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

(PIN: 1T0318E_ _ _J249323—)

(PIN: 1T0320E_ _ _J249291—)

(PIN: 1T0324E_ _ _ J297099—)

JOHN DEERE

OPERATOR'S MANUAL

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

OMT306353 ISSUE F3 (ENGLISH)

CALIFORNIA

Proposition 65 Warning

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

If this product contains a gasoline engine:

⚠ WARNING

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

The State of California requires the above two warnings.

Worldwide Construction And Forestry Division

PRINTED IN U.S.A.

CARB Non-road Emissions Control Warranty Statement—Compression Ignition

Emissions Control Warranty Statement 2019 through 2021

DXLOGOV1 —UN—28APR09

JOHN DEERE

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

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

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

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT:

The California Air Resources Board (CARB) is pleased to explain the emission-control system warranty on 2019 through 2021 off-road diesel engines. In California, new off-road engines must be designed, built and equipped to meet the State’s stringent anti-smog standards. John Deere must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the fuel injection system and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

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

EMISSIONS WARRANTY EXCLUSIONS:

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

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

Continued on next page

Contents

Continued on next page

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.

Avoid Static Electricity Risk When Refueling

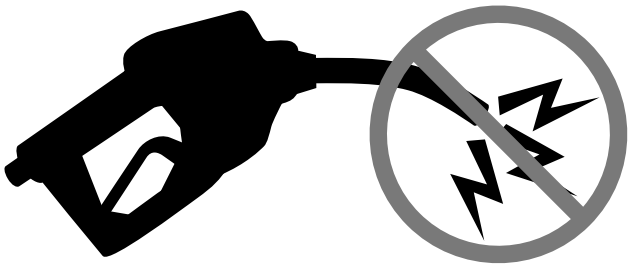
The removal of sulfur and other compounds in Ultra-Low Sulfur Diesel (ULSD) fuel decreases its conductivity and increases its ability to store a static charge.

Refineries may have treated the fuel with a static dissipating additive. However, there are many factors that can reduce the effectiveness of the additive over time.

Static charges can build up in ULSD fuel while it is flowing through fuel delivery systems. Static electricity discharge when combustible vapors are present could result in a fire or explosion.

Therefore, it is important to ensure that the entire system used to refuel your machine (fuel supply tank, transfer pump, transfer hose, nozzle, and others) is properly grounded and bonded. Consult with your fuel or fuel system supplier to ensure that the delivery system is in compliance with fueling standards for proper grounding and bonding practices.

RG22142 —UN—17MAR14



RG21992 —UN—21AUG13

DX,FUEL,STATIC,ELEC -19-12JUL13-1/1

High Debris Applications

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

T133552 —UN—15APR13

Flammable Debris

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

Park and Prepare for Service Safely

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

- Do not support machine with any hydraulically actuated tools or attachments.
- Do not support machine with cinder blocks or wooden pieces that may crumble or crush.
- Do not support machine with a single jack or other devices that may slip out of place.
- Always install boom lock before working on or around this machine with the loader boom raised.
- Park machine on a level surface and lower equipment to the ground.
- Engage park brake.
- Stop engine.
- Attach a “DO NOT OPERATE” tag in an obvious place in the operator's station.

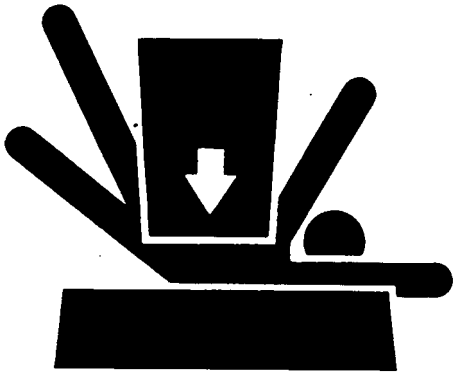
Securely support machine or attachment before working under it.

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

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

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

T133332 —19—17APR13



TS229 —UN—23AUG88

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

Service Cooling System Safely

Explosive release of fluids from pressurized cooling system can cause serious burns.

Do not service radiator through the radiator cap. Only fill through the surge tank filler cap. Shut off engine. Only remove surge tank filler cap when cool enough to touch with bare hands. Slowly loosen cap to relieve pressure before removing completely.

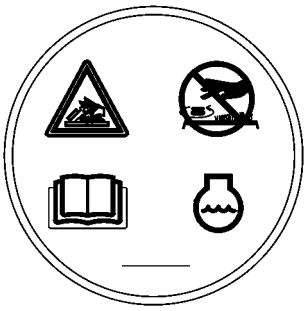
TS281 —UN—15APR13

TX,SURGE -19-19JAN11-1/1

14. **WARNING, Pressurized System**

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

This safety message is positioned on the surge tank cap.



