

# 35G Excavator

(PIN: 1FF035GX\_\_K270001— )



## OPERATOR'S MANUAL 35G Excavator (PIN: 1FF035GX\_\_K270001— ) OMT333111 ISSUE C5 (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.

Additional Proposition 65 Warnings can be found in this manual.

**Worldwide Construction  
And Forestry Division**

LITHO IN U.S.A.

# Introduction

## Foreword

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

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

MEASUREMENTS in this manual are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by facing in the direction of forward travel.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I.N.) in the Machine Numbers section. Accurately record all the numbers to help in tracing the machine if machine is ever stolen. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place off the machine.

WARRANTY is provided as part of John Deere's support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate or statement which you should have received from your dealer.

This warranty provides you the assurance that John Deere will back its products where defects appear within the warranty period. In some circumstances, John Deere also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied. Setting fuel delivery above specifications or otherwise overpowering machines will result in such action.

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

VD76477,00004EB -19-07JUL14-1/1

### Manual Identification—READ THIS FIRST!

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

#### Choosing the Correct Supporting Manuals

John Deere excavators are available in different machine configurations based on the various markets into which they are sold. Different supporting manuals exist for different machine configurations.

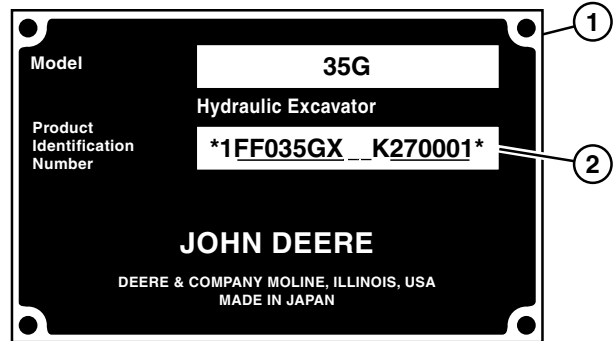
When necessary, product identification numbers are listed on the front covers of excavator manuals. These numbers are used to identify the correct supporting manual for your machine.

#### Product Identification Number

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



PIN Plate Location



Example of PIN Plate

1— PIN Plate

2— 17-Character PIN

TX1125761A —UN—13DEC12

TX1128576 —UN—21DEC12

The PIN identifies the producing factory, machine model number, machine option, year of manufacture, engine emission level, and machine serial number.

17-Character PIN Examples																
(3)			(4)				(5)	(6)	(7)	(8)	(9)					
1	F	F	0	3	5	G	X			K	2	7	0	0	0	1

- **(3)—World Code**—Identifies location where machine is manufactured.
- **(4)—Machine Model Identifier**—Identifies model number.
- **(5)—Machine Option Code**—Identifies which major machine option is equipped. This character will change from one machine to another.
- **(6)—Check Letter**—This is a random character assigned by the factory. This is not used in machine identification.
- **(7)—Manufacturing Year Code**—Identifies year of machine manufacture.
- **(8)—Engine Emission Code**—Represents engine emission certification.
- **(9)—Machine Serial Number**—Identifies machine serial number. This character will change from one machine to another.

The following is an example for a 35G machine that meets Final Tier 4 (8-19 kW) emission levels:

**1FF035GX\_K270001**

- 1FF** ..... **World Code** (manufacturing location)
  - 1DW ..... Davenport Works
  - 1T8 ..... Thibodaux Works
  - 1T0 ..... Dubuque Works
  - 1FF ..... Deere—Hitachi
- 035G** ..... **Machine Model Identifier**
- X** ..... **Machine Option Code**
  - X ..... Base Machine
  - S ..... Super Duty
  - E ..... Easy Power (EP)
  - T ..... Total Machine Control (TMC) Configuration
- ..... **Check Letter** (variable)
- ..... **Manufacturing Year Code** (variable)
  - C ..... 2012
  - D ..... 2013
  - E ..... 2014
  - F ..... 2015
  - G ..... 2016
- K** ..... **Engine Emission Code**
  - C ..... Tier 2 and Stage II
  - D ..... Tier 3 and Stage III A
  - E ..... Interim Tier 4 and Stage III B
  - F ..... Tier 4 Stage IV
  - G ..... Interim Tier 4 and Stage III A (19-56 kW)
  - H ..... Final Tier 4 and Stage III A (19-37 kW)
  - J ..... Final Tier 4 and Stage III B (37-56 kW)
  - K ..... Final Tier 4 (8-19 kW)
- 270001** ..... **Machine Serial Number**

KR46761,00006B7 -19-21DEC12-2/2

**IMPORTANT**

Warranty will not apply to engine and drivetrain failures resulting from unauthorized adjustments to this engine.

Unauthorized adjustments are in violation of the emissions regulations applicable to this engine and may result in substantial fines and penalties.

VD76477,000104D -19-27JUN12-1/1

## FCC Notifications to User

### FCC Notification

These devices comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) These devices may not cause harmful interference, and (2) these devices must accept any interference received, including interference that may cause undesired operation.

These devices must be operated as supplied by John Deere Ag Management Solutions. Any changes or modifications made to these devices without the expressed written approval of John Deere Ag Management Solutions may void the user's authority to operate these devices.

### Modular Telematics Gateway and Satellite Module

This equipment has been tested and found to comply with the limits for Class B digital devices, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a

residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, no guarantee shall be made that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

MM16284.000196F -19-07JUL14-1/1



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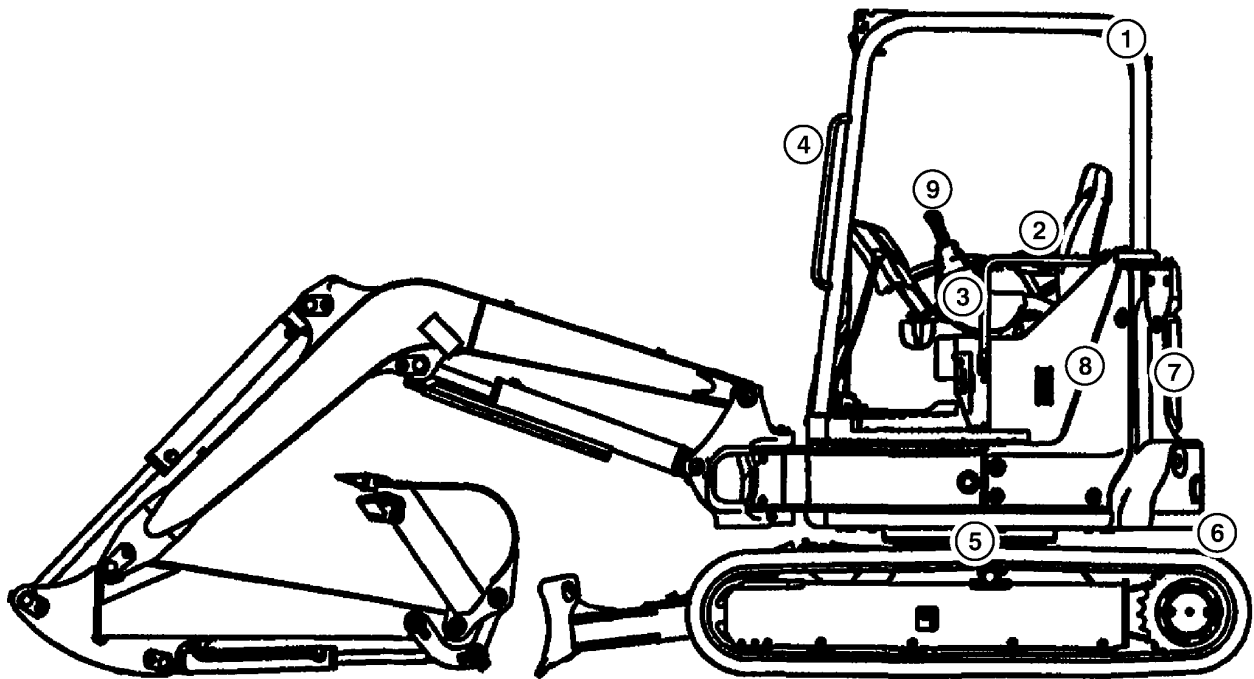
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# Safety—Safety and Operator Conveniences

## Safety and Operator Convenience Features



TX1126204

Canopy Model Shown

TX1126204 —UN—04DEC12

**Please remember that the operator is the key to preventing accidents.**

- 1. ROPS/TOPS/FOPS.** A protective structure protects the operator of the compact excavator.
- 2. Seat Belt.** A seat belt is provided for the operator.
- 3. Pilot Control Shutoff.** A lever near the cab exit reminds the operator to deactivate hydraulic functions before leaving the machine and prevents engine start-up unless lever is in locked position.
- 4. Handholds.** Large, conveniently placed handholds make it easy to enter or exit the operator's station or service area.
- 5. Hydraulic Hose Protection.** Covered hoses in swing area improve durability and protect the operator.

**6. Swing Brake.** Swing brake is engaged when the pilot control shutoff lever is raised. Helps secure upperstructure when transporting the machine.

**7. Travel Alarm.** Alerts bystanders of machine movement when travelling.

**8. Fan Guard.** A fan guard inside the engine compartment helps prevent contact with the fan blades.

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

**Cab with Heater/Defroster/Air Conditioner—If Equipped.** Circulates both outside and inside air through filters for a clean working environment. Built in defroster vents direct air flow for effective window defogging/deicing.

KR46761,00006B9 -19-18DEC12-1/1

# Safety—General Precautions

## Recognize Safety Information

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

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

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

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



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

TI 33555 —UN—15APR13

TI 33558 —19—28AUG00

## Follow Safety Instructions

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

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

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

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



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

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

TS201 —UN—15APR13

## Operate Only If Qualified

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

Operator should be familiar with the job site and surroundings before operating. Try all controls and

machine functions with the machine in an open area before starting to work.

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

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

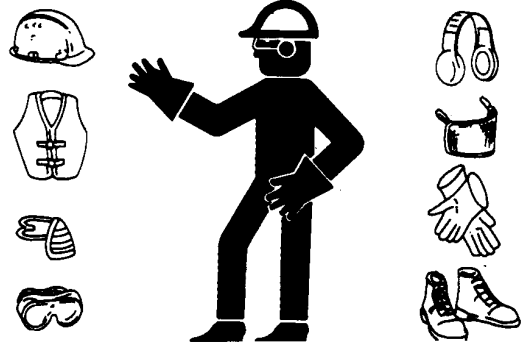
### Wear Protective Equipment

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

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

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

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



TS206—UN—15APR13

TX,WEAR,PE -19-22SEP10-1/1

### Avoid Unauthorized Machine Modifications

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

Modifications of this machine, or addition of unapproved products or attachments, may affect machine stability or

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

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

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### Control Pattern Selector—If Equipped

This machine may be equipped with a control pattern selector valve. Ensure all personnel are clear of machine

and area is large enough to operate machine functions. Verify the machine response to each control movement.

DB84312,00000A5 -19-04JAN12-1/1

### Add Cab Guarding for Special Uses

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

Additional level II FOPS (falling object protective structure), forestry protection packages, and special screens or guarding should be installed when falling or flying objects could enter or damage the machine. A rear screen should always be used with a winch to protect against a snapping cable. Before operating in any special work environments, follow the operator protection recommendations of the manufacturer of any specialized attachment or equipment. Contact your authorized John Deere dealer for information on protective guarding.

TX,CABGUARD -19-12FEB13-1/1

### Inspect Machine

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

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



T6607AQ —UN—15APR13

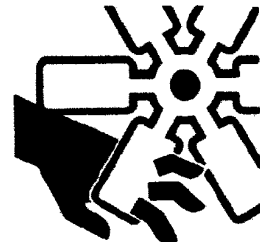
TX,INSPECT -19-08SEP10-1/1

### Stay Clear of Moving Parts

Entanglements in moving parts can cause serious injury.

