320 P Backhoe Loader

(PIN: CA00001—)

(PIN: DA00001—)

OPERATOR'S MANUAL

320 P Backhoe Loader

OMT483854X019 ISSUE A4 (ENGLISH)

John Deere Tianjin Construction Works
PRINTED IN U.S.A.

EPA Non-road Emissions Control Warranty Statement—Compression Ignition

DXLOGOV1 —UN—28APR09

JOHN DEERE

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

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

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

JOHN DEERE'S WARRANTY RESPONSIBILITY

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

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

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

EMISSION WARRANTY EXCLUSIONS

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

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

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

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

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

Emission_CI_EPA (18Dec09)

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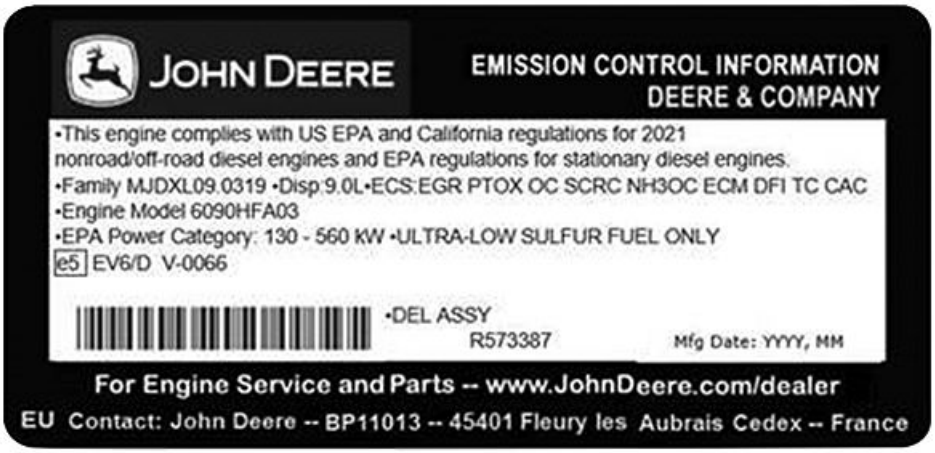
DX,EMISSIONS,EPA -19-12DEC12-1/2

Carbon Dioxide Emissions (CO_2)



RG33429 —UN—04FEB21

SAMPLE - Engine Emissions Label

To identify the carbon dioxide (CO_2) output, locate the engine emissions label. Find the appropriate family on the emissions label and reference the chart.

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

This CO_2 measurement results from testing over a fixed test cycle under laboratory conditions a(n) (parent) engine representative of the engine type (engine family) and shall not imply or express any guarantee of the performance of a particular engine.

Emissions Label Family	CO_2 Result
_JDXL02.9323	952 g/kW-hr
_JDXL02.9327	784 g/kW-hr
_JDXL04.5337	819 g/kW-hr
_JDXL04.5338	682 g/kW-hr
_JDXL04.5304	1004 g/kW-hr
_JDXN04.5174	792 g/kW-hr
_JDXL06.8324	720 g/kW-hr
_JDXL06.8328	683 g/kW-hr
_JDXL06.8336	701 g/kW-hr
_JDXN06.8175	771 g/kW-hr
_JDXL09.0319	646 g/kW-hr
_JDXL09.0325	695 g/kW-hr
_JDXL09.0329	657 g/kW-hr
_JDXL09.0333	650 g/kW-hr
_JDXL13.5326	684 g/kW-hr
_JDXL13.6320	651 g/kW-hr
_JDXL13.5340	632 g/kW-hr
_JDXL18.0341	683 g/kW-hr
_JDXL18.0342	687 g/kW-hr
F28	870 g/kW-hr
F32	710 g/kW-hr
F33	677 g/kW-hr

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Prevent Battery Explosions

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

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

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

Keep battery electrolyte levels properly maintained.

TS204 —UN—15APR13

Battery Explosions

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

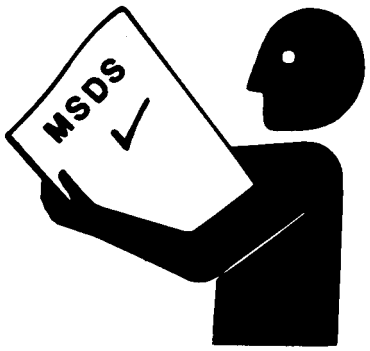
Handle Chemical Products Safely

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

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

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

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



TS1132 —UN—15APR13

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

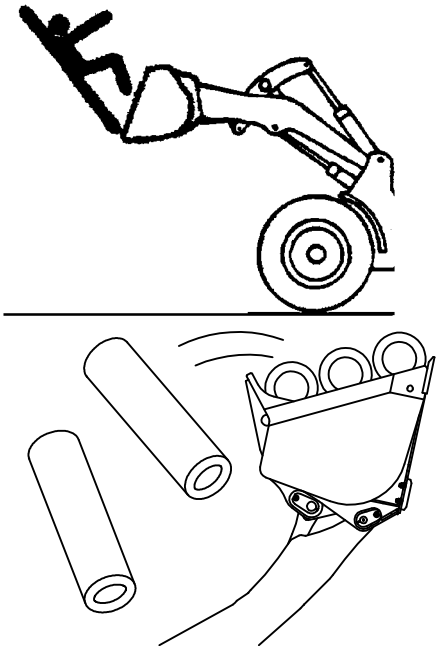
Use Special Care When Operating Loader

Never use the loader to lift people. Do not allow anyone to ride in the bucket or use the bucket as a work platform.

Operate carefully with raised loads. Raising the load reduces machine stability, especially on side slopes or an unstable surface. Drive and turn slowly with a raised load.

Ensure that objects in the bucket are secure. Do not attempt to lift or carry objects that are too big or too long to fit inside the bucket unless secured with an adequate chain or other device. Keep bystanders away from raised loads.

Be careful when lifting objects. Never attempt to lift objects too heavy for your machine. Assure machine stability and hydraulic capability with a test lift before attempting other maneuvers. Use an adequate chain or sling and proper rigging techniques to attach and stabilize loads. Never lift an object above or near another person.



T141957 —UN—15APR13

T141902 —UN—07MAY01

TX,LOADER,OP -19-17DEC20-1/1

8. **WARNING, Avoid Injury From Escaping Fluid—If Equipped**

   Avoid injury from escaping fluid. Contents of this accumulator are under pressure. Refer to proper machine model technical manual for disassembly or charging instructions and equipment required.

   Charge with DRY NITROGEN only.

   This label is located inside the battery compartment under left side of cab, on the ride control accumulator.

YN1323647 —UN—08MAY22

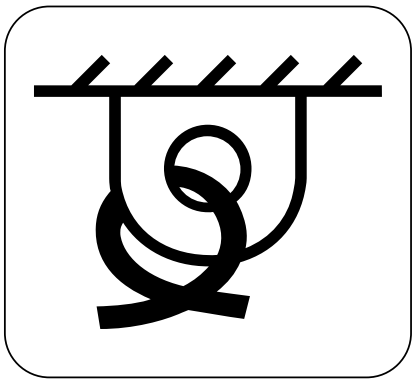
WARNING, Avoid Injury From Escaping Fluid—If Equipped

yn00108,1668413794753 -19-05JAN23-10/21

9. **IMPORTANT, Tie-Down Point**

   Route appropriate tie-down device through tie-down points.

   These labels are located strategically throughout the machine.



TX1171997 —UN—19SEP14

IMPORTANT, Tie-Down Point

yn00108,1668413794753 -19-05JAN23-11/21

10. **WARNING, Prevent Unintended Machine Movement**

    Place the transmission control lever (TCL) in neutral and set park brake before leaving operator's seat or operating backhoe.

    This label is located in the operator's station behind the TCL.