TX1099924 —UN—24OCT11

WARNING, Pressurized System

MB60223,0000020 -19-21MAY14-16/16

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

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

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

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

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

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

JK47244,0000278 -19-04AUG14-2/2

Interlocking Seat Bar

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

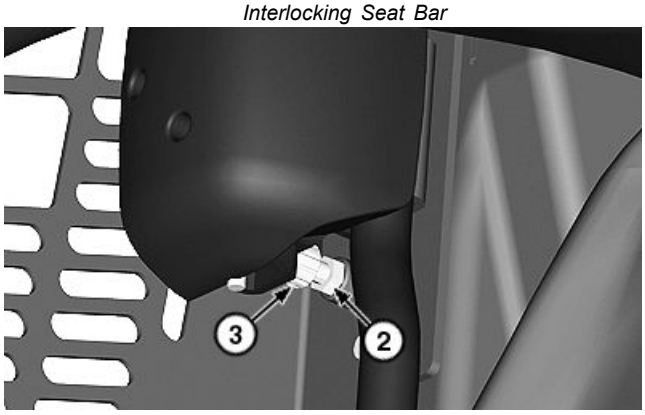
Adjusting the Interlocking Seat Bar

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

1— Interlocking Seat Bar
2— Lock Nut
3— Adjustable Stop

TX1066761A —UN—23OCT09

Interlocking Seat Bar



TX1119802 —UN—07AUG12

Locking Seat Bar Adjustment

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

Fire Extinguisher Location

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

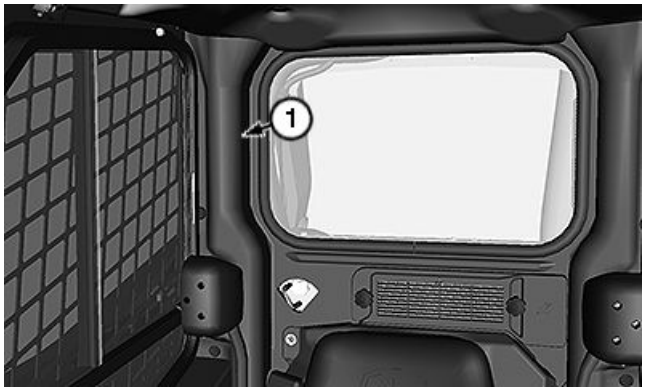
The recommended location for the fire extinguisher is inside the cab on the right-rear ROPS post, boom lock side of the rear window.

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

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

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

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



TX1169358A —UN—18AUG14

Fire Extinguisher Mounting Location

1— Fire Extinguisher Mounting Location

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

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

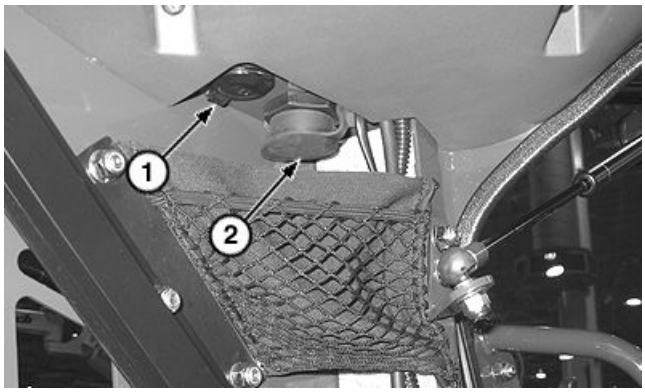
12-Volt Power Outlet

NOTE: Machine switched power must be on for operation.

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

1— 12-Volt Power Outlet

2— Service ADVISOR™ Connector



TX1066774A —UN—11NOV09

Power Outlet

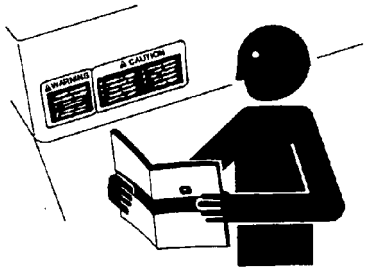
Service ADVISOR is a trademark of Deere & Company

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

Before Starting Work

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

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



T133556 —UN—24AUG00

Reading Operator's Manual

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

Operator's Daily Machine Check Before Starting

Safety and Protective Device Checks

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

Check condition of guards, shields, and covers.

Overall Machine Checks

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

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

Check for loose or missing hardware.

