Plugging Point (CFPP)** should be at least 5°C (9°F) below the expected lowest temperature or **Cloud Point** below the expected lowest ambient temperature.
- **Fuel lubricity** should pass a maximum scar diameter of 0.45 mm as measured by ASTM D6079 or ISO 12156-1.

**Diesel fuel quality and sulfur content** must comply with all existing emissions regulations for the area in which the engine operates. DO NOT use diesel fuel with sulfur content greater than 10 000 mg/kg (10 000 ppm).

**Sulfur content for Interim Tier 4 and Stage III B 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 1000–5000 mg/kg (1000–5000 ppm) REDUCES oil and filter change intervals.
- **BEFORE** using diesel fuel with sulfur content greater than 5000 mg/kg (5000 ppm), contact your John Deere dealer

**Sulfur Content for Tier 2 and Stage II Engines**
- Use of diesel fuel with sulfur content less than 500 mg/kg (500 ppm) is **RECOMMENDED**
- Use of diesel fuel with sulfur content 500–5000 mg/kg (500–5000 ppm) **REDUCES** the oil and filter change interval
- **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 5000–10 000 mg/kg (5000–10 000 ppm) **REDUCES** the oil and filter change intervals.

**IMPORTANT:** Do not use diesel fuel with sulfur content greater than 10 000 mg/kg (10 000 ppm).

**IMPORTANT:** Improper fuel additive usage may cause damage on fuel injection equipment of diesel engines.

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.

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.
Handling and Storing Diesel Fuel

**CAUTION:** Reduce the risk of fire. Handle fuel carefully. **DO NOT** fill the fuel tank when engine is running. **DO NOT** smoke while you fill the fuel tank or service the fuel system.

Fill the fuel tank at the end of each day’s operation to prevent water condensation and freezing during cold weather.

Keep all storage tanks as full as 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.

When using biodiesel fuel, the fuel filter may require more frequent replacement due to premature plugging.

Check engine oil level daily prior to starting engine. A rising oil level may indicate fuel dilution of the engine oil.

**IMPORTANT:** The fuel tank is vented through the filler cap. If a new filler cap is required, always replace it with an original vented cap.

When fuel is stored for an extended period or if there is a slow turnover of fuel, add a fuel conditioner to stabilize the fuel and prevent water condensation. Contact your fuel supplier for recommendations.
Biodiesel Fuel

Biodiesel fuel is comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats. Biodiesel blends are biodiesel mixed with petroleum diesel fuel on a volume basis.

Before using fuel containing biodiesel, review the Biodiesel Use Requirements and Recommendations in this Operator’s Manual.

Environmental laws and regulations can encourage or prohibit the use of biofuels. Operators should consult with appropriate governmental authorities prior to using biofuels.

All John Deere Engines with Exhaust Filter (Released 2011 and After)

While 5% blends (B5) are preferred, biodiesel concentrations up to a 20% blend (B20) in petroleum diesel fuel can be used. Biodiesel blends up to B20 can be used ONLY if the biodiesel (100% biodiesel or B100) meets ASTM D6751, EN 14214, or equivalent specification. Expect a 2% reduction in power and a 3% reduction in fuel economy when using B20.

Biodiesel concentrations above B20 can harm the engine’s emission control systems and should not be used. Risks include, but are not limited to, more frequent stationary regeneration, soot accumulation, and increased intervals for ash removal.

John Deere approved fuel conditioners, which contain detergent and dispersant additives, are required when using B20, and are recommended when using lower biodiesel blends.

All John Deere Engines Excluding Exhaust Filter (Primarily Released Prior to 2012)

While 5% blends (B5) are preferred, biodiesel concentrations up to a 20% blend (B20) in petroleum diesel fuel can be used. Biodiesel blends up to B20 can be used ONLY if the biodiesel (100% biodiesel or B100) meets ASTM D6751, EN 14214, or equivalent specification. Expect a 2% reduction in power and a 3% reduction in fuel economy when using B20.

These John Deere engines can operate on biodiesel blends above B20 (up to 100% biodiesel). Operate at levels above B20 ONLY if the biodiesel is permitted by law and meets the EN 14214 specification (primarily available in Europe). Engines operating on biodiesel blends above B20 might not fully comply with or be permitted by all applicable emissions regulations. Expect up to a 12% reduction in power and an 18% reduction in fuel economy when using 100% biodiesel.

John Deere approved fuel conditioners, which contain detergent and dispersant additives, are required when using B20, and are recommended when using lower biodiesel blends.

Biodiesel Use Requirements and Recommendations

The petroleum diesel portion of all biodiesel blends must meet the requirements of ASTM D975 (US) or EN 590 (EU) commercial standards.

Biodiesel users in the U.S. are strongly encouraged to purchase biodiesel blends from a BQ-9000 Certified Marketer and sourced from a BQ-9000 Accredited Producer (as certified by the National Biodiesel Board). Certified Marketers and Accredited Producers can be found at the following website: http://www.bq9000.org.

Biodiesel contains residual ash. Ash levels exceeding the maximums allowed in either ASTM D6751 or EN14214 can result in more rapid ash loading and require more frequent cleaning of the Exhaust Filter (if present).

The fuel filter can require more frequent replacement, when using biodiesel fuel, particularly if switching from diesel. Check engine oil level daily prior to starting engine. A rising oil level can indicate fuel dilution of the engine oil.

Biodiesel blends up to B20 must be used within 90 days of the date of biodiesel manufacture. If used, biodiesel blends above B20 must be used within 45 days from the date of biodiesel manufacture.

When using biodiesel blends up to B20, the following must be considered:

- Cold weather flow degradation
- Stability and storage issues (moisture absorption, microbial growth)
- Possible filter restriction and plugging (usually a problem when first switching to biodiesel on used engines.)
- Possible fuel leakage through seals and hoses (primarily an issue with older engines)
- Possible reduction of service life of engine components

Request a certificate of analysis from your fuel distributor to ensure that the fuel is compliant with the specifications provided in this Operator’s Manual.

Consult your John Deere dealer for approved fuel conditioners to improve storage and performance with biodiesel fuels.

The following must also be considered if using biodiesel blends above B20:

- Possible coking or blocked injector nozzles, resulting in power loss and engine misfire if John Deere approved fuel conditioners are not used
- Possible crankcase oil dilution (requiring more frequent oil changes)
- Possible lacquering or seizure of internal components
- Possible formation of sludge and sediments
- Possible thermal oxidation of fuel at elevated temperatures
- Possible compatibility issues with other materials (including copper, lead, zinc, tin, brass, and bronze) used in fuel handling equipment
- Possible reduction in water separator efficiency
- Possible damage to paint if exposed to biodiesel

Continued on next page
• Possible corrosion of fuel injection equipment
• Possible elastomeric seal and gasket material degradation (primarily an issue with older engines)
• Possible high acid levels within fuel system
• Because biodiesel blends above B20 contain more ash, using blends above B20 can result in more rapid ash loading and require more frequent cleaning of the Exhaust Filter (if present)

IMPORTANT: Raw pressed vegetable oils are NOT acceptable for use as fuel in any concentration in John Deere engines. Their use could cause engine failure.

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 cetane number, fuel type, sulfur content, water content, appearance, suitability for cold weather operations, bacteria, cloud point, acid number, particulate contamination, and whether the fuel meets specification.

Contact your John Deere dealer for more information on diesel fuel analysis.
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 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 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 (cooler 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).

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.
**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.

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 both conventional and synthetic oils.

Re-refined base stock products may be used if the finished lubricant meets the performance requirements.

Avoid mixing different brands or types of oils. Oil manufacturers blend base stock and additives to create their oils and to meet certain specifications and performance requirements. Mixing different oils can interfere with proper functioning of these formulations and degrade lubricant performance.

Consult your authorized John Deere dealer to obtain specific information and recommendations.

---

**Engine Break-In Oil**

**IMPORTANT:** Do not use John Deere PLUS-50™ oil or engine oils meeting API CG4, API CF4, or CCMC D5 performance levels during the first 250 hours of operation of a new or rebuilt engine. These oils will not allow the engine to break-in properly.

New engines are filled at the factory with John Deere ENGINE BREAK-IN OIL.

Change the oil and filter after the first 250 hours of operation of a new or rebuilt engine.

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After engine overhaul, fill the engine with John Deere ENGINE BREAK-IN OIL.

If John Deere ENGINE BREAK-IN OIL is not available, use a diesel engine oil with oil viscosity based on the expected air temperature range, and meeting one of the following, during the first 250 hours of operation:

- API Service Classification
- CCMC Specification D4

After the break-in period, use John Deere PLUS-50® or other diesel engine oil as recommended in this manual.
Diesel Engine Oil—Stage II Engine

Use oil viscosity based on the expected air temperature range during the period between oil changes.

**John Deere PLUS-50™ oil is preferred.**

Oil meeting one of the following specifications are also recommended:

- ACEA Oil Sequence E7
- ACEA Oil Sequence E6
- ACEA Oil Sequence E5
- ACEA Oil Sequence E4

Extended service intervals may apply when John Deere PLUS-50™, ACEA E7, ACEA E6, ACEA E5, or ACEA E4 engine oils are used. Consult your John Deere dealer for more information.

Other oils may be used if they meet one or more of the following:

- John Deere TORQ-GARD SUPREME™
- API Service Category CJ-4
- API Service Category CI-4 PLUS
- API Service Category CI-4
- API Service Category CH-4
- ACEA Oil Sequence E3

**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.

DO NOT use diesel fuel with sulfur content greater than 1.0% (10 000 ppm).

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TORQ-GARD SUPREME is a trademark of Deere & Company
## Diesel Engine Oil and Filter Service Intervals—Stage II Engine

The oil and filter service intervals in the following table should be used as guidelines. Actual service intervals also depend on operation and maintenance practices. It is suggested to use oil analysis to determine the actual useful life of the oil and to aid in selection of the proper oil and filter service interval.

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.

**Engine Oil and Filter Service Intervals**

<table>
<thead>
<tr>
<th>Fuel Sulfur</th>
<th>Standard Drain Oil Pan</th>
<th>Extended Drain Oil Pan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0.05% (500 ppm)</td>
<td>250 hours</td>
<td>250 hours</td>
</tr>
<tr>
<td>Standard Oil</td>
<td>375 hours</td>
<td>500 hours</td>
</tr>
<tr>
<td>Fuel Sulfur 0.05 to 0.50% (500 to 5000 ppm)</td>
<td>150 hours</td>
<td>150 hours</td>
</tr>
<tr>
<td>Premium Oil</td>
<td>275 hours</td>
<td>400 hours</td>
</tr>
<tr>
<td>Fuel Sulfur 0.50% to 1.00% (5000 ppm to 10 000 ppm)</td>
<td>125 hours</td>
<td>125 hours</td>
</tr>
<tr>
<td>Standard Oil</td>
<td>187 hours</td>
<td>250 hours</td>
</tr>
<tr>
<td>Premium Oil</td>
<td>0.50% to 1.00%</td>
<td>0.50% to 1.00%</td>
</tr>
</tbody>
</table>

**IMPORTANT:** When using biodiesel blends greater than B20, reduce the oil and filter service interval by 50% or monitor engine oil based on test results from OILSCAN.

**Oil types** (premium or standard) in the table include:

- **"Premium Oils"** include John Deere PLUS-50™, ACEA E7, ACEA E6, ACEA E5, or ACEA E4 oils.
- **"Standard Oils"** include John Deere TORQ-GARD SUPREME™, API CJ-4, API CI-4 PLUS, API CH-4, or ACEA E3 oils.

**NOTE:** The 500 hour extended oil and filter change interval is only allowed if all of the following conditions are met:

- Engine equipped with an extended drain interval oil pan
- Use of premium fuel with sulfur content less than 0.05% (500 ppm)
- Use of premium oil: John Deere PLUS-50, ACEA E7, ACEA E6, ACEA E5, or ACEA E4
- Perform engine oil analysis to determine the actual extended service life of ACEA E7, ACEA E6, ACEA E5, and ACEA E4 oils
- Use of an approved John Deere oil filter

Diesel fuel sulfur level will affect engine oil and filter service intervals. Higher fuel sulfur levels reduce oil and filter service intervals as shown in the table.

- Use of diesel fuel with sulfur content less than 0.05% (500 ppm) is strongly recommended.

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TORQ-GARD SUPREME is a trademark of Deere & Company
Diesel Engine Oil—Tier 3 and Stage III A Engines

Use oil viscosity based on the expected air temperature range during the period between oil changes.

**John Deere Plus-50™ II oil is preferred.**

John Deere Plus-50 is also recommended.

Other oils may be used if they meet one or more of the following:

- John Deere Torq-Gard™
- API Service Category CJ-4
- API Service Category CI-4 PLUS
- API Service Category CI-4
- ACEA Oil Sequence E9
- ACEA Oil Sequence E7
- ACEA Oil Sequence E6
- ACEA Oil Sequence E5
- ACEA Oil Sequence E4

**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.

DO NOT use diesel fuel with sulfur content greater than 10 000 mg/kg (10 000 ppm).

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*Torq-Gard is a trademark of Deere & Company*
Diesel Engine Oil and Filter Service Intervals—Tier 3/Stage III A Engine

The oil and filter service intervals in the following table should be used as guidelines. Actual service intervals also depend on operation and maintenance practices. It is suggested to use oil analysis to determine the actual useful life of the oil and to aid in selection of the proper oil and filter service interval.

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.

**Diesel fuel sulfur level** will affect engine oil and filter service intervals. Higher fuel sulfur levels reduce oil and filter service intervals as shown in the table.

- Use of diesel fuel with sulfur content less than 0.10% (1000 mg/kg) is strongly recommended.
- Use of diesel fuel with sulfur content 0.10% (1000 mg/kg) to 0.50% (5000 mg/kg) may result in REDUCED oil and filter change intervals as shown in the table.
- BEFORE using diesel fuel with sulfur content greater than 0.50% (5000 mg/kg), contact your John Deere dealer.
- DO NOT use diesel fuel with sulfur content greater than 1.00% (10 000 mg/kg).

**Oil types** in the table include:
- John Deere Plus-50™ II and John Deere Plus-50
- “Other Oils” include John Deere Torq-Gard Supreme™, API CJ-4, API CI-4 PLUS, API CI-4, ACEA E9, ACEA E7, ACEA E6, ACEA E5, or ACEA E4 oils.

Use of lower specification oils in Tier 3 engines may result in premature engine failure.

**NOTE:** The 500 hour extended oil and filter change interval is only allowed if all the following conditions are met:
- Engine equipped with an extended drain interval oil pan
- Use of diesel fuel with sulfur content less than 0.50% (5000 mg/kg)
- Use of John Deere Plus-50™ II or John Deere Plus-50 oil
- Use of an approved John Deere oil filter

<table>
<thead>
<tr>
<th>Oil Pan Size (L/kW)</th>
<th>U.S. Tier 3 and EU Stage III A - PowerTech Plus™</th>
<th>Oil Pan Size (L/kW)</th>
<th>U.S. Tier 3 and EU Stage III A - PowerTech™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil pan capacity</td>
<td>Greater than or equal to 0.10</td>
<td>Greater than or equal to 0.12</td>
<td>Greater than or equal to 0.14</td>
</tr>
<tr>
<td></td>
<td>Less than 0.10% (1000 mg/kg)</td>
<td>Less than 0.10% (1000 mg/kg)</td>
<td>Less than 0.10% (1000 mg/kg)</td>
</tr>
<tr>
<td>Plus-50</td>
<td>375 hours</td>
<td>500 hours</td>
<td>500 hours</td>
</tr>
<tr>
<td>Other Oils</td>
<td>250 hours</td>
<td>250 hours</td>
<td>250 hours</td>
</tr>
<tr>
<td>Fuel Sulfur</td>
<td>0.10 - 0.20% (1000 - 2000 mg/kg)</td>
<td>0.10 - 0.20% (1000 - 2000 mg/kg)</td>
<td>Less than 0.10% (1000 mg/kg)</td>
</tr>
<tr>
<td>Plus-50</td>
<td>300 hours</td>
<td>300 hours</td>
<td>500 hours</td>
</tr>
<tr>
<td>Other Oils</td>
<td>200 hours</td>
<td>200 hours</td>
<td>250 hours</td>
</tr>
<tr>
<td>Fuel Sulfur</td>
<td>0.20 - 0.50% (2000 - 5000 mg/kg)</td>
<td>0.20 - 0.50% (2000 - 5000 mg/kg)</td>
<td>Less than 0.10% (1000 mg/kg)</td>
</tr>
<tr>
<td>Plus-50</td>
<td>250 hours</td>
<td>250 hours</td>
<td>300 hours</td>
</tr>
<tr>
<td>Other Oils</td>
<td>150 hours</td>
<td>150 hours</td>
<td>200 hours</td>
</tr>
<tr>
<td>Fuel Sulfur</td>
<td>0.50 - 1.00% (5000 - 10 000 mg/kg)</td>
<td>0.50 - 1.00% (5000 - 10 000 mg/kg)</td>
<td>Less than 0.10% (1000 mg/kg)</td>
</tr>
<tr>
<td>Plus-50</td>
<td>Contact John Deere Dealer</td>
<td>Contact John Deere Dealer</td>
<td>Contact John Deere Dealer</td>
</tr>
<tr>
<td>Other Oils</td>
<td>Contact John Deere Dealer</td>
<td>Contact John Deere Dealer</td>
<td>Contact John Deere Dealer</td>
</tr>
</tbody>
</table>

The service interval of “Other Oils” may be extended only if oil analysis is performed to determine the actual service life, to a maximum not to exceed that of Plus-50.

**IMPORTANT:** When using biodiesel blends greater than B20, reduce the oil and filter service interval by 50% or monitor engine oil based on test results from Oilscan.

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**Torq-Gard Supreme is a trademark of Deere & Company**
**PowerTech Plus is a trademark of Deere & Company**
**PowerTech is a trademark of Deere & Company**
Hydraulic Oil

**IMPORTANT:** This machine is factory filled with Super EX 46HN extended life zinc-free hydraulic oil.

**DO NOT MIX ZINC-BASED AND ZINC-FREE OILS.**

Flushing system is required when changing from zinc-free to zinc-based oils. Contact authorized dealer for the flushing procedure.

Avoid mixing different brands of oils. Oil manufacturers engineer their oils to meet certain specifications and requirements. Mixing different oils can degrade lubricant and machine performance.

Use oil viscosity based on the expected air temperature range during the period between oil changes.

**Low Temperature Operation**

- **Do not mix** zinc-based and zinc-free oils.
- A preferred ISO 32 hydraulic oil may be added to the machine for low temperature operations. Hydraulic system oil viscosity must be 32Cst at 40°C minimum and must not be operated when ambient temperature exceeds 30°C (86°F).
- When switching back to warm weather operation a preferred ISO46 hydraulic oil may be added to the machine. The hydraulic system oil viscosity must be 40Cst at 40°C minimum and must not be operated when ambient temperature exceeds 40°C (104°F).