XJ1309361A —UN—04FEB21

WARNING, Prevent Unintended Machine Movement

Continued on next page

yn00108,1668413794753 -19-05JAN23-12/21

Right Console Functions

1—Sealed Switch Module (SSM)

For switch and function details, see Sealed Switch Module (SSM) Functions in this section.

2—Standard Display Monitor (SDM)

For monitor indicator and gauge information, see Standard Display Monitor (SDM) Functions in this section.

For monitor menu information, see Standard Display Monitor (SDM) (2-3).

3—Mechanical Front Wheel Drive (MFWD) Switch

Press upper half of switch to engage the MFWD axle. Press lower half of switch to disengage the MFWD axle.

4—Not Used

5—Beacon Light Switch (if equipped)

Press upper half of switch to turn on beacon light. Press lower half of switch to turn off beacon light.

6—Air Suspension Seat Height Adjustment Switch (if equipped)

CAUTION: Ensure seat is locked in position before operating machine. A seat that is loose or not properly locked can cause loss of control of machine and injuries or death.

Press upper half of switch to increase air suspension seat height and firmness of ride. Press lower half of switch to decrease air suspension seat height and firmness of ride.

7—Not Used

8—Rear Wiper Switch (if equipped)

Press upper half of switch to turn on rear windshield wiper. Press lower half of switch to turn off rear windshield wiper.

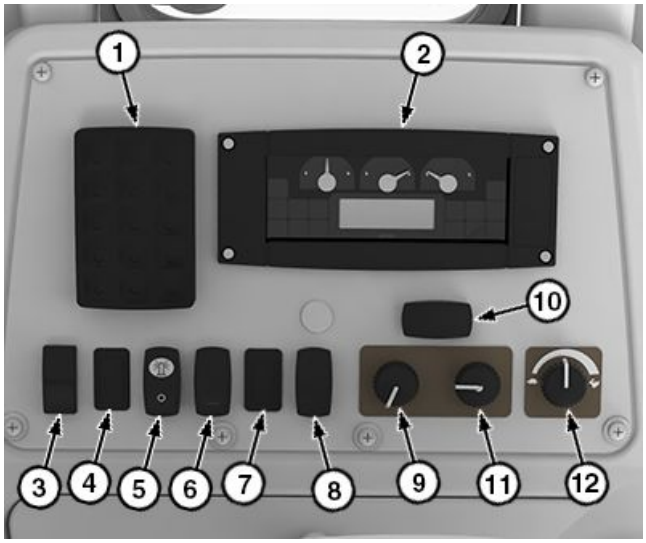
9—Temperature Control Knob (if equipped)

Turn knob to adjust air temperature. Turn knob clockwise towards HOT (red) for warmer air (best for heating and defrosting). Turn knob counterclockwise towards COLD (blue) for cooler air (best for venting and air conditioning).

10—Defroster, Heater, and Air Conditioner Switch (if equipped)

NOTE: Blower speed knob; defroster, heater, and air conditioner switch; and temperature control knob must be adjusted as a group to obtain proper operation of the defroster, heater, or air conditioner.

Use the air conditioner with the temperature control knob in a middle-to-cool position to dehumidify air without over cooling.



YN1334119A —UN—01DEC22

Right Side Console

1— Sealed Switch Module (SSM)
2— Standard Display Monitor (SDM)
3— Mechanical Front Wheel Drive (MFWD) Switch
4— Not Used
5— Beacon Light Switch (if equipped)
6— Air Suspension Seat Height Adjustment Switch (if equipped)
7— Not Used
8— Rear Wiper Switch (if equipped)
9— Temperature Control Knob (if equipped)
10— Defroster, Heater, and Air Conditioner Switch (if equipped)
11— Blower Speed Knob (if equipped)
12— Engine Speed Control Knob

The defroster, heater, and air conditioner switch has three positions:

- Press left half of switch to activate the air conditioner. Adjust the blower speed knob and temperature control knob as appropriate.
- Press right half of switch to activate the defrost mode. In this position, the air conditioner compressor is powered and a vent is opened to provide air flow to the front windshield. Adjust the blower speed knob and temperature control knob as appropriate.
- Set the switch to the middle position for maximum heater performance. In this position, the air conditioner compressor is not powered.

11—Blower Speed Knob (if equipped)

Turn knob clockwise to increase blower speed or counterclockwise to reduce blower speed. The blower speed knob has four speed settings plus an OFF position.

12—Engine Speed Control Knob

Turn knob clockwise to increase engine speed. Turn knob counterclockwise to decrease engine speed.

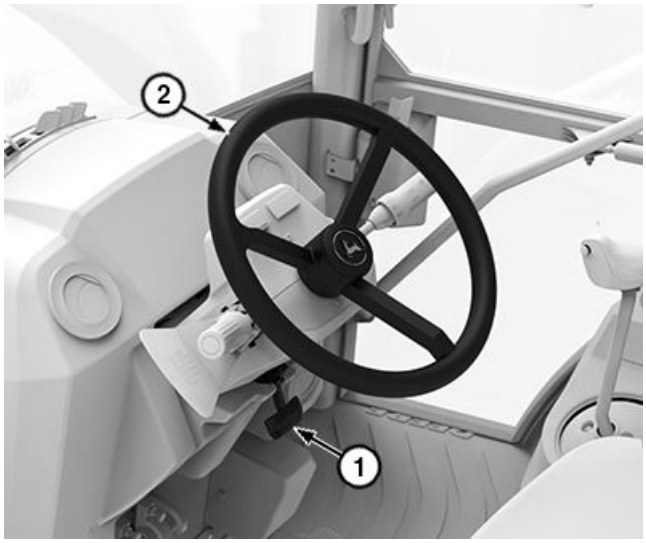
yn00108,1669184280779 -19-10JAN23-1/1

Steering Wheel Tilt Lever—Cab Machines

Pull tilt lever (1) to adjust steering wheel (2) to desired tilt angle. Release lever to lock steering wheel in position.

1— Tilt Lever

2— Steering Wheel



YN1333843A —UN—27NOV22

Steering Wheel and Tilt Lever

yn00108,1669533656238 -19-01DEC22-1/1

Opening Windows—Cab Machines

Side and Door Windows

The side windows and door windows can open 180°. The door windows can be used as alternative exits.

To open, pull handle (1) in and away from cab post latch.

Retain in open position against fixed window on same side by fastening knob (2) into socket (3). Turn knob until tension is felt to prevent window from swinging during operation.

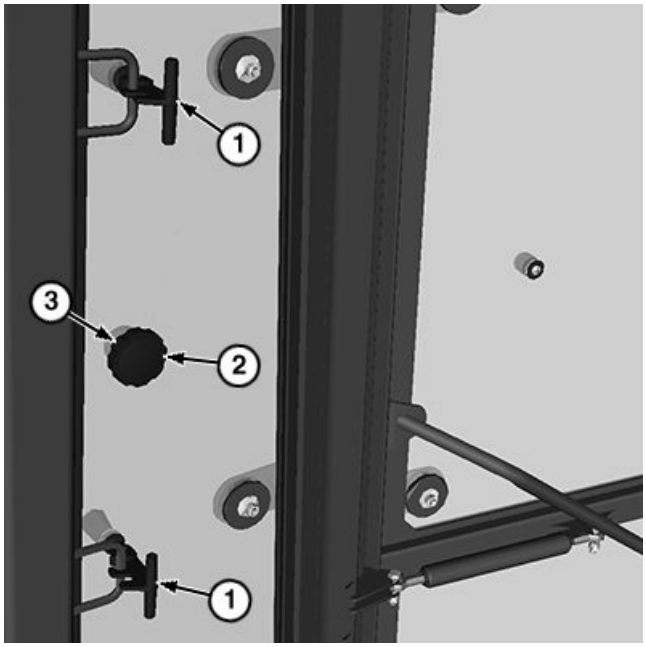
Rear Windows

Squeeze upper rear window latches (4) and slide upper rear window up or down.