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

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



T133592 —UN—15APR13

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

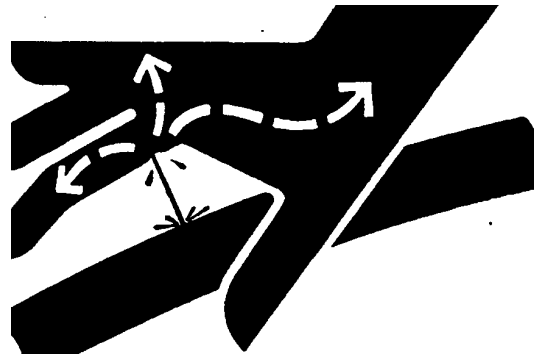
### Avoid High-Pressure Fluids

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

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

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

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



X9811 —UN—23AUG88

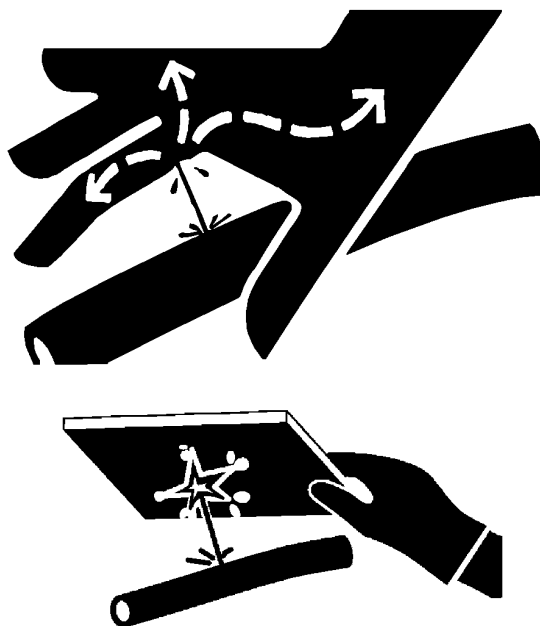
DX,FLUID -19-11DEC12-1/1

### Avoid High-Pressure Oils

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

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

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



T133509 —UN—15APR13

T133840 —UN—20SEP00

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

### Work In Ventilated Area

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

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



TS220 —UN—15APR13

DX,AIR -19-17FEB99-1/1

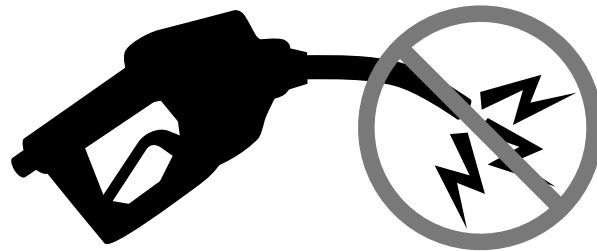
### Avoid Static Electricity Risk When Refueling

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

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

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

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



RG22142 —UN—17MAR14

RG21992 —UN—21AUG13

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

### Prevent Fires

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

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

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

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



T133553 —UN—07SEP00



T133554 —UN—07SEP00



T133552 —UN—15APR13

TX,PREVENT,FIRE -19-20JAN11-1/1



### Prevent Battery Explosions

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

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

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



TS204—UN—15APR13

DX,SPARKS -19-03MAR93-1/1

### 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

### Dispose of Waste Properly

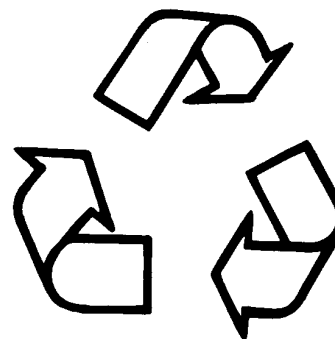
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

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.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

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



TS1133—UN—15APR13

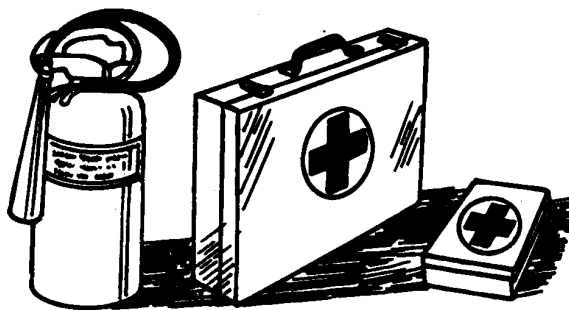
DX,DRAIN -19-03MAR93-1/1

### Prepare for Emergencies

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

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



TS291—UN—15APR13

DX,FIRE2 -19-03MAR93-1/1

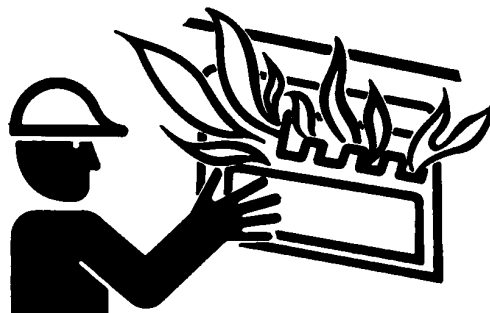
### Clean Debris from Machine

Keep engine compartment, radiator, batteries, hydraulic lines, exhaust components, fuel tank, and operator's station clean and free of debris.

Clean any oil spills or fuel spills on machine surfaces.

Temperature in engine compartment could go up immediately after engine is stopped. **BE ON GUARD FOR FIRES DURING THIS PERIOD.**

Open access door(s) to cool the engine faster, and clean engine compartment.



T6669AG—UN—15APR13

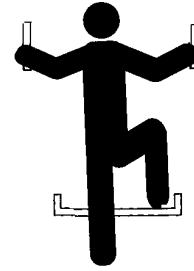
TX,DEBRIS -19-20JAN11-1/1

# Safety—Operating Precautions

## Use Steps and Handholds Correctly

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

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



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

T133468 —UN—15APR13

## Start Only From Operator's Seat

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

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



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

T133715 —UN—15APR13

## Use and Maintain Seat Belt

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

Examine seat belt frequently. Be sure that webbing is not cut or torn. Replace seat belt immediately if any part is damaged or does not function properly.

**The complete seat belt assembly should be replaced every three years, regardless of appearance.**



# USE SEAT BELT

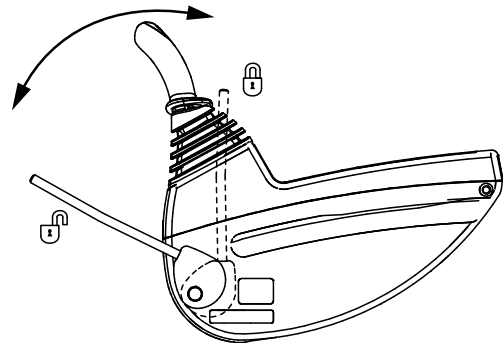
TX,SEAT,BELT -19-20JAN11-1/1

T133716 —19—17APR13

## Prevent Unintended Machine Movement

Be careful not to accidentally actuate control levers when coworkers are present. Pull pilot shutoff lever to locked (UP) position during work interruptions. Pull pilot shutoff lever to locked (UP) position and stop engine before allowing anyone to approach machine.

Always lower work equipment to the ground and pull pilot shutoff lever to locked (UP) position before standing up or leaving the operator's seat. Stop engine before exiting.



VD76477,000036D -19-19APR11-1/1

T216779 —UN—22NOV05

### Avoid Work Site Hazards

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

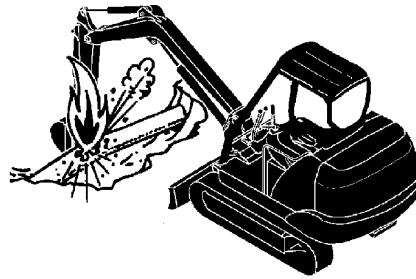
**Prepare work site properly.** Avoid operating near structures or objects that could fall onto the machine. Clear away debris that could move unexpectedly if run over.

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

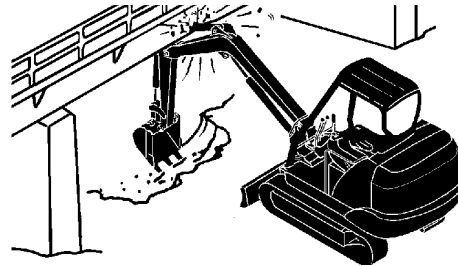
**Keep bystanders clear at all times.** Keep bystanders away from raised booms, attachments, and unsupported loads. Avoid swinging or raising booms, attachments, or loads over or near personnel. Use barricades or a signal person to keep vehicles and pedestrians away. Use a signal person if moving machine in congested areas or where visibility is restricted. Always keep signal person in view. Coordinate hand signals before starting machine.

**Operate only on solid footing** with strength sufficient to support machine. When working close to an excavation, position travel motors away from the hole.

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



T153094 —UN—01APR02



T153086 —UN—01APR02



T153097 —UN—01APR02

VD76477,0000136 -19-27FEB12-1/1

### Keep Riders Off Machine

Only allow operator on machine.

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

Riders may obstruct operator's view or impair his ability to operate machine safely.



T120807

T120807 —UN—14APR99

TX14740,0001E7A -19-19MAR02-1/1

### Avoid Backover Accidents

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

**Be certain reverse warning alarm is working properly.**

**Use a signal person when backing if view is obstructed or when in close quarters.** Keep signal person in view at all times. Use prearranged hand signals to communicate.

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



TX.AVOID.BACKOVER -19-25OCT10-1/1

PC10857XW —UN—15APR13

### Avoid Machine Tip Over

**Use seat belt at all times.**

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

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

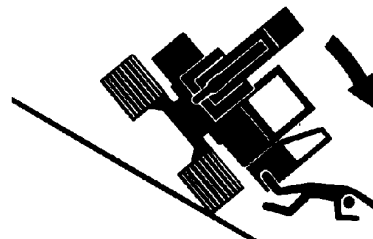
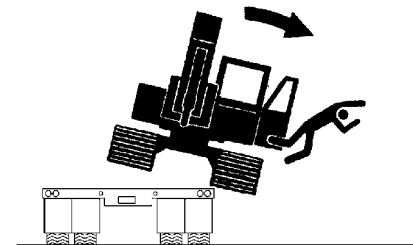
**Be careful on slopes.** Use extra care on soft, rocky or frozen ground. Machine may slip sideways in these conditions. When traveling up or down slopes, keep the bucket on uphill side and just above ground level.

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

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



**USE  
SEAT  
BELT**



TX03679,00016DF -19-03JAN07-1/1

T133716 —19—17APR13

T133545 —UN—15SEP00

T133803 —UN—27SEP00

### Inspect and Maintain ROPS

A damaged rollover protective structure (ROPS) should be replaced, not reused.

The protection offered by ROPS could be impaired if ROPS is subjected to structural damage, is involved in an overturn incident, or is in any way altered by welding, bending, drilling, or cutting.

If ROPS was loosened or removed for any reason, inspect it carefully before operating the machine again.

To maintain the ROPS:

- Replace missing hardware using correct grade hardware.
- Check hardware torque.
- Check isolation mounts for damage, looseness, or wear; replace them if necessary.
- Check ROPS for cracks or physical damage.

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

### Prevent Acid Burns

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

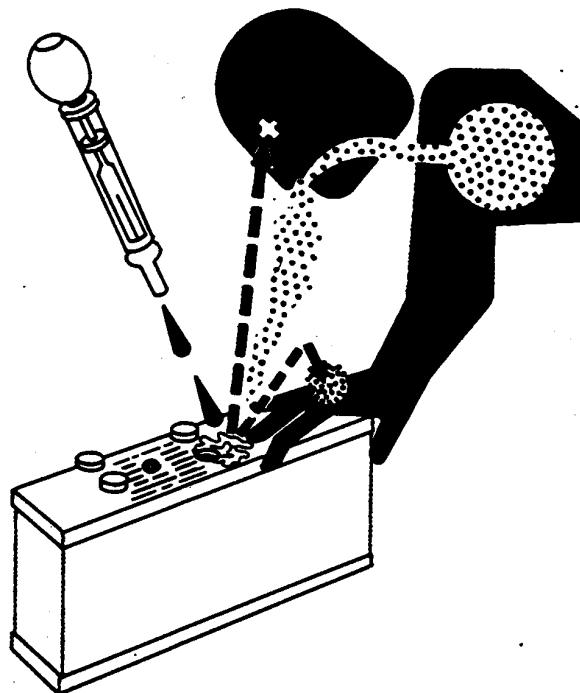
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 15—30 minutes. Get medical attention immediately.

If acid is swallowed:

1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 2 L (2 quarts).
3. Get medical attention immediately.



TS203—UN—23AUG88

DX,POISON -19-21APR93-1/1

### Travel Safely

*NOTE: When working on steep slopes, travel as straight up and down as possible to prevent roll-over.*

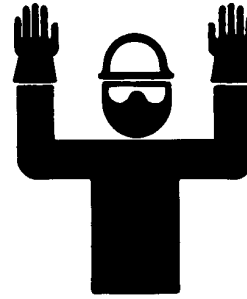
**DO NOT PARK ON A HILLSIDE OR AN INCLINE.**

*Always park the machine on level ground.*

Know the location of bystanders before moving the machine.

Always keep the reverse warning alarm in working condition. The alarm warns bystanders when the machine starts to move in reverse.

Use a signal person when moving the machine in congested areas. Coordinate hand signals before starting the machine.