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

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

Exhaust Filter

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

- **NATURAL/PASSIVE**
- **AUTO**
- **PARKED**

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

- LOW
- MODERATE
- HIGH

For more information, see Engagement and Monitor Unit (EMU)—Main Menu—Exhaust Filter. (Section 2-3.)

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

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

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

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

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

Natural/Passive Cleaning

During normal machine operation the exhaust heat will naturally clean the soot build up in the exhaust filter.

Auto Cleaning

NOTE: Low idle will only adjust under the following conditions:

- *If operator takes engine speed above low idle threshold, engine speed will not return to factory low idle setting.*
- *Low idle will increase automatically if vehicle is in a “safe” state.*

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

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

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

NOTE: If auto cleaning is set to disabled, machine may revert back to enabled after a power cycle.

□ DEFAULT TO PREVIOUS
□ DEFAULT TO ENABLED
□ DEFAULT TO DISABLED

See your authorized dealer if a different default setting is preferred.

IMPORTANT: Avoid machine damage. Do not stop engine when Exhaust Filter Cleaning Indicator illuminates.

With auto cleaning enabled, exhaust filter cleaning is automatically performed as needed, with no interaction from the operator. An exhaust filter cleaning indicator will illuminate on the EMU when the system is actively performing an exhaust filter auto cleaning. Machine can be operated as normal. When the exhaust filter auto cleaning process has completed its cycle, the cleaning indicator will automatically turn off.

If filter restriction reaches the MODERATE soot level with auto cleaning enabled and the EMU indicates a parked cleaning is needed, further action is needed to clean the filter. A pop-up will appear indicating to run a parked filter cleaning at the earliest convenience.

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

Continued on next page

Operating Boom—EH Controls

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

EH Hands Only (ISO Pattern) Controls

The right joystick (1) controls the boom:

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

Float Position:

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

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

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

To activate float:

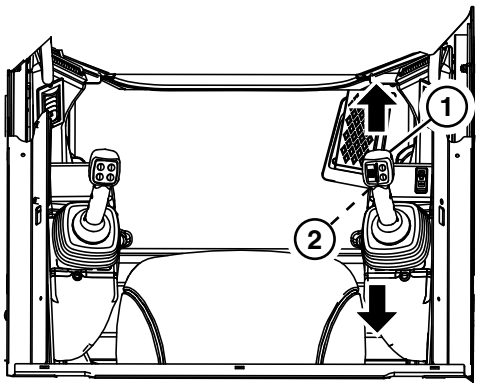
1. Activate boom down motion.
2. Press and release float switch (2).
3. Allow joystick to move to neutral position.

NOTE: Pressing float switch again will not deactivate float.

To deactivate float:

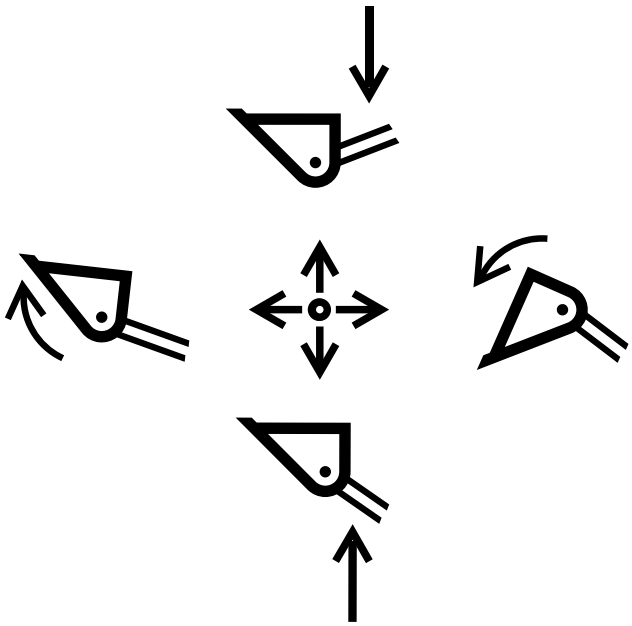
1. Move right joystick a minimum of 10% either forward or backward.

1— Right Joystick **2— Float Switch**



TX1126818 —UN—18DEC12

Right Joystick



TX1067123 —UN—04NOV09

Right Joystick Operation—ISO Pattern

Continued on next page

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

Power Quik-Tatch™

TX1124964 —UN—19NOV12

Control Panel

Installing an attachment:

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

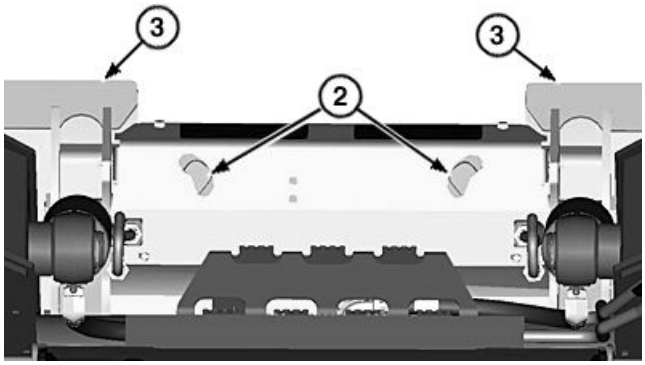
NOTE: The switch will automatically return to center position when released. The lock pins will stop at the position they are in at the time the switch is released.