Squeeze middle rear window latches (5) and slide middle rear window up or down.

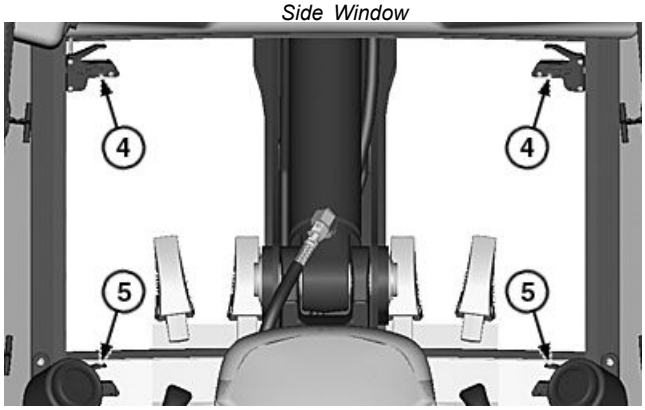
Ensure all rear window latches lock into detent positions on window frame.

1— Handle (8 used)
2— Fastening Knob (2 used)
3— Socket (2 used)
4— Upper Rear Window Latch (2 used)
5— Middle Rear Window Latch (2 used)



TX1220133 —UN—27JUL16

Side Window



TX1107562A —UN—03FEB12

Rear Window

IDR2EHK,00004E3 -19-15JUL20-1/1

Driving the Machine

CAUTION: Prevent possible injury or death in case of an accident or machine overturn. Always wear seat belt when operating machine.

1. Fasten seat belt.

CAUTION: Prevent possible injury from unexpected machine movement. Machine will turn in direction of brake pedals (2 or 3) if only one brake pedal is applied. Connect brake pedals together before traveling at high speed.

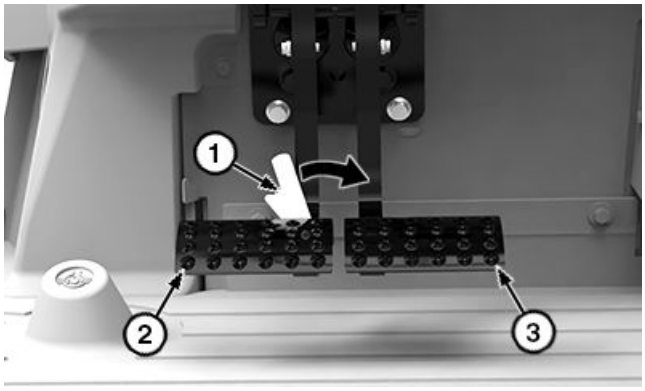
2. Engage brake pedal locking bar (1) to lock left and right brake pedals (2 and 3) together. Keep brake pedal locking bar engaged unless brakes are to be used to aid in steering.
3. Apply brakes.

NOTE: Park brake indicator illuminates, alarm sounds, and STOP indicator illuminates when the transmission control lever (TCL) is moved out of neutral (N) while park brake is engaged.

Disengage the park brake before moving the TCL out of neutral.

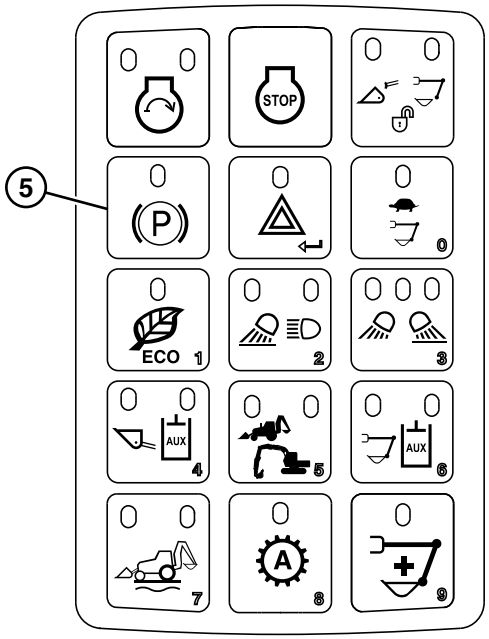
4. Press park brake switch (5) to disengage the park brake.

1— Brake Pedal Locking Bar
2— Left Brake Pedal
3— Right Brake Pedal
5— Park Brake Switch



YN1334434A —UN—07DEC22

Brake Pedals



TX1302961 —UN—11SEP20

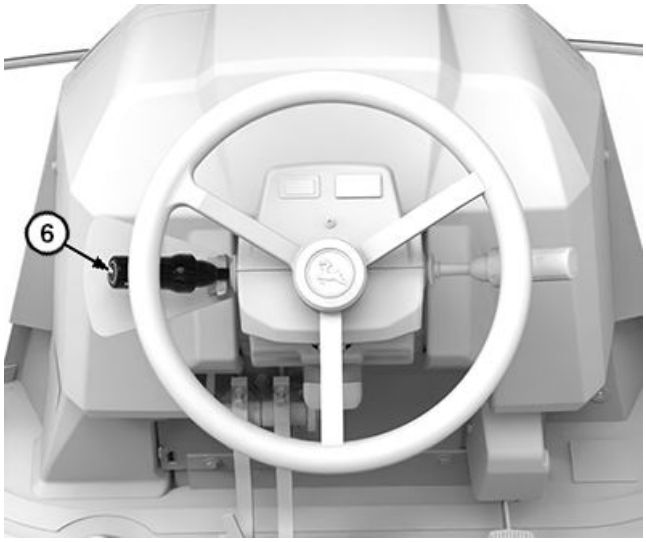
Sealed Switch Module (SSM)

yn00108,1670208163400 -19-07DEC22-1/3

CAUTION: Prevent possible injury from unexpected machine movement. Never rely on transmission control lever (TCL) (6) to keep machine from moving. Always engage park brake to hold machine.

5. Use transmission control lever (TCL) (6) to change direction of travel.
   - Reduce speed when changing direction of travel.
   - Move TCL to forward (F) or reverse (R) to select desired direction of travel.
   - Move TCL to neutral (N) when machine is not moving. TCL will drop to a detented position when in neutral.

6— Transmission Control Lever (TCL)



YN1334436A —UN—07DEC22

Transmission Control Lever (TCL)

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yn00108,1670208163400 -19-07DEC22-2/3

Backhoe Operation—Pilot Controls—Excavator Pattern

CAUTION: Different control patterns are available for this backhoe. Always verify control response before operating.

Prevent possible personal injury from unexpected machine movement. DO NOT operate backhoe from outside the operator's station. Only operate when in the operator's seat, in backhoe operating position, and with stabilizers down.

IMPORTANT: To avoid machine damage, do not swing boom into stabilizers.

NOTE: If transmission control lever (TCL) is moved to forward (F) or reverse (R) while the seat is in backhoe operating position, an audible alarm sounds and STOP indicator illuminates on the standard display monitor (SDM).

Rotate seat to backhoe operating position.

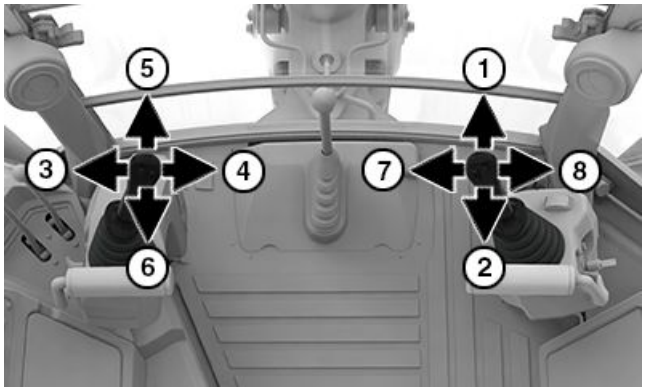
NOTE: If the seat is rotated out of backhoe operating position or the engine is shut off, the pilot controls are automatically disabled. To enable pilot controls, cycle pilot enable switch to lock position and then back to unlock position.