Travel Safely

CN93077,00000B3 -19-14FEB13-1/1

T6964AD —UN—20DEC88

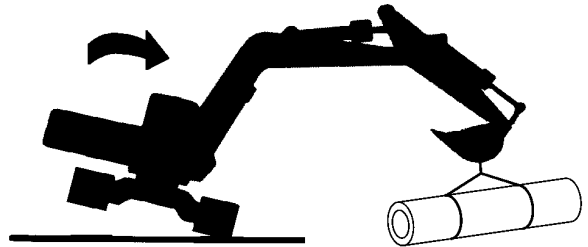
### Use Special Care When Lifting Objects

Never use this machine to lift people.

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

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

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



TX03679,00016E1 -19-03JAN07-1/1

T133839 —UN—27SEP00

### Add and Operate Attachments Safely

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

Ensure that a qualified person is involved in attachment installation. Add guards to machine if operator protection

is required or recommended. Verify that all connections are secure and attachment responds properly to controls.

Carefully read attachment manual and follow all instructions and warnings. In an area free of bystanders and obstructions, carefully operate attachment to learn its characteristics and range of motion.

TX.ATTACH -19-20JAN11-1/1

# Safety—Maintenance Precautions

## Park and Prepare for Service Safely

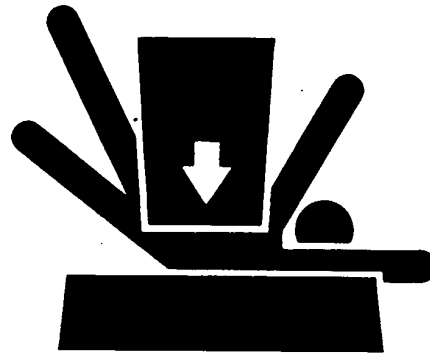
**Warn others of service work.** Always park and prepare your machine for service or repair properly.

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

Securely support machine or attachment before working under it.

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

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



T133332—19—17APR13

TS229—UN—23AUG88

OUT4001,000089A -19-30JAN12-1/1

## Service Cooling System Safely

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

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.



TS281—UN—15APR13

DX,RCAP -19-04JUN90-1/1



### Remove Paint Before Welding or Heating

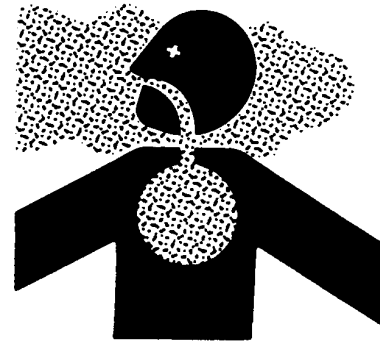
Avoid potentially toxic fumes and dust.

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

Remove paint before heating:

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

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



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

Dispose of paint and solvent properly.

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

TS220—UN—15APR13

### Make Welding Repairs Safely

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

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

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

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



Heating Near Pressurized Fluid Lines

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

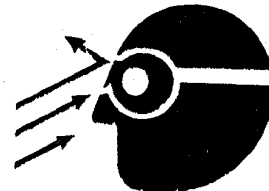
MB60223.0000212 -19-19FEB15-1/1

T133547—UN—15APR13

### Drive Metal Pins Safely

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

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

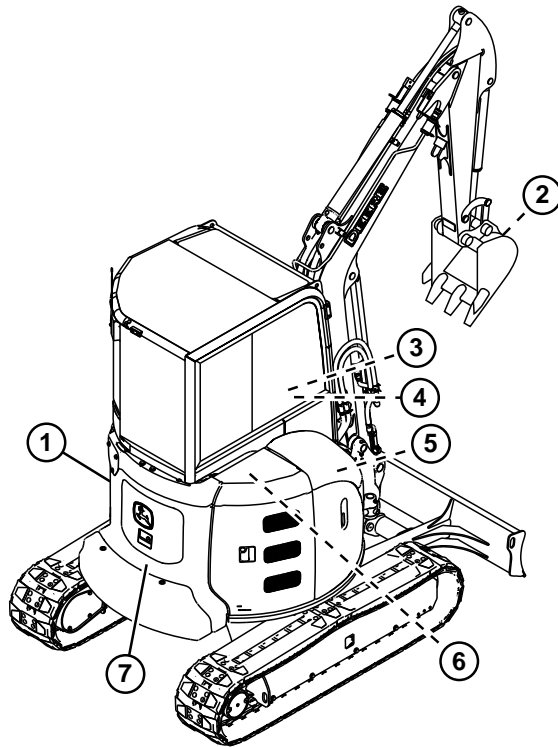


TX,PINS -19-20JAN11-1/1

T133738—UN—15APR13

# Safety—Safety Signs

## Safety Signs



TX1127652

### Safety Signs

1— CAUTION, Avoid Burns  
2— WARNING, Avoid Injury

3— CAUTION, Alternative Control  
Pattern  
4— DANGER, Electric Lines

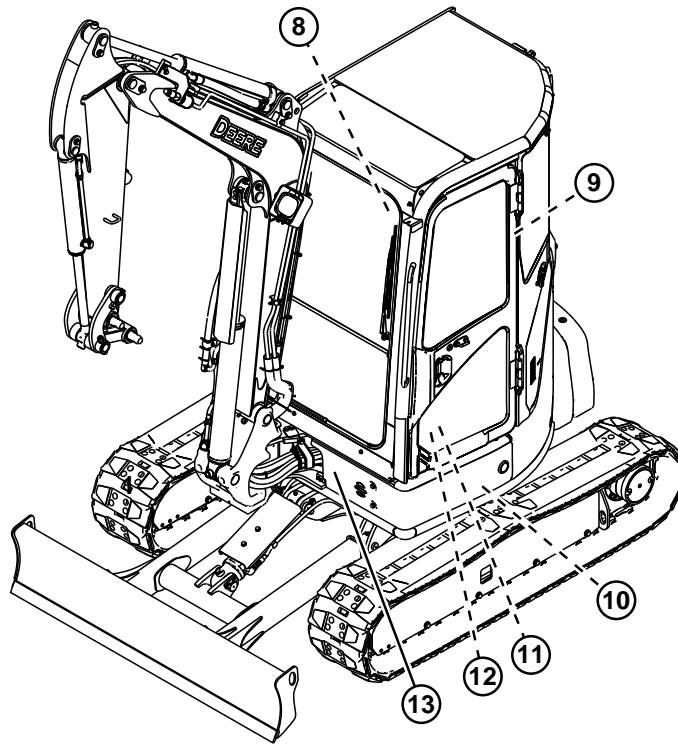
5— CAUTION, Avoid Personal  
Injury  
6— CAUTION, PRESSURIZED

7— WARNING, Stay Clear

Continued on next page

MB60223.0000007 -19-11APR14-1/15

TX1127652—UN—19DEC12



TX1127653

Safety Signs

- |   |   |  |
|---|---|--|
| 8— CAUTION, Avoid Injury                          | 10— WARNING, Install Cab Tilt Locking Bar | 12— CAUTION, Avoid Serious Injury or Death |
| 9— WARNING, Seat Belt Should Be Worn At All Times | 11— CAUTION, Stop Engine                  | 13— WARNING, Stay Clear                    |

MB60223,0000007 -19-11APR14-2/15

TX1127653—UN—27DEC12

1. CAUTION, Avoid Burns

To avoid burns, be careful not to contact surface.

This safety label is located at the rear of the machine to the left of the engine compartment.



CAUTION, Avoid Burns

Continued on next page

MB60223,0000007 -19-11APR14-3/15

TX1127630—19—19DEC12

**2. WARNING, Avoid Injury**

Avoid injury from attachment falling off machine.

This safety label is located on the wedge bar.



WARNING, Avoid Injury

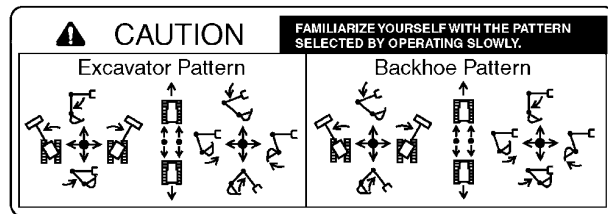
MB60223.0000007 -19-11APR14-4/15

TX1127631 —19—19DEC12

**3. CAUTION, Alternative Control Pattern**

Familiarize yourself with the pattern selected by operating slowly.

The safety label is located inside the cab on the right-side window.



CAUTION, Alternative Control Pattern

MB60223.0000007 -19-11APR14-5/15

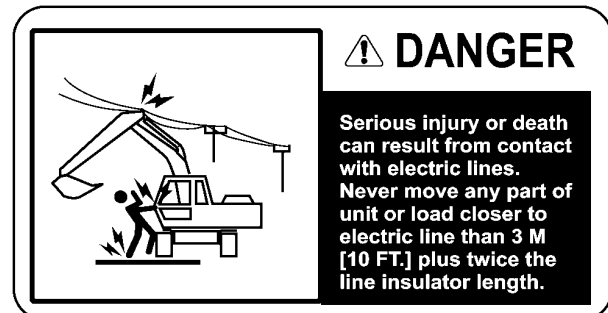
TX1127628 —19—06DEC12

**4. DANGER, Electric Lines**

Serious injury or death can result from contact with electric lines.

Never move any part of unit or load closer to electric line than 3 M [10 ft.] plus twice the line insulator length.

This safety label is located inside the cab on the right-side window.



DANGER, Electric Lines

MB60223.0000007 -19-11APR14-6/15

TX1104374 —19—19DEC12

Continued on next page

5. **CAUTION, Avoid Personal Injury**

Do not attempt to remove the cap while engine is running or when the hydraulic oil temperature is high.

Before removing cap, always stop the engine, wait for hydraulic oil to cool, and slowly loosen the cap to release internal pressure.

This safety label is located on top of the hydraulic reservoir.



CAUTION, Avoid Personal Injury

MB60223,0000007 -19-11APR14-7/15

TX1127622 —19—06DEC12

6. **CAUTION, PRESSURIZED**

DO NOT OPEN HOT.

Remove slowly.

This safety label is located above the radiator cap.



CAUTION, PRESSURIZED

MB60223,0000007 -19-11APR14-8/15

TX1127629 —19—06DEC12

7. **WARNING, Stay Clear**

Operator may swing or reverse machine.

This safety label is located at the rear of the machine below the engine compartment.



WARNING, Stay Clear

Continued on next page

MB60223,0000007 -19-11APR14-9/15

TX1104370 —19—19DEC12

8. **CAUTION, Avoid Injury**

To prevent injury from the front window falling, lock window in place with locking pins on both sides.

This safety label is located inside the cab on the front window.



CAUTION, Avoid Injury

MB60223,0000007 -19-11APR14-10/15

TX1127627 —19—06DEC12

9. **WARNING, Seat Belt Should Be Worn At All Times**

A seat belt should be worn at all times during machine operation to prevent serious injury or death in the event of an accident or machine overturn. Failure to wear a seat belt during machine operation may result in serious injury or death.

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



WARNING, Seat Belt Should Be Worn At All Times

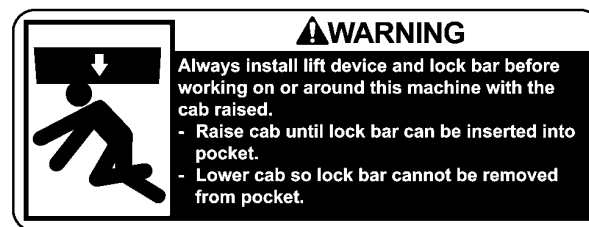
MB60223,0000007 -19-11APR14-11/15

TX1128604 —19—19DEC12

10. **WARNING, Install Cab Tilt Locking Bar**

Always install cab locking bar, failure to do so may result in serious accident.

This safety label is located underneath the cab on the cab locking bar.



WARNING, Install Cab Tilt Locking Bar

Continued on next page

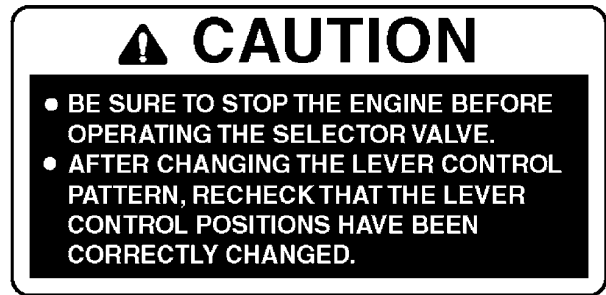
MB60223,0000007 -19-11APR14-12/15

TX1129210 —UN—10JAN13

**11. CAUTION, Stop Engine**

Be sure to stop the engine before operating the selector valve.

This safety label is located inside the cab on the seat base.