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

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

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

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



TX1128700 —UN—27DEC12

Power Quik-Tatch™

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

13. Connect hydraulic hoses to couplers, if needed. See Connecting and Disconnecting Auxiliary Hydraulics in this section.

Removing the attachment:

1. Park machine on level surface.

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

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

   If attachment does have hydraulic hoses connected to couplers:

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

Continued on next page

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

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

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

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

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

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

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

Auto Lock Feature

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

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

JK47244,000014F -19-14NOV13-2/2

Engagement and Monitor Unit (EMU)—Normal Display

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

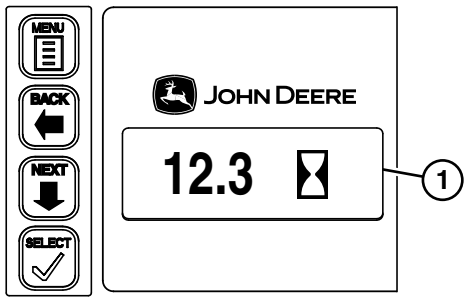
Approximately 5 seconds later, the normal display will be shown.

Display window (1) has six active selectable displays.

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

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

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



TX1144063 —UN—16SEP13

Display Window (hour meter shown)

1— Display Window

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

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

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

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

Operator Presets

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

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

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

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

Unlocking the Machine (Operator and Owner)

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

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

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

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

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

Locking the Machine (Operator and Owner)

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

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

Prompt for Lock

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

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

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

Auto Lock—5 Minutes

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

   OR

   Press SELECT to lock the machine immediately.

Auto Lock—60 Minutes

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

   OR

   Press SELECT to lock the machine immediately.

Continued on next page

Operating in Cold Temperature Climates

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

See Cold Weather Starting. (Section 2-2.)

The following oils are recommended for optimum starting performance:

Diesel Engine Oil

- SAE 0W-40 John Deere Plus-50™ II

Hydraulic and Hydrostatic Oil

- John Deere Hydrau™XR

Plus-50 is a trademark of Deere & Company
Hydrau is a trademark of Deere & Company

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

Operating at High Altitude

Machines equipped with 4TNV98C engines are designed to operate below 1524 m (5000 ft.). Machine performance can be affected when operating at or above this altitude.

JK47244,0000336 -19-01OCT13-1/1

Alternative and Synthetic Lubricants

Conditions in certain geographical areas may require lubricant recommendations different from those printed in this manual.

Some John Deere brand coolants and lubricants may not be available in your location.

Consult your John Deere dealer to obtain information and recommendations.

Synthetic lubricants may be used if they meet the performance requirements as shown in this manual.

The temperature limits and service intervals shown in this manual apply to John Deere branded fluids or fluids that have been tested and/or approved for use in John Deere equipment.

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

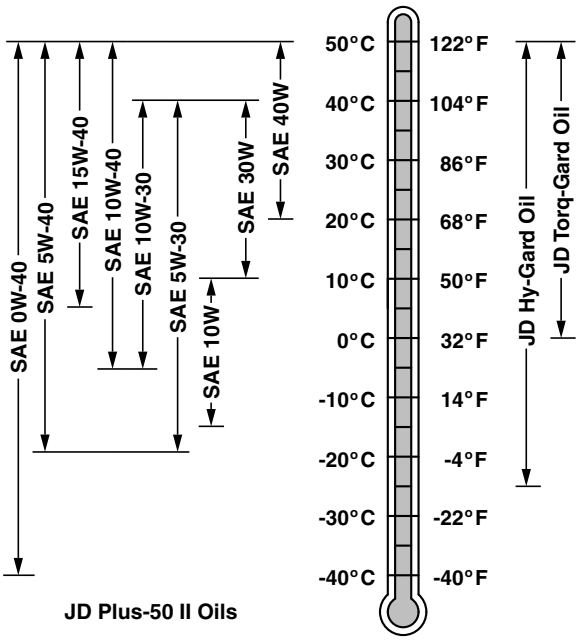
DX,ALTER -19-13JAN18-1/1

Chain Case Oil

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

The following oils are preferred:

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



Oil Viscosities for Ambient Temperature Ranges

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

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

Multipurpose Extreme Pressure (EP) Grease

IMPORTANT: For automated lubrication systems different ambient air temperatures need to be considered.