Momentarily press left half of pilot enable switch to unlock position to enable pilot controls. The three-position rocker switch returns to middle position and pilot joysticks active indicator illuminates on the SDM.

Press control pattern select switch on sealed switch module (SSM) to select excavator control pattern (right light-emitting diode [LED] is illuminated). With this control pattern, functions must correspond to the black-on-yellow labels located on the cab post.

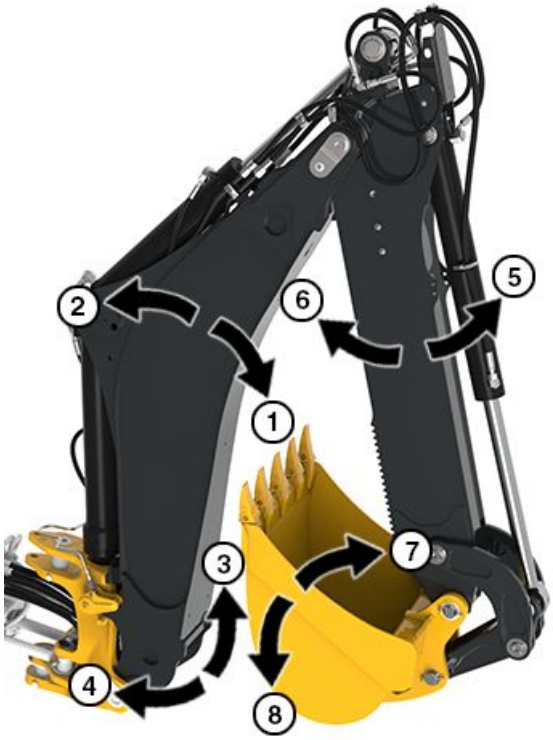
Operate backhoe with pilot control levers as shown to maneuver backhoe components in desired directions.

Pilot control levers return to neutral position when released. Backhoe components remain positioned.



YN1337508A —UN—31JAN23

Pilot Controls—Excavator Pattern



YN1337506A —UN—31JAN23

Backhoe Movement

1— Boom Lower
2— Boom Raise
3— Boom Swing Left
4— Boom Swing Right
5— Dipperstick Raise
6— Dipperstick Lower
7— Bucket Load
8— Bucket Dump

yn00108,1675215139527 -19-31JAN23-1/1

Lifting Objects

CAUTION: Avoid personal injury. Never move the load suddenly. Never move load over bystander's head. DO NOT allow any bystanders near the load. Keep all bystanders away from raised load until blocks are supporting load or load is sitting on the ground.

Ensure chain/sling is in good condition and is rated for load being lifted.

1. For maximum lifting capability, attach chain/sling to buckets at positions shown. For capacities of backhoe, see Miscellaneous—Specifications (4-6).
2. Attach a hand line to load for stability. Use long enough line to ensure that person holding line is a safe distance from load.
3. Before lifting, perform following test of load stability:

NOTE: If using backhoe to lift, raise rear tires off ground 50 mm (2 in) and ensure machine is level. If ground is soft, place boards or other wide support under stabilizer feet to increase stability.

   a. Park machine close to load.

   b. Attach load to chain/sling.

   c. Raise load 50 mm (2 in) above ground.

   d. If using backhoe, swing load all the way to one side.

   e. While keeping load close to the ground, extend load away from machine.

TX1014618A —UN—03NOV06

Lifting With Front Loader

TX1014625A —UN—03NOV06

Lifting With Backhoe

If there is any indication of reduced stability of the machine, lower load to the ground and make necessary adjustments so machine can successfully perform test. Do not lift load until machine can perform test at acceptable level.

TX,LIFTING,OBJECTS -19-16MAY23-1/1

Diagnostics—Codes

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

Navigate through menu: **MAIN MENU >> DIAGNOSTICS >> CODES**.

CODES Menu Items

Menu Items		Submenu Items	Description
ACTIVE AND STORED CODES	>>	• Source controller of fault (example: VCU, SSM, ECU) • Suspect parameter number (SPN) • Failure mode indicator (FMI) • Code type: active or stored • Text description of the DTC	Provides the capability to display in sequence up to 20 of the latest DTCs that are currently active and stored on the machine. As each active DTC is resolved or fixed, the code is removed from the active code list and added to the stored code list. Each DTC is saved in order of occurrence. The listed information is displayed for each code. Press SELECT button again to view the last and first occurrence of DTC.

BE78919,000047D -19-11AUG20-1/1

Setup—Monitor

The MONITOR menu displays current monitor settings and allows operator to view and change a variety of settings for the monitor.

Navigate through menu: **MAIN MENU >> SETUP >> MONITOR**.

MONITOR Menu Items

Menu Items		Submenu Items
LANGUAGE	>>	ENGLISH SPANISH FRENCH RUSSIAN PORTUGUESE
UNITS	>>	ENGLISH METRIC
CONTRAST	>>	Displays a value between 1—10. Press NEXT button to increase and BACK button to decrease value and SELECT button to store.
JOB TIMER	>>	VISIBLE HIDDEN

BE78919,000047E -19-11AUG20-1/1

Setup—Auto Idle

The AUTO IDLE menu allows the operator to enable or disable the auto-idle feature.

Navigate through menu: **MAIN MENU >> SETUP >>AUTO IDLE**.

BE78919,000049B -19-11AUG20-1/1

Diesel Engine Break-In™ Oil

New engines are filled at the factory with either John Deere Break-In™ or Break-In Plus™ Engine Oil. During the break-in period, add John Deere Break-In or Break-In Plus Engine Oil, respectively, as needed to maintain the specified oil level.

Operate the engine under various conditions, particularly heavy loads with minimal idling, to help seat engine components properly.

Change the oil and filter at 250 hours maximum for Break-In Oil or 500 hours maximum for Break-In Plus Oil during the initial operation of a new or rebuilt engine.

After engine overhaul, fill the engine with either John Deere Break-In or Break-In Plus Engine Oil.

If John Deere Break-In or Break-In Plus Engine Oil is not available, use a 10W-30 diesel engine oil meeting one of the following during the first 250 hours of operation:

- API Service Classification CE
- API Service Classification CD
- API Service Classification CC
- ACEA Oil Sequence E2
- ACEA Oil Sequence E1

IMPORTANT: Do not use Plus-50™ II, Plus-50, or engine oils meeting any of the following for the initial break-in of a new or rebuilt engine:

API CK-4	**ACEA E9**
API CJ-4	**ACEA E7**
API CI-4 PLUS	**ACEA E6**
API CI-4	**ACEA E5**
API CH-4	**ACEA E4**
API CG-4	**ACEA E3**
API CF-4	
API CF-2	
API CF	

These oils will not allow the engine to break in properly.

John Deere Break-In Plus Engine Oil can be used for all John Deere diesel engines at all emission certification levels.

After the break-in period, use John Deere Plus-50 II, John Deere Plus-50, or other diesel engine oil as recommended in this manual.

Break-In is a trademark of Deere & Company
Break-In Plus is a trademark of Deere & Company
Plus-50 is a trademark of Deere & Company

TX,ENOIL4 -19-13FEB23-1/1

Testing Coolant Freeze Point

The use of a handheld coolant refractometer is the quickest, easiest, and most accurate method to determine coolant freeze point. This method is more accurate than a test strip or a float-type hydrometer which can produce poor results.