*CAUTION, Stop Engine*

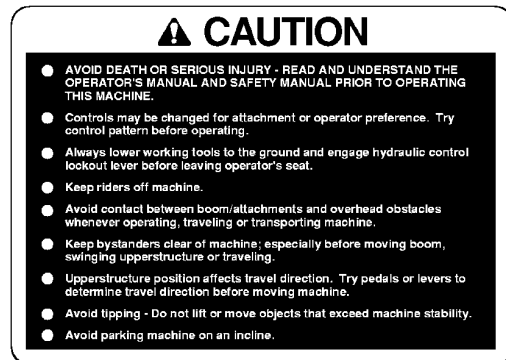
MB60223.0000007 -19-11APR14-13/15

TX1127626 —19—06DEC12

**12. CAUTION, Avoid Serious Injury or Death**

Read and understand the operator's manual and safety manual before operating this machine.

This safety label is located inside the cab on the seat base.



*CAUTION, Avoid Serious Injury or Death*

MB60223.0000007 -19-11APR14-14/15

TX1127625 —19—19DEC12

**13. WARNING, Stay Clear**

Stay clear of swing area.

Operate controls only from seat.

This safety label is located on the front of machine.



*WARNING, Stay Clear*

MB60223.0000007 -19-11APR14-15/15

TX1127624 —19—19DEC12

# Operation—Operator's Station

## Right Console—Cab

**1. Work Light Switch (1):** Press right half of switch to turn work lights ON. Press left half of switch to turn work lights OFF.

**2. Wiper and Washer Switch (2):** Press switch to operate wiper continuously. Press and hold down switch to activate washer.

*NOTE: Make sure upper front window is fully secure. Wiper will not operate if window is not in proper position.*

**3. Travel Speed Control Switch (3):** Press right half of switch (rabbit) to select fast travel mode. As load increases, travel speed decreases. Press left half of switch (turtle) to select slow travel mode.

- 1—Work Light Switch                      3—Travel Speed Control Switch  
2—Wiper and Washer Switch



Right Console

TX112623A —UN—16NOV12

KR46761.00007A9 -19-28DEC12-1/1

## Right Console—Canopy

**1. Work Light Switch (1):** Press right half of switch to turn work lights ON. Press left half of switch to turn work lights OFF.

**2. Travel Speed Control Switch (2):** Press right half of switch (rabbit) to select the fast travel mode. As load increases, travel speed decreases. Press left half of switch (turtle) to select slow travel mode.

- 1—Work Light Switch                      2—Travel Speed Control Switch



Right Console

TX1127385A —UN—04DEC12

KR46761.00007AA -19-28DEC12-1/1



## Key Switch

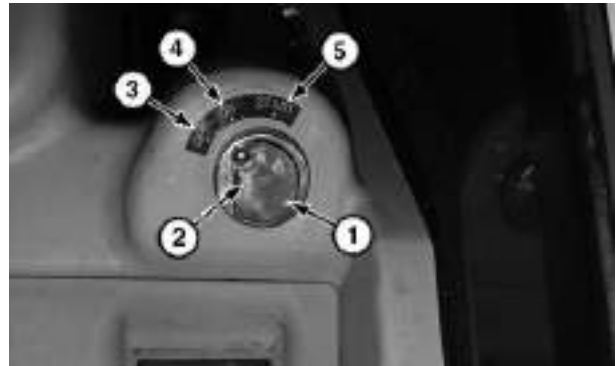
Rotate key switch cover (1) counterclockwise to uncover key switch (2).

*NOTE: Key (6) is inserted and removed with switch in the OFF (3) position.*

To operate key switch, insert key (6) in key switch.

Rotate key clockwise to START (5) position. Key will return to ON (4) position when released. Engine begins functioning with key in this position.

- |                     |          |
|---------------------|----------|
| 1— Key Switch Cover | 4— ON    |
| 2— Key Switch       | 5— START |
| 3— OFF              | 6— Key   |



Key Positions



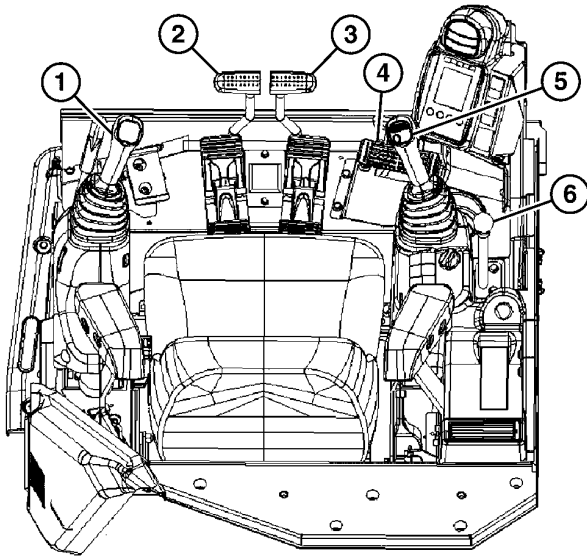
Key Switch

KR46761,000071E -19-27DEC12-1/1

TX1125714A —UN—03DEC12

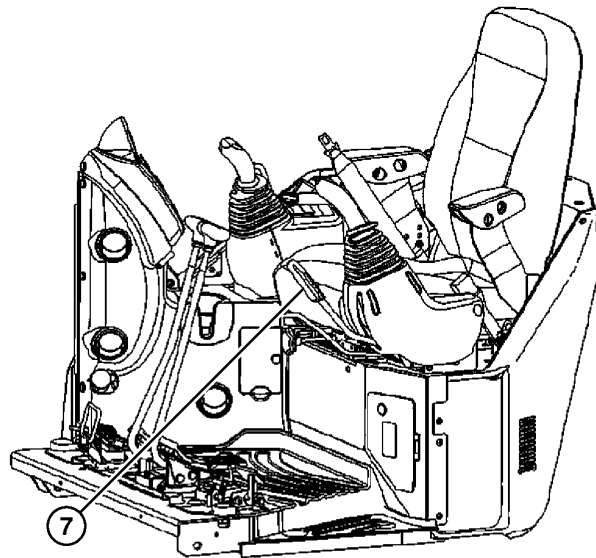
TX1125715A —UN—16NOV12

### Pedals and Levers



*Pedals and Levers*

TX1126062—UN—20NOV12

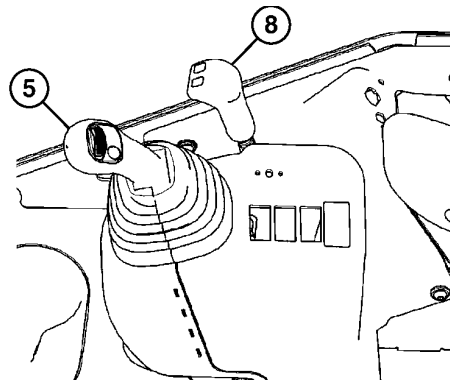


*Pilot Shutoff Lever*

TX1126389—UN—21NOV12

- 1—Left Control Lever
- 2—Left Travel Lever
- 3—Right Travel Lever
- 4—Boom Swing Pedal

- 5—Right Control Lever (horn located on top of lever)
- 6—Blade Control Lever
- 7—Pilot Control Shutoff Lever
- 8—Angle Blade Control Lever (if equipped)



*Angle Blade Control Lever—If Equipped*

TX1126390—UN—18DEC12

KR46761,00007B4 -19-27DEC12-1/1

### Engine Speed Control Dial

Use the engine speed control dial (1) to adjust engine speed.

Turn dial clockwise to increase speed.

Turn dial counterclockwise to decrease speed.

1— Engine Speed Control Dial



Engine Speed Control Dial

TX1125703A —UN—16NOV12

JS93577,000002B -19-27DEC12-1/1

### Horn

Horn button (1) is located on right control lever. Press button to sound horn.

1— Horn Button



Horn Button

TX1125702A —UN—29NOV12

KR46761,0000722 -19-12NOV12-1/1

## Pilot Shutoff Lever

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

Always pull pilot shutoff lever to locked (UP) position when stopping engine or leaving operator's station.

Push pilot shutoff lever forward to unlocked (DOWN) position to operate machine.

### 1—Pilot Shutoff Lever



Pilot Shutoff Lever Location

TX1126246 —JUN—19NOV12

JS93577,000032 -19-13DEC12-1/1

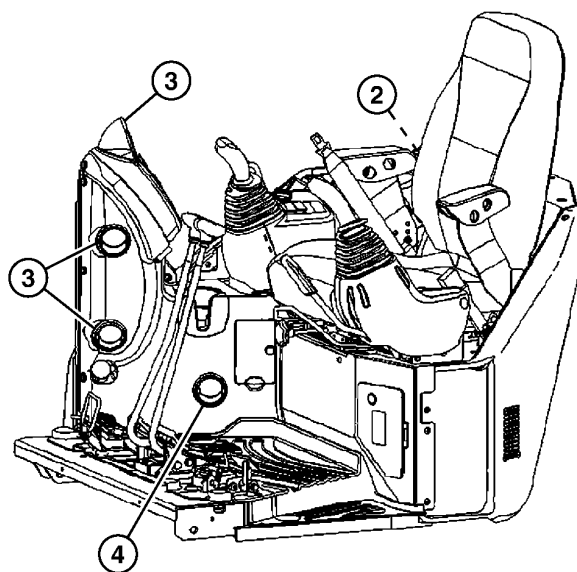
### Cab Heater and Air Conditioner—If Equipped

Air conditioner control panel (1) is used to heat and cool air flow within the cab.

- 1— Air Conditioner Control Panel
- 2— Right Rear Vent
- 3— Right Front Vents
- 4— Foot Vent



Air Conditioner Panel



Cab Vents

Continued on next page

JS93577.0000062 -19-19DEC12-1/3

TX1128087A —UN—13DEC12

TX1128068 —UN—13DEC12

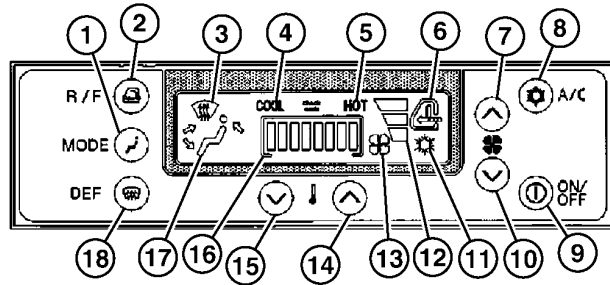
**CAUTION:** Avoid personal injury and/or machine damage. Keep fire hazards away from the control panel.

**IMPORTANT:** Avoid compressor damage. Do not suddenly increase engine speed.

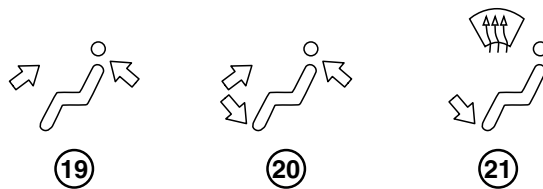
- 1 — **Vent Mode Switch:** Press the vent mode switch until desired mode (19-21) is displayed.
- 2 — **Circulation and Fresh Air Mode Switch:** Press to select between recirculation and fresh air mode. Fresh air mode routes outside air into the cab. Circulation mode closes fresh air vent and circulates air already in cab. Circulation mode is also indicated on display when selected.
- 3 — **Right Air Vent Indicator**
- 4 — **Cool Temperature Indicator**
- 5 — **Warm Temperature Indicator**
- 6 — **Recirculation Indicator**
- 7 — **Blower Speed Increase Switch:** Press to increase blower speed until desired speed is displayed. Blower speed can be set to one of three stages ranging from slow to fast. Speed will be indicated on air conditioner panel display.
- 8 — **Air Conditioner Switch:** Press to turn on air conditioner.
- 9 — **Air Conditioner Power Switch:** Press activate the air conditioner control panel.
- 10 — **Blower Speed Decrease Switch:** Press to decrease blower speed until desired speed is displayed. Blower speed can be set to one of three stages ranging from slow to fast. Speed will be indicated on air conditioner panel display.
- 11 — **A/C Indicator**
- 12 — **Blower Speed Indicator**
- 13 — **Blower Indicator**
- 14 — **Temperature Increase Switch:** Press to increase set temperature in cab.
- 15 — **Temperature Decrease Switch:** Press to decrease set temperature in cab.
- 16 — **Temperature Indicator**
- 17 — **Vent Mode Indicator**
- 18 — **Defroster Switch:** Press to have air blow from all vents in cab.

### Heating Operation

1. Select desired vent mode (19-21). 21 is the mode usually used for the heating operation though any mode may be used.
2. Press the temperature decrease switch (15) to set the temperature indicator toward the right.
3. Adjust inside cab temperature using temperature control switches (14 and 15).
4. Adjust blower speed using blower control switches (7 and 10).
5. Operate circulation and fresh air mode switch to maintain the air vent in the fresh air circulation mode.