**Seasonal Hydraulic Flushing**

- **Do not mix** zinc-based and zinc-free oils.
- Two hydraulic tank flushes are required when changing hydraulic oils for seasonal operation. Drain and refill tank with new oil (ISO32-cold, ISO46-warm.). Operate machine to mix oil in system. Drain and refill tank again. Check oil viscosity.

The following oil is preferred:

**5000 hour change interval:**
- Zinc-Free Super EX 46HN oil from John Deere

**2500 hour change interval:**
- Zinc-Free Daphne Super Hydro A 32 (For low temperature operation.)
- Shell Tellus Oil S46

**1500 hour change interval:**

The following products can be used provided a complete hydraulic system flush has been performed. Contact your dealer for this procedure.

Other Premium AW oils may be used:

**The following oils are zinc-based and must not be mixed with 2500 hour and 5000 hour zinc-free oils.**

- Texaco Inc.: Rando Oil HD46 or 32 (For low temperature operation.)
- Mobil Oil: DTE25-46 or 32 (For low temperature operation.)
- Shell Oil: Tellus Oil T46 or T32 (For low temperature operation.)

**Biodegradable Hydraulic Oil:**

**IMPORTANT:** Other fire resistant and readily biodegradable oil (also called FR oils) are not approved in John Deere Construction and Forestry equipment.

Use only Exxon Mobil EAL Envirosyn 46H Synthetic Esther Oil when a biodegradable oil is required. (Contact your John Deere dealer for Registration and Routine Oil Analysis to meet warranty requirements.)
Swing Gear Case and Travel Gear Case Oils

Use oil viscosity based on the expected air temperature range during the period between oil changes.

The following oils are preferred:

- John Deere GL-5 GEAR LUBRICANT
- John Deere EXTREME-GARD™

Other oils may be used if they meet API Service Classification GL-5.

Pump Drive Gear Case Oil

Use oil viscosity based on the expected air temperature range during the period between oil changes.

The following oil is preferred:

- John Deere PLUS-50™ II

The following oil is also recommended:

- John Deere Torq-Gard™

Other oils may be used if they meet one or more of the following:

- API Service Category CI-4
- API Service Category CH-4
- API Service Category CG-4

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Torq-Gard is a trademark of Deere & Company
Track Adjuster, Working Tool Pivot, Swing Bearing, and Swing Bearing Gear Grease

Use grease based on NLGI consistency numbers and the expected air temperature range during the service interval.

The following greases are preferred:
- John Deere SD POLYUREA GREASE

The following greases are also recommended:
- John Deere HD MOLY GREASE
- John Deere HD LITHIUM COMPLEX GREASE
- John Deere HD WATER RESISTANT GREASE
- John Deere GREASE-GARD

Other greases may be used if they meet the following:
- NLGI Performance Classification GC-LB

IMPORTANT: Some types of grease thickener are not compatible with others.

Heavy Duty Diesel Engine Coolant

The engine cooling system is filled to provide year-round protection against corrosion and cylinder liner pitting, and winter freeze protection to -37°C (-34°F). If protection at lower temperatures is required, consult your John Deere dealer for recommendations.

The following engine coolants are preferred:
- John Deere COOL-GARD™ II Premix
- John Deere COOL-GARD II PG Premix

Use John Deere COOL-GARD II PG Premix 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.

John Deere COOL-GARD II Premix, COOL-GARD II PG Premix, and COOL-GARD II Concentrate coolants do not require use of supplemental coolant additives.

Other Coolants

John Deere COOL-GARD II and COOL-GARD II PG coolants might not be available in the geographical area where service is performed.

If these coolants are unavailable, use a coolant concentrate or prediluted coolant intended for use with heavy duty diesel engines and with a minimum of the following chemical and physical properties:
- Is formulated with a quality nitrite-free additive package.
- 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
- Protects the cooling system metals (cast iron, aluminum alloys, and copper alloys such as brass) from corrosion

The additive package must be part of one of the following coolant mixtures:
- ethylene glycol or propylene glycol base prediluted (40—60%) heavy duty coolant
- ethylene glycol or propylene glycol base heavy duty coolant concentrate in a 40—60% mixture of concentrate with quality water

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.

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.
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.

John Deere COOL-GARD™ II Coolant Extender

Some coolant additives will gradually deplete during engine operation. For John Deere COOL-GARD™ II Premix, COOL-GARD II PG Premix, and COOL-GARD II Concentrate, replenish coolant additives between drain intervals by adding John Deere COOL-GARD II Coolant Extender.

John Deere COOL-GARD II Coolant Extender should not be added unless indicated by coolant testing.

John Deere COOL-GARD II Coolant Extender is a chemically matched additive system for use with all John Deere COOL-GARD II coolants. John Deere 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 may result in additive drop-out, gelation of the coolant, or corrosion of cooling system components.

Add the recommended concentration of John Deere COOL-GARD II Coolant Extender. DO NOT add more than the recommended amount.
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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Operating in Warm Temperature Climates

John Deere engines are designed to operate using glycol base engine coolants.

Always use a recommended glycol base engine coolant, even when operating in geographical areas where freeze protection is not required.

John Deere COOL-GARD™ II Premix is available in a concentration of 50% ethylene glycol. However, there are situations in warm temperature climates where a coolant with lower glycol concentration (approximately 20% ethylene glycol) has been approved. In these cases, the low glycol formulation has been modified to provide the same level of corrosion inhibitor as John Deere COOL-GARD II Premix (50/50).

**IMPORTANT:** Water may be used as coolant in emergency situations only.

Foaming, hot surface aluminum and iron corrosion, scaling, and cavitation will occur when water is used as the coolant, even when coolant conditioners are added.

Drain cooling system and refill with recommended glycol base engine coolant as soon as possible.

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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:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorides</td>
<td>&lt;40 mg/L</td>
</tr>
<tr>
<td>Sulfates</td>
<td>&lt;100 mg/L</td>
</tr>
<tr>
<td>Total dissolved solids</td>
<td>&lt;340 mg/L</td>
</tr>
<tr>
<td>Total hardness</td>
<td>&lt;170 mg/L</td>
</tr>
<tr>
<td>pH</td>
<td>5.5 to 9.0</td>
</tr>
</tbody>
</table>

Freeze Protection

The relative concentrations of glycol and water in the engine coolant determine its freeze protection limit.

<table>
<thead>
<tr>
<th>Glycol Type</th>
<th>Freeze Protection Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene Glycol</td>
<td></td>
</tr>
<tr>
<td>40%</td>
<td>-24°C (-12°F)</td>
</tr>
<tr>
<td>50%</td>
<td>-37°C (-34°F)</td>
</tr>
<tr>
<td>60%</td>
<td>-52°C (-62°F)</td>
</tr>
<tr>
<td>Propylene Glycol</td>
<td></td>
</tr>
<tr>
<td>40%</td>
<td>-21°C (-6°F)</td>
</tr>
<tr>
<td>50%</td>
<td>-33°C (-27°F)</td>
</tr>
<tr>
<td>60%</td>
<td>-49°C (-56°F)</td>
</tr>
</tbody>
</table>

DO NOT use a coolant-water mixture greater than 60% ethylene glycol or 60% propylene glycol.

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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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Service Machine at Specified Intervals

Lubricate, make service checks, and make adjustments at intervals shown on the periodic maintenance chart and on the following pages.

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.

Check the Hour Meter Regularly

Check the hour meter (1) to determine when your machine needs periodic maintenance.

There are two ways to check the hour meter:

- Without key inserted or with the key at the OFF position, press and hold the Hour Meter Button (14) until the default screen appears.
- Turn key to the ON position to view the default screen and the hour meter.

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.

1—Hour Meter 14—Hour Meter Button

Engine Identification

Use the following information to identify the engine as either a Stage II or Tier 3/Stage IIIA engine.

Stage II Engine Component Identification

Machines equipped with Stage II engines have a fixed geometry turbocharger (1).

Machines equipped with Stage II engines do not have an EGR cooler.

In machines equipped with Stage II engines, the engines are tan in color.

1—Fixed Geometry Turbocharger
**Tier 3/Stage IIIA Engine Component Identification**

Machines equipped with Tier 3/Stage IIIA engines have a variable geometry turbocharger (2).

Machines equipped with Tier 3/Stage IIIA engines have an EGR cooler (3).

In machines equipped with Tier 3/Stage IIIA, the engines are yellow in color.

2— Variable Geometry Turbocharger  
3— EGR Cooler

---

**Engine Serial and Model Number Identification**

The engine serial number plate is located on the right rear of the engine block.

The last two digits of the engine model number (2) can be used to identify an engine as either a Stage II or Tier 3/Stage IIIA engine based on machine application.

<table>
<thead>
<tr>
<th>Engine Model Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6090HT006</td>
<td>Stage II engines (Turbocharged and air-to-air aftercooled)</td>
</tr>
<tr>
<td>6090HT002</td>
<td>Tier 3/Stage IIIA engines (Turbocharged and air-to-air aftercooled)</td>
</tr>
</tbody>
</table>
Prepare Machine for Maintenance
1. Park machine on a level surface as shown.
2. Stop engine.

Open Access Doors for Service

**CAUTION:** Prevent possible injury from door closing. Secure door in the OPEN position.

To hold door open, remove rod (1) from stored position (2) and insert in tab (3).

1— Rod
2— Stored Position
3— Tab

Open Engine Cover for Service

**CAUTION:** Prevent possible injury. Unlock latch. Pull open latches to unlock cover. Raise the cover until the end of the bar is securely locked into catch.

Raise cover using handle on cover until the end of the rod is securely locked into catch (1).

1— Catch

Fuel Tank

**CAUTION:** 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.

**Specification**

Fuel Tank—Capacity .................................................. 628.0 L (166.0 gal)

**IMPORTANT:** If machine has been run out of fuel, engine will not start. Contact your authorized dealer for instructions.

To avoid condensation, fill the fuel tank at the end of each day’s operation.
Hydraulic Breaker and Crusher Attachments

IMPORTANT: Avoid mixing different brands or types of oils. Oil manufacturers engineer their oils to meet certain specifications and performance requirements. Mixing different oil types can degrade lubricant and machine performance.

This excavator is factory filled with Super EX 46HN extended life zinc-free hydraulic oil. Avoid servicing this excavator with products that do not meet this specification. If oils have been mixed or if alternate service oils are desired, the complete hydraulic system needs to be totally flushed by an authorized dealer.

Hydraulic breaker or crusher operation subjects the machine's hydraulic system to possible contamination and accelerated deterioration. The hydraulic return filter and hydraulic oil must be replaced more often to prevent damage to hydraulic pumps and other hydraulic components. Change the hydraulic return filter and oil at the intervals recommended below based on the amount of machine operating time the attachment is used.

NOTE: John Deere recommends the addition of the hydraulic filter restriction indicator kit with the attachment.

<table>
<thead>
<tr>
<th>Percentage of Operating Time</th>
<th>Hydraulic Return Filter Change Interval (hours)</th>
<th>Hydraulic Oil Change Interval (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breaker or Crusher Used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>600</td>
</tr>
<tr>
<td>60</td>
<td>150</td>
<td>800</td>
</tr>
<tr>
<td>40</td>
<td>200</td>
<td>1000</td>
</tr>
<tr>
<td>20</td>
<td>300</td>
<td>1300</td>
</tr>
</tbody>
</table>

Fluid Analysis Program Test Kits and 3-Way Coolant Test Kit

Fluid Analysis Program Test Kits and the 3-Way Coolant Test Kit are John Deere fluid sampling products to help you monitor machine maintenance and system condition. The objective of a fluid sampling program is to ensure machine availability when you need it and to reduce repair costs by identifying potential problems before they become critical.

Engine, hydraulic, power train, and coolant samples should be taken from each system on a periodic basis, usually prior to a filter and/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.
## Service Intervals

**Model:** 350 DLC  
**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

Fluid samples should be taken from each system at its recommended change interval prior to actually draining the fluid. Regular oil sampling will extend the operational life of your machine.

<table>
<thead>
<tr>
<th>Interval</th>
<th>Tasks</th>
</tr>
</thead>
</table>
| As Required       | □ Remove and clean fuel tank inlet screen  
                   □ Check and clean air cleaner dust unloader valve  
                   □ Drain water separator filter  
                   □ Add coolant extender as indicated by COOL-GARD™ II test strips  
                   □ Check windshield washer fluid  
                   □ Check and adjust track sag  
                   □ Drain water and sediment from fuel tank sump  
                   □ Drain auxiliary fuel filter/water separator—if equipped |
| Every 10 Hours or Daily | □ Check hydraulic system oil level  
                           □ Grease hydraulic coupler—if equipped  
                           □ Check engine oil level  
                           □ Check engine coolant level |
| Initial Service - 50 Hours | □ Inspect and re-torque track hardware |
| Initial Service - 250 Hours | □ Drain and refill engine break-in oil and replace filter |

<table>
<thead>
<tr>
<th>Interval</th>
<th>Tasks</th>
</tr>
</thead>
</table>
| Every 50 Hours or Weekly | □ Drain water and sediment from fuel tank sump  
                           □ Drain water separator filter |
| Every 100 Hours   | □ Grease working tool pivots |
| Initial Service - 250 Hours | □ Drain and refill engine break-in oil and replace filter |

<table>
<thead>
<tr>
<th>Interval</th>
<th>Tasks</th>
</tr>
</thead>
</table>
| Every 250 Hours   | □ Check and adjust A/C belt  
                   □ Check swing gear case oil level  
                   □ Drain hydraulic oil tank sump  
                   □ Check pump drive gear case oil level  
                   □ Inspect and re-torque track hardware  
                   □ Check battery electrolyte level and terminals  
                   □ Check travel gear case oil level  
                   □ Clean primary air cleaner element  
                   □ Take engine oil sample |
| Every 500 Hours   | □ Grease front end pin joints  
                   □ Grease swing bearing  
                   □ Grease swing bearing gear  
                   □ Drain and refill engine oil and replace filter  
                   □ Replace water separator filter  
                   □ Replace final fuel filter  
                   □ Check air intake hoses  
                   □ Replace auxiliary fuel filter/water separator—if equipped  
                   □ Clean cab fresh air and cab recirculating air filters (replace every 6th cleaning)  
                   □ Grease swing bearing  
                   □ Take diesel fuel sample  
                   □ Take engine coolant sample  
                   □ Take hydraulic oil sample  
                   □ Take swing gear case oil sample  
                   □ Take pump drive gear case oil sample  
                   □ Take travel gear case sample  
                   □ Take swing gear case oil sample |
| Every 1000 Hours  | □ Drain and refill swing gear case oil  
                   □ Clean engine crankcase vent tube |

*Perform initial service once after the first 250 hours of operation.*
<table>
<thead>
<tr>
<th>Maintenance—Periodic Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Replace hydraulic oil tank filter</td>
</tr>
<tr>
<td>□ Replace pilot oil filter</td>
</tr>
<tr>
<td>□ Drain and refill pump drive gear case oil</td>
</tr>
<tr>
<td><strong>Every 2000 Hours</strong></td>
</tr>
<tr>
<td>□ Drain and refill travel gear case oil</td>
</tr>
<tr>
<td><strong>Every 4000 Hours</strong></td>
</tr>
<tr>
<td>□ Replace engine crankshaft dampener</td>
</tr>
<tr>
<td><strong>Every 5000 Hours</strong></td>
</tr>
<tr>
<td>□ Drain and refill hydraulic system oil</td>
</tr>
<tr>
<td><strong>Every 6000 Hours</strong></td>
</tr>
<tr>
<td>□ Drain, flush and refill engine cooling system</td>
</tr>
</tbody>
</table>

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### Required Parts

**REQUIRED PARTS**

Insure 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.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>Initial Service - 250 Hours</th>
<th>Every 250 Hours</th>
<th>Every 500 Hours</th>
<th>Every 1000 Hours</th>
<th>Every 2000 Hours</th>
<th>Every 4000 Hours</th>
<th>Every 5000 Hours</th>
<th>Every 6000 Hours</th>
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</thead>
<tbody>
<tr>
<td>Engine Oil Filter</td>
<td>RE521420</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Water Separator Element</td>
<td>RE242329</td>
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<td>1</td>
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<tr>
<td>Auxiliary Fuel Filter/Water Separator—Stage II Engine—if Equipped</td>
<td>AT365869</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Fuel Filter Element</td>
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<td>Hydraulic System Return Oil Filter</td>
<td>RE566068</td>
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<td>Air Filter Primary</td>
<td>AT330978</td>
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<td>Air Filter Secondary</td>
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<td>Dust Unloader Valve</td>
<td>M96679</td>
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<td>Pilot Oil Filter</td>
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<tr>
<td>Engine Crankshaft Dampener</td>
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<td>Engine Crankshaft Dampener RE57604</td>
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<td>Engine Rocker Arm Cover Gasket</td>
<td>RE518263</td>
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<tr>
<td>Cab Fresh Air Filter</td>
<td>4S00686</td>
<td>As Required</td>
<td></td>
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<tr>
<td>Recirculating Air Filter</td>
<td>4S00685</td>
<td>As Required</td>
<td></td>
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<tr>
<td>Hydraulic Tank Vent Cap Filter</td>
<td>4626878</td>
<td>1</td>
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</tr>
<tr>
<td>PLUS-50™ Engine Oil</td>
<td>27.0 L (7.2 gal)</td>
<td>28.0 L (8.3 gal)</td>
<td>28.0 L (8.3 gal)</td>
<td>28.0 L (8.3 gal)</td>
<td>28.0 L (8.3 gal)</td>
<td>28.0 L (8.3 gal)</td>
<td>28.0 L (8.3 gal)</td>
<td>28.0 L (8.3 gal)</td>
<td>1</td>
</tr>
<tr>
<td>API GL-5 Gear Oil</td>
<td>17.0 L (4.5 gal)</td>
<td>35.4 L (9.3 gal)</td>
<td>35.4 L (9.3 gal)</td>
<td>35.4 L (9.3 gal)</td>
<td>35.4 L (9.3 gal)</td>
<td>35.4 L (9.3 gal)</td>
<td>35.4 L (9.3 gal)</td>
<td>298 L (78.7 gal)</td>
<td>1</td>
</tr>
<tr>
<td>Hitachi SUPER EX 46HN Hydraulic Oil</td>
<td>2908-0503</td>
<td>298 L (78.7 gal)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Coolant Extender</td>
<td>TY26603</td>
<td>As Required</td>
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<td></td>
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<td></td>
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<tr>
<td>COOL-GARD™ II Pre-Mix</td>
<td>TY26575</td>
<td>39.7 L (10.5 gal)</td>
<td></td>
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</tr>
<tr>
<td>Fluid Analysis Kits</td>
<td></td>
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<tr>
<td>Diesel Engine Oil</td>
<td>AT317904</td>
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<td>1</td>
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<td>1</td>
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<tr>
<td>Hydraulic Oil</td>
<td>AT303189</td>
<td>1</td>
<td>1</td>
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<td>1</td>
<td>1</td>
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<td>1</td>
</tr>
<tr>
<td>Travel Gear Case Oil</td>
<td>AT303189</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
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</tr>
<tr>
<td>Swing Gear Case Oil</td>
<td>AT303189</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Pump Drive Gear Case Oil</td>
<td>AT303189</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Diesel Fuel</td>
<td>AT180344</td>
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<td>1</td>
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<td>1</td>
</tr>
<tr>
<td>COOL-GARD™ II Test Strips</td>
<td>TY26605</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Engine Coolant</td>
<td>AT183016</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**IMPORTANT:** If fuel sulfur content exceeds 0.2 percent change the engine oil at 1/2 the normal interval. If engine has not run 250 hours before the season changes, change oil.