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

John Deere SD Polyurea Grease is preferred.

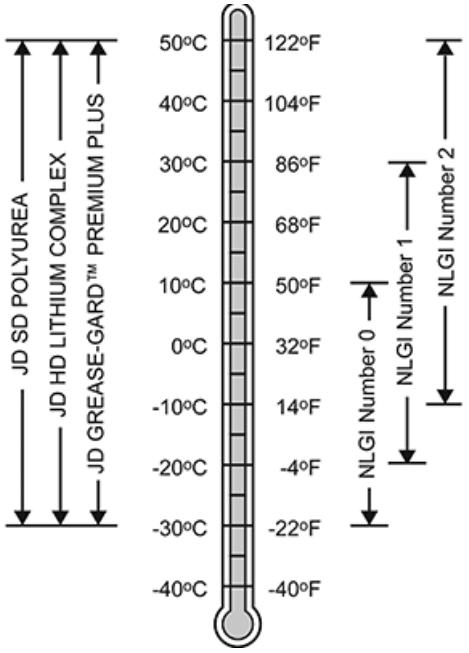
The following greases are also recommended:

- John Deere HD Lithium Complex Grease
- John Deere Grease-Gard™ Premium Plus

Other greases may be used if they meet the following:

- NLGI Performance Classification GC-LB
- ISO-L-X-BDHB 2 or DIN KP 2 N-10 Lithium Complex, Non-Synthetic Base Oil (100 to 220 mm2/s @ 40°C)

IMPORTANT: Some types of thickeners, base oils, and additives used in greases are not compatible with others. Mixing greases should be avoided. Consult your grease supplier before mixing different types of grease.



Greases for Air Temperature Ranges

Grease-Gard is a trademark of Deere & Company

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

□ Replace hydraulic oil reservoir breather
Every 1500 Hours
□ Check and adjust engine valve lash
Every 6000 Hours
□ Drain, flush, and refill cooling system

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

JK47244,0000346 -19-30SEP15-2/2

Replace Secondary Engine Air Filter

IMPORTANT: Prevent possible engine damage. Do not clean primary engine air filter. Replace filter when air restriction light is illuminated on engagement and monitor unit (EMU). To prevent dirt from being sucked into engine, do not remove filter when engine is running.

Do not start engine without both primary and secondary filters installed.

NOTE: Secondary air filter should only be removed at every third primary filter replacement or if visual inspection indicates immediate attention is required.

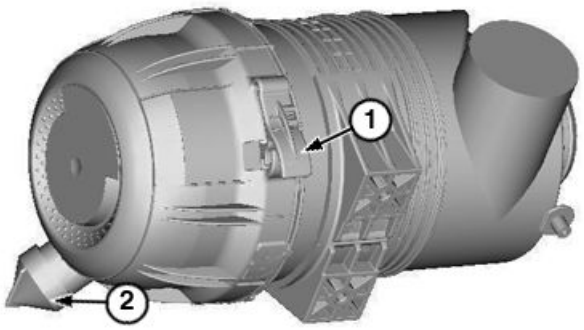
1. Park machine on level surface.
2. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
3. Engage park brake and stop engine.

NOTE: On turbocharged engines, air filters are serviced from left side of machine. On naturally-aspirated engines, air filters are serviced from right side of machine.

4. Open engine cover and remove engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)
5. Remove dust unloader valve (2) and clean out dust found in drop tube.
6. Replace dust unloader valve if worn or damaged. Install dust unloader valve.
7. Pull up on service cover latch (1) and rotate service cover counterclockwise to remove.
8. To remove primary filter (3), gently move end of filter back and forth to break seal.
9. Gently pull filter out of housing and discard. Avoid dislodging contaminant from filter or knocking filter against housing.
10. Remove secondary filter (4) by pulling straight out. Replace secondary filter if dirty or damaged.

IMPORTANT: DO NOT use compressed air to clean debris from air cleaner housing. Debris can enter engine, causing internal engine damage.

11. Clean air filter housing.
12. Install secondary filter by pressing filter firmly in place until seated. When properly fitted, secondary filter should fit tightly inside outlet tube.
13. Install new primary filter by gently sliding filter over secondary filter and pressing primary filter in place until fully seated. When installing, apply pressure by hand at outer rim of filter to complete a tight seal. Continue pushing filter into outlet tube until filter stops.