Air Conditioner Panel Display



Vent Modes

When air conditioner switch (8) is activated during heating operation, air in the cab will be dehumidified.

### Cooling Operation

1. Select desired vent mode (19-21). 19 is the mode usually used for the cooling operation though any mode may be used.
2. Press the temperature increase switch (14) to set the temperature indicator toward the left.
3. Adjust inside cab temperature using temperature control switches (14 and 15).
4. Adjust blower speed using blower control switches (7 and 10).
5. Operate circulation and fresh air mode switch to maintain the air vent in the fresh air circulation mode.

When air conditioner switch (8) is activated during cooling operation, cool air will blow out from all vents.

### Defroster Operation

1. Select the right front vents by operating vent mode switch (1). Vent mode (20) will be displayed in air conditioner control panel.
2. Adjust the louvers on right front vents as required.
3. Adjust blower speed using blower control switches (7 and 10).

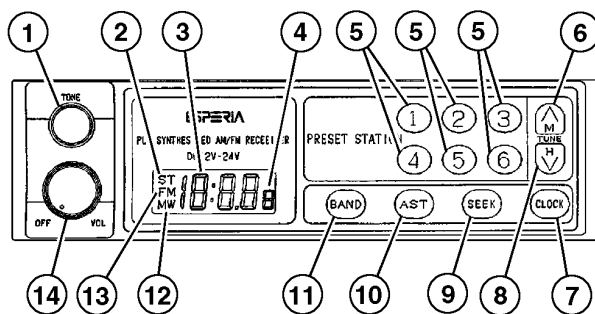
*Operation—Operator's Station*

4. Adjust inside cab temperature using temperature control switches (14 and 15).

5. If windows become clouded and/or dehumidifying is needed, turn air conditioner switch (8) on.

JS93577,0000062 -19-19DEC12-3/3

## Operating AM/FM Radio—If Equipped



Radio

- |                                  |                           |                                   |                                      |
|----------------------------------|---------------------------|-----------------------------------|--------------------------------------|
| 1— Tone Control Knob             | 5— Station Preset Buttons | 9— Seek Button                    | 13— FM Frequency Indicator           |
| 2— FM Stereo Frequency Indicator | 6— Tuning Increase Button | 10— Auto-Store/Scan Preset Button | 14— Power Switch/Volume Control Knob |
| 3— Radio Frequency Display       | 7— Clock Button           | 11— Band Button                   |                                      |
| 4— Preset Display                | 8— Tuning Decrease Button | 12— AM Frequency Indicator        |                                      |

Press power switch (14) to turn on radio, and repeatedly press one of tuning buttons (6 and 8) until desired station is reached. To preset a station, select the desired station using tuning buttons. Press and hold one of the station preset buttons (5) for more than 2 seconds until an electronic tone is heard. The frequency of the preset station is indicated on radio frequency display (3).

### 1. Tone Control Knob

Rotate clockwise to intensify treble. Rotate counterclockwise to reduce treble.

### 2. FM Stereo Frequency Indicator

Illuminates when an FM stereo radio wave frequency is selected.

### 3. Radio Frequency Display

Displays the radio frequency that is currently tuned.

### 4. Preset Display

Displays the station preset button number assigned to the frequency that is currently tuned.

### 5. Station Preset Buttons

Each button stores one preset AM (MW) and FM station. Press button assigned to desired station.

### 6. Tuning Increase Button

Tap button to increase the frequency. Press and maintain pressure on button to continually increase radio frequency. Release button once desired radio frequency is displayed.

### 7. Clock Button

Press button to display time. Press once more to display the current tuned frequency.

### 8. Tuning Decrease Button

Tap button to decrease the frequency. Press and maintain pressure on button to continually decrease radio frequency. Release button once desired radio frequency is displayed.

### 9. Seek Button

Press to locate the next receivable station. The seek function stops when a station has been located.

### 10. Auto-Store/Scan Preset Button

Press to receive the preset frequency station for every 5 seconds sequentially. Once a desired station frequency has been found, press button again to interrupt the scan feature and maintain radio frequency. Press and hold button for 2 seconds to automatically store the station.

### 11. Band Button

Press this button to select AM (MW) or FM band.

### 12. AM Frequency Indicator

Illuminates when the AM (MW) band is selected.

### 13. FM Frequency Indicator

Illuminates when the FM band is selected.

### 14. Power Switch/Volume Control Knob

When rotating knob, a click indicates radio power has been turned on or off. Rotate knob clockwise to turn on radio and increase volume. Rotate knob counterclockwise to decrease volume and turn radio off.

### Radio Operation

- Key switch must be in ON or START position.
- If radio is not already powered on, rotate power switch/volume control knob clockwise until a click is heard.
- Select station using:
  - tuning buttons
  - station preset buttons
  - auto-store/scan preset button
  - seek button
- Rotate power switch/volume control knob to desired volume level.
- Rotate tone control knob to preference.

To turn radio off, rotate power switch/volume control knob counterclockwise until a click is heard.

Continued on next page

KR46761,00007E9 -19-04DEC14-1/2

TX1042841—UN—28MAY08



**NOTE:** If battery power to the radio is disconnected, radio frequencies assigned to the station preset buttons will be lost.

### Station Presetting Procedures

#### Manually Setting Station Preset Buttons

1. Key switch must be in ON or START position.
2. If radio is not already powered on, rotate power switch/volume control knob clockwise until a click is heard.
3. Rotate power switch/volume control knob to desired volume level.
4. Select station using:
  - tuning buttons or
  - seek button
5. To assign radio frequency, continuously press a station preset button for 2 seconds. Each station preset button may be assigned one AM (MW) station and one FM station. The preset number is displayed when the frequency is assigned.

After presetting has been completed, the preset frequency can be changed if a preset button is pressed and held for 2 seconds.

#### Auto-Storing Procedure for Setting Station Preset Buttons

**NOTE:** Using the auto-storing procedure overwrites any frequencies previously assigned to a station preset button.

1. Key switch must be in ON or START position.
2. If radio is not already powered on, rotate power switch/volume control knob clockwise until a click is heard.

3. Rotate power switch/volume control knob to desired volume level.
4. Press auto-store/scan preset button for more than 2 seconds. Radio automatically searches frequencies for receivable stations. The first six stations are assigned to the station preset buttons.

#### Preset Scanning

1. Key switch must be in ON or START position.
2. If radio is not already powered on, rotate power switch/volume control knob clockwise until a click is heard.
3. Rotate power switch/volume control knob to desired volume level.
4. Press and release auto-store/scan preset button. Radio automatically searches preset frequencies for receivable stations for 5 seconds. Press and release auto-store/scan preset button a second time to resume normal radio operation.

#### Setting the Clock

1. Key switch must be in ON or START position.
2. If radio is not already powered on, rotate power switch/volume control knob clockwise until a click is heard.
3. If necessary, press the clock button to display time.
4. While maintaining pressure on the clock button, press the tuning decrease button to change the hour display. Release buttons once desired hour is displayed.
5. While maintaining pressure on the clock button, press the tuning increase button to change the minute display. Release buttons once desired minute is displayed.

KR46761,00007E9 -19-04DEC14-2/2

### Cab Dome Light

The cab dome light is located on the left side post inside the cab.

**NOTE:** The cab dome light **will NOT** turn ON if the key switch is in OFF position.

Push cab dome light (1) to turn cab light on.

1— Cab Dome Light



Cab Dome Light

TX1125711A —UN—19NOV12

KR46761,00006C1 -19-17DEC14-1/1

### Door Release Lever—If Equipped

**IMPORTANT:** Prevent machine damage from swinging door. Ensure door is latched securely in outer latch if operating with door open.

To unlock the door, push down the door release lever (1) located on the left side of the operator's seat.

1—Door Release Lever



Door Release Lever

TX1125936A—UN—16NOV12

JS93577,0000033 -19-06DEC12-1/1

### Front (Secondary Exit) Window—If Equipped

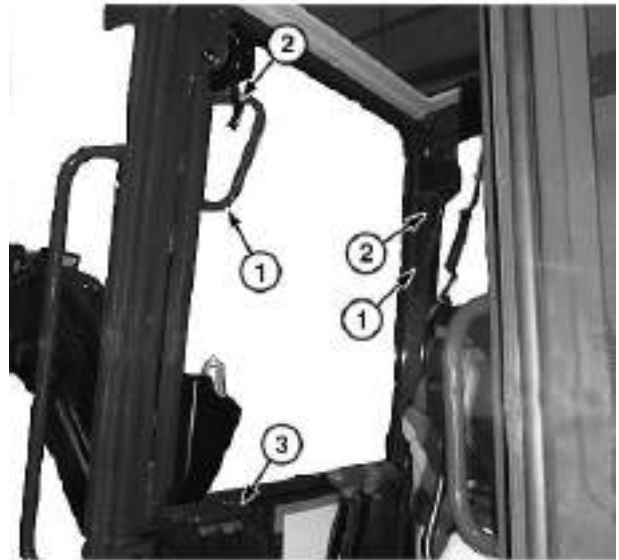
1. Grasp the handholds (1).
2. Pull latches (2) down to release window.

**CAUTION:** Prevent possible injury from unexpected rapid window movement. Front window can come down forcefully. Close window only when sitting on operator's seat. Guide window down slowly. Ensure cab frame lock pin is fully engaged.

3. Use bottom handle (3) to pull window along rail until it securely catches into lock pin (4).
4. Unlatch cab frame lock pin to release window.
5. Use handholds to slide window down slowly.
6. Push on handholds until window latches are locked in place.

1— Handhold (2 used)  
2— Latch (2 used)

3— Bottom Handle  
4— Lock Pin



Front Window



Lock Pin

TX1126042A —UN—16NOV12

TX1126043A —UN—27NOV12

KR46761,00007A6 -19-13DEC12-1/1

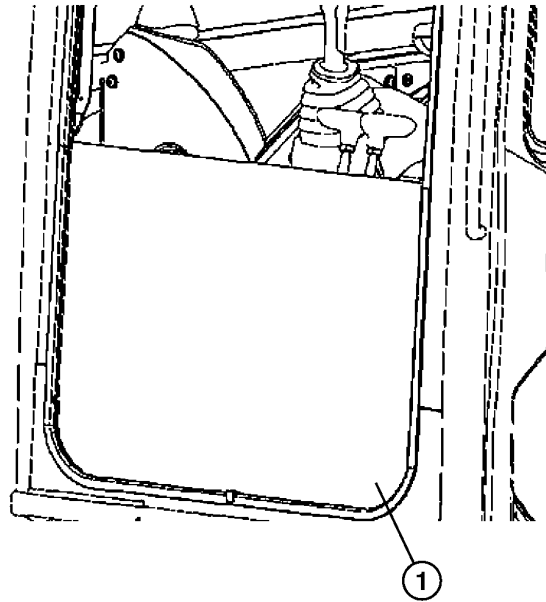
## Removing Lower Front Window—If Equipped

**NOTE:** In cold weather, some operators may choose to work with the upper front window open and the lower front window in place. This provides excellent visibility and tends to hold the heat being circulated around the operator's feet.

Upper front window must be opened and locked in position before lower front window can be removed.

1. Open upper front window. See Front (Secondary Exit) Window—If Equipped in this section.
2. While pulling in on lower front window (1), raise window to remove.
3. Store window in safe location.

1—Lower Front Window



Lower Front Window

TX1127576 —UN—06DEC12

KR46761,00007D6 -19-08DEC12-1/1

## Fire Extinguisher Mounting Location

### MOUNTING LOCATION:

The designated fire extinguisher mounting location (1) is inside the operator's station on the right rear side behind the operator's seat.

### USE:

**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 manufacturer's instructions and proper fire fighting procedures before the need to use the fire extinguisher arises. See Prevent Fires. (Section 1-2.)

### MAINTENANCE:

**IMPORTANT: Avoid possible machine damage. Check gauge (if equipped) on fire extinguisher. If fire extinguisher is not fully charged, recharge or replace it according to the manufacturer's instructions.**

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



Fire Extinguisher Mounting Location (cab machine shown)

1—Fire Extinguisher Mounting Location

TX1128272A —UN—17DEC12

KR46761,00007F9 -19-04DEC14-1/1

### Secondary Exit Tool—If Equipped

*NOTE: For secondary exit of machine, use the secondary exit tool to break window. Always keep tool inside cab.*

Secondary exit tool (1) is located inside the cab on the left rear cab post.