1Perform initial service once after the first 50 hours of operation and every 250 hours thereafter.

2Perform initial service once after the first 250 hours of operation.

3For recommended oil types and oil viscosities based on operating temperatures, see Maintenance-Machine. (Section 3-1.)
Based on fluid analysis results, intervals may need to be adjusted for your operating conditions. Consult your local John Deere Dealer.

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**Remove and Clean Fuel Tank Inlet Screen**

Clean fuel tank inlet screen (1) using solvent or diesel fuel to remove any debris.

Replace screen if damaged.

1—Fuel Tank Inlet Screen

---

**Check and Clean Air Cleaner Dust Unloader Valve**

**IMPORTANT:** A missing, damaged, or hardened dust unloader valve will make the dust cup precleaner ineffective, causing very short element life. Valve should suck closed above 1/3 engine speed.

Squeeze dust valve (1) to remove dust from the air cleaner.

If operating in high dust conditions, squeeze dust valve every couple of hours of operation to release dust.

1—Air Cleaner Dust Unloader Valve

---

**Check and Adjust Track Sag**

1. Swing upperstructure 90° and lower bucket to raise track off ground.

2. Keep the angle (1) between boom and arm 90—110° and position the bucket's round side on the ground.

**CAUTION:** Prevent possible injury from unexpected machine movement. Place blocks under machine frame to support machine while measuring track sag.

3. Place blocks under machine frame to support machine.

4. Rotate track forward two full rotations and then in reverse two full rotations.

1—Boom-To-Arm Angle
5. Measure distance (1) at middle track roller from bottom of track frame to top surface of track shoe.

**350DLC—Specification**
Track—Sag............................................340—380 mm (13-3/8—15.0 in.)

1—Distance

---

**IMPORTANT:** Prevent possible damage to track components. DO NOT use the grease fitting on the track adjusting cylinder for lubrication. Use this fitting ONLY for track adjustment.

1. To tighten track, connect a grease gun to grease fitting (1) located through access hole (4) in track frame. Add grease until sag is within recommended limits.

**CAUTION:** Prevent possible injury from high pressure grease. DO NOT remove grease fitting (1) from nut (2).

2. To loosen, slowly turn nut (2) counterclockwise; grease will escape through the bleed hole (3).

3. When amount of track sag is satisfactory, turn nut clockwise to tighten.

**Specification**
Nut—Torque...............................................................147 N·m (108 lb-ft)

1—Grease Fitting  3—Bleed Hole
2—Nut  4—Access Hole
Check Windshield Washer Fluid

Check fluid in windshield washer tank (1). If necessary, remove fill cap to add fluid.
During winter season, use all season windshield washer fluid which will not freeze.

1—Windshield Washer Tank

Drain Water and Sediment from Fuel Tank Sump

1. Park machine on a level surface. Rotate upperstructure 90° for easier access.
2. Stop engine.
3. Remove fuel tank fill cap.
4. Open drain valve (1) for several seconds to drain water and sediment into a container. Dispose of waste properly. Close drain valve.
5. Install fill cap.

1—Drain Valve
Drain Water Separator Filter

1. Open right access door to access water separator (1).
2. Open drain valve (2) to extract water from fuel system. Collect waste in a container, and dispose of it properly.
3. Close drain valve.

**IMPORTANT:** For John Deere Tier 3 engines and beyond ONLY: DO NOT prefill fuel filters. Debris in unfiltered fuel will damage fuel system components.

4. Bleed fuel system if necessary. See Bleed Fuel System in Miscellaneous-Machine. (Section 4-1.)

Check Coolant

⚠️ **CAUTION:** Prevent possible injury from hot spraying fluids. Shut off engine. Remove filler cap only when cool enough to touch with bare hands. Slowly loosen cap to relieve pressure before removing completely.

**IMPORTANT:** John Deere COOL-GARD™ II Coolant Extender does not protect against freezing. Coolant extender prevents rust, scale, and liner cavitation.

**NOTE:** Check coolant every 1000 hours or 1 year, or when replacing 1/3 or more of coolant. Add coolant extender as necessary.

1. Remove surge tank cap (1) and test coolant solution. Use one of the following kits to check coolant.

   - **COOL-GARD II Test Strips**
     Coolant test strips provide an effective method to check freeze point and additive levels of engine coolant. See your authorized dealer for COOL-GARD II test strips and follow instructions on kit.
   - **COOLSCAN PLUS™**
     For a more thorough evaluation of coolant, perform COOLSCAN PLUS analysis, where available. See your authorized dealer for information about COOLSCAN PLUS.

2. Add John Deere COOL-GARD II Coolant Extender as necessary. Follow instructions on container for amount.

**Specification**

<table>
<thead>
<tr>
<th>Cooling System Capacity</th>
<th>26 L</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.9 gal</td>
</tr>
</tbody>
</table>

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COOLSCAN PLUS is a trademark of Deere & Company
Draining Auxiliary Fuel Filter and Water Separator—If Equipped

1. Open engine service door to access auxiliary fuel filter and water separator (1).

2. Place pan under drain valve hose (3).

3. Open drain valve hose on the bottom of auxiliary fuel filter and water separator and drain water from fuel system into a container. Dispose of waste properly.

4. When water and sediment are removed, close drain valve.

5. Start and run engine at fast idle for 2 minutes. If engine won't start or dies, bleed the fuel system. See Bleed Fuel System (Section 4-1.)

6. Operate engine and check for leaks.

1—Auxiliary Fuel Filter and Water Separator
2—Sediment Bowl
3—Drain Valve Hose
Maintenance—Every 10 Hours or Daily

Check Engine Oil Level

IMPORTANT: Prevent engine damage. Do not run engine when oil level is below the ADD mark.

IMPORTANT: If it is necessary to add oil before the 250 hour oil change, use John Deere brand Break-In Oil. See Engine Break-In Oil. (Section 3-1.)

The most accurate oil level reading is obtained when the engine is cold before starting the engine for the day's operation.

1. Make sure dipstick (1) is fully seated.
2. Remove dipstick to check oil level.

BEFORE THE ENGINE IS STARTED: The engine is full when oil level is in the cross-hatch area (3). It is acceptable to run the engine when the oil level is above the ADD mark.

AFTER THE ENGINE HAS BEEN RUN: Allow the oil to drain into the oil pan for 10 minutes before checking the oil level. Ten minutes after shutdown the engine oil level must be above the ADD mark.

3. If necessary, remove filler cap (2) to add oil.

| 1— Dipstick | 2— Filler Cap | 3— Cross-Hatch Area |

Check Engine Coolant Level

With the engine cold, coolant level must be above the MIN COLD mark on the surge tank (1).

If coolant is below the MIN COLD mark, add coolant to the surge tank.

CAUTION: Prevent possible injury from hot spraying fluids. Shut off engine. Remove filler cap only when cool enough to touch with bare hands. Slowly loosen cap to relieve pressure before removing completely.

IMPORTANT: Avoid mixing different brands or types of coolant. Coolant manufacturers engineer their coolants to meet certain specifications and performance requirements. Mixing different coolant types can degrade coolant and machine performance.

If surge tank is empty, check for leaks. Repair as required. Add coolant to the surge tank.
Check Hydraulic System Oil Level

IMPORTANT: Prevent damage to hydraulic system components. DO NOT run engine without oil in hydraulic tank.

Avoid mixing different brands or types of oils. Oil manufacturers engineer their oils to meet certain specifications and performance requirements. Mixing different oil types can degrade lubricant and machine performance.

This excavator is factory filled with Super EX 46HN extended life zinc-free hydraulic oil. Avoid servicing this excavator with products that do not meet this specification. If oils have been mixed or if alternate service oils are desired, the complete hydraulic system needs to be totally flushed by an authorized dealer.

1. Park machine on a level surface, and position machine with arm cylinder fully retracted and bucket cylinder fully extended.

2. Stop engine.

3. Check oil level gauge (1) on hydraulic tank. Oil must be between marks on window.
   If necessary, add oil.
   To add oil:

   ![Hydraulic Oil Level Window](image)

   1—Hydraulic Oil Level Window

   CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. Relieve pressure by pushing pressure release button (1).

4. Push pressure release button.

5. Insert 5 mm hex wrench to remove cap screws (3).

6. Remove cover.

7. Add oil.

8. Install cover and cap screws.

   ![Pressure Release Button](image)
   ![Hydraulic Tank Cover](image)
   ![Cap Screws](image)

   1—Pressure Release Button  3—Cap Screws (4 used)
   2—Hydraulic Tank Cover
Lubricate Hydraulic Coupler—If Equipped

NOTE: Cylinders that are supplied without grease zerks DO NOT need to be lubricated.

To keep hydraulic coupler in proper working condition it must be lubricated on a daily basis.

Most hydraulic couplers are supplied with a cylinder grease zerk (1) located on the head end of the cylinder or the cylinder barrel, a lock arm grease zerk (2), and a grease zerk on each side of the hydraulic coupler for the locking wedge.

Apply grease to fittings until it escapes from joints. See Track Adjuster, Working Tool Pivot, Swing Bearing, and Swing Bearing Gear Grease. (Section 3-1.)
Inspect and Re-Torque Track Hardware

Tracks shoes should be inspected and re-torqued at first 50 hours and 250 hour intervals thereafter. See Inspect and Re-Torque Track Hardware. (Section 3-9.)
Drain Water and Sediment From Fuel Tank Sump

1. Park machine on a level surface. Rotate upperstructure 90° for easier access.
2. Stop engine.
3. Remove fuel tank fill cap.
4. Open drain valve (1) for several seconds to drain water and sediment into a container. Dispose of waste properly. Close drain valve.
5. Install fill cap.

1—Drain Valve

Drain Water Separator Filter

1. Open right access door to access water separator.
2. Open drain valve (1) to extract water from fuel system. Collect waste in a container and dispose of waste properly.
3. Close drain valve.

1—Drain Valve
Lubricate Working Tool Pivots

Lubricate working tool pivots (4 points) until grease escapes from joints. Lubricate every 4 hours for first 20 hours. Lubricate every 10 hours during first 30—100 hours and when working in mud and water.
Drain and Refill Engine Break-In Oil and Replace Filter

NOTE: Change engine break-in oil after 250 hours.

1. Run engine to warm oil.
2. Park machine on a level surface.
3. Stop engine.
4. Open small cover under the engine. Open drain valve on side of engine oil pan. Allow oil to drain into a container. Dispose of waste oil properly.
5. Turn filter (1) counterclockwise to remove. Clean mounting surface on base.
6. Apply thin film of oil to rubber gasket of new filter.
7. Install new filter. Turn filter clockwise by hand until gasket touches mounting surface.
8. Tighten filter 1/2—3/4 turn more.
10. Remove filler cap (2).

Specification

<table>
<thead>
<tr>
<th>Engine—Oil Capacity</th>
<th></th>
<th>27.0 L</th>
<th>7.2 gal</th>
</tr>
</thead>
</table>

11. Fill engine with oil. See Maintenance—Machine. (Section 3-1.)
12. Install filler cap.

   Engine oil pressure indicator on monitor must go out within 15-20 seconds. If not, stop engine immediately and find the cause.

15. Check for any leakage at filter. Tighten filter just enough to stop leakage.
16. Close cover from under the engine.
Check and Adjust A/C Belt

Visually check the belt for wear. Replace if necessary.

**NOTE:** When a new belt is installed, be sure to readjust the tension after operating the engine for 3 to 5 minutes at slow idle speed to be sure that the new belt is seated correctly.

Use the following steps to adjust compressor belt tension:

1. Check compressor belt tension by depressing the midpoint between compressor pulley (1) and crank pulley (2) with thumb.

   **Speciation**
   
<table>
<thead>
<tr>
<th>Component</th>
<th>Deflection</th>
<th>Depressing Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor Belt</td>
<td>9 mm to 12 mm</td>
<td>98 N (10 kgf, 22 lbf)</td>
</tr>
<tr>
<td></td>
<td>0.35 in. to 0.47 in.</td>
<td></td>
</tr>
</tbody>
</table>
   
2. If tension is not within specifications, loosen bolt (3).

3. Move the tension pulley (4) by bolt (5) until tension is correct. Tighten bolt (3).

Check Swing Gear Case Oil Level

1. Park machine on a level surface.
2. Remove dipstick (1). Wipe dipstick clean and replace completely into tube.
3. Remove dipstick. Oil must be in the dipstick cross-hatch area (3).
4. If oil is needed, remove filler cap (2) and add oil.
5. Check oil level.
6. Install filler cap.

   1—Dipstick  3—Dipstick Cross-Hatch Area
   2—Filler Cap
Drain Water and Sediment From Hydraulic Tank Sump

**CAUTION:** High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. Relieve pressure by pushing the pressure release button (1).

1. Push the pressure release button (1) to relieve pressure.

2. Insert a 5 mm hex wrench to remove cap screws (3).

3. After oil is cool, loosen sump plug (4) for several seconds to drain water and sediment into a container. Do not remove plug completely. Dispose of waste properly.

4. Tighten sump plug and reinstall hydraulic oil tank cover and cap screws.

1—Pressure Release Button
2—Hydraulic Oil Tank Cover
3—Cap Screws (4 used)
4—Sump Plug
Check Pump Drive Gear Case Oil Level

1. Open right service door to access pump drive gear case.
2. Remove dipstick (1).
3. Wipe dipstick clean and insert completely into tube.
4. Remove dipstick.
5. Oil level must be approximately halfway below the H mark. Insert dipstick.

To add oil:
1. Remove filler plug (2).
2. Add oil. See Maintenance—Machine. (Section 3-1.)
3. Install filler plug.

1—Dipstick 2—Filler Plug
Check Battery Electrolyte Level and Terminals

CAUTION: Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

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

ALWAYS remove grounded (-) battery clamp first and replace it last.

Sulfuric acid in battery electrolyte is poisonous. 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.

Avoid Acid Burns
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.

2. Fill each cell to within specified range with distilled water. DO NOT overfill.

⚠️ CAUTION: Prevent possible injury. ALWAYS remove grounded (-) battery clamp first and replace it last.

3. Disconnect battery clamps, grounded clamp first.

1—Battery Post
2—Fill Tube
3—Electrolyte Level Range

4. Clean battery terminals (1) and clamps with a stiff brush.

5. Apply lubricating grease (2) around battery terminal base only.

6. Install and tighten clamps, grounded clamp last.

1—Battery Terminal
2—Lubricating Grease
Check Travel Gear Case Oil Level

1. Park the machine on level ground rotating travel gear case until positioned as shown.

2. Stop engine.

CAUTION: High pressure release of oils from pressurized system can cause serious burns. Wait for travel gear case oil to cool. Keep body and face away from check plug (2). Gradually loosen check plug to release air to relieve pressure.

3. After travel gear case has cooled, slowly loosen check plug (2) to release air to relieve pressure.

4. Remove check plug. Oil must be to bottom of hole.

5. If necessary, remove fill plug (1), and add oil until oil flows out of oil level check plug hole.


   **Specification**

   Plug—Torque................................................................. 49 N·m

   36 lb.-ft.

7. Check second travel gear case oil level.
Clean Primary Air Cleaner Element

1. Lift lever (1) to unlock cover.
2. Rotate cover counterclockwise, and remove cover.
3. Remove primary element (2).
4. Tap element with the palm of your hand, NOT ON A HARD SURFACE.

**CAUTION:** Prevent possible injury from flying chips if compressed air is more than 210 kPa (2.1 bar) (30 psi). 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 chips, and wear personal protection equipment including eye protection.

5. If this does not remove dust, use compressed air under 210 kPa (2.1 bar) (30 psi).
6. Direct air up and down the pleats from inside to outside. Be careful not to make a break in the element.

**IMPORTANT:** A damaged or dirty element may cause engine damage.

Install a new primary element:

1. If the element shows damage.
2. If element will not clean.
3. After 1000 hours service or annually.

Install a new secondary element:

1. If the primary element is damaged and needs to be replaced.
2. If the element is visibly dirty.
3. After 1000 hours service or annually.

DO NOT clean a secondary element. Install a new element carefully centering it in the canister.

Take Engine Oil Sample

See your authorized dealer.
Inspect and Re-Torque Track Hardware

Tracks shoes should be inspected and re-torqued at first 50 hours and at 250 hour intervals thereafter.

Re-Torquing of Track Shoe Cap Screws

IMPORTANT: Failure to maintain correct track shoe cap screw torque will result in serious damage to the undercarriage components, shorter life expectancy, and it will void the Manufacturer’s warranty on the undercarriage components.

Each inspection and re-torquing should be documented by completing a Service Report for each unit, placing a copy of this report in the machine file, and forwarding a copy to the manufacturers attention.

1. Verify that nuts are square with the milled surface of link and there is full contact between nut and milled surface.

2. Starting at any cap screw, tighten all cap screws in sequence shown to the re-torque specification.

   **Specification**
   
   Cap Screw—Re-Torque............................................................1130 N.m  
   833 lb-ft

Track Hardware Inspection And Replacement

IMPORTANT: Operating a machine with loose shoes can cause the cap screws and holes in the shoes and links to wear making it difficult to keep the shoes tight. Loose shoes can also cause hardware failure and loss of shoes.

For shoes with missing or loose cap screws and nuts, remove shoes and clean the mating surface of shoes and links before replacing cap screws and nuts. The cap screws must be replaced because they have been stretched to yield previously.

1. Clean the mating surface of shoe and links. Install shoes.

2. Apply a light coating of oil to cap screw threads before installing.

3. Install nuts with the rounded corners against milled surface of link and chamfered side away from link. Check that nuts are square with the milled surface of link and there is full contact between nut and milled surface. As necessary, hold the nut so it does not turn.