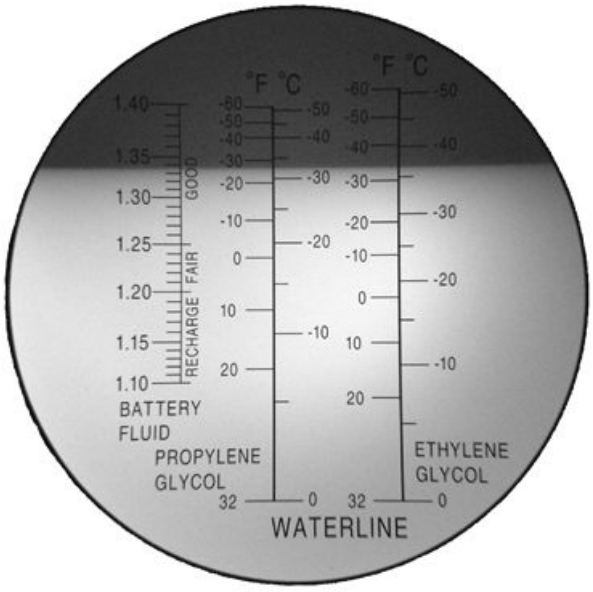
A coolant refractometer is available through your John Deere dealer under the SERVICEGARD™ tool program. Part number 75240 provides an economical solution to accurate freeze point determination in the field.

To use this tool:

1. Allow cooling system to cool to ambient temperatures.
2. Open radiator cap to expose coolant.
3. With the included dropper, collect a small coolant sample.
4. Open the lid of the refractometer, place one drop of coolant on the window and close the lid.
5. Look through the eyepiece and focus as necessary.
6. Record the listed freeze point for the type of coolant (ethylene glycol coolant or propylene glycol) being tested.

TS1732 —UN—04SEP13

SERVICEGARD™ Part Number 75240



TS1733 —UN—04SEP13

Image with a Drop of 50/50 Coolant Placed on the Refractometer Window

SERVICEGARD is a trademark of Deere & Company

DX,COOL,TEST -19-13JUN13-1/1

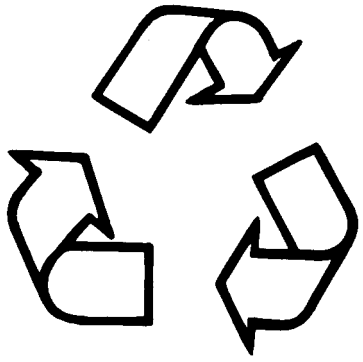
Disposing of Coolant

Improperly disposing of engine coolant can threaten the environment and ecology.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Inquire on the proper way to recycle or dispose of waste from a local environmental or recycling center, or from an authorized John Deere dealer.



TS1133 —UN—15APR13

Recycle Waste

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

The maintenance schedule decal consists of “tracks” located around an outline of a machine. Each “track” represents an interval at which a maintenance inspection or procedure is performed. Specific maintenance icons are located on each “track”, indicating which inspection or procedure is performed. For certain intervals, the consult Operator’s Manual (9) icon is shown. This indicates that it is necessary to reference the Operator’s Manual for specific information regarding maintenance inspections or procedures. For more information on fuel sulfur/engine oil (5), see the table in Engine Oil and Filter Service Intervals (3-1).

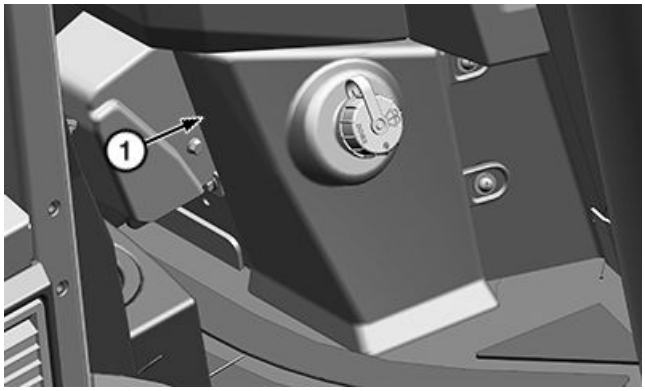
ouyc278,1670315886252 -19-04JAN23-2/2

Check Windshield Washer Fluid Level—If Equipped

1. Park machine on level surface. Lower front loader boom to ground.
2. Shut off engine.
3. Open right side cab door.

NOTE: During winter season, use all-season windshield washer fluid which will not freeze.

4. The windshield washer fluid bottle (1) is located inside the cab next to the speed control pedal.
5. Check fluid level in windshield washer fluid bottle and refill as required.



XJ1305883A —UN—30NOV20

Windshield Washer Fluid Bottle

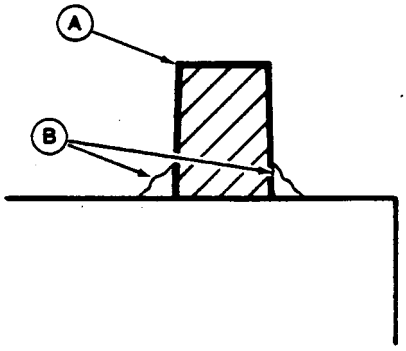
1— Windshield Washer Fluid Bottle

yn00108,1665908129232 -19-08NOV22-1/1

Clean and Tighten Battery Terminals

CAUTION: Battery gas can explode. Keep sparks and flames away from batteries. Always remove grounded (-) battery clamp first and replace it last.

1. Disconnect battery clamps, grounded clamp first.
2. Clean terminal (A) and clamp with a stiff brush.
3. Apply lubricating grease (B) where battery terminal meets top of battery case to prevent grease from escaping.
4. Install and tighten clamps, grounded clamp last.



T6758AA —UN—21OCT88

Battery Terminal

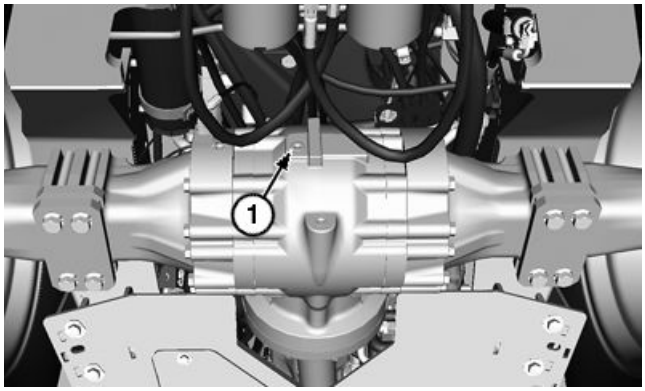
A—Terminal **B—Lubricating Grease**

TX,55,FF765 -19-30NOV16-1/1

Check Rear Axle Oil Level

NOTE: If the backhoe has been run in high-speed transport, wait 30 minutes for the axle oil level to stabilize before checking oil.

1. Park machine on a level surface.
2. Remove rear axle oil level plug (1). Oil should be filled to bottom of plug hole.
3. If oil level is not correct, add oil as necessary. See Transmission, Axles, and Mechanical Front Wheel Drive (MFWD) Oil. (Section 3-1.)
4. Install plug.



TX1106233 —UN—07FEB12

Rear Axle Oil Level Plug

1— Rear Axle Oil Level Plug

JG33441,0000094 -19-06NOV14-1/1

Check Coolant Condition

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

NOTE: Check coolant every 1000 hours or 1 year, or when replacing 1/3 or more of coolant using SERVICEGARD™ tool program.

1. Open engine hood to access surge tank. See Opening and Closing Engine Hood. (Section 3-2.)
2. Test engine coolant. See Testing Coolant Freeze Point (3-1).
3. Install surge tank cap.

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TS281 —UN—15APR13

Pressurized Fluids

4. Close engine hood.

JG33441,0000057 -19-31JUL23-1/1

Clean Machine Regularly

Remove any grease, oil, fuel, or debris buildup to avoid possible injury or machine damage.