1— Secondary Exit Tool



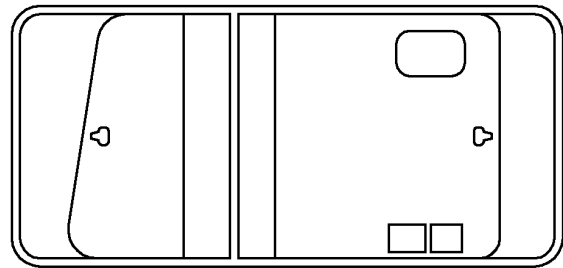
Secondary Exit Tool

TX1125709A —UN—16NOV12

KR46761,00007A1 -19-13DEC12-1/1

### Opening Right Side Window—If Equipped

Slide front pane to the rear to open. Slide front pane to the front to close. Slide rear pane to the front to open. Slide rear pane to the rear to close.



T122098

Right Side Window

T122098 —UN—30JUN99

JS93577,0000067 -19-04DEC14-1/1

## Adjusting Operator Seat

Move seat fore-and-aft adjustment (1) to the right and hold to slide the seat forward or rearward. Release seat fore-and-aft adjustment to lock.

- 1—Seat Fore-and-Aft Adjustment



Seat Adjustment

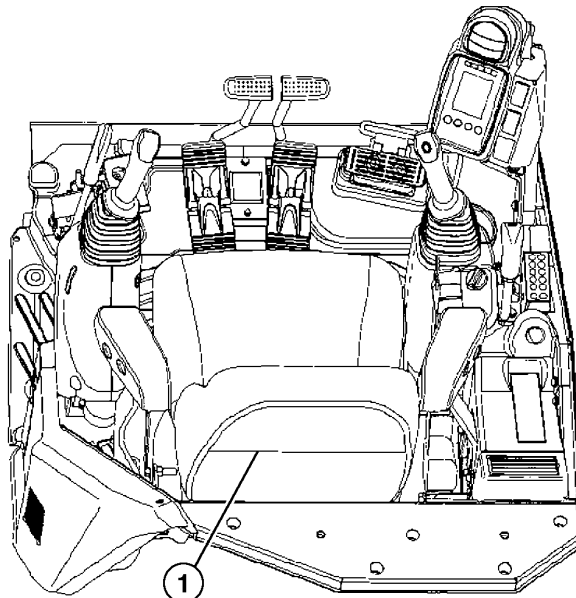
TX1125938A—UN—19NOV12

JS93577,000002E -19-11DEC12-1/1

## Operator's Manual Compartment

Store operator's manual in operator's manual compartment (1) behind the seat.

- 1—Operator's Manual Compartment



Operator's Manual Compartment

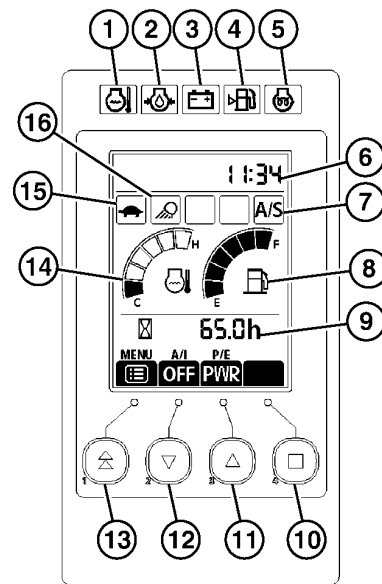
TX112747—UN—10DEC12

KR46761,00007D4 -19-28DEC12-1/1

# Operation—Monitor Operation

## Monitor

- |                                  |                                  |
|----------------------------------|----------------------------------|
| 1— Engine Overheat Indicator     | 9— Hour Meter                    |
| 2— Engine Oil Pressure Indicator | 10— Select Switch                |
| 3— Alternator Indicator          | 11— ECO/PWR Mode Selector Switch |
| 4— Fuel Level Indicator          | 12— Auto-Idle Selector Switch    |
| 5— Engine Preheat Indicator      | 13— Menu Switch                  |
| 6— Clock                         | 14— Coolant Temperature Gauge    |
| 7— Auto Shutdown Indicator       | 15— Travel Speed Indicator       |
| 8— Fuel Gauge                    | 16— Work Light Indicator         |



Monitor

KR46761,00007E1 -19-10DEC12-1/1

TX112767 —UN—10DEC12

## Monitor Functions

**1. Engine Overheat Indicator:** Displays for abnormally increased coolant temperature. Stop operation. Run the engine at slow idle speed and lower the coolant temperature.

**2. Engine Oil Pressure Indicator:** Displays when engine oil pressure has decreased. Immediately stop engine. Check engine oil system and oil level.

**3. Alternator Indicator:** Displays when electrical system is abnormal. Contact your authorized dealer.

**4. Fuel Level Indicator:** Displays when fuel level is low. Refill fuel tank as soon as possible.

**5. Engine Preheat Indicator:**

**IMPORTANT: Prevent engine damage. Do not use ether in this machine.**

If preheating is required, the engine preheat indicator is automatically lit. If preheating is not required, this indicator will not display.

**6. Clock:** Clock indicates present time.

**7. Auto Shutdown Indicator:** Displays if auto shutdown was selected by operator from the menu screen. For more information, see MENU—Auto Shutdown in this section.

**8. Fuel Gauge:** Displays remaining fuel amount as indicated by gauge. Fuel machine before gauge reaches E. If fuel level sensor malfunction is detected, fuel gauge will flash. See your authorized dealer.

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

**10. Select Switch:** Press switch to select preferred menu option.

**11. ECO/PWR Mode Indicator Selector Switch:** Press switch to select power mode (ECO or PWR).

- **ECO (Economy) Mode:** Used to improve fuel efficiency and reduce noise level with a small difference in engine speed.
- **PWR (Power) Mode:** Used when more general digging work is needed.

**12. Auto-Idle Selector Switch:** Press switch to turn on or off auto-idle mode.

**13. Menu Switch:** Press menu switch to display MENU screen.

**14. Coolant Temperature Gauge:**

**IMPORTANT: Possible engine damage may occur.**

**If coolant temperature gauge reaches hot zone, idle engine to lower coolant temperature before stopping engine. If gauge continues to rise, stop engine.**

Displays engine coolant temperature. Gauge should be around the center of the scale during operation. If coolant temperature gauge sensor malfunction is detected, coolant temperature gauge will flash. See your authorized dealer.

**15. Travel Speed Indicator:** Displays travel speed selected (rabbit—fast speed travel or turtle—slow speed travel).

**16. Work Light Indicator:** Displays if work lights are turned ON.

KR46761,00007E2 -19-19DEC12-1/1



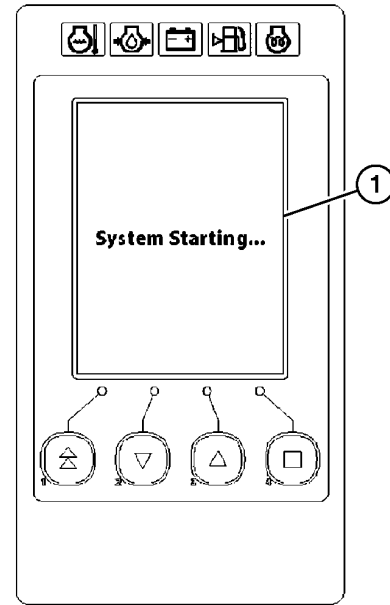
### Monitor Start-Up

*NOTE: Start the engine after the default screen is displayed.*

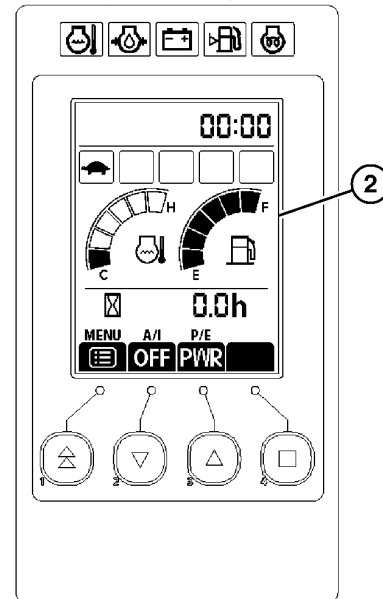
*NOTE: The engine oil pressure and alternator indicators will remain on until engine is started. If either indicator remains on after engine is started, immediately stop engine. See your authorized dealer.*

When the key switch is turned to the ON position, the System Starting screen (1) displays for about 2 seconds and then the default screen (2) is displayed.

1— System Starting Screen      2— Default Screen



System Starting Screen



Default Screen

TX1127804 —UN—10DEC12

TX1127805 —UN—10DEC12

KR46761,0000748 -19-21DEC12-1/1

## MENU

When the default screen (1) is displayed, press the menu switch (2) to display the MENU screen (3).

The MENU screen displays submenus which can be selected to view diagnostic information or change various operating characteristics of the machine or the monitor.

*NOTE: Translations shown on screen may be abbreviated.*

The submenus under MENU that appear on monitor include:

*NOTE: Alarm List ONLY appears as a submenu if there is an actual alarm.*

- **Alarm List**—provides detailed information of generated alarms.
- **Auto Shutdown**—allows operator to set a desired time for machine shutdown to take place.
- **Clock**—allows operator to view and adjust clock settings.
- **Trip**—allows operator to view operation hours and set trip meters.
- **Brightness ADJ.**—allows operator to adjust the brightness of the monitor for better viewing.

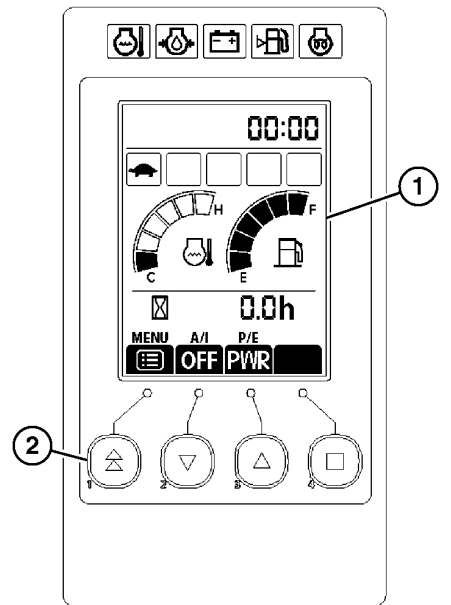
*NOTE: The Alarm List will always be displayed first on the MENU screen if there is an actual alarm.*

Use up arrow (4) and down arrow (5) to highlight desired submenu. Press select switch (6) to display chosen submenu.

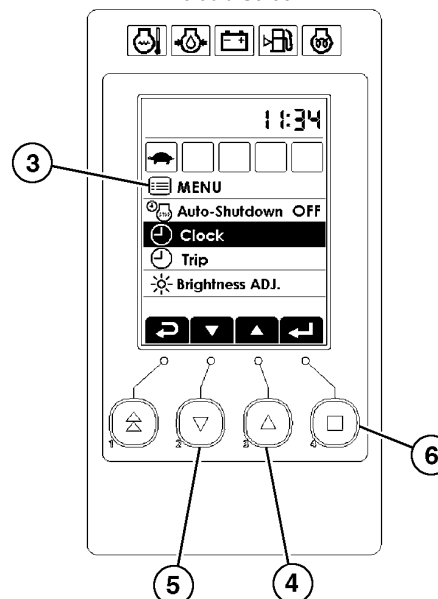
Press menu switch to return to previous screen.

- 1— Default Screen
- 2— Menu Switch
- 3— MENU Screen

- 4— Up Arrow
- 5— Down Arrow
- 6— Select Switch



Default Screen



MENU Screen

TX1127806 —JUN—10DEC12

TX1127807 —JUN—21DEC12

KR46761.00007E3 -19-27DEC12-1/1

### MENU—Alarm List

The Alarm List menu will always appear as the first submenu under MENU, but ONLY if there is an actual alarm generated. If there is more than one alarm, a list will be displayed. If there are no alarms, Alarm List will not appear as a submenu.

The submenus under MENU that appear on monitor include:

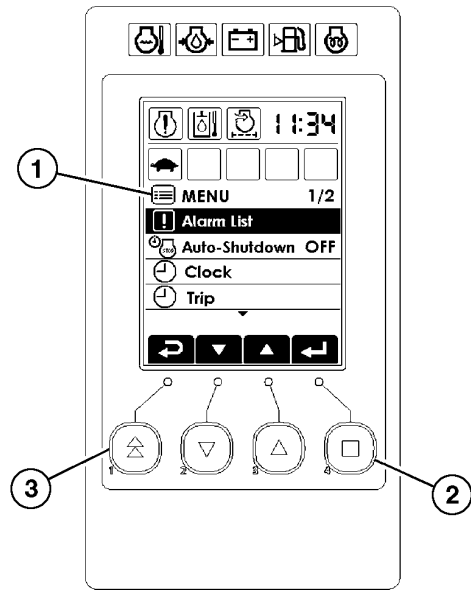
*NOTE: Alarm List ONLY appears as a submenu if there is an actual alarm.*

- Alarm List
- Auto Shutdown
- Clock
- Trip
- Brightness ADJ.