4. Starting at any cap screw, tighten all cap screws in sequence shown to the torque specification.

   **Specification**
   
   Cap Screw—Torque............................................................1130 N.m  
   833 lb-ft
Lubricate Front End Pin Joints

Lubricate front end pin joints (20 points) until grease escapes from joints. Lubricate every 4 hours for first 20 hours. Lubricate every 10 hours during first 30—100 hours and when working in mud and water.
**Lubricate Swing Bearing**

**CAUTION:** Prevent possible injury from unexpected machine movement if controls are moved by another person. Lubricating swing bearing and rotating the upperstructure must be done by one person. Before you lubricate swing bearing, clear the area of all persons.

1. Park machine on a level surface.
2. Stop engine.
3. Lubricate swing bearing with 8 shots of grease at both grease fittings.
4. Start engine. Raise bucket several inches off the ground and turn upperstructure 45 degrees.

**NOTE:** It is not necessary to start the engine the last time.

5. Lower bucket to the ground.
6. Repeat steps 2—4 three times.

**Grease Swing Bearing Gear**

**CAUTION:** Prevent possible injury from unexpected machine movement if controls are moved by another person. Lubricating swing bearing gear and rotating the upperstructure must be done by one person.

1. Remove swing bearing gear access cover (1).
2. Grease must be 13—25 mm (1/2—1 in.) deep measured from the bottom of the ring gear. The grease must also be free of contamination by dirt and water.

   If the grease is contaminated, remove grease and replace with clean grease.

**IMPORTANT:** If water or mud is found in swing gear area, See Operating in Water and Mud (Section 2-3.)

3. Add grease as required (approximately 0.113 kg (1/4 lb) every 90°). See Maintenance—Machine. (Section 3-1.)

**IMPORTANT:** Excessive grease can damage the swing gear case seal.
Replace Water Separator Filter

1. Ensure key switch is in the OFF position.
2. Thoroughly clean exterior of water separator assembly and surrounding area.

**CAUTION:** Fuel in filter may be under high pressure. Open valve on bottom of water separator bowl to relieve pressure prior to removing filter.

3. Drain water and contaminates from water separator bowl into a suitable container by opening the drain valve (1) on bottom of filter.
4. Disconnect the water in fuel (WIF) sensor connector (2).
5. Remove water separator bowl (3) from filter element. Clean and dry separator bowl.
6. Inspect bowl. Replace if necessary.
7. Remove filter element and O-ring from water separator assembly and discard.
8. Install new filter element.

Replace Final Fuel Filter

**NOTE:** Do not clean fuel tank inlet screen and change fuel filter at the same time. Clean fuel tank inlet screen and run engine before changing fuel filter.

1. Turn key switch to the OFF position.
2. Disconnect the water in fuel (WIF) sensor connector (1).
3. Remove fuel filter (2) using a filter wrench. Discard filter.
5. Start and run engine at fast idle for 2 minutes. If engine won’t start or dies, bleed the fuel system. See Bleed Fuel System. (Section 4-1.)
Replacing Auxiliary Fuel Filter and Water Separator—If Equipped

1. Open engine service door to access auxiliary fuel filter and water separator (1).
2. Thoroughly clean auxiliary fuel filter header assembly and surrounding area.
3. Disconnect preheat element electrical connector, if equipped.
4. Place suitable container under drain valve hose (3).
5. Open drain valve hose and drain fuel. Dispose of waste properly.
6. Close drain valve hose and remove sediment bowl (2) from filter assembly. Clean and dry sediment bowl.

**IMPORTANT: DO NOT prefill fuel filter. Debris in unfiltered fuel will damage fuel system components.**

7. Remove filter and replace with new filter.
8. Install sediment bowl.
9. Connect preheat element electrical connector, if equipped.
10. Start and run engine at fast idle for 2 minutes. If engine won't start or dies, bleed the fuel system. See Bleed Fuel System (Section 4-1.)
11. Operate engine and check for leaks.
12. Tighten filter element and bowl only enough to stop leaks.

Check Air Intake Hoses

1. Check air intake hoses for cracks. Replace as necessary.
2. Check for loose connections and tighten clamps as necessary.
Drain and Refill Engine Oil and Replace Filter

1. Run engine to warm oil.
2. Park machine on a level surface.
3. Stop engine.
4. Open small cover under the engine. Open drain valve on side of engine oil pan. Allow oil to drain into a container. Dispose of waste oil properly.
5. Turn filter (1) counterclockwise to remove. Clean mounting surface on base.
6. Apply thin film of oil to rubber gasket of new filter.
7. Install new filter. Turn filter clockwise by hand until gasket touches mounting surface.
8. Tighten filter 1/2—3/4 turn more.
10. Remove filler cap (2).

Specification

Engine—Oil Capacity
With Filter Change............................................................ 27.0 L
7.2 gal

11. Fill engine with oil. (See Section 3-1)
12. Install filler cap.

Engine oil pressure indicator on monitor must go out within 15-20 seconds. If not, stop engine immediately and find the cause.
15. Check for any leakage at filter. Tighten filter just enough to stop leakage.
16. Close cover under the engine.
Clean Cab Fresh Air and Cab Recirculating Air Filters

IMPORTANT: Replace filters after the sixth cleaning.

Removing Cab Fresh Air Filter:
1. Unlock, and open left cab side cover (1) below cab door window.
2. Squeeze tab (2) on each side of the filter to remove.

Removing Cab Recirculating Air Filter:
1. Move operator’s seat forward to access filter (3) located under the rear deck.
2. Squeeze tab (4) on right side of filter to remove.

Cleaning Filters:
1. Clean filters in one of 2 ways.

CAUTION: Reduce compressed air to less than 196 kPa (1.96 bar) (28.4 psi) when using for cleaning purposes. Clear area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

- Use compressed air opposite to the normal air flow.
- Wash filters with water. Soak the filters in warm, soapy water for 5 minutes. Flush filter. Allow filter to dry before installing.

2. Install filter.

1— Side Cover  2— Fresh Air Filter Tab (2 used)  3— Recirculating Air Filter  4— Recirculating Air Filter Tab

Take Fluid Samples

See your authorized dealer for taking the following fluid samples:
- Diesel Fuel
- Coolant
- Hydraulic Oil
- Swing Gear Case Oil
- Pump Drive Gear Case Oil
- Travel Gear Case Oil
Drain and Refill Swing Gear Case Oil

Specification

| Swing Gear Case—Oil | Capacity | 17.0 L | 4.5 gal |

1. Remove plug mounted on end of drain pipe to drain oil into a container. Dispose of waste oil properly.

2. Install plug.

3. Remove filler cap (2), and add oil.

4. Install filler cap.

5. Check oil level on dipstick (1).

Replace Hydraulic Oil Tank Filter

1. Park machine on a level surface with arm cylinder fully retracted and bucket cylinder fully extended.

2. Stop engine.

- **CAUTION:** High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. DO NOT remove hydraulic cap. Relieve pressure by pushing the pressure release button (1).

3. To release pressure, push the pressure release button (1).

4. Hold down filter cover (2) against light spring load when removing the last two cap screws.

---

Continued on next page
5. Remove spring (3), and filter element (5).
6. Discard filter element (5) and O-ring (3).

NOTE: Remove element, and inspect for metal particles and debris in bottom of filter canister. Excessive amounts of brass and steel particles can indicate a hydraulic pump, motor, or valve malfunction, or a malfunction in process. A rubber type of material can indicate cylinder packing problem.

7. Install new filter element and spring.
8. Install cover (2) with a new O-ring (3).

**Specification**

Cap Screw—Torque....................................................... 49 N·m (36 lb-ft)

9. Reinstall, and tighten bolts (1) to 49 N·m (36 lb-ft).

1—Bolts (6 used)  
2—Filter Cover  
3—O-Ring  
4—Spring  
5—Filter Element

---

**Replace Pilot Oil Filter**

⚠️ CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. Relieve pressure by pushing the pressure release button (1).

1. To relieve hydraulic pressure push the pressure release button (1).
2. Open right access door.

1—Pressure Release Button  
2—Hydraulic Oil Tank Cover

Continued on next page
3. Remove filter canister (1).
4. Remove filter element (2).
5. Remove O-ring (3).
6. Install new O-ring and filter element.

**Specification**

Filter Canister—Torque: 39 N·m (29 lb-ft)

7. Install filter canister.
**Inspect Serpentine Belt**

1. Check belt regularly for wear, especially for cracks at the bottom of grooves and for frayed edges.
2. If necessary, replace belt.
3. Install a 1/2 in. drive socket wrench to the belt tension adjuster (1). Turn wrench to pull tension adjuster pulley away from belt, releasing belt tension.
4. Hold tension adjuster away from belt while removing old belt and installing new belt.
5. Slowly release wrench tension to allow tension adjuster to move against new belt. Tension is automatically adjusted.
6. Remove wrench.

**Drain and Refill Pump Drive Gear Case Oil**

1. Remove filler plug (2).
2. Remove drain plug (3). Allow oil to drain into a container. Dispose of waste oil properly.
3. Apply liquid pipe thread sealant to drain plug. Install plug.

**Specification**

<table>
<thead>
<tr>
<th>Pump Drive Gear Case—Oil Capacity</th>
<th>1.0 L</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 qt</td>
<td></td>
</tr>
</tbody>
</table>

4. Add oil.
5. Remove dipstick (1), and check oil level. Oil level must be approximately halfway below "H" mark.

**Maintenance—Every 1000 Hours**

ER79617_0002B0C -19-29MAR10-1/1

TX1010649A -UN-20DEC06

3-11-4

PN=134
**Clean the Engine Crankcase Ventilation Tube**
Clean the engine crankcase ventilation tube.

1—Engine Crankcase Ventilation Tube

**Replace Air Cleaner Elements**
1. Lift lever (1) to unlock cover.
2. Rotate cover counterclockwise, and remove cover.
3. Remove primary element (2).
4. Remove secondary element.
5. Clean the inside of the filter canister.
6. Install elements, making sure the secondary element is centered in canister.
7. Replace cover, and lock by rotating clockwise until “LOCK” symbol is aligned with arrows on body.

1—Lever 2—Primary Element

**Replace Air Cleaner Dust Valve**
*NOTE:* A missing, damaged, or hardened dust valve will cause the air filter elements to be ineffective.

Replace dust valve (1).

1—Air Cleaner Dust Valve
Check Coolant
See Check Coolant. (Section 3-3.)
Check and Adjust Engine Valve Lash
See your authorized dealer for engine valve clearance adjustment.

Drain and Refill Travel Gear Case Oil

1. Park the machine on level ground rotating travel gear case until pictured as shown.
2. Stop engine.

⚠️ CAUTION: High pressure release of oils from pressurized system can cause serious burns. Wait for travel gear case oil to cool. Keep body and face away from check plug. Gradually loosen check plug to release pressure.

3. After travel gear case has cooled, slowly loosen check plug (2) to release pressure.

   Specification
   Travel Gear Case—Oil
   Capacity (each)................................................................................4.7 L
   1.2 gal

4. Remove drain plug (3). Allow oil to drain into a container. Dispose of waste oil properly.
5. Wrap threads of drain plug with a sealing-type tape. Install plug. Tighten plug to 49 N·m (430 lb-in.).
6. Remove oil fill plug (1).
7. Add oil until oil flows out of oil level check plug hole.
8. Wrap threads of check plug, and fill plug with sealing-type tape. Install plugs. Tighten plugs to 49 N·m (36 lb-ft).
Replace Engine Crankshaft Dampener

The crankshaft dampener assembly is not repairable and should be replaced every four years or 4000 hours, whichever occurs first, or whenever crankshaft is replaced. See your authorized John Deere dealer.
Drain and Refill Hydraulic System Oil

NOTE: Change original factory fill hydraulic oil after first 5000 hours. Change every 5000 hours thereafter if using Super EX 46HN, if using alternative oils see Hydraulic Oil. (Section 3-1.)

IMPORTANT: Prevent damage to hydraulic system components. DO NOT run engine without oil in the tank.

Avoid mixing different brands or types of oils. Oil manufacturers engineer their oils to meet certain specifications and performance requirements. Mixing different oil types can degrade lubricant and machine performance.

This excavator is factory filled with Super EX 46HN extended life zinc-free hydraulic oil. Avoid servicing this excavator with products that do not meet this specification. If oils have been mixed or if alternate service oils are desired, the complete hydraulic system needs to be totally flushed by an authorized dealer.

1. Park machine on level surface with upperstructure rotated 90° for easier access.
2. Position machine with arm cylinder fully retracted and bucket cylinder fully extended.
3. Stop engine.

CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. Relieve pressure by pushing pressure release button (1).

4. To relieve pressure, push the pressure release button (1).
5. Use 5 mm hex wrench to remove cap screws (3).
6. Remove cover.

Specification

<table>
<thead>
<tr>
<th>Hydraulic Tank—Oil Capacity</th>
<th>135 L</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 gal</td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page
7. Open ball valve (4). Allow oil to drain into a container. Dispose of waste oil properly.

4— Ball Valve

8. Remove cover (2) with suction screen.

1— Pressure Release Button  2— Hydraulic Oil Tank Cover

NOTE: The hydraulic oil filter and pilot oil filter can be changed at this point in the procedure. See Maintenance—Every 1000 Hours. (Section 3-11.)

10. Install suction screen with cover. Suction screen must seal against outlet pipe in bottom of tank. If necessary, loosen nut (2) to adjust rod length.

11. Close ball valve and bottom guard.

12. Add oil until it is between marks on sight glass.

Specification

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suction Screen Rod (1)</td>
<td>Length: 869 mm</td>
</tr>
<tr>
<td></td>
<td>34.2 in.</td>
</tr>
<tr>
<td>Suction Screen Rod Nut</td>
<td>Torque: 17 N·m</td>
</tr>
<tr>
<td></td>
<td>150 lb-in.</td>
</tr>
<tr>
<td>Hydraulic Cover Cap Screw</td>
<td>Torque: 49 N·m</td>
</tr>
<tr>
<td></td>
<td>36 lb-ft</td>
</tr>
</tbody>
</table>

Continued on next page
**IMPORTANT:** If the hydraulic pump is not filled with oil, it will be damaged when the engine is started.

13. Remove air bleed plugs (3) from hydraulic pump until oil flows from bleed holes.
15. Check oil level in sight glass. Add oil if necessary. Install and tighten tank cover.
16. Purge air from cylinders and swing motor by cycling hydraulic functions.

3—Bleed Plug

---

**Replace Hydraulic Tank Vent Cap Filter**

⚠️ **CAUTION:** To prevent possible burn injury from hot hydraulic oil, wait for hydraulic oil to cool before starting work.

1. Park machine on solid level surface as shown at right. Stop engine.

⚠️ **CAUTION:** High pressure release of oil from pressurized system can cause serious burns or penetrating injury. Relieve by pushing **pressure release button (1).**

2. Push the pressure release button (1) on top of the hydraulic oil tank cover (2).

1—Pressure Release Button 2—Hydraulic Oil Tank Cover

---

Continued on next page
3. Remove rubber pressure release button.

4. Remove bolt under the pressure release button, and then remove hydraulic tank vent cap filter cover (2) by turning counterclockwise.

5. Remove vent cap filter (3). Install new filter.

**IMPORTANT:** Do not allow water and/or contaminants to stay between cover (2) and body (4).

6. Reinstall filter cover until it comes in contact with the filter element. Then, further tighten the cover 1/4 turn.

7. Reinstall bolt, and securely install rubber pressure release button.

1—Pressure Release Button  
2—Hydraulic Tank Vent Cap Filter Cover  
3—Vent Cap Filter  
4—Body
Drain Cooling System

**IMPORTANT:** Avoid mixing different brands or types of coolant. Coolant manufacturers engineer their coolants to meet certain specifications and performance requirements. Mixing different coolant types can degrade coolant and machine performance.

John Deere COOL-GARD™ II Pre-Mix coolant is recommended when adding new coolant to cooling system.

Follow directions on container for correct mixture ratio.

Drain and flush cooling system using commercial products, replace radiator cap, and refill with new coolant.

1. Check coolant hoses for cracks and leaks. Replace if necessary.
2. Tighten clamps.
3. Check radiator and oil cooler for dirt, grease, leaks, and loose or broken mountings. Clean radiator and oil cooler fins.

**CAUTION:** Prevent possible injury from hot spraying water. **DO NOT** remove surge tank cap (1) unless engine is cool. Then remove cap slowly.

4. Remove surge tank cap to relieve pressure.

**Specification**

<table>
<thead>
<tr>
<th>Cooling System—Capacity</th>
<th>39.7 L</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10.5 gal</td>
</tr>
</tbody>
</table>

COOL-GARD is a trademark of Deere & Company

5. Remove cover from underside of machine to access radiator drain valve (1).
6. Turn radiator drain valve (1) counterclockwise to open. Allow coolant to drain into a container. Dispose of waste coolant properly.
7. Close radiator drain valve.

1—Radiator Drain Valve

Continued on next page
8. Turn engine block coolant drain plug (2) counterclockwise to drain engine block. Drain coolant into a container. Dispose of waste properly.


2—Engine Block Coolant Drain Plug
Cooling System Fill and Deaeration Procedure

CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns. Shut off engine. Only remove radiator cap when cool enough to touch with bare hands. Slowly loosen radiator cap to relieve pressure before removing completely.

Specification
Cooling System—Capacity................................................................. 39.7 L
10.5 gal.

IMPORTANT: Use only permanent-type low silicate ethylene glycol base antifreeze in coolant solution. Other types of antifreeze may damage cylinder seals.

John Deere COOL-GARD™ II Pre-Mix coolant is recommended when adding new coolant to cooling system. Follow directions on container for correct mixture ratio.

FREEZING TEMPERATURES: Fill with permanent-type, low silicate, ethylene glycol antifreeze (without stop-leak additive) and clean, soft water.

1. Remove cap from top tank (deaeration tank) of cooling system.
2. Remove EGR cooler vent plug (A) from rear of cooler.
3. Fill high pressure coolant circuit at top tank.
4. Begin filling coolant surge tank (if equipped).
5. When air is purged and coolant is visibly coming out of vent hole on EGR cooler, install EGR cooler vent plug and tighten to specification.

Specification
EGR Cooler Vent Plug to Cooler—Torque.......................................................... 20 N·m 
15 lb-ft

6. Complete filling coolant surge tank (if equipped) to Full Hot mark.

NOTE: Coolant level in surge tank will drop the first few cycles unless there is a leak.

7. Install top tank (deaeration) cap.

Deaeration
The cooling system requires several warm-up and cool down cycles to deaerate. It will NOT deaerate during normal operation. Only during warm-up and cool down cycles will the system deaerate.

1. Start engine. Run engine until coolant reaches a warm temperature.
2. Stop engine. Allow coolant to cool.
3. Check coolant level at surge tank.
4. Repeat Steps 1—3 until surge tank coolant level is repeatedly at the same level (stabilized).