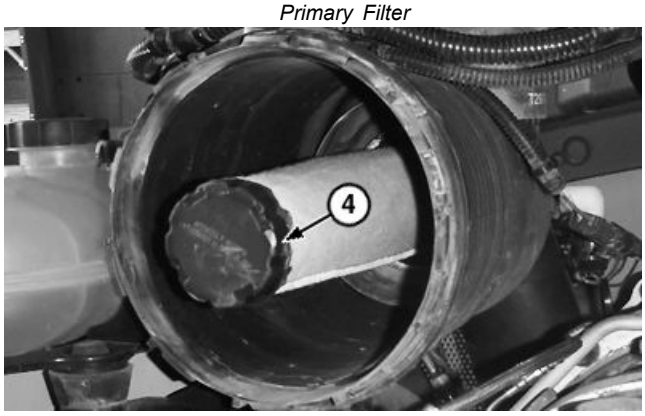


TX1140430 —UN—12JUL13

Service Cover Latch and Dust Unloader Valve

TX1144082 —UN—16SEP13

Primary Filter



TX1140428 —UN—16SEP13

Secondary Filter

1— Service Cover Latch
2— Dust Unloader Valve
3— Primary Filter
4— Secondary Filter

The critical sealing area will compress slightly, adjust itself, and distribute sealing pressure evenly.

IMPORTANT: Prevent possible engine damage. If service cover does not fit flush to air filter housing, primary filter is not properly seated in housing.

14. Replace service cover with dust unloader valve facing downward. Rotate service cover clockwise to lock in position. Do not force service cover onto air cleaner or use service cover to push filter into place.

Continued on next page

JK47244,0000325 -19-06MAR14-1/2

Take Engine Oil Sample

See your authorized dealer.

OUT4001,000039B -19-14MAR12-1/1

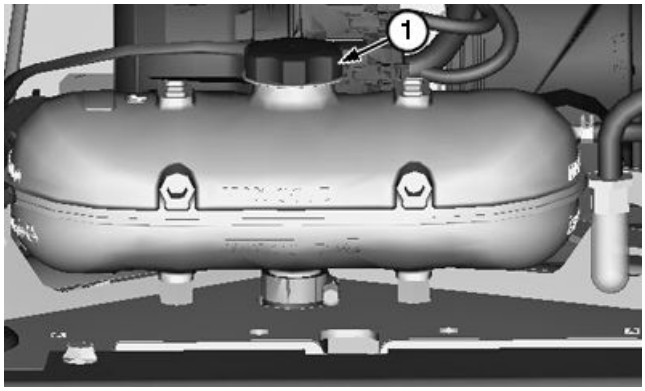
Drain Cooling System

1. Park machine on a level surface.
2. Allow engine to cool.
3. Open engine cover and remove right engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)

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

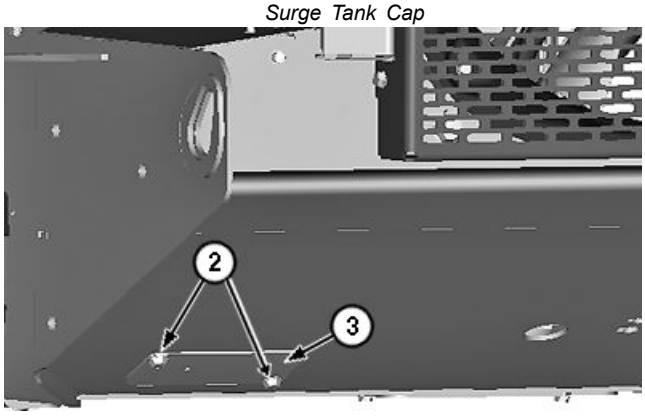
4. Slowly turn surge tank cap (1) to release pressure. Remove cap.
5. Under left rear side of machine, remove cap screws (2) from access cover (3) and pull out access cover.
6. Route coolant drain hose through access cover opening. Place suitable container under drain hose.
7. On right side of machine, open cooling system drain valve (4) and allow coolant to drain into container. Dispose of used coolant properly.
8. Close cooling system drain valve.
9. Flush cooling system. See Flush Cooling System in this section.