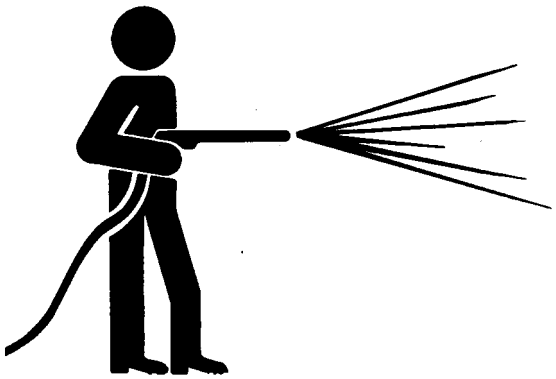
IMPORTANT: Avoid using high-pressure washing for electronic or electric devices, including the engine control unit (ECU), relays, and harness couplers.

Never steam-clean or pour cold water on the high-pressure fuel pump while it is still warm; doing so may cause pump parts to seize. Also, avoid steam-cleaning electrical components, wiring, sensors, and the ECU.

Avoid using high-pressure washing when cleaning the exhaust stack to prevent damage to engine.

Avoid machine damage. Machine is equipped with a sealed and lubricated track, avoid water being forced between the plastic pins and rubber plugs while washing machine with pressure washer.

Steam-clean engine thoroughly. High-pressure washing is not recommended.



T6642EJ —UN—18OCT88

Clean Machine Regularly

High-pressure washing greater than 1379 kPa (13.8 bar) (200 psi) can damage freshly painted finishes. Paint should be allowed to air-dry for 30 days minimum after receipt of machine before cleaning with high pressure. Use low-pressure wash operations until 30 days have elapsed.

Do not spray oil cooler fins at an angle; doing so may bend the cooler fins.

BB11933,0000076 -19-16NOV22-1/1

Welding On Machine

CAUTION: Avoid potentially toxic fumes and dust. Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch. Do all work outside or in a well-ventilated area. Dispose of paint and solvent properly.

When sanding or grinding painted surfaces, avoid breathing the dust. Wear an approved respirator. When using solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

IMPORTANT: Have only a qualified welder perform this job. Connect welder ground clamp close to each weld area so electrical current does not pass through any bearings, articulation joints, pivot points, or cylinders. Remove or protect all parts that can be damaged by heat or weld splatter.

1. Remove paint before welding or heating.
   - When sanding or grinding paint, avoid breathing the dust.
   - Wear an approved respirator. When using solvent or paint stripper, remove stripper with soap and water before welding.
   - Remove solvent or paint stripper containers and other flammable material from area.
   - Allow fumes to disperse at least 15 minutes before welding or heating.

IMPORTANT: Electrical current traveling from the welder through the machine electrical system may damage the machine electrical system, including batteries, control units, or other electrical components. Disconnect battery positive and negative cables before welding on machine.

2. Disconnect the negative (-) battery cables.
3. Disconnect the positive (+) battery cables.
4. Cover, protect, or move any wiring harness sections away from welding area.
5. For machine equipped with position sensing cylinders:
   - Disconnect all position sensors before welding.
   - Never connect welder ground clamp to piston rod or barrel.
   - Never weld on or near a cylinder with a sensor installed.

For any repairs, see an authorized John Deere dealer.

TX,WOM -19-28SEP23-1/1

Keep Electronic Control Unit Connectors Clean

IMPORTANT: Do not open control unit and do not clean with a high-pressure spray. Moisture, dirt, and other contaminants may cause permanent damage.

1. Keep terminals clean and free of foreign debris. Moisture, dirt, and other contaminants may cause the terminals to erode over time and not make a good electrical connection.
2. If a connector is not in use, put on the proper dust cap or an appropriate seal to protect it from foreign debris and moisture.
3. Control units are not repairable.
4. Since control units are the components LEAST likely to fail, isolate failure before replacing by completing a diagnostic procedure. (See your John Deere dealer.)
5. The wiring harness terminals and connectors for electronic control units are repairable.

DX,WW,ECU04 -19-11JUN09-1/1

JDLink™ Machine Monitoring System (MMS)—If Equipped

JDLink™ is an equipment monitoring and information delivery system. JDLink™ automatically collects and manages information about where and how construction and forestry equipment is being used, as well as critical machine health data and service status.

For more information, see an authorized John Deere dealer or visit www.deere.com (browse to Construction, Services and Support, JDLink™).

JDLink is a trademark of Deere & Company

VD76477,0001541 -19-26MAR15-1/1

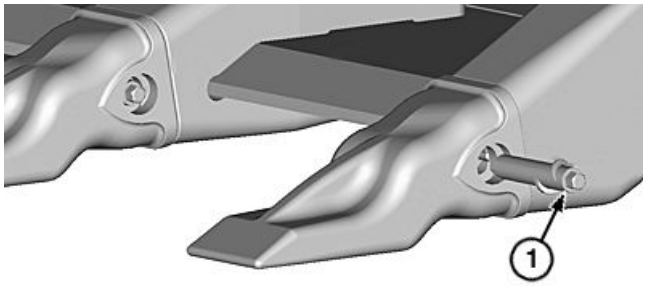
Replacing Bucket Teeth—TK Series

IMPORTANT: Prevent machine damage. Check bucket teeth periodically so that wear does not extend to the bucket tooth shank.

1. Remove pin (1) by rotating counterclockwise 180° using a ratchet and socket.
2. Remove tooth.
3. Inspect pin and rubber locks (2) for damage. Replace if necessary.
4. Position the new tooth over the tooth shank.
5. Install pin by rotating clockwise 180°. Install pin in same orientation as removed. Check alignment of pin.

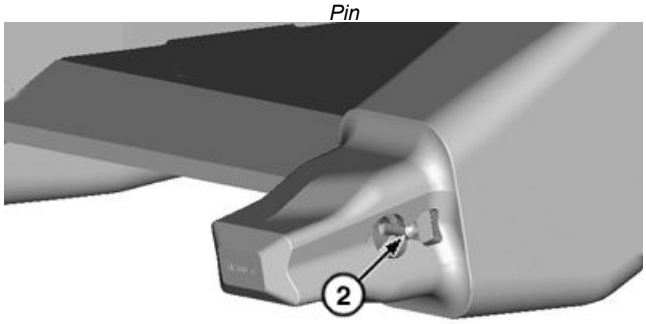
1— Pin

2— Rubber Lock (2 used)



TX1150806 —UN—10JAN14

Pin



TX1150895 —UN—10JAN14

Rubber Lock

CD50885,000001F -19-20AUG20-1/1

2. Start engine and run at slow idle with park brake on.
3. Steer right to left 3 times to fill the brake valve reservoir.
4. Shut off engine.

Continued on next page

JJ5JLD3,00001F7 -19-31JUL23-2/5

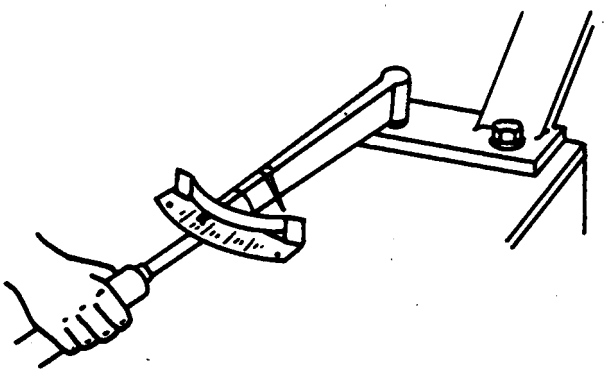
Keep ROPS Installed Properly

CAUTION: Avoid personal injury or death. Make certain all parts are reinstalled correctly if the rollover protective structure (ROPS) is loosened or removed for any reason. Tighten mounting bolts to proper torque.

The protection offered by ROPS will be impaired if ROPS is subjected to structural damage, is involved in an overturn incident, or is in any way altered. A damaged ROPS should be replaced, not reused.

When installation of equipment on a machine necessitates loosening or removing ROPS, mounting bolts must be tightened to specification.