NOTE: The level of the coolant in the cooling system MUST BE repeatedly checked after all drain and refill procedures to ensure that all air is out of the system which allows the coolant level to stabilize. Check coolant level only when the engine is cold.

5. If necessary, fill surge tank to above the MIN COLD mark.
6. Install surge tank and cap.
Cleaning Radiator, Oil Cooler, Charge Air Cooler and Fuel Cooler

**CAUTION:** Prevent possible injury from rotating fan and flying debris. Shut off engine before opening cover. Avoid rotating fan and fan blast.

1. Turn machine off.
2. Open the engine cover and the fan access cover (1).
3. Attach an air wand to an air compressor and blow dirt and debris back through cooling system.
4. Close fan access cover and engine cover.
5. Open left rear access door.
6. Remove bolts (2) and swing out the A/C condenser (3).
7. Use compressed air to clean out the heat exchanger (4).
8. Swing A/C condenser back and reinstall bolts.
9. Close left rear access door.

---

If machine is equipped with a Hydraulic Reverse Fan Function use the reverse cooling fan switch to clean the cooling system.

The reversing cooling fan switch has 3 positions:

- **AUTO:** Every 60 minutes the radiator cooling fan will automatically reverse direction for 15 seconds without intervention from the operator.
- **OFF:** Fan resumes normal operation.
- **MANUAL:** Fan will reverse direction for 15 seconds when right portion of switch is pressed.

**NOTE:** The reversing fan function shall not be reactivated within one minute of its last completion (this time includes "Automatic" cycle).

---

**Do Not Service or Adjust Injection Nozzles or High Pressure Fuel Pump**

If injection nozzles are not working correctly or are dirty, the engine will not run normally. (See your authorized dealer for service.)

Changing the high pressure fuel pump in any way not approved by the manufacturer will end the warranty. (See your copy of the John Deere warranty on this machine.)

Do not service a high pressure fuel pump that is not operating correctly. (See your authorized high pressure fuel pump service center.)
**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 your authorized dealer.

**Precautions for Alternator and Regulator**

When batteries are connected, follow these rules:

1. Disconnect negative (-) battery cable when you work on or near alternator or regulator.
2. Be sure alternator wires are correctly connected BEFORE you connect batteries.
3. Do not ground alternator output terminal.
4. Do not disconnect or connect any alternator or regulator wires while batteries are connected or while alternator is operating.
5. Connect batteries or a booster battery in the correct polarity (positive [+] to positive [+] and negative [-] to negative [-]).
6. Do not disconnect the batteries when engine is running and alternator is charging.
7. Disconnect battery cables before you connect battery charger to the batteries.
Handling, Checking, and Servicing Batteries Carefully

**CAUTION:** Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

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

Always remove grounded (-) battery clamp first, and replace it last.

Sulfuric acid in battery electrolyte is poisonous. 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.

SERVICEGARD is a trademark of Deere & Company
Using Battery Charger

⚠️ CAUTION: Disconnect battery ground before you charge batteries in the machine to prevent damage to electrical components.

A battery may explode if charged when it is frozen. Warm battery to 16°C (60°F) before charging.

A battery charger may be used as a booster to start engine.

IMPORTANT: DO NOT use battery charger as a booster if a battery has a 1.150 specific gravity reading or lower. Turn off charger before connecting or disconnecting it.

Using Booster Batteries—24-Volt System

Before boost starting, machine must be properly shutdown to prevent unexpected machine movement when engine starts.

⚠️ 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 the batteries are charged in a well ventilated area.

IMPORTANT: The machine electrical system is a 24-volt negative (-) ground. Connect two 12-volt booster batteries together as shown for 24-volts.

1. Connect one end of the positive cable to the positive terminal of the machine batteries (A) and the other end to the positive terminal of the booster batteries (B).
2. Connect one end of the negative cable to the negative terminal of the booster batteries. Connect the other end of the negative cable to the machine frame as far away from the machine batteries as possible.
4. Immediately after starting engine disconnect the end of the negative cable from the machine frame. Then disconnect the other end of the negative cable from the negative terminal of the booster batteries.
5. Disconnect positive cable from booster batteries and machine batteries.

Replacing Batteries

Your machine has two 12-volt batteries with negative (-) ground. Batteries must meet one of the specifications below.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery—Cold Cranking Amps At -18°C (0°F)</td>
<td>800</td>
</tr>
<tr>
<td>Battery—Minutes</td>
<td></td>
</tr>
<tr>
<td>Reserve Capacity At 25 Amps</td>
<td>180</td>
</tr>
</tbody>
</table>

If one battery in a 24-volt system has failed but the other is still good, replace the failed battery with one of the same type. For example, replace a failed maintenance-free battery with a new maintenance-free battery. Different types of batteries may have different rates of charge. This difference could overload one of the batteries and cause it to fail.
Location of Fluid Sampling Test Ports—If Equipped

1—Engine Sample Port  
2—Hydraulic Sample Port

Welding On Machine

**IMPORTANT:** Disconnect battery ground strap or turn battery disconnect switch to “OFF” to prevent voltage spikes through alternator or monitor. Disable electrical power before welding. Turn off main battery switch or disconnect positive battery cable. Separate harness connectors to engine and vehicle microprocessors. Connect welder ground clamp close to each weld area so electrical current does not arc inside any bearings.

Clean the Machine Regularly

Remove any grease, oil, fuel, or debris build-up to avoid possible injury or machine damage.

**IMPORTANT:** Directing pressurized water at electronic/electrical components or connectors, bearings and hydraulic seals, fuel injection pumps or other sensitive parts and components may cause product malfunctions. Reduce pressure and spray at a 45 to 90 degree angle.

High pressure washing (greater than 1379 kPa (13.8 bar) (20 psi)) can damage freshly painted finishes. Paint should be allowed to air dry for 30 days minimum after receipt of machine before cleaning with high pressure. Use low pressure wash operations until 30 days have elapsed. Do not spray heat exchangers at an angle.
## Adding 12—Volt Accessories

**IMPORTANT:** This machine has a 24-volt electrical system. Installing 12-volt accessories without addition of 24-volt to 12-volt converter may cause battery failure.

This machine is equipped with a 12-volt, 8-amp outlet.

When possible, use 24-volt accessories. If 12-volt accessories are added, use a 24-volt to 12-volt converter. Converters are available from your John Deere dealer.

Converter capacity requirements depend on the load of the accessories installed. Follow electronic dealer and manufacturer’s recommendations to determine the capacity of the converter required and its installation requirements. If standard equipment, verify if amperage is adequate for application.

**IMPORTANT:** DO NOT connect an accessory to one battery. Connecting a 12-volt accessory to one battery will cause one battery to overcharge, and the other battery to undercharge, causing battery failure.

## 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 your authorized dealer or visit www.deere.com (browse to Construction, Services and Support, JDLink™).

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## Replacing Fuses

Fuse block 1 and fuse block 2 are located in the fuse box (1) behind the seat.

Remove cover.

**IMPORTANT:** Install fuse with correct amperage rating to prevent electrical system damage from overload.

1—Fuse Box
Fuse (Blade-Type) Color Codes

<table>
<thead>
<tr>
<th>Amperage Rating</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Black</td>
</tr>
<tr>
<td>3</td>
<td>Violet</td>
</tr>
<tr>
<td>4</td>
<td>Pink</td>
</tr>
<tr>
<td>5</td>
<td>Tan</td>
</tr>
<tr>
<td>7-1/2</td>
<td>Brown</td>
</tr>
<tr>
<td>10</td>
<td>Red</td>
</tr>
<tr>
<td>15</td>
<td>Light Blue</td>
</tr>
<tr>
<td>20</td>
<td>Yellow</td>
</tr>
<tr>
<td>25</td>
<td>Natural (white)</td>
</tr>
<tr>
<td>30</td>
<td>Light Green</td>
</tr>
</tbody>
</table>

Fuse Block 1

F1—Work and Drive Lights 20 A Fuse (Marked LAMP)
F2—Windshield Wiper and Washer 10 A Fuse (Marked WIPER)
F3—Air Conditioner and Heater 20 A Fuse (Marked HEATER)
F4—Solenoid 10 A Fuse (Marked SOLENOID)
F5—Travel Alarm 5 A Fuse (Marked OPT. 1)
F6—12 Volt Power Outlet 10 A Fuse (Marked OPT. 2)
F7—Start Aid 20 A Fuse (Marked START AID) (Not Used) (Field Option)
F8—Engine Control Unit (ECU) 20 A Fuse (Marked ECM)
F9—Radio Backup 10 A Fuse (Marked BACK UP)
F10—Information Controller and Main Controller Battery Power 5 A Fuse (Marked C/U)
F11—Radio and Dome Light 5 A Fuse (Marked RADIO)
F12—Lighter 10 A Fuse (Marked LIGHTER)
F13—Cab Auxiliary Power Connector One 10 A Fuse (Marked AUXILIARY)
F14—Not Used
F15—Air Conditioner and Heater 5 A Fuse (Marked AIRCON)
F16—Controller Key Switch Signal 10 A Fuse (Marked POWER ON)
F17—Horn 10 A Fuse (Marked HORN)
F18—Service Advisor Diagnostic Connector Power 5 A Fuse (Marked DIAG)
F19—Controller 5 A Fuse (Marked SW. BOX)
F20—Optional Equipment 5 A Fuse (Marked OPT.3)

Continued on next page
Fuse Block 2

<table>
<thead>
<tr>
<th>Fuse</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>F21</td>
<td>Heated Air Seat 10 A</td>
</tr>
<tr>
<td>F22</td>
<td>Front Cab Light One 10 A</td>
</tr>
<tr>
<td>F23</td>
<td>Rear Cab Light 10 A</td>
</tr>
<tr>
<td>F24</td>
<td>12 Volt Power Unit 10 A</td>
</tr>
<tr>
<td>F25</td>
<td>IMOBI 5 A Fuse (Marked IMOBI)</td>
</tr>
<tr>
<td>F26</td>
<td>Quick Hitch 5 A Fuse (Marked QUICK HITCH)</td>
</tr>
<tr>
<td>F27</td>
<td>Cab Auxiliary Power Connector Three 5 A</td>
</tr>
<tr>
<td>F28</td>
<td>Not Used</td>
</tr>
<tr>
<td>F29</td>
<td>Not Used</td>
</tr>
<tr>
<td>F30</td>
<td>Not Used</td>
</tr>
<tr>
<td>F31</td>
<td>Seat Compressor 10 A</td>
</tr>
<tr>
<td>F32</td>
<td>Front Cab Light Two 10 A</td>
</tr>
<tr>
<td>F33</td>
<td>Warning Lamp 10 A</td>
</tr>
<tr>
<td>F34</td>
<td>Cab Auxiliary Power Connector Two 10 A</td>
</tr>
<tr>
<td>F35</td>
<td>Not Used</td>
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</tr>
<tr>
<td>F39</td>
<td>Not Used</td>
</tr>
<tr>
<td>F40</td>
<td>Not Used</td>
</tr>
</tbody>
</table>

Continued on next page
**JDLink™ In-Line Fuse (If Equipped)**

1. Turn machine off.
2. Open battery compartment access door.
3. Remove cap screws (2) from cover to access the 7.5 Amp JDLink™ unswitched power in-line fuse (1) on the yellow wire.
4. To deactivate the JDLink™ Machine Monitoring System, remove the unswitched power in-line fuse.
5. Install cover and cap screws.
6. Close access door.

**JDLink™ In-Line Fuse**

1— JDLink™ Unswitched Power In-Line Fuse
2— Cap Screws (3 used)
3— JDLink™ Ground In-Line Fuse (7.5 Amp)
4— JDLink™ Switched Power In-Line Fuse (3 Amp)

---

**Replacing Bucket Teeth**

⚠ **CAUTION:** Guard against injury from flying pieces of metal; wear goggles or safety glasses.

**IMPORTANT:** Angle the drift toward the bucket to avoid damaging the rubber pin lock.

1. Use a hammer and drift to drive out locking pin.

**NOTE:** Alternate buckets may use different tooth assemblies.

2. Remove tooth.

---

*JDLink is a trademark of Deere & Company*
3. Inspect rubber pin lock (A) for damage. Replace if necessary.

4. If rubber pin lock has moved, reposition in slot in adapter tooth shank.

   A—Rubber Pin Lock

5. Position the new tooth over the tooth shank.

6. Drive the locking pin into the hole fully.

   NOTE: Check bucket teeth periodically so that wear does not extend to the bucket tooth shank.

   Tooth Shank
Replacing Bucket Tooth Tip—Heavy-Duty Bucket

1. Clean tooth (A) and tooth tip (B).
2. Insert lock removal tool under U-shaped pin (C).

**CAUTION:** Avoid possible injury. Pin may fly after it is released from tooth tip. Keep a firm grip on pin to prevent injury.

3. Remove pin.
4. Turn tooth tip counterclockwise and pull it towards you to remove.
5. Clean tooth shank.
6. Replace U-shaped pin at same time you replace tooth tip.
7. Insert tooth tip on shank turning tip clockwise.
8. Install U-shaped pin. Side of pin marked "FRONT" (D) must face tooth tip. Make sure pin is firmly engaged over tooth tip.

![Bucket Tooth Tip—Heavy-Duty Bucket](image1)

![U-Shaped Pin—Heavy-Duty Bucket](image2)

Removing the Bucket

1. Lower bucket to the ground.
2. Remove snap rings and locking pins.

Track Sag General Information

To maximize undercarriage life, keep track sag within specification. Tracks may require adjustment several times during a working day due to changing soil type and moisture content. Adjust tracks in the actual operating conditions.

**TIGHT TRACK:** Packing causes a tight track. If material packs in the undercarriage, adjust tracks with the material packed in the components.

While the track spring will recoil and the machine can continue to operate with a tight track, continued operation will result in excessive pin and bushing wear, sprocket popping, tooth tip wear, and excessive loads on the entire undercarriage and travel drive system.

Machine productivity and fuel consumption are also adversely affected because increased horsepower is needed to move the machine.

**LOOSE TRACK:** A loose track has more side to side motion, increasing side wear on the links, rollers and front idler. An excessively loose track will slap at high ground speeds, resulting in high impact loads on the sprocket teeth, bushings, and carrier rollers.
### Unified Inch Bolt and Screw Torque Values

**TS1671 — UN — 01MAY03**

<table>
<thead>
<tr>
<th>Bolt or Screw Size</th>
<th>SAE Grade 1</th>
<th>SAE Grade 2</th>
<th>SAE Grade 5, 5.1 or 5.2</th>
<th>SAE Grade 8 or 8.2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lubricated(^a)</td>
<td>Dry(^c)</td>
<td>Lubricated(^a)</td>
<td>Dry(^c)</td>
</tr>
<tr>
<td></td>
<td>N·m</td>
<td>lb.-in.</td>
<td>N·m</td>
<td>lb.-in.</td>
</tr>
<tr>
<td>1/4</td>
<td>3.7</td>
<td>33</td>
<td>4.7</td>
<td>42</td>
</tr>
<tr>
<td>5/16</td>
<td>7.7</td>
<td>68</td>
<td>9.8</td>
<td>86</td>
</tr>
<tr>
<td>3/8</td>
<td>13.5</td>
<td>120</td>
<td>17.5</td>
<td>155</td>
</tr>
<tr>
<td>7/16</td>
<td>22</td>
<td>194</td>
<td>28</td>
<td>20.5</td>
</tr>
<tr>
<td>1/2</td>
<td>34</td>
<td>25</td>
<td>42</td>
<td>31</td>
</tr>
<tr>
<td>9/16</td>
<td>48</td>
<td>35.5</td>
<td>60</td>
<td>45</td>
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<td>265</td>
</tr>
<tr>
<td>1-1/8</td>
<td>400</td>
<td>300</td>
<td>510</td>
<td>375</td>
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<td>1-1/4</td>
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<td>1-1/2</td>
<td>990</td>
<td>730</td>
<td>1250</td>
<td>930</td>
</tr>
</tbody>
</table>

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For plastic insert or crimped steel type lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application. Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Replace fasteners with the same or higher grade. If higher grade fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

\(^a\)Grade 2 applies for hex cap screws (not hex bolts) up to 6 in. (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

\(^b\)“Lubricated” means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

\(^c\)“Dry” means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B, F13E or F13H zinc flake coating.
### Metric Bolt and Screw Torque Values

**TS1670 — UN — 01MAY03**

<table>
<thead>
<tr>
<th>Bolt or Screw Size</th>
<th>Class 4.8</th>
<th>Class 8.8 or 9.8</th>
<th>Class 10.9</th>
<th>Class 12.9</th>
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<td>Dry</td>
<td>Lubricated</td>
<td>Dry</td>
</tr>
<tr>
<td></td>
<td>N·m</td>
<td>lb.-in.</td>
<td>N·m</td>
<td>lb.-in.</td>
</tr>
<tr>
<td>M6</td>
<td>4.8</td>
<td>42</td>
<td>6</td>
<td>53</td>
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<tr>
<td></td>
<td>8.8</td>
<td>79</td>
<td>11.3</td>
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Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. 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 fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

"Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.
Bleed the Fuel System

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting fuel or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles that eject fluids under high pressure. Use a piece of cardboard or paper to search for leaks. Do not use your hand.

If ANY fluid is injected into the skin, a doctor familiar with this type of injury must surgically remove it within a few hours or gangrene may result. Doctors unfamiliar with this type of injury may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

NOTE: Whenever the fuel system has been opened up for service (lines disconnected or filters removed), or if machine has run out of fuel, it will be necessary to bleed air from the system.

1. Turn key to the ON position.
2. Wait two minutes.
3. Turn key to the OFF position.
4. Turn key back to the ON position.
5. Wait two minutes.
Operational Checkout

Use this procedure to check all systems and functions on the machine. It is designed so you can make a quick check of machine operation while doing a walk around inspection and performing specific checks from the operator’s seat.

Should you experience a problem with your machine, you will find helpful diagnostic information in this checkout that will pinpoint the cause. This information may allow you to perform a simple adjustment yourself which will reduce the down time of your machine. Use the table of contents to help find adjustment procedures.

The information you provide after completing the operational checkout will allow you or your authorized dealer to pinpoint a specific test or repair needed to restore the machine to design specifications.

A location will be required which is level and has adequate space to complete the checks. No tools or equipment are needed to perform the checkout.

Complete the necessary visual checks (oil levels, oil condition, external leaks, loose hardware, linkage, wiring, etc.) prior to doing the checkout. The machine must be at operating temperature for many of the checks.

Start at the top of the left column and read completely down column before performing check. Follow this sequence from left to right. In the far right column, if no problem is found, you will be instructed to go to next check. If a problem is indicated, you will be referred to either a section in this manual or to your authorized dealer for repair.