1— Surge Tank Cap
2— Cap Screw (2 used)
3— Access Cover
4— Drain Valve



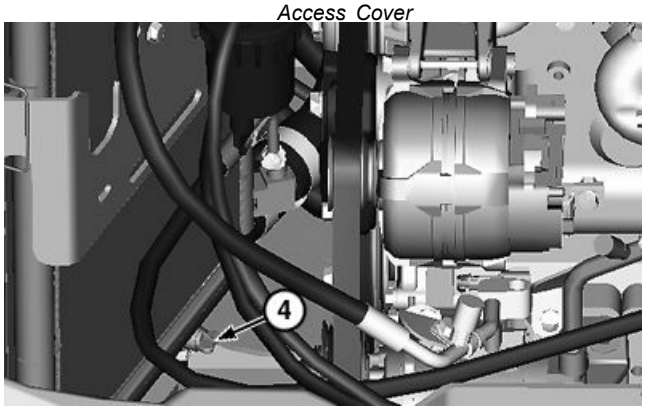
TX1144777 —UN—30SEP13

Surge Tank Cap



TX1143769A —UN—10SEP13

Access Cover



TX1140864A —UN—19JUL13

Cooling System Drain Valve

JK47244,000032F -19-27SEP13-1/1

Removing Battery

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

NOTE: If battery is dead, battery will need to be charged or engine boost started before removal procedure so boom can be raised.

1. Remove attachment.
2. Park machine on level surface.
3. Raise boom and lock in raised position. See Boom Lock. (Section 2-2.)
4. Engage park brake and stop engine.
5. Open engine cover and remove left engine side panel. See Engine Side Panels—Remove and Install. (Section 3-2.)
6. Disconnect negative (-) terminal (2) cable from battery.
7. Pull back red positive terminal cover (1) and disconnect positive (+) cable from battery.
8. Clean battery with a damp cloth or rag. Keep dirt out of battery cells.
9. Loosen J-bolts (3) on battery hold-down bracket.
10. Lift battery from battery compartment.
11. Clean battery, battery terminals, cable ends, battery compartment, and other parts with a solution of 1 part baking soda to 4 parts water. Keep solution out of battery cells.
12. Rinse all parts with clean water and let dry.

NOTE: If a new battery is needed, install a battery of equal specification. See Replacing Battery in this section.

TX1139742 —UN—16SEP13

Battery

1— Positive Terminal Cover
2— Negative Terminal
3— J-Bolt (2 used)

13. Place battery in battery compartment.
14. Install battery hold-down bracket.
15. Install J-bolts and tighten hardware.
16. Connect positive (+) cable to battery positive (+) terminal. Apply petroleum or silicone spray to terminal to prevent corrosion. Make sure connection is tight. Push red positive cover over positive terminal.
17. Connect negative (-) cable to battery negative (-) terminal. Apply petroleum or silicone spray to terminal to prevent corrosion. Make sure connection is tight.
18. Install left engine side panel and close engine cover.
19. Lower boom.

JK47244,000030A -19-12JUL13-1/1

Replacing Battery

This machine has one 12-volt battery with negative (-) ground. Battery must meet one of the specifications below.

Specification	
Battery—Cold Cranking Amps	750
Battery—Minutes Reserve Capacity	150

For removal and installation procedure, see Removing Battery in this section.

JK47244,000031F -19-10JUL13-1/1

Operational Checkout

Use this procedure to perform a quick check of machine operation by doing a walk-around inspection and performing specific checks from the operator's seat.

Complete visual checks (oil levels, oil condition, external leaks, loose hardware, linkage, wiring, etc.) before performing checkout.

Most checks will require machine to be on a level surface with adequate space to operate functions and systems to be at normal operating temperatures. Some checks may require varied surfaces.

No special tools are necessary to perform the checkout.

If no problem is found, go to next check. If a problem is indicated, an additional check or repair procedure will be suggested.

JB92884,00000FB -19-27AUG19-1/41

Diagnostic Trouble Code Check

JB92884,00000FB -19-27AUG19-2/41

Display and Clear Diagnostic Trouble Codes	**Always check for diagnostic trouble codes (DTCs) and correct them before performing operational checkout.** Check for active and stored diagnostic trouble codes (DTCs). Diagnostic trouble codes can be displayed by using one of the following methods: • Engagement and Monitor Unit (EMU) - To access DTCs using EMU, See Engagement and Monitor Unit (EMU)—Main Menu—Codes. (Section 2-3.) • Service ADVISOR™ Diagnostic Application *LOOK: Are diagnostic trouble codes present?*	**YES:** Correct all diagnostic trouble codes before proceeding. **NO:** Continue with operational checkout.

Service ADVISOR is a trademark of Deere & Company

JB92884,00000FB -19-27AUG19-3/41

Operational Checks—Switched Power OFF, Engine OFF Checks

JB92884,00000FB -19-27AUG19-4/41

Periodic Maintenance Decal Check	Periodic maintenance decal check. *LOOK: Is periodic maintenance decal legible?*	**YES:** Go to next check. **NO:** Replace decal.