Specification	
ROPS Mounting Bolts—Torque	420 N·m 310 lb·ft

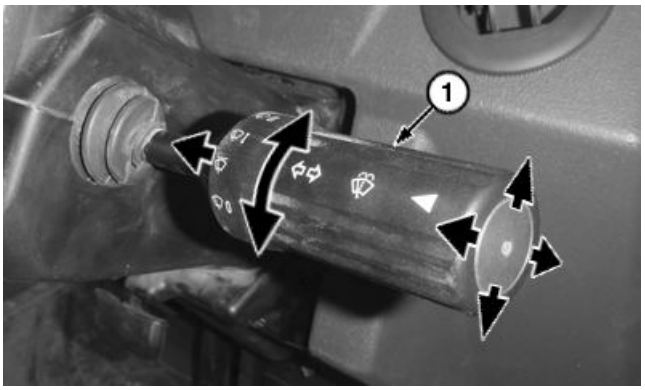


TS176 —UN—23AUG88

Tighten Mount Bolts to Proper Torque

LB82152,0000B2A -19-09FEB16-1/1

4 Front Wiper and Washer Circuit Check (if equipped)



TX1175160A —UN—21OCT14

Multi-Function Lever (MFL) (cab shown)

1— Multi-Function Lever (MFL)

NOTE: The multi-function lever (MFL) has multiple positions to control front worklights, turn signals, windshield wiper, and washer functions (if equipped).

Rotate or push in on the multi-function lever (MFL) to select desired windshield wiper functions:

- Intermittent
- Low speed
- High speed
- Windshield washer

NOTE: Wiper intermittent delay time is adjustable in monitor setup, wiper delay. See Setup—Wiper Delay (2-3).

Rotate multi-function lever (MFL) to select desired windshield operating modes.

LOOK: Does front wiper operate in intermittent mode?

YES: Continue check.

LOOK: Does front wiper operate in slow mode?

NO: Check fuse. See Replacing Fuses (4-1).

LOOK: Does front wiper operate in fast mode?

IF OK: See an authorized John Deere dealer.

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.

YES: Go to next check.

Push in on end of multi-function lever (MFL) (toward steering column) and hold to spray washer fluid on windshield and activate wiper at low speed.

NO: Washer fluid reservoir may be empty.

LOOK: Does front wiper continue to operate?

NO: Check washer hose for kinks or obstructions.

LOOK: Does front washer pump operate?

IF OK: See an authorized John Deere dealer.

Continued on next page

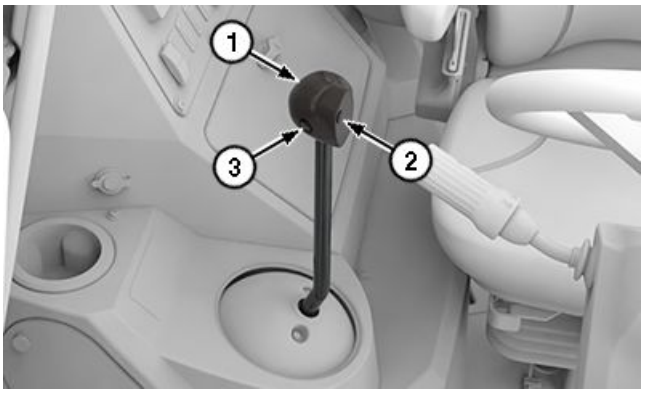
7 Park Brake Function Check	Fasten seat belt.	
	Start the engine and set engine speed to low idle.	
	Lock operator's seat in loader position.	
	Apply service brakes.	
	Release park brake.	
	Move transmission control lever (TCL) to third gear forward (3F).	
	Slowly increase engine speed enough to allow machine to start to move approximately 3 m (10 ft).	
	Apply the park brake.	
	NOTE: Transmission will shift to neutral (N) as soon as park brake is applied.	
	LOOK/FEEL: Does park brake engage when park brake switch is pushed and does the machine stop?	
	LOOK/FEEL: Does monitor show RELEASE PARK BRAKE?	
	LOOK/FEEL: Does monitor show a flashing STOP symbol?	**YES:** Go to next check.
	LOOK/FEEL: Does an audible warning sound?	**NO:** See an authorized John Deere dealer.

ouyc278,1670226279720 -19-04JAN23-36/63

8 Pilot Control Enable/Disable Switch Check	Start the engine and set engine speed to low idle.	
	Apply the park brake.	
	Lock seat in backhoe position.	
	Enable pilot controls.	
	Operate backhoe functions.	**YES:** Continue check.
	LOOK: Do backhoe functions move?	**NO:** See an authorized John Deere dealer.
	Disable pilot controls and move backhoe control levers.	**YES:** See an authorized John Deere dealer.
	LOOK: Do activated functions move?	**NO:** Continue check.
	NOTE: Rotating seat position from backhoe to loader position will disable pilot control switch automatically.	
	Enable pilot controls.	
	Rotate operator's seat to loader position.	**YES:** See an authorized John Deere dealer.
	LOOK: Do backhoe functions move?	**NO:** Go to next check.

Continued on next page

ouyc278,1670226279720 -19-04JAN23-37/63

24 Mechanical Front Wheel Drive (MFWD) Driving Check	 YN1334438A —UN—07DEC22 *Loader Control Lever* **1— Loader Control Lever** **2— Clutch Disconnect Switch** **3— Momentary Mechanical Front Wheel Drive (MFWD) Switch** Set engine speed to low idle. Lock operator's seat in loader position. **CAUTION: Prevent possible crushing injury from heavy component. Use appropriate lifting device. Do not crawl under a hydraulically supported machine.** **CAUTION: Prevent possible injury from unexpected boom or bucket movement when equipped with ride control. Ride control accumulator energy must be discharged when working on hydraulic components.** If equipped, disable ride control (no LEDs are illuminated on switch). Raise machine off the ground using the loader bucket and stabilizers. Release park brake. Shift transmission to first gear and operate engine at approximately 1500 rpm. Move transmission control lever (TCL) to forward (F) position. Turn on toggle switch for mechanical front wheel drive (MFWD). *NOTE: When mechanical front wheel drive is OFF, there may be a small amount of drag that turns the front wheels slowly.* *LOOK: Do the front wheels turn faster than when MFWD is turned OFF?*	**YES:** Continue check. **NO:** See an authorized John Deere dealer.
	Disengage MFWD switch. *NOTE: When mechanical front wheel drive is OFF, there may be a small amount of drag that may turn front wheels slightly.* *LOOK: Do the front wheels stop turning or slow down?*	**YES:** Continue check. **NO:** See an authorized John Deere dealer.
	Disengage MFWD switch. Shift transmission to first gear and operate engine at approximately 1500 rpm. Press and hold the momentary mechanical front wheel drive (MFWD) switch (3) on the loader control lever. *NOTE: When mechanical front wheel drive is OFF for this check, there may be a small amount of drag that may turn front wheels slightly.* *LOOK: Do the front wheels turn faster than when MFWD is turned OFF?*	**YES:** Go to next check. **NO:** See an authorized John Deere dealer.

Continued on next page

Symptom	Problem	Solution
	Low battery power	Check battery charge. Charge or replace battery. See Using Battery Charger (4-1).
	Electronic control system problem or basic engine	See an authorized John Deere dealer.
	Cold start aid (if equipped) not functioning properly	See an authorized John Deere dealer.
Engine Misfires, Runs Irregularly	Fuel quality and quantity	Replace fuel with proper fuel if quality is poor. Fill fuel tank is quantity is low.
	Restricted fuel tank breather	Remove fuel tank cap and listen for sound of air entering tank. Replace cap. See Replace Fuel Tank Breather (3-8).
	Restricted air filters	Replace air filters. See Replace Primary and Secondary Engine Air Filter Elements (3-3).
	Restricted fuel filters	Replace fuel filters. See Replace Fuel Filters (3-7).
	Air in fuel	Check fuel system for loose connections or damage. See an authorized John Deere dealer.
	Engine accessories cycling on and off	Check engine accessories (air conditioner or fan drives) cycling on and off.
	Electronic interference	Check for improperly installed radios or other accessories.
	Electronic control system problem or basic engine	See an authorized John Deere dealer.
Engine Does Not Develop Full Power	Restricted air filters	Replace air filters. See Replace Primary and Secondary Engine Air Filter Elements (3-3).
	Restricted fuel filters	Replace fuel filters. See Replace Fuel Filters (3-7).
	Fuel quality and quantity	Replace fuel with proper fuel if quality is poor. Fill fuel tank is quantity is low.
	Unbalanced liquid ballast	Verify correct ballast volume and weight in tires.