At MENU screen (1) with Alarm List highlighted, press select switch (2) to view generated alarms.

Press menu switch (3) to return to previous screen.

**Possible alarm indicators that could appear are:**



MENU Screen

1— MENU Screen  
2— Select Switch

3— Menu Switch

KR46761,000074A -19-28DEC12-1/11

TX1127819 —UN—10DEC12

•**Engine Trouble Alarm**—Engine or engine related parts are abnormal. Contact your authorized John Deere dealer.

TX1127879 —UN—11DEC12



Engine Trouble Alarm

KR46761,000074A -19-28DEC12-2/11

•**Engine Oil Pressure Alarm**—Engine oil pressure has decreased. Immediately stop engine. Check engine oil system and oil level.

TX1086353 —UN—06JAN11



Engine Oil Pressure Alarm

KR46761,000074A -19-28DEC12-3/11

•**Engine Overheat Alarm**—Engine coolant temperature has abnormally increased. Stop operation. Run the engine at slow idle speed and lower the coolant temperature.

TX1086350 —UN—06JAN11



Engine Overheat Alarm

Continued on next page

KR46761,000074A -19-28DEC12-4/11

Operation—Monitor Operation

•**Warning Alarm**—An abnormal condition has been detected. Stop operation. Contact your authorized John Deere dealer.

TX1086352 —UN—06JAN11



Warning Alarm

KR46761,000074A -19-28DEC12-5/11

•**Engine Air Filter Restriction Alarm**—Air filter elements are restricted. Replace air filter elements.

TX1086365 —UN—06JAN11



Engine Air Filter Restriction Alarm

KR46761,000074A -19-28DEC12-6/11

•**Water Separator Alarm**—Water accumulated in water separator. Drain water separator.

TX1127870 —UN—11DEC12



Water Separator Alarm

KR46761,000074A -19-28DEC12-7/11

•**Engine Control Dial Malfunction Alarm**—Engine control dial malfunction is detected. Repair or replace.

TX1127874 —UN—11DEC12



Engine Control Dial Malfunction Alarm

KR46761,000074A -19-28DEC12-8/11

•**Machine Malfunction Alarm**—Machine malfunction is detected. Contact your authorized John Deere dealer.

TX1086367 —UN—06JAN11

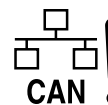


System Malfunction Alarm

KR46761,000074A -19-28DEC12-9/11

•**CAN Communication Alarm**—CAN Communication device is abnormal. Contact your authorized John Deere dealer.

TX1127876 —UN—11DEC12



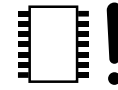
CAN Communication Alarm

Continued on next page

KR46761,000074A -19-28DEC12-10/11

•**EEPROM Malfunction Alarm**—Communication system is abnormal. Contact your authorized John Deere dealer.

TX1127878 —UN—11DEC12



EEPROM Malfunction Alarm

KR46761,000074A -19-28DEC12-11/11

### MENU—Auto Shutdown

The Auto Shutdown menu provides the capability to turn on this feature and set a desired time for machine shutdown to take place.

At MENU screen (1), use down arrow (2) to highlight Auto Shutdown.

Press select switch (3) to display run time option (4).

Adjust run time by using up arrow (5) or down arrow.

Auto Shutdown can be set to activate after 3, 5, 10, or 15 minute increments. Press select switch to store desired run time.

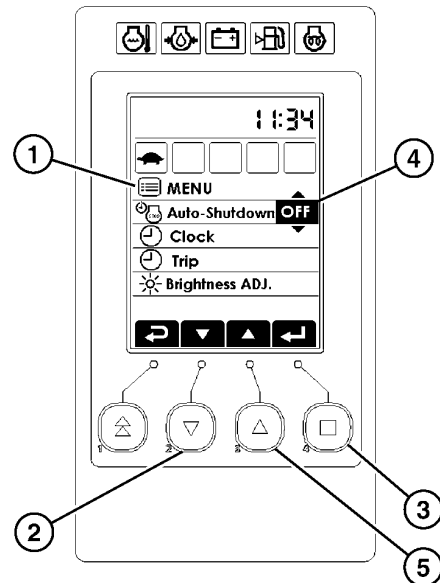
When Auto Shutdown function is set, the Auto Shutdown Indicator (6) will illuminate.

Thirty seconds prior to auto shutdown, the monitor will display time (7) remaining until auto shutdown.

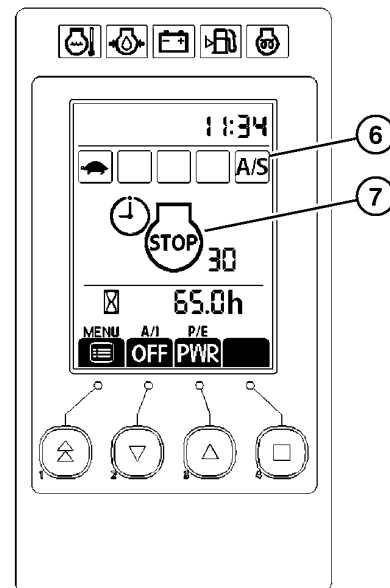
Press menu switch to return to previous screen.

- 1— MENU Screen
- 2— Down Arrow
- 3— Select Switch
- 4— Run Time Option

- 5— Up Arrow
- 6— Auto Shutdown Indicator
- 7— Time



Auto Shutdown Screen



Auto Shutdown Enabled Screen

TX1127829 —UN—11DEC12

TX1127835 —UN—11DEC12

KR46761,00007E5 -19-28DEC12-1/1

## MENU—Clock

At MENU screen (1), use down arrow (2) to highlight Clock.

Press select switch (3) to display Clock Menu (4).

The submenus under Clock that appear on monitor include:

- Hour
- Minute
- Display

Use up arrow (5) or down arrow to highlight desired submenu.

Press select switch to display selected submenu.

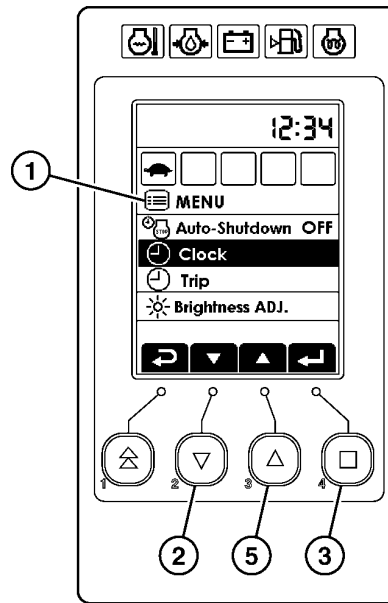
Use up arrow or down arrow to adjust Clock setting.

Press select switch to return to Clock menu.

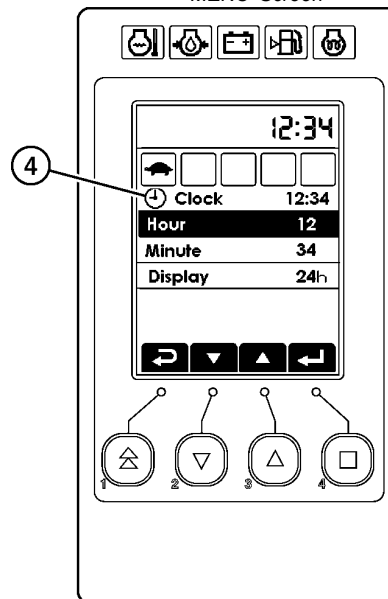
Press menu switch to return to previous screen.

- 1— MENU Screen
- 2— Down Arrow
- 3— Select Switch

- 4— Clock Menu
- 5— Up Arrow



MENU Screen



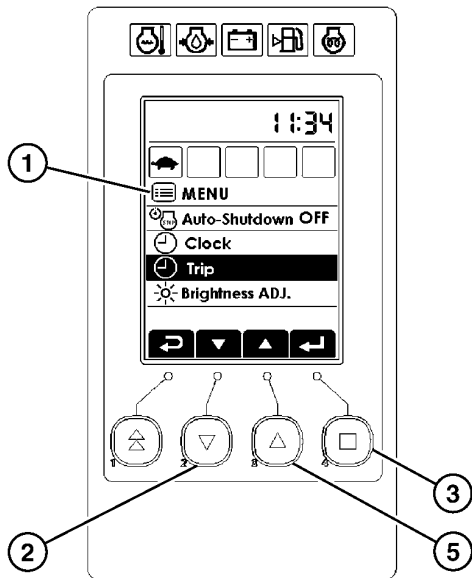
Clock Menu Screen

TX1127915 —JUN—11DEC12

TX1127918 —JUN—11DEC12

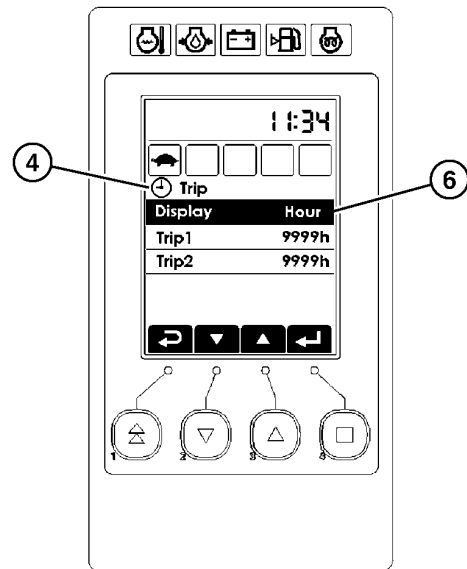
KR46761,00007E6 -19-28DEC12-1/1

## MENU—Trip



MENU Screen

TX1128034—UN—13DEC12



Trip Menu

TX1128037—UN—13DEC12

At MENU screen (1) press down arrow (2) to highlight Trip.

Press select switch (3) to display Trip Menu (4).

The submenus under Trip that appear on monitor include:

- Display
- Trip 1
- Trip 2

Use down arrow to highlight desired submenu.

Press select switch.

Use up arrow (5) or down arrow to adjust settings.

**NOTE:** In Display submenu (6) if hour is selected, the hour meter is displayed on default screen. If Trip 1 is selected, set time for Trip 1 is displayed; and if Trip 2 is selected, set time for Trip 2 is displayed on default screen.

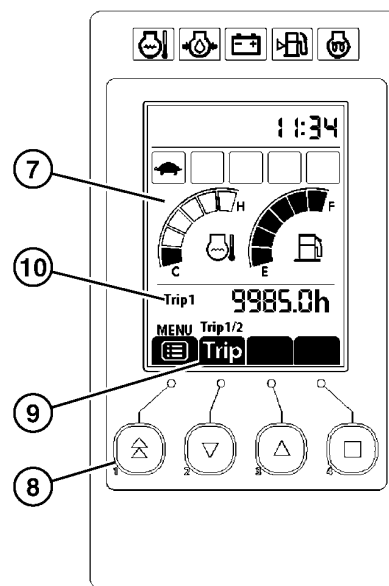
Press select switch to select desired setting.

Press menu switch (8) to return to previous screen.

With Default screen (7) displayed, hold down menu switch.

When menu switch is held down, Trip will be displayed on short cut key (9).

Continue holding menu switch and use down arrow to adjust display setting (10).



Default Screen

TX1128039—UN—13DEC12

- 1— MENU Screen
- 2— Down Arrow
- 3— Select Switch
- 4— Trip Menu
- 5— Up Arrow

- 6— Display Submenu
- 7— Default Screen
- 8— Menu Switch
- 9— Short Cut Key
- 10— Display Setting

KR46761,00007E8 -19-28DEC12-1/1

## MENU—Brightness Adjustment

The Brightness Adjustment menu allows operator to adjust the brightness of the monitor for better viewing.

At MENU screen (1) press down arrow (2) to highlight Brightness ADJ.

Press select switch (3) to view Brightness ADJ. menu (4).

Press down arrow to highlight Brightness.

Press select switch.

Use up arrow (5) or down arrow to adjust Brightness setting (6).

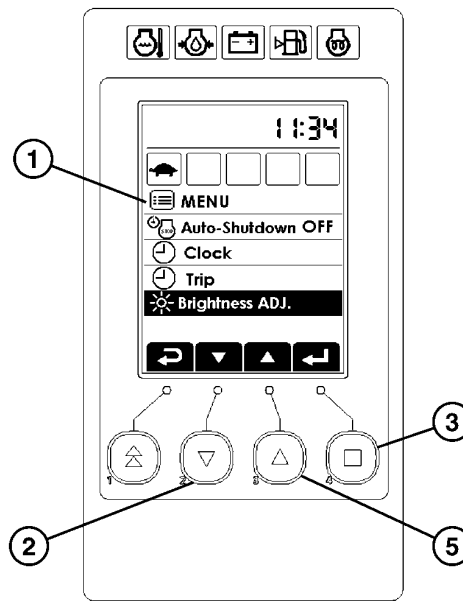
Press select switch to select desired setting.