Operational Checks—Key Switch Off, Engine Off Checks

Horn Circuit Check

Key switch Off.

Push horn button (A) on top of left pilot control lever.

LISTEN: Does horn sound?

YES: Go to next check.
NO: Check horn 10 A fuse (F17).

NO: See your authorized dealer.
Hour Meter and Fuel Gauge Check

1—Hour Meter
14—Hour Meter Button

Press and hold hour meter button (14) until default screen appears.

LOOK: Does hour meter (1) display machine hours?
YES: Go to next check.
NO: Check controller 5 A fuse (F19).

LOOK: Does fuel gauge display correct fuel level?
Monitor Start Up Check

1—Alternator Alarm Indicator

Turn key switch to ON position.

LOOK: Does monitor display system starting screen?

LOOK: Does default screen with hour meter appear?

LOOK: Does alternator alarm indicator (1) appear on default screen?

YES: Go to next check.

NO: Check controller 5 A fuse (F19).
Monitor, Gauges and Battery Disconnect Relay Checks

- Work Mode Indicator
- Auto-Idle Indicator
- Engine Coolant Temperature Gauge
- F1 Function Button Indicator
- Fuel Gauge
- Hour Meter

**NOTE:** If engine coolant temperature is below 30°C (86°F) engine temperature gauge needle may not move.

Turn key switch to ON.

**LISTEN:** Does battery relay click?

**LOOK:** Does engine coolant temperature gauge (3) display correct engine coolant temperature?

**LOOK:** Does fuel gauge (5) display correct fuel level?

**LOOK:** Does hour meter (6) display machine hours?

**LOOK:** Do work mode indicator (1) and F1 function button indicator (4) display correct work mode (dig or attachment)?

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Travel Lever and Pedal Neutral Checks

A—Travel Lever and Pedal Forward
B—Travel Lever and Pedal Reverse

Push both travel levers and pedals forward (A), then release.

Pull both travel levers and pedals rearward (B), then release.

**FEEL:** Do levers and pedals require equal effort to operate in forward and reverse?

**LOOK:** Do levers and pedals return to neutral at the same time when released?

**YES:** Go to next check.

**NO:** See your authorized dealer.
Light Circuit Checks

5—Work Light Switch
6—Windshield Wiper and Washer Switch

Turn work light switch (5) to 1st position.

LOOK: Are monitor panel back lights and drive lights on?

YES: Go to next check.
NO: Check work and drive lights 20 A fuse (F1) and controller 5 A fuses (F19).

Turn light switch to 2nd position.

LOOK: Do monitor panel back lights and drive lights remain on and boom work lights come on?

IF OK: See your authorized dealer.

Windshield Wiper Controls Check

5—Work Light Switch
6—Windshield Wiper and Washer Switch

NOTE: Front window must be fully closed and latched for this check.

Turn wiper switch (6) to first INT position.

LOOK: Does wiper operate intermittently?

YES: Go to next check.
NO: Check windshield wiper and washer 10 A fuse (F2).

Turn wiper switch to second INT position.

LOOK: Does wiper operate intermittently, but faster than when in first position?

Turn wiper switch to third INT position.

LOOK: Does wiper operate intermittently, but faster than when in second position?

Turn wiper switch to ON position.

LOOK: Does wiper operate continuously?

Move wiper switch to OFF position.

LOOK: Does wiper arm stop in park position at left side of windshield?
## Windshield Washer Circuit Check

**IMPORTANT:** Washer motor may be damaged if washer switch is held for more than 20 seconds, or continually operated with no fluid in the washer fluid tank.

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<td>6</td>
<td>Windshield Wiper and Washer Switch</td>
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**NOTE:** Front window must be fully closed and latched for this check.

Push washer switch (6)

**LOOK:** Is washer fluid supplied to windshield?

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**YES:** Go to next check.

**NO:** Check washer fluid level. See Windshield Washer Fluid Level.

**NO:** Check windshield wiper and washer 10 A fuse (F2).

**IF OK:** See your authorized dealer.

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*Continued on next page*
Windshield Wiper Circuit Check

1—Lock Pin
2—Lock Release Bar

NOTE: The wiper cannot operate with the upper front window open. The washer can operate with the upper front window open. When closing window, check that window upper left corner makes good contact with the cab.

Slide lock pin (1) inward, then down into notch.
Pull lock release bar (2) toward operator.
While holding lower handle on window, pull window up and back as far as it can go.

⚠️ CAUTION: Prevent possible injury from window closing. Always lock the pin in the cab frame boss hole.

Slide lock pin into cab frame boss hole and rotate downward into the lock position.
Turn windshield wiper (6) ON.

LISTEN: Does wiper circuit click?
LOOK: Does wiper remain stationary in park position?

⚠️ CAUTION: Prevent possible injury from window closing. Upper front window comes down very forcefully. Close window only when sitting on operator’s seat. Guide window down slowly.

Operational Checks—Key Switch On, Engine On Checks

Continued on next page
Monitor and Gauge Circuit Checks

1—Work Mode Indicator
2—Hour Meter
3—Engine Coolant Temperature Gauge
4—Fuel Gauge
5—Engine Oil Pressure Alarm Indicator
6—Alternator Alarm Indicator
7—Alarm Light

IMPORTANT: Stop the engine immediately if alarm light (7) or engine oil pressure alarm indicator (5) comes on after engine starts.

Start engine.

LOOK: Does alternator alarm indicator (6) display then go off after engine starts?

LOOK: Do all alarm indicators remain off after engine starts?

LOOK: Does engine coolant temperature gauge (3) display correct engine coolant temperature?

LOOK: Does fuel gauge (4) display correct fuel level?

Continued on next page
Pilot Shutoff Circuit Check

CAUTION: Machine may move during this check. Make sure area is clear and large enough to operate all machine functions.

Turn engine speed dial (1) to slow idle (L) position.
Place pilot shutoff lever in LOCKED (rearward) position.
Slowly actuate dig and travel functions.

YES: See your authorized dealer.

LOOK: Do dig and travel functions operate?

NO: Continue check.

Place pilot shutoff lever in UNLOCKED (forward) position.
Slowly actuate dig and travel functions.

YES: Go to next check.
NO: See your authorized dealer.

Continued on next page
**Engine Speed Dial Check**

1 — Engine Speed Dial  
2 — Auto-Idle Switch  
3 — Power Mode Switch

Turn auto-idle switch (2) to A/I OFF.  
Place pilot shutoff lever in LOCKED (rearward) position.  
Turn engine speed dial (1) clockwise.  
LISTEN: Does engine speed increase?  
Turn engine speed dial (1) counterclockwise.  
LOOK/LISTEN: Does engine speed decrease?

**YES:** Go to next check.  
**NO:** Check controller 5A fuse (F19).  
**IF OK:** See your authorized dealer.
**P (Power) Mode Circuit Check**

1— Engine Speed Dial
2— Auto-Idle Switch
3— Power Mode Switch
4— Travel Speed Switch

Turn engine speed dial (1) to fast idle (H) position.
Turn power mode switch (3) to P (power) mode.
Turn auto-idle switch (2) to A/I OFF.
Turn travel mode switch (4) to fast (rabbit) mode.
Place pilot shutoff lever in UNLOCKED (forward) position.
Slowly actuate any dig function.

**LISTEN/LOOK:** Does engine speed remain at fast idle?
Slowly actuate travel function.

**LOOK/LISTEN:** Does engine speed remain at fast idle?
Turn travel mode switch to slow (turtle) position.
Slowly actuate travel function.

**LOOK/LISTEN:** Does engine speed decrease when travel function is actuated?

**NOTE:** Engine should return to fast idle after several seconds when travel pedals are returned to neutral.

*Continued on next page*
E (Economy) Mode Check

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch
4—Travel Speed Switch

Turn power mode switch (3) to P (power) mode.
Turn auto-idle switch (2) A/I OFF.
Turn engine speed dial (1) to fast idle (H) position.
Turn power mode switch (3) to E (economy) mode.
LOOK/LISTEN: Does engine speed decrease?
Turn power mode switch (3) to P (power) mode.
LOOK/LISTEN: Does engine speed increase?

YES: Go to next check.
NO: See your authorized dealer.
P (Power) Mode Check

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch
4—Travel Speed Switch

Turn power mode switch (3) to P (power) mode.
Turn auto-idle switch (2) to A/I OFF.
Turn engine speed dial (1) to fast idle (H) position.
Turn power mode switch (3) to E (economy) mode.

LOOK/LISTEN: Does engine speed decrease?

Turn power mode switch (3) to P (power) mode.

LOOK/LISTEN: Does engine speed increase?

YES: Go to next check.
NO: See your authorized dealer.
HP (High Power) Mode Check

1— Engine Speed Dial
2— Auto-Idle Switch
3— Power Mode Switch
4— Travel Speed Switch

Turn power mode switch (3) to P (power) mode.
Turn auto-idle switch (2) to A/I OFF.
Turn engine speed dial (1) to fast idle (H) position.
Turn power mode switch (3) to HP (high power) mode.
Actuate arm in function over relief.

LOOK/LISTEN: Does engine speed increase as function goes over relief?

YES: Go to next check.
NO: Check controller 5 A fuse (F19).

NO: See your authorized dealer.
Auto-Idle Circuit Check

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch

Turn engine speed dial (1) to fast idle (H) position.
Turn power mode switch (3) to HP (high power) mode.
Turn auto-idle switch (2) to A/I OFF.
Place pilot shutoff lever to UNLOCKED position.
Turn auto-idle switch (2) to A/I ON.

LOOK/LISTEN: Does auto-idle indicator (2) illuminate?
Does engine speed decrease after 4—6 seconds?
Slowly actuate dig function.

LOOK/LISTEN: Does engine speed return to fast idle?

YES: Go to next check.

NO: Check solenoid 10 A fuse (F4).

Continued on next page
Travel Alarm Check

T7850AF —UN—22OCT92

A—Pilot Shutoff Lever
B—Travel Lever and Pedal Forward
C—Travel Lever and Pedal Rearward

⚠️ CAUTION: Machine will move during this check. Make sure area is clear and large enough to operate the machine.

Place pilot shutoff lever (A) to UNLOCKED position (forward).
Push travel pedals or levers forward (B).
LISTEN: Does travel alarm sound?
Push travel pedals or pull levers rearward (C).
LISTEN: Does travel alarm sound?

YES: Go to next check.
NO: Check travel alarm 5 A fuse (F5).

Travel Alarm Cancel Switch Circuit Check

TX1000876 —UN—03DEC05

1—Travel Alarm Cancel Switch

⚠️ CAUTION: Machine will move during this check. Make sure area is clear, and large enough to operate the machine.

NOTE: Travel alarm must operate for this check.
Place pilot shutoff lever (A) to UNLOCKED position (forward).
Push travel pedals or levers and allow travel alarm to operate for a minimum of 12 seconds.
LISTEN: Does travel alarm sound?
While continuing travel, push travel alarm cancel switch (A).
LISTEN: Does travel alarm stop sounding?

YES: Go to next check.
NO: Check travel alarm 5 A fuse (F5).

See your authorized dealer.
Hydraulic Oil Tank Pressurization Check

1—Hydraulic Oil Tank Pressure Release Button
2—Hydraulic Oil Tank Cover

Raise boom to full height, then lower boom to ground.
Slowly depress pressure release button on hydraulic oil tank cover.
LISTEN: Is air heard escaping from the pressure release button on hydraulic oil tank cover?

YES: Go to next check.
NO: Replace hydraulic oil tank cover.

IMPORTANT: The pressurized oil tank creates pressure at the inlet to the hydraulic pumps. If tank cover does not seal, hydraulic pumps could cavitate and be damaged.

Control Lever Pattern Check—Backhoe Pattern

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch

CAUTION: Machine will move during this check. Make sure area is clear, and large enough to operate the machine.
Locate pilot control lever pattern decal on right window. Become familiar with excavator and backhoe pattern functions.

Turn engine speed dial (1) to slow idle (L) position.
Place pilot shutoff lever (A) to UNLOCKED position (forward).
Slowly actuate pilot control levers to all positions shown on decal.
LOOK: Do functions operate as expected in backhoe pattern?

YES: Go to next check.
NO: See your authorized dealer.
Control Lever Pattern Check—Excavator Pattern

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch

CAUTION: Machine will move during this check. Make sure area is clear, and large enough to operate the machine.

Locate pilot control lever pattern decal on right window. Become familiar with excavator and backhoe pattern functions.

- Turn engine speed dial (1) to slow idle (L) position.
- Place pilot shutoff lever (A) to UNLOCKED position (forward).
- Slowly actuate pilot control levers to all positions shown on decal.

LOOK: Do functions operate as expected in excavator pattern?

YES: Go to next check.
NO: See your authorized dealer.
CAUTION: Make sure area is clear and large enough to swing extended arm and bucket. Machine must be on level ground.

Position upper structure with boom to the front. Move arm to the extended position, bucket to the retracted position, and bucket-to-arm pivot pin at same level as boom-to-frame pivot pin. Turn engine speed dial (1) to fast idle (H) position. Turn power mode switch (3) to P (power) mode. Fully actuate swing function. Swing clockwise 90 degrees and then release lever. 

**LOOK:** Does upperstructure stop within 45 degrees (1/8 turn) or less after releasing lever?

Position upper structure with boom to the front. Fully actuate swing function. Swing counterclockwise 90 degrees and then release lever. **LOOK:** Does upperstructure stop within 45 degrees (1/8 turn) or less after releasing lever?

**YES:** Go to next check.

**NO:** See your authorized dealer.
Swing Park Brake and Circuit Drift Check

Fill the bucket with dirt.
Position machine on a side hill with a slope of approximately 25%. If a hill is not available, raise one side of machine approximately 300 mm (1 ft) with the boom and then put a block under the track.
Move arm to the fully extended position.
Raise boom so arm-to-bucket pivot pin are the same height as boom-to-frame pivot pin.
Position upper structure with cab over travel motors, perpendicular to tracks.
Turn engine speed dial (1) to slow idle (L) position.
Wait approximately 5 minutes with all functions in neutral.
NOTE: Function does not need to be fully actuated to disengage the swing park brake.
Slowly actuate bucket load function to disengage the swing park brake. Do not hold the function over relief for more than 10 seconds.

LOOK: Does upper structure hold position when swing park brake is engaged?
LOOK: Does upper structure move only slightly when swing park brake is disengaged?

Swing upper structure 180 degrees counterclockwise and repeat procedure.
Turn engine speed dial (1) to slow idle (L) position.
Wait approximately 5 minutes with all functions in neutral.
Slowly actuate bucket load function to disengage the swing park brake. Do not hold the function over relief for more than 10 seconds.

LOOK: Does upper structure hold position when swing park brake is engaged?
LOOK: Does upper structure move only slightly when swing park brake is disengaged?

YES: Go to next check.
NO: See your authorized dealer.
Swing Power Check

Fill the bucket with dirt.

Position machine on a hill side with a slope of approximately 25%. If a hill is not available, raise one side of machine approximately 300 mm (1 ft) with the boom and then put a block under the track.

Move arm to the fully extended position. Raise boom so arm-to-bucket pivot pin are the same height as boom-to-frame pivot pin.

Swing upperstructure clockwise so it's 90 degrees to the slope

Turn engine speed dial (1) to fast idle (H) position.

Turn power mode switch (3) to HP (high power) mode.

Actuate the swing function to swing up hill.

LOOK: Does upperstructure swing up hill?

Swing upperstructure 180 degrees counterclockwise and repeat procedure.

Turn engine speed dial (1) to fast idle (H) position.

Power mode switch (3) in HP (high power) mode.

Actuate the swing function to swing up hill.

LOOK: Does upperstructure swing up hill?

YES: Go to next check.

NO: See your authorized dealer.
Dig Function Drift Check

Fill bucket with dirt.

Position bucket at maximum reach with bucket pivot pin the same height as boom pivot pin.

Retract arm cylinder, then extend about 2 inches

Extend bucket cylinder then retract about 2 inches.

Stop engine.

Measure amount cylinders extend or retract in 5 minutes.

Measure distance from bottom of bucket to ground.

Compare measurements to specifications.

350DLC—Specification

Boom Cylinder—Drift ................................................................. 20 mm

Arm Cylinder—Drift ................................................................. 30 mm

Bucket Cylinder—Drift .............................................................. 20 mm

Bottom of Bucket-to-Ground—Drift .......................................... 150 mm

Yes: Go to next check.

No: See your authorized dealer.

LOOK: Is cylinder drift within specification?
Swing Priority Circuit Check

CAUTION: Perform check in an open area away from other machinery or personnel.

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch

Position machine as shown.
Turn engine speed dial (1) to fast idle (H) position.
Turn power mode switch (3) to P (power) mode.
Operate swing function and record time required for three complete revolutions.
Divide that time by three to get an average time for one revolution.

Specification
Swing Function—Time—One Revolution.................................................. 5.4—6.1 seconds

IMPORTANT: Position machine as shown. Operate swing and arm in slowly a few times before attempting to perform check to ensure bucket does not contact machine or ground.

Position machine as shown, arm extended, bucket curled and upper structure 90 degrees to tracks.
Turn engine speed dial (1) to fast idle (H) position.
Turn power mode switch (3) to P (power) mode.
Raise boom high enough so bucket does not contact the machine or ground during arm in and swing combined operation.
Operate swing function and slowly actuate arm in function when upper structure is in line with tracks. Record time required for one complete revolution.

NOTE: Swing speed should not slow when actuating arm in.

LOOK: Does swing speed remain unchanged when actuating arm in?

YES: Go to next check.
NO: See your authorized dealer.
Control Valve Lift Check Test

1—Engine Speed Dial
Turn engine speed dial (1) to slow idle to (L) position.
Position machine as shown.
Slowly lower boom, extend arm (retract cylinder), and dump bucket (retract cylinder).

LOOK: Do functions move in opposite direction as pilot control levers are first moved, then change direction as levers are moved further?

YES: See your authorized dealer.
NO: Go to next check.

Boom Up, Arm In, and Bucket Combined Function Operation Check

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch
Turn engine speed dial (1) to fast idle (H) position.
Turn power mode switch (3) to P (power) mode.
Actuate boom up function, arm in function and then bucket function in combination.

LOOK: Does boom continue to move at approximately the same speed after bucket function is actuated?

YES: Go to next check.
NO: See your authorized dealer.
Boom Regenerative Valve Operation Check

1— Engine Speed Dial
2— Auto-Idle Switch
3— Power Mode Switch

Turn engine speed dial (1) to fast idle (H) position.
Turn power mode switch (3) to P (power) mode.
Raise boom and extend the arm to full extension.
Actuate the boom down, then arm in and boom up functions in combined operation.