Continued on next page

Symptom	Problem	Solution
	Intake hose to hydraulic pump restricted	See an authorized John Deere dealer.
	Hydraulic pump malfunction	See an authorized John Deere dealer.

JJ5JLD3,00001B2 -19-30JUN20-3/2

Steering System

Symptom	Problem	Solution
No Steering	Low hydraulic oil level	Check hydraulic oil level. Add oil to correct level.
	Steering load sense isolator	See an authorized John Deere dealer.
	Loader coupler valve (if equipped) two-way check valve	See an authorized John Deere dealer.
Slow or Hard Steering	Hydraulic oil aerated	Incorrect hydraulic oil. Drain and refill.
		Check for loose or leaking suction hose.
	Too much load in loader bucket	Reduce load.
	Pinched steering line	Inspect and repair line as required.
Erratic ("spongy") Steering	Hydraulic oil level too high or low	Drain or add oil to correct level.
	Hydraulic oil aerated	Incorrect hydraulic oil. Drain and refill.
		Check for loose or leaking suction hose.
Machine Turns in Opposite Direction	Steering cylinder lines connected to wrong ports	Connect steering cylinder lines to opposite ports.

JJ5JLD3,00001B3 -19-19JUN20-1/1

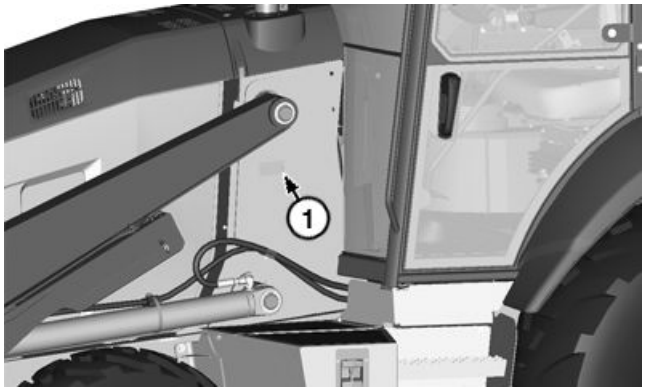
Miscellaneous—Machine Numbers

Record Product Identification Number (PIN)

Product Identification Number (PIN):

The PIN plate (1) is located on left side of machine on the loader frame. Each machine has a 17-character PIN shown on this plate.

1— PIN Plate



TX1171862 —UN—17DEC14

PIN Plate Location

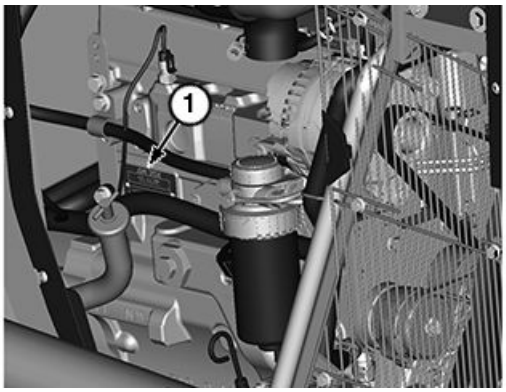
JB3888,0000E62 -19-23SEP14-1/1

Record Engine Serial Number

Engine Serial Number:

The engine serial number plate (1) is located on the right side of the engine.

1— Engine Serial Number Plate



TX1181474 —UN—23DEC14

Engine Serial Number Plate Location

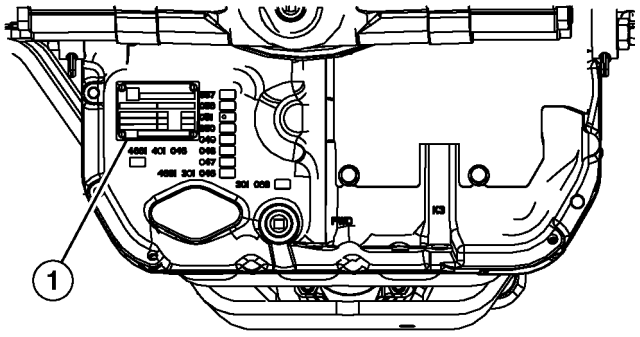
JJ5JLD3,000021A -19-04SEP20-1/1

Record Transmission Serial Number

Transmission Serial Number:

The transmission serial number plate (1) is located on the right side of the machine, near the lower left corner of transmission case.

1— Transmission Serial Number Plate



TX1107878 —UN—08FEB12

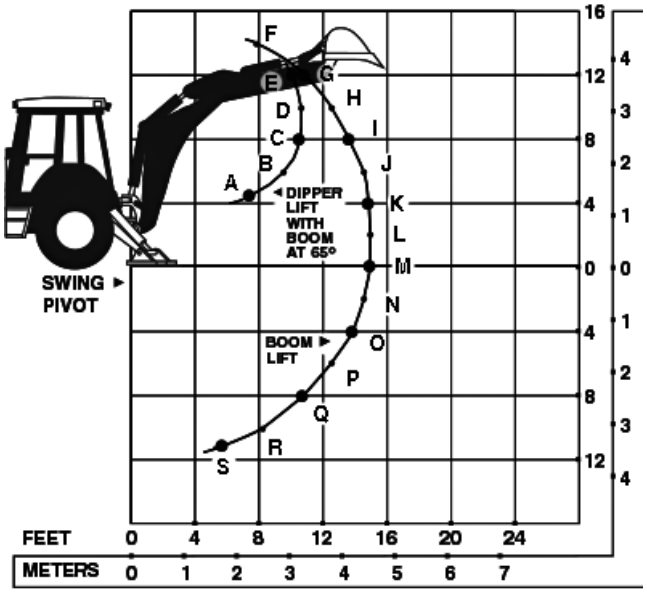
Transmission Serial Number Plate Location

JJ5JLD3,0000224 -19-15SEP20-1/1

Backhoe Loader Lifting Capacities—Standard Dipperstick

NOTE: Loader bucket on ground significantly improves side stability, therefore improving lift capacity to the side. Lift capacity over the rear is not affected.

Lifting capacity ratings are made with bucket hinge pin, loader bucket, stabilizer, and tires on firm, level ground and are stability limited. Lifting capacities are 87% of the maximum lift and are not to exceed 75% of the tipping load when measured at hinge pin of bucket. Angle between boom and ground is 65 degrees. Machine is equipped with 610 mm (24 in) standard bucket, extendable dipper stick, and standard equipment.



Lift Capacity Backhoe (with standard dipperstick based on SAE J31, normal lift)

Backhoe Lift Capacity With Standard Dipperstick	
A	4782 kg (10 543 lb)
B	3673 kg (8097 lb)
C	3236 kg (7135 lb)
D	3168 kg (6985 lb)
E	3038 kg (6698 lb)
F	1839 kg (4054 lb)
G	1936 kg (4269 lb)
H	1918 kg (4228 lb)
I	1873 kg (4128 lb)
J	1820 kg (4013 lb)
K	1768 kg (3897 lb)
L	1717 kg (3786 lb)
M	1671 kg (3685 lb)
N	1630 kg (3594 lb)
O	1596 kg (3518 lb)
P	1571 kg (3463 lb)
Q	1563 kg (3447 lb)
R	1609 kg (3547 lb)
S	1735 kg (3824 lb)

ouyc278,1670890735382 -19-04JAN23-1/1