JB92884,00000FB -19-27AUG19-5/41

Cab Door and Window Seals Check (if equipped)	Open and close cab door and windows. Inspect seals. *LOOK/FEEL: Do cab door and windows seal properly?* *LOOK/FEEL: Do cab door and windows latch properly?*	**YES:** Go to next check. **NO:** Adjust door and windows to close against seals properly. Replace seals as necessary. **NO:** Adjust or replace latches as necessary.

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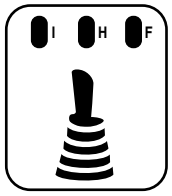
JB92884,00000FB -19-27AUG19-6/41

Pattern Select Check (EH only, if equipped)

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



TX1125299 —UN—06NOV12

Pattern Select Switch

Position engine speed control dial in slow idle position.

Park brake and hydraulic enable engaged.

Press pattern select switch on sealed switch module (SSM) to change control pattern, (EMU) will display selected control pattern.

NOTE: The LEDs will illuminate with corresponding control pattern.

- *I—EH Hands Only (ISO pattern) Controls*
- *H—EH Hands Only (H pattern) Controls*
- *F—EH Hand and Foot Controls (H pattern LED will stay lit)*

Disable park brake.

Enable hydraulics.

Operate machine controls.

LOOK/FEEL: Does machine follow selected control pattern?

YES: Go to next check.

NO: See an authorized John Deere dealer.

Continued on next page

JB92884,00000FB -19-27AUG19-31/41

Electrical System

Symptom	Problem	Solution
Park Brake Will Not Disengage	Interlocking seat bar switch is not activated	Lower interlocking seat bar to activate seat switch.
		Raise/lower interlocking seat bar to reactivate seat switch.
	Joysticks not in neutral (EH machines)	Move joysticks to neutral position.
	Park brake has not gone through the momentary down (UNLOCKED) position (key start only)	Push lower half of switch.
Park Brake Will Not Engage	Park brake is not in the up (LOCKED) position (key start only)	Push upper half of switch.
Starting Motor Will Not Turn	Battery cables and terminals corroded	Clean cables and connections as necessary.
	Loose connection at starter or starter relay	Check electrical connections.
	Blown fuse	Replace fuse.
	Battery dead or low charge	Check battery voltage and charge as necessary.
Engine Cranks Slowly	Low battery input	Check battery voltage and charge as necessary.
	Loose or corroded battery cables	Clean and tighten cables as necessary.
	Engine oil viscosity too heavy	Drain engine oil and refill with proper oil.
Battery Will Not Charge	Battery malfunction	Replace battery.
	Low engine speed or excessive idling	Increase engine speed.
	Battery cables and terminals corroded	Clean cables and connections as necessary.
	Loose or damaged accessory drive belt	Check accessory drive belt.
Lights Do Not Work	Blown fuse	Replace fuse.
	Bulb malfunction	Check bulb connection or replace as necessary.

Continued on next page

Item	Measurement	Specification
9—Ground Clearance	Height	0.22 m 0 ft. 9 in.
10—Angle of Departure	Angle	28°
11—Front Turn Radius (with foundry bucket)	Distance	2.03 m 6 ft. 8 in.
12—Dump Angle (full lift height)	Angle	43°
13—Bucket Rollback (ground level)	Angle	33°
Base Machine	Operating Weight	3246 kg 7150 lb.

JK47244,0000304 -19-23OCT13-2/2

320E Machine Specifications

Item	Measurement	Specification
Yanmar 4TNV98CT	Non-Road Emission Standards	Certified To EPA Final Tier 4 Emissions
	Type	4-Stroke Cycle, Turbocharged
	Bore and Stroke	98 x 110 mm 3.86 x 4.33 in.
	Cylinders	4
	Displacement	3.3 L 203 cu in.
	Rated Gross Horsepower @ 2500 rpm	51.7 kw 69 hp
	Cooling Fan	Hydraulic Variable Speed
	Electrical System	12 Volt
	Battery	150 Minutes Reserve Capacity
Yanmar 4TNV98C	Non-Road Emission Standards	Certified To EPA Final Tier 4 Emissions
	Type	4-Stroke Cycle, Naturally-Aspirated
	Bore and Stroke	98 x 110 mm 3.86 x 4.33 in.
	Cylinders	4
	Displacement	3.3 L 203 cu in.
	Rated Gross Horsepower @ 2500 rpm	51.7 kw 69 hp
	Cooling Fan	Hydraulic Variable Speed
	Electrical System	12 Volt
	Battery	150 Minutes Reserve Capacity

JK47244,0000305 -19-20AUG13-1/1