LOOK: Does the boom move smoothly through the complete cycle down and up and not hesitate when it goes past the vertical position?

YES: Go to next check.
NO: See your authorized dealer.

Arm Regenerative Valve Operation Check

1— Engine Speed Dial
2— Auto-Idle Switch
3— Power Mode Switch

Turn engine speed dial (1) to fast idle (H) position.
Turn power mode switch (3) to P (power) mode.
Extend the arm to full extension and then lower boom so bucket is on the ground.
Actuate the boom up and arm in functions in combined operation.

LOOK: Does the arm move smoothly through the complete cycle and not hesitate when it goes through the vertical position?

YES: Go to next check.
NO: See your authorized dealer.
Bucket Regenerative Valve Operation Check

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch

Turn engine speed dial (1) to fast idle (H) position.

Turn power mode switch (3) to P (power) mode.

Actuate boom up, arm out and bucket dump functions.

Actuate boom down function, arm in function and then the bucket curl function.

LOOK: Does the bucket move smoothly through the complete cycle and not hesitate when it goes to the curl position?

YES: Go to next check.

NO: See your authorized dealer.

Travel Speed Selection Check

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch
4—Travel Speed Switch

Turn engine speed dial (1) to fast idle (H) position.

Turn travel speed switch (4) to slow speed (turtle) mode.

Actuate travel function to full speed.

Turn travel speed switch (4) to fast speed (rabbit) mode.

LOOK: Does machine travel speed increase?

Actuate a dig function and then return to neutral.

LOOK: Does machine travel speed decrease and then increase as dig function is actuated and then released?

Turn travel speed switch (4) to slow speed (turtle) mode.

LOOK: Does machine travel speed decrease?

YES: Go to next check.

NO: See your authorized dealer.
Travel System Tracking Check

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch
4—Travel Speed Switch

Turn engine speed dial (1) to fast idle (H) position.

Turn power mode switch (3) to P (power) mode.

Turn travel speed switch (4) to fast speed (rabbit) mode.

5—Distance of Mistrack
6—Acceleration and Deceleration Zone (approximately): 3—5 m (10—16 ft.)
7—Test Line (distance): 20 m (66 ft.)
8—Track Print

Operate machine at full travel forward speed on a flat and level surface approximately 30 m (99 ft.).

**NOTE:** When machine mistracks right, hydraulic pump 1 circuit oil flow may be less than specification. When machine mistracks left, hydraulic pump 2 circuit oil flow may be less than specification.

Observe direction of mistrack.

Create a straight test line 20 m (66 ft.) (7) long between two points on track print (8).
Measure and record greatest distance of mistrack (5) between inside edge of track print and test line.
Repeat procedure in reverse travel.
LOOK: Does machine mistrack less than 200 mm (7 7/8 in.)?

YES: Go to next check.
NO: See your authorized dealer.

Travel System Tracking Checks While Operating a Dig Function

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch
4—Travel Speed Switch

NOTE: Machine will slow down during this test.
Turn engine speed dial (1) to fast idle (H) position.
Turn travel speed switch (4) to fast speed (rabbit) mode.
Operate machine at full speed forward on a flat and level surface.
After machine is moving, actuate arm out from neutral to full actuation and extend the arm.

LOOK: Does machine mistrack excessively when the arm is extended?

YES: See your authorized dealer.
NO: Go to next check.

Continued on next page
Travel System Maneuverability Check

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch
4—Travel Speed Switch

Turn engine speed dial (1) to fast idle (H) position.
Turn travel speed switch (4) to fast speed (rabbit) mode.
Drive machine at full speed forward down a slope.
Turn in each direction.

LOOK: Does each track slow down in response to pedal or lever movement in order to turn?

Repeat the procedure in reverse travel.
Turn travel speed switch (4) in fast speed (rabbit) mode.
Drive machine at full speed in reverse down a slope.
Turn in each direction.

LOOK: Does each track slow down in response to pedal or lever movement in order to turn?

YES: Go to next check.
NO: See your authorized dealer.
Cycle Times Check

CAUTION: Prevent possible injury from unexpected machine movement. Clear all persons from the area before operating machine.

NOTE: Warm hydraulic oil to operating temperature for this check.

1—Engine Speed Dial
2—Auto-Idle Switch
3—Power Mode Switch

Turn engine speed dial (1) to fast idle (H) position.
Turn auto-idle switch (2) A/I OFF.

Boom

Move machine to position shown for each test.
Record cycle time for each function.

Arm, Bucket, Swing
<table>
<thead>
<tr>
<th>Specification</th>
<th>YES: Go to next check.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boom Raise (Cylinder Extend)—Cycle Time (Seconds)</td>
<td>3.0—3.6</td>
</tr>
<tr>
<td>Boom Lower (Cylinder Retract)—Cycle Time (Seconds)</td>
<td>1.9—2.5</td>
</tr>
<tr>
<td>Arm In (Cylinder Extend)—Cycle Time (Seconds)</td>
<td>3.2—3.8</td>
</tr>
<tr>
<td>Arm Out (Cylinder Retract)—Cycle Time (Seconds)</td>
<td>3.4—4.0</td>
</tr>
<tr>
<td>Bucket Load (Cylinder Extend)—Cycle Time (Seconds)</td>
<td>3.3—3.9</td>
</tr>
<tr>
<td>Bucket Dump (Cylinder Retract)—Cycle Time (Seconds)</td>
<td>2.1—2.7</td>
</tr>
<tr>
<td>Swing Left or Right, 3 Revolutions From a Running Start—Cycle Time (Seconds)</td>
<td>16.3—18.3</td>
</tr>
<tr>
<td>Drive 20 m (65 ft) From A Running Start—Cycle Time (Seconds)</td>
<td>12.0—14.4</td>
</tr>
<tr>
<td>Drive 20 m (65 ft) From A Running Start—Cycle Time (Seconds)</td>
<td>20.6—24.6</td>
</tr>
<tr>
<td>Track Raised For 3 revolutions From A Running Start—Cycle Time (Seconds)</td>
<td>32.8—36.8</td>
</tr>
</tbody>
</table>

**LOOK:** Does machine perform within specifications?

**NO:** See your authorized dealer.
Start engine and warm to normal operating temperature.

Press temperature control switch to maximum heat position.

**FEEL:** Does warm air come from the vents?

Press temperature control switch to maximum cold position.

**LISTEN:** Does air conditioner compressor clutch solenoid “click”?

**FEEL:** Does cool air come from the vents?

**YES:** Check complete.

**NO:** Heater does not operate. Check air conditioner and heater 20 A fuse (F3).

**IF OK:** See your authorized dealer.
Heater And Air Conditioner Controls Check (Automatic Temperature Control)

Key ON, press OFF switch (5).
Start engine and warm to normal operating temperature.
Press AUTO switch (4).

LISTEN: Does air conditioner compressor clutch solenoid “click”? 
LOOK: Does indicator light above A/C and AUTO switches illuminate?
LOOK: Does monitor display illuminate and display vent position, fan speed, and temperature setting?
Press temperature control switch to maximum heat position.

FEEL/LISTEN: Does vent position change?
LOOK: Does fan speed change to maximum and temperature setting increase?
LOOK: Does full heat (FH) appear in the temperature setting area?
FEEL: Does warm air come from the vents?
Press temperature control switch to maximum cold position.

FEEL/LISTEN: Does vent position change?
LOOK: Does fan speed change to maximum and temperature setting decrease?
LOOK: Does full cool (FC) appear in the temperature setting area?
FEEL: Does cool air come from the vents?
Press A/C switch.

LISTEN: Does air conditioner compressor clutch solenoid “click”? (Heater is ON in manual mode.) 
LOOK: Do indicator lights above A/C and AUTO switches go OFF?
Press temperature control switch to maximum heat position.

FEEL/LISTEN: Does vent position change?
LOOK: Does fan speed change to maximum and temperature setting increase?
LOOK: Does full heat (FH) appear in the temperature setting area?
FEEL: Does warm air come from the vents?
Press A/C switch.

LISTEN: Does air conditioner compressor clutch solenoid “click”? (Air conditioner and heater are ON in manual mode.) 
Press temperature control switch to maximum cold position.

FEEL/LISTEN: Does vent position change?
LOOK: Does fan speed change to maximum and temperature setting decrease?
LOOK: Does full cool (FC) appear in the temperature setting area?
FEEL: Does cool air come from the vents?

YES: Check complete.
Press OFF switch.

LOOK:  Is air conditioner and heater OFF? (Push AUTO to start A/C and heater).

NO:  Heater fan does not blow air. Check air conditioner and heater 20 A fuse (F3).

IF OK:  See your authorized dealer.
Using Troubleshooting Charts

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 dealer.
## Engine

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engine Cranks But Will Not Start Or Hard To Start</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No fuel</td>
<td></td>
<td>Add fuel. Bleed air.</td>
</tr>
<tr>
<td>Incorrect fuel</td>
<td></td>
<td>Use correct fuel.</td>
</tr>
<tr>
<td>Water separator clogged or not primed</td>
<td></td>
<td>Check water separator.</td>
</tr>
<tr>
<td>Water in fuel</td>
<td></td>
<td>Check, drain, and refill.</td>
</tr>
<tr>
<td>Low battery power</td>
<td></td>
<td>Charge or install new batteries.</td>
</tr>
<tr>
<td>Slow cranking speed (poor electrical connection)</td>
<td></td>
<td>Clean and tighten battery and starter connections.</td>
</tr>
<tr>
<td>Incorrect engine oil</td>
<td></td>
<td>Use correct oil.</td>
</tr>
<tr>
<td><strong>Engine Will Not Crank</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak battery</td>
<td></td>
<td>Replace battery.</td>
</tr>
<tr>
<td>Corroded or loose battery connections</td>
<td></td>
<td>Clean battery terminals and connections.</td>
</tr>
<tr>
<td>Fuse</td>
<td></td>
<td>Check fuses F1 and F3.</td>
</tr>
<tr>
<td>Battery disconnect</td>
<td></td>
<td>Check battery disconnect shut off.</td>
</tr>
<tr>
<td>Telematics level-2 alarm</td>
<td></td>
<td>See authorized dealer.</td>
</tr>
<tr>
<td><strong>Engine Knocks, Runs Irregularly, Or Stops</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air filter clogged</td>
<td></td>
<td>Clean or replace elements. Clean system.</td>
</tr>
<tr>
<td>Air in Fuel System</td>
<td></td>
<td>Bleed air from fuel system.</td>
</tr>
<tr>
<td>Contaminated fuel</td>
<td></td>
<td>Drain tank. Add clean fuel. Replace water separator.</td>
</tr>
<tr>
<td>Engine speed control system</td>
<td></td>
<td>See authorized dealer.</td>
</tr>
<tr>
<td><strong>Excessive Fuel Consumption</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor fuel quality</td>
<td></td>
<td>Drain fuel and replace with quality fuel of the proper grade.</td>
</tr>
<tr>
<td>Air cleaner restricted or dirty</td>
<td></td>
<td>Replace air cleaner element as required.</td>
</tr>
<tr>
<td>Leaks in fuel supply system</td>
<td></td>
<td>Locate source of leak and repair as required.</td>
</tr>
</tbody>
</table>
# Miscellaneous—Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessive Oil Consumption</td>
<td>Poor fuel quality</td>
<td>Drain fuel and replace with quality fuel of the proper grade.</td>
</tr>
<tr>
<td></td>
<td>Crankcase Ventilation</td>
<td>Clean crankcase.</td>
</tr>
<tr>
<td></td>
<td>Worn engine</td>
<td>See authorized dealer</td>
</tr>
<tr>
<td></td>
<td>Air cleaner restricted or dirty</td>
<td>Replace air cleaner element as required.</td>
</tr>
<tr>
<td>Engine Idles Poorly</td>
<td>Poor fuel quality</td>
<td>Drain fuel and replace with quality fuel of the proper grade.</td>
</tr>
<tr>
<td></td>
<td>Air in fuel system</td>
<td>Bleed air system.</td>
</tr>
<tr>
<td></td>
<td>Air filters</td>
<td>Clean or replace engine air filters.</td>
</tr>
<tr>
<td></td>
<td>Fuel filters</td>
<td>Clean or replace fuel filters.</td>
</tr>
<tr>
<td></td>
<td>Engine speed control system</td>
<td>See your authorized dealer.</td>
</tr>
<tr>
<td>Auto-Idle Does Not Work</td>
<td>Idle is not above 1000 RPM</td>
<td>Advance engine speed dial to high idle.</td>
</tr>
<tr>
<td></td>
<td>Auto-idle is off</td>
<td>Turn auto-idle ON.</td>
</tr>
<tr>
<td></td>
<td>Hydraulic functions operating</td>
<td>Release hydraulic functions for ten seconds.</td>
</tr>
<tr>
<td>Engine Not Developing Full Power</td>
<td>Air filters clogged</td>
<td>Clean or replace filter elements.</td>
</tr>
<tr>
<td></td>
<td>Fuel filter clogged</td>
<td>Change filter. Bleed air.</td>
</tr>
<tr>
<td></td>
<td>Contaminated fuel</td>
<td>Drain fuel tank. Change water separator, change fuel filter, bleed air.</td>
</tr>
<tr>
<td></td>
<td>Incorrect fuel</td>
<td>Use correct fuel.</td>
</tr>
<tr>
<td></td>
<td>Fuel filter not installed correctly</td>
<td>Install new filter and o-ring. Ensure proper o-ring seal.</td>
</tr>
<tr>
<td></td>
<td>Worn engine</td>
<td>See authorized dealer</td>
</tr>
<tr>
<td></td>
<td>Hydraulic issue</td>
<td>See authorized dealer</td>
</tr>
<tr>
<td>Engine Oil Pressure Low</td>
<td>Low crankcase oil level</td>
<td>Fill crankcase to proper oil level.</td>
</tr>
<tr>
<td></td>
<td>Excessive oil temperature</td>
<td>Remove and inspect oil cooler.</td>
</tr>
<tr>
<td></td>
<td>Incorrect oil</td>
<td>Drain crankcase and refill with correct oil.</td>
</tr>
<tr>
<td>Symptom</td>
<td>Problem</td>
<td>Solution</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Worn engine</td>
<td>See authorized dealer.</td>
<td></td>
</tr>
<tr>
<td>Engine Oil Pressure High</td>
<td>Incorrect Oil</td>
<td>Drain crankcase and refill with correct oil.</td>
</tr>
<tr>
<td>Engine Coolant Temperature Above Normal</td>
<td>Plugged air filter</td>
<td>Clean air filter, replace if necessary.</td>
</tr>
<tr>
<td></td>
<td>Lack of coolant in cooling system</td>
<td>Fill cooling system to proper level.</td>
</tr>
<tr>
<td></td>
<td>Radiator core and/or side screens dirty</td>
<td>Clean radiator as required.</td>
</tr>
<tr>
<td></td>
<td>Engine overloaded</td>
<td>Reduce engine load.</td>
</tr>
<tr>
<td></td>
<td>Too low crankcase oil level</td>
<td>Fill crankcase to proper oil level.</td>
</tr>
<tr>
<td></td>
<td>Loose or defective fan belt</td>
<td>Replace/tighten fan belt as required.</td>
</tr>
<tr>
<td></td>
<td>Premature belt wear or belt flies off pulley</td>
<td>Check pulley alignment.</td>
</tr>
<tr>
<td></td>
<td>Loose recovery tank cap</td>
<td>Secure cap properly.</td>
</tr>
<tr>
<td>Engine Emits Excessive Black or Gray Exhaust Smoke</td>
<td>Incorrect fuel</td>
<td>Use correct fuel.</td>
</tr>
<tr>
<td>Engine Emits Excessive White Exhaust Smoke</td>
<td>Clogged or dirty air intake or exhaust system</td>
<td>Clean air intake and exhaust system.</td>
</tr>
<tr>
<td></td>
<td>Wrong fuel</td>
<td>Use correct fuel.</td>
</tr>
<tr>
<td></td>
<td>Cold engine</td>
<td>Run engine until warm.</td>
</tr>
</tbody>
</table>
### Hydraulic System

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No Hydraulic Functions</strong></td>
<td>Pilot Shutoff Lever</td>
<td>Place pilot shutoff in UNLOCKED (up) position.</td>
</tr>
<tr>
<td></td>
<td>Low hydraulic oil</td>
<td>Add oil.</td>
</tr>
<tr>
<td></td>
<td>Fuse</td>
<td>Check fuse F7.</td>
</tr>
<tr>
<td></td>
<td>Clogged suction filter</td>
<td>Clean.</td>
</tr>
<tr>
<td><strong>Hydraulic Functions Are Slow or Have Little or No Power</strong></td>
<td>Low oil level</td>
<td>Fill hydraulic oil tank to full mark.</td>
</tr>
<tr>
<td></td>
<td>Cold oil</td>
<td>Perform cold weather warm-up.</td>
</tr>
<tr>
<td></td>
<td>Incorrect oil</td>
<td>Use correct oil.</td>
</tr>
<tr>
<td></td>
<td>Suction screen clogged</td>
<td>Inspect and clean.</td>
</tr>
<tr>
<td></td>
<td>Hydraulic tank cap/cover</td>
<td>Replace cap/cover.</td>
</tr>
<tr>
<td><strong>Power Boost Does Not Work</strong></td>
<td>Fuse</td>
<td>Check fuse F7.</td>
</tr>
<tr>
<td><strong>Hydraulic Oil Overheats</strong></td>
<td>Incorrect oil</td>
<td>Use correct oil.</td>
</tr>
<tr>
<td></td>
<td>Clogged radiator or oil cooler</td>
<td>Clean and straighten fins.</td>
</tr>
<tr>
<td></td>
<td>Radiator screen clogged</td>
<td>Clean screen.</td>
</tr>
<tr>
<td></td>
<td>Clogged filters</td>
<td>Install new filters.</td>
</tr>
<tr>
<td></td>
<td>Low oil level</td>
<td>Fill tank to full mark.</td>
</tr>
<tr>
<td></td>
<td>Contaminated oil</td>
<td>Drain oil and refill.</td>
</tr>
<tr>
<td><strong>Oil Foams</strong></td>
<td>High or low oil level</td>
<td>Correct level.</td>
</tr>
<tr>
<td></td>
<td>Incorrect oil</td>
<td>Use correct oil.</td>
</tr>
<tr>
<td></td>
<td>Water in oil</td>
<td>Change oil.</td>
</tr>
<tr>
<td></td>
<td>Kinks or dents in oil lines</td>
<td>Check lines.</td>
</tr>
<tr>
<td><strong>No Swing Function</strong></td>
<td>Pilot control hoses pinched or kinked</td>
<td>Inspect and correct.</td>
</tr>
<tr>
<td><strong>Swing Function Is &quot;Jerky&quot;</strong></td>
<td>Lack of grease</td>
<td>Fill with grease</td>
</tr>
<tr>
<td><strong>Slow Travel Speed only</strong></td>
<td>Fuse</td>
<td>Replace fuse F16.</td>
</tr>
</tbody>
</table>
|                                              | Pilot control valve hoses pinched or kinked | Inspect and correct.}
### Miscellaneous—Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Travel Is &quot;Jerky&quot;</strong></td>
<td>Track sag adjustment</td>
<td>Adjust track sag.</td>
</tr>
<tr>
<td></td>
<td>Rocks or mud jammed in track frame</td>
<td>Remove and repair.</td>
</tr>
<tr>
<td><strong>Engine Stops When Travel Or Control Lever Actuated</strong></td>
<td>Water separator clogged</td>
<td>Drain. Change element.</td>
</tr>
</tbody>
</table>

*NOTE: If any other problems are encountered which require special tools or machine knowledge to correct, see your authorized dealer.*
Prepare Machine for Storage

IMPORTANT: Avoid machine damage, do not use biodiesel during machine storage. When using biodiesel blends, switch to petroleum diesel for long term storage.