*NOTE: Night mode can be set by following above procedure with the work lights on.*

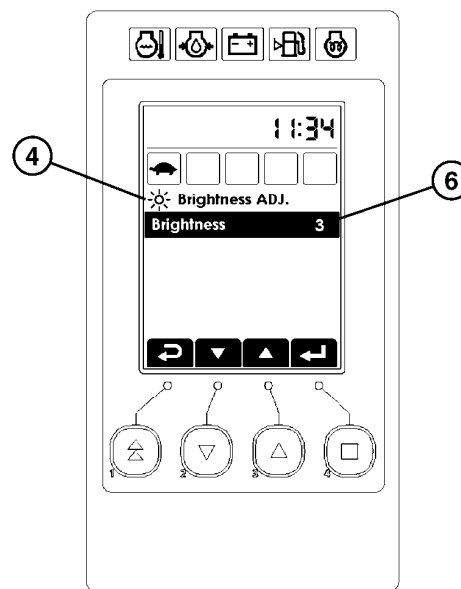
Press menu button to return to previous screen.

- 1—MENU Screen
- 2—Down Arrow
- 3—Select Switch

- 4—Brightness ADJ. Menu
- 5—Up Arrow
- 6—Brightness Setting



MENU Screen



Brightness ADJ. Menu

TX1128004—UN—12DEC12

TX1128001—UN—12DEC12

KR46761,00007E7 -19-28DEC12-1/1



# Operation—Operating the Machine

## Operating in High Altitude

**IMPORTANT:** Avoid machine damage. This machine is designed to operate below 1500 m (4918

ft.) Contact your authorized dealer before operating above 1500 m (4918 ft.)

KR46761,0000808 -19-04DEC14-1/1

## Before Starting Work

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

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



Reading Operator's Manual

TX03679,0001780 -19-21AUG12-1/1

T133556—UN—24AUG00

## Operator's Daily Machine Check Before Starting

### Safety and Protective Devices Checks

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

Clear all steps and walking surfaces.

Check condition of guards, shields, and covers.

### Overall Machine Checks

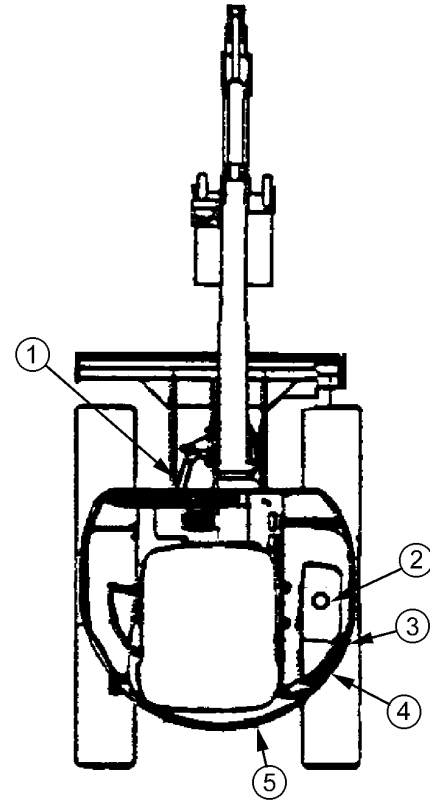
Check for worn or frayed electrical wires and loose or corroded connections.

Inspect machine for bent, broken, or loose parts.

Check for loose or missing hardware.

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

- |  |   |
|--|---|
| 1— Check Pedal and Lever Movement/Clean Out Cab Debris | 4— Check/Clean Radiator and Oil Cooler Outer Fins |
| 2— Check Hydraulic Tank Oil Level                      | 5— Check Engine Oil Level                         |
| 3— Check Coolant Recovery Tank Level                   |   |



T123629

KR46761,00007F2 -19-28OCT14-1/1

T123629—UN—17AUG99

## Starting the Engine

*NOTE: Engine will not start unless pilot control shutoff lever is in locked (up) position.*

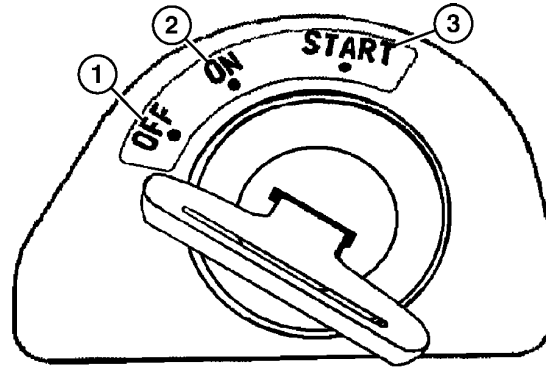
1. Turn the key switch to ON (2) position.
2. Sound horn to alert persons nearby.
3. Turn the engine speed control dial (4) to slow idle (5).

**IMPORTANT: Prevent starter damage. Never operate starter for more than 15 seconds at a time. If engine does not start, return key switch to OFF. Wait for approximately 30 seconds, then try again. After a false start, do not turn key switch until engine stops.**

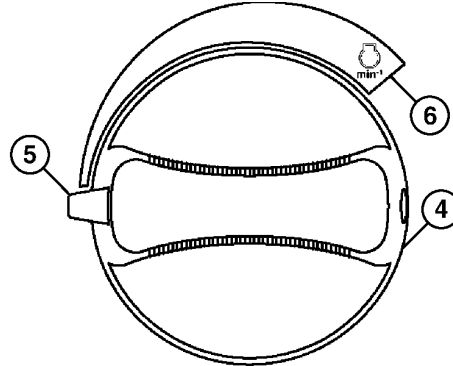
4. Turn key switch to START (3) position. Release key; switch will return to ON position.

1—OFF  
2—ON  
3—START

4—Engine Speed Control Dial  
5—Slow Idle  
6—Fast Idle



Key Switch



Engine Speed Control Dial

TX1126205—JUN—20NOV12

TX1126244—JUN—20NOV12

KR46761.00007AC -19-13DEC12-1/1

### Starting the Engine in Cold Weather

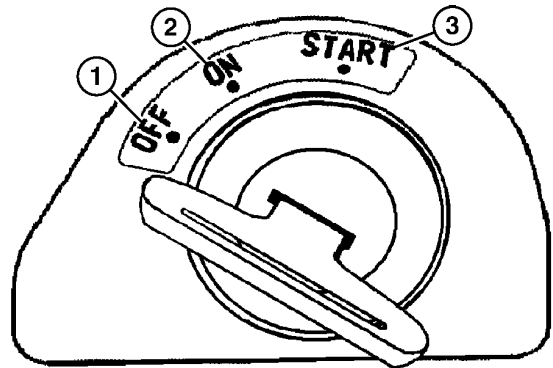
**NOTE:** Engine will not start unless pilot control shutoff lever is in locked (UP) position.

1. Turn engine speed control dial (4) halfway between slow idle (5) and fast idle (6).
2. Sound horn to alert persons nearby.
3. Turn key switch to ON (2) position.
4. The basic screen will be displayed on monitor. Machine will automatically check if preheating is required. When preheating is required, preheat indicator will light.

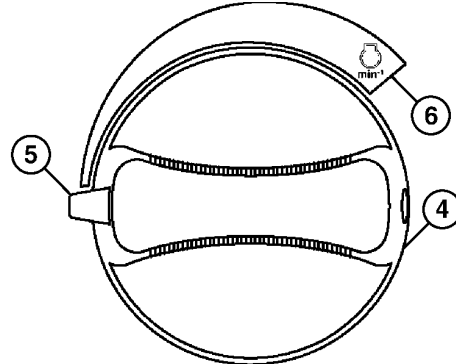
**IMPORTANT: Prevent starter damage. Never operate starter for more than 15 seconds at a time. If engine does not start, return key switch to OFF. Wait for 30 seconds, then try again. After a false start, do not turn key switch until engine stops.**

5. When engine preheat indicator light goes out after 15 seconds, immediately turn key switch to START (3) position. Release key; switch will return to ON (2) position.
6. Allow sufficient time for warm-up operation to be completed.

- |          |                              |
|----------|------------------------------|
| 1— OFF   | 4— Engine Speed Control Dial |
| 2— ON    | 5— Slow Idle                 |
| 3— START | 6— Fast Idle                 |



Key Switch



Engine Speed Control Dial

KR46761,00007AD -19-13DEC12-1/1

TX1126205—UN—20NOV12

TX1126244—UN—20NOV12

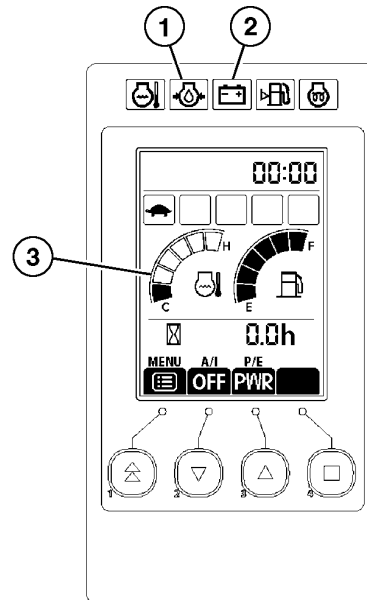
### Checking Instruments After Starting

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

After the engine is started, the alternator indicator (2) light and engine oil pressure indicator (1) light should go out. If they do not, stop the engine immediately. Find and correct the problem.

Engine coolant temperature gauge (3) should be in the white zone.

- |                                  |                                     |
|----------------------------------|-------------------------------------|
| 1— Engine Oil Pressure Indicator | 3— Engine Coolant Temperature Gauge |
| 2— Alternator Indicator          |                                     |




Monitor Screen

JS93577,000005D -19-04JAN13-1/1

TX1127748—UN—10DEC12


## Cold Weather Warm-Up

 **CAUTION: Prevent possible injury from unexpected machine movement. If hydraulic oil is cold, hydraulic functions move slowly. DO NOT attempt normal machine operation until hydraulic functions move at close-to-normal cycle times.**

In extremely cold conditions, an extended warm-up period will be necessary. Under such conditions, the radiator and oil cooler should be covered to maintain correct operating temperature.

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

1. Run engine at 1/2 speed for 5 minutes. Do not run at fast or slow idle.

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

2. Exercise travel and swing functions slowly, initially moving only short distances.
3. Operate boom, arm, and bucket functions by moving cylinders a short distance each direction for the first time.
4. Continue cycling cylinders by increasing cylinder extension until full stroke is obtained.

**IMPORTANT: Holding function actuated for more than 30 seconds can cause damage from hot spots in the control valve.**

5. Actuate bucket curl function (cylinder extend) for 10 seconds and release for 5 seconds for a period of 2-1/2 minutes.
6. Repeat procedure with bucket dump function.
7. Operate all hydraulic functions to distribute warm oil in all cylinders, motors, and lines.
8. If hydraulic functions still move slowly, repeat steps 5 and 6.

VD76477,000005C -19-18JUL06-1/1

## Travel Pedals and Levers

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

The instructions below apply when the upperstructure is facing forward and travel motors are to the rear of the machine. If the upperstructure is rotated to the rear and the travel motors are to the front of the machine, the machine moves OPPOSITE to the direction described.

**NOTE:** *Unfold foot pedals before using.*

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

**REVERSE TRAVEL (3):** Push down on rear of both pedals or pull both levers rearward.

**NEUTRAL POSITION (2):** Travel brakes will automatically stop and hold the machine.

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

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

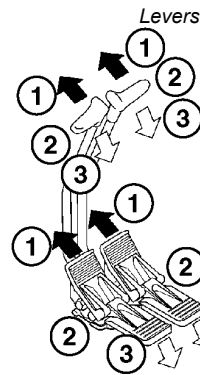
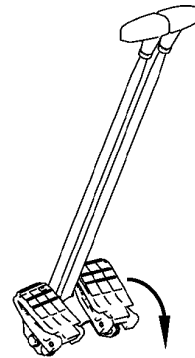
**SHORT TURN (COUNTERROTATE):** Push down the front of one pedal and the rear of the other or push one lever forward and pull the other rearward.

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

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

**COLD WEATHER OPERATION:** Travel pedal and lever dampers are provided for smooth control. In extremely

T204926



T204927

Pedals and Levers

1— Forward Travel  
2— Neutral Position

3— Reverse Travel

cold weather, pedal or lever effort will increase. Operate pedals or levers several times with pilot shutoff lever in locked (UP) position.