1. Before storage, operate engine on at least one complete tank of petroleum diesel fuel to purge the fuel system. Ensure that the fuel tank is full during storage to prevent water 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. Replace air cleaner elements.

IMPORTANT: High pressure washing greater than 1379 kPa (13.8 bar) (200 psi) can damage freshly painted finishes. Paint should be allowed to air dry for 30 days minimum after receipt of machine before cleaning parts or machines with high pressure. Use low pressure wash operations until 30 days have elapsed.

4. Wash the machine. Use low pressure wash operations (less than 1379 kPa (13.8 bar) (200 psi)) until 30 days after receipt of machine have elapsed. Paint areas to prevent rust. Replace decals, where needed.

5. Apply oil to track chains. Run machine back and forth several times. Park machine on a hard surface to prevent tracks from freezing to ground.

LPS is a trademark of the Holt Lloyd Corporation.

6. Store machine in a dry, protected place. If stored outside, cover with a waterproof material.

IMPORTANT: LPS 3 Rust Inhibitor can destroy painted finish. DO NOT spray LPS 3 Rust Inhibitor on painted areas.

7. Retract all hydraulic cylinders, if possible. If not, coat exposed cylinder rods with LPS ® 3 Rust Inhibitor.

8. Place a DO NOT OPERATE tag on the right control lever.

9. Lubricate all grease points.

NOTE: If the batteries are kept disconnected for more than one month or when the batteries are reconnected, contact your nearest Hitachi dealer. Resetting of the information controller (ICX) may be required.

10. Remove the batteries and store in a dry, protected place after charging fully. If not removed, disconnect the negative battery cable from the (—) terminal.

11. Add a fuel stabilizer additive and top off fuel tank with fuel to prevent condensation.

12. Drain water separator.

13. Remove keys and lock all covers and doors.
Monthly Storage Procedure

**CAUTION:** Prevent possible injury or death from asphyxiation. Engine exhaust fumes can cause sickness or death. Start engine ONLY in a well-ventilated area.

1. Drain water and sediment from fuel tank when air temperature is above freezing.
2. Remove LPS 3® Rust Inhibitor from cylinder rods with a cleaning solvent.

LPS 3 Rust Inhibitor is a trademark of Illinois Tool Works.

**IMPORTANT:** Prevent possible engine damage. During cold temperatures, check fluidity of engine oil on dipstick. If the oil appears waxy and/or jelly-like rather than liquid, DO NOT attempt to start engine. Use external heat source to warm the crankcase until oil appears fluid.

3. Check all fluid levels. If low, check for leaks and add oil as required.
4. Check belts.
5. Check condition of all hoses and connections.
6. Check battery electrolyte level. Charge and install battery.
7. For machines with **tires**, check condition of tires and tire pressure.
   For machines with **tracks**, check condition of tracks and track sag.

   On crawler machines with non sealed-and-lubricated track chains, apply oil to the pin-to-bushing joints. Run machine back and forth several times.
8. Park machine on a hard surface to prevent tracks from freezing to ground.
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.

   **CAUTION:** Prevent possible injury from unexpected machine movement. Clear the area of all persons before running machine through the operation procedure.
13. Make sure the area is clear to allow for movement. Cycle all hydraulic functions several times. Check condition of all hoses and connections.
14. Park the machine with cylinder rods retracted, if possible. Turn key switch to OFF.
15. Apply LPS 3 Rust Inhibitor to exposed cylinder rod areas.
Record Product Identification Number (PIN)

Purchase Date

NOTE: Record all 13 characters of the Product Identification Number.

Record Engine Serial Number

Engine Serial Number (1)

1—Engine Serial Number

Record Travel Motor Serial Numbers

Travel Motor Serial Number

Travel Motor Serial Number

NOTE: Cover removed for clarity of photograph
Record Swing Motor Serial Number

Swing Motor Serial Number _____________________________

Hydraulic Coupler Serial Number—If Equipped

Hydraulic Coupler Serial Number _____________________________

1—Hydraulic Coupler Serial Number Plate

Keep Proof of Ownership

1. Maintain in a secure location an up-to-date inventory of all product and component serial numbers.
2. Regularly verify that identification plates have not been removed. Report any evidence of tampering to law enforcement agencies and order duplicate plates.
3. Other steps you can take:
   - Mark your machine with your own numbering system
   - Take color photographs from several angles of each machine
Keep Machines Secure

1. Install vandal-proof devices.
2. When machine is in storage:
   - Lower equipment to the ground
   - Set tracks to widest position to make loading more difficult
   - Remove any keys and batteries
3. When parking indoors, put large equipment in front of exits and lock your storage buildings.
4. When parking outdoors, store in a well-lighted and fenced area.
5. Make note of suspicious activity and report any thefts immediately to law enforcement agencies.
## 350DLC Stage II Engine Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Deere PowerTech 9.0</td>
<td>Type</td>
<td>4-Stroke Cycle, Turbocharged</td>
</tr>
<tr>
<td></td>
<td>Bore And Stroke</td>
<td>118.4 x 136 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.66 x 5.35 in.</td>
</tr>
<tr>
<td></td>
<td>Cylinders</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Displacement</td>
<td>9.0 L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>548 cu in.</td>
</tr>
<tr>
<td></td>
<td>Net Torque @ 1600 RPM</td>
<td>1267 N·m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>934 lb-ft</td>
</tr>
<tr>
<td></td>
<td>Compression Ratio</td>
<td>16:1</td>
</tr>
<tr>
<td></td>
<td>Power At 1900 RPM</td>
<td>202 kW Net SAE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>271 hp</td>
</tr>
<tr>
<td></td>
<td>Cooling Fan</td>
<td>Variable Hydraulic Suction</td>
</tr>
<tr>
<td></td>
<td>Electrical System</td>
<td>24 Volt</td>
</tr>
<tr>
<td></td>
<td>Batteries (2) 12 volt</td>
<td>180 Minutes Reserve Capacity:</td>
</tr>
<tr>
<td>Oil Pan Size</td>
<td>Capacity</td>
<td>0.13 L/kW</td>
</tr>
</tbody>
</table>

## 350DLC Tier 3/Stage IIIA Engine Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Deere PowerTech Plus 9.0</td>
<td>Type</td>
<td>4-Stroke Cycle, Turbocharged</td>
</tr>
<tr>
<td></td>
<td>Bore And Stroke</td>
<td>118.4 x 136 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.66 x 5.35 in.</td>
</tr>
<tr>
<td></td>
<td>Cylinders</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Displacement</td>
<td>9.0 L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>548 cu in.</td>
</tr>
<tr>
<td></td>
<td>Net Torque @ 1600 RPM</td>
<td>1267 N·m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>934 lb-ft</td>
</tr>
<tr>
<td></td>
<td>Compression Ratio</td>
<td>16:1</td>
</tr>
<tr>
<td></td>
<td>Power At 1900 RPM</td>
<td>202 kW Net SAE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>271 hp</td>
</tr>
<tr>
<td></td>
<td>Cooling Fan</td>
<td>Variable Hydraulic Suction</td>
</tr>
<tr>
<td></td>
<td>Electrical System</td>
<td>24 Volt</td>
</tr>
<tr>
<td></td>
<td>Batteries (2) 12 volt</td>
<td>180 Minutes Reserve Capacity:</td>
</tr>
<tr>
<td>Oil Pan Size</td>
<td>Capacity</td>
<td>0.13 L/kW</td>
</tr>
</tbody>
</table>
## 350DLC Drain and Refill Capacities

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Tank</td>
<td>Capacity</td>
<td>628.0 L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>166 gal</td>
</tr>
<tr>
<td>Cooling System</td>
<td>Capacity</td>
<td>39.7 L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.5 gal</td>
</tr>
<tr>
<td>Engine</td>
<td>Oil Capacity, Including Filter Change</td>
<td>27.0 L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.2 gal</td>
</tr>
<tr>
<td>Hydraulic Tank</td>
<td>Oil Capacity</td>
<td>298 L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>78.7 gal</td>
</tr>
<tr>
<td>Hydraulic System</td>
<td>Oil Capacity</td>
<td>374 L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>98.8 gal</td>
</tr>
<tr>
<td>Swing Gear Case</td>
<td>Oil Capacity</td>
<td>17 L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.5 gal</td>
</tr>
<tr>
<td>Travel Gear Case (each)</td>
<td>Oil Capacity</td>
<td>9.2 L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.4 gal</td>
</tr>
<tr>
<td>Pump Drive Gear Case</td>
<td>Oil Capacity</td>
<td>1.0 L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.1 qt</td>
</tr>
</tbody>
</table>
### 350DLC Machine Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1—Sprocket Center To Idler Center</td>
<td>Distance</td>
<td>4050 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13 ft 3 in.</td>
</tr>
<tr>
<td>2—Undercarriage</td>
<td>Length</td>
<td>4940 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 ft 2 in.</td>
</tr>
<tr>
<td>3—Counterweight Clearance</td>
<td>Distance</td>
<td>1160 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 ft 10 in.</td>
</tr>
<tr>
<td>4—Rear End Swing Radius</td>
<td>Distance</td>
<td>3370 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 ft 1 in.</td>
</tr>
<tr>
<td>5—Overall Width (excluding back mirrors)</td>
<td>Distance</td>
<td>2990 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 ft 8 in.</td>
</tr>
<tr>
<td>6—Cab</td>
<td>Height</td>
<td>3140 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 ft 4 in.</td>
</tr>
<tr>
<td>7—Minimum Ground Clearance</td>
<td>Distance</td>
<td>510 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 ft 8 in.</td>
</tr>
<tr>
<td>8—Center Of Sprocket To Center Of Sprocket</td>
<td>Distance</td>
<td>2590 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 ft 6 in.</td>
</tr>
</tbody>
</table>

**NOTE:** Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with PCSA and SAE standards. Except where otherwise noted these specifications are based on a machine equipped with 800 mm (32 in.) shoes, counterweight, 4.0 m (13 ft 1 in.) arm, 1160 kg (2557 lb) 1.76 m³ (2.3 yd³) bucket, full fuel tank, 79 kg (175 lb) operator and standard equipment.
<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>9—Track Shoe</td>
<td>Width</td>
<td>800 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32 in.</td>
</tr>
<tr>
<td>10—Undercarriage</td>
<td>Width</td>
<td>With 800 mm shoes: 3390 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With 32 in. shoes: 11 ft 1 in.</td>
</tr>
<tr>
<td>11—Machine</td>
<td>Overall Length</td>
<td>With 4000 mm Arm: 11 090 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With 13 ft 1 in. Arm: 36 ft 5 in.</td>
</tr>
<tr>
<td>12—Machine</td>
<td>Transport Height</td>
<td>With 4000 mm Arm: 3600 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With 13 ft 1 in. Arm: 11 ft 10 in.</td>
</tr>
<tr>
<td>Machine</td>
<td>Operating Weight</td>
<td>35 049 kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>77 269 lb</td>
</tr>
</tbody>
</table>
350DLC Working Ranges

NOTE: Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with PCSA and SAE standards.

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1—Maximum Digging Reach</td>
<td>Distance</td>
<td>With 4000 mm Arm: 11 860 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With 13 ft 1 in. Arm: 38 ft 11 in.</td>
</tr>
</tbody>
</table>

Except where otherwise noted, these specifications are based on a machine equipped with 800 mm (32 in.) shoes, counterweight and 4.0 m (13 ft 1 in.) arm.
### Miscellaneous—Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2—Maximum Digging Reach At Ground Level</td>
<td>Distance</td>
<td>With 4000 mm Arm: 11 670 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With 13 ft 1 in. Arm: 38 ft 3 in.</td>
</tr>
<tr>
<td>3—Minimum Swing Radius</td>
<td>Radius</td>
<td>With 4000 mm Arm: 4470 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With 13 ft 1 in. Arm: 14 ft 8 in.</td>
</tr>
<tr>
<td>4—Maximum Cutting Height</td>
<td>Height</td>
<td>With 4000 mm Arm: 10 750 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With 13 ft 1 in. Arm: 35 ft 3 in.</td>
</tr>
<tr>
<td>5—Maximum Dumping Height</td>
<td>Height</td>
<td>With 4000 mm Arm: 7630 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With 13 ft 1 in. Arm: 25 ft 0 in.</td>
</tr>
<tr>
<td>6—Maximum Digging Depth</td>
<td>Depth</td>
<td>With 4000 mm Arm: 8180 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With 13 ft 1 in. Arm: 26 ft 10 in.</td>
</tr>
<tr>
<td>7—Maximum Digging Depth (flat bottom)</td>
<td>Depth</td>
<td>With 4000 mm Arm: 8040 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With 13 ft 1 in. Arm: 26 ft 5 in.</td>
</tr>
<tr>
<td>8—Maximum Vertical Wall</td>
<td>Depth</td>
<td>With 4000 mm Arm: 10 750 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With 13 ft 1 in. Arm: 35 ft 3 in.</td>
</tr>
<tr>
<td>9—Tail Swing Radius</td>
<td>Radius</td>
<td>With 4000 mm Arm: 3390 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With 13 ft 1 in. Arm: 11 ft 1 in.</td>
</tr>
</tbody>
</table>
350DLC Lift Capacity—KG (LB)

Arm: 2.67 m (8 ft 9 in.)  Bucket: 1.4 m³ (1.83 yd³)  Shoe: 600 mm (24 in.)

Ratings are at bucket lift hook, using standard counterweight, situated on firm, level, uniform supporting surface.

Power Dig: On

Figures do not exceed 87 percent of hydraulic capacity or 75 percent of weight needed to tip machine. Figures marked with an (a) are hydraulically-limited capacities. Remaining figures are stability-limited capacities.

<table>
<thead>
<tr>
<th>LIFTING OVER FRONT</th>
<th>Load Point Height</th>
<th>Horizontal Distance from Centerline of Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>m (ft)</td>
<td>1.52 (5)</td>
</tr>
<tr>
<td>6.10 (20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.57 (15)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.05 (10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.52 (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ground Line</td>
<td></td>
<td>12184 (26861)</td>
</tr>
<tr>
<td>-1.52 (-5)</td>
<td></td>
<td>*10375 (22873)</td>
</tr>
<tr>
<td>-3.05 (-10)</td>
<td></td>
<td>*14428 (31808)</td>
</tr>
<tr>
<td>-4.57 (-15)</td>
<td></td>
<td>*11836 (26093)</td>
</tr>
</tbody>
</table>

| LIFTING OVER SIDE  | m (ft)           | 1.52 (5) | 3.05 (10) | 4.57 (15) | 6.10 (20) | 7.62 (25) | 9.14 (30) |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 6.10 (20)          |                  | 6079 (13402) |          |           |           |          |
| 4.57 (15)          |                  | 8531 (18808) | 5851 (12899) | 4158 (9166) |
| 3.05 (10)          |                  | 7875 (17361) | 5535 (12203) | 4026 (8875) |
| 1.52 (5)           |                  | 7328 (16155) | 5235 (11542) | 3874 (8541) |
| Ground Line        |                  | 7041 (15523) | 5029 (11086) | 3763 (8297) |
| -1.52 (-5)         |                  | *10375 (22873) | 6966 (15357) | 4945 (10901) | 3742 (8250) |
| -3.05 (-10)        |                  | *14428 (31808) | *8849 (19509) | 7042 (15524) | 4996 (11015) |
| -4.57 (-15)        |                  | 11581 (25532) | 7286 (16063) |

*Hydraulically-limited capacity
### 350DLC Lift Capacity—KG (LB)

<table>
<thead>
<tr>
<th>Arm: 3.20 m (10 ft 6 in.)</th>
<th>Bucket: 1.4 m³ (1.83 yd³)</th>
<th>Shoe: 600 mm (24 in.)</th>
</tr>
</thead>
</table>

Specifications:

- Ratings are at bucket lift hook, using standard counterweight, situated on firm, level, uniform supporting surface.
- Figures do not exceed 87 percent of hydraulic capacity or 75 percent of weight needed to tip machine. Figures marked with an (a) are hydraulically-limited capacities. Remaining figures are stability-limited capacities.

#### Power Dig: On

<table>
<thead>
<tr>
<th>LIFTING OVER FRONT</th>
<th>Load Point Height</th>
<th>Horizontal Distance from Centerline of Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>m (ft)</td>
<td>1.52 (5)</td>
<td>3.05 (10)</td>
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*Hydraulically-limited capacity
**350DLC Lift Capacity—KG (LB)**

Arm: 4.0 m (13 ft 1 in.)  
Bucket: 1.4 m³ (1.83 yd³)  
Shoe: 600 mm (24 in.)

Ratings are at bucket lift hook, using standard counterweight, situated on firm, level, uniform supporting surface.

Power Dig: On

Figures do not exceed 87 percent of hydraulic capacity or 75 percent of weight needed to tip machine. Figures marked with an (a) are hydraulically-limited capacities. Remaining figures are stability-limited capacities.

### LIFTING OVER FRONT

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*Hydraulically-limited capacity*
### 350DLC Lift Capacity—KG (LB)

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<th>Bucket: 1.4 m³ (1.83 yd³)</th>
<th>Shoe: 800 mm (32 in.)</th>
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Ratings are at bucket lift hook, using standard counterweight, situated on firm, level, uniform supporting surface.

**Power Dig:** On

**LIFTING OVER FRONT**

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*Hydraulically-limited capacity

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### 350DLC Lift Capacity—KG (LB)

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Ratings are at bucket lift hook, using standard counterweight, situated on firm, level, uniform supporting surface.

**Power Dig:** On

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*Hydraulically-limited capacity*
### 350DLC Lift Capacity—KG (LB)

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Ratings are at bucket lift hook, using standard counterweight, situated on firm, level, uniform supporting surface.

**Power Dig:** On

**LIFTING OVER FRONT**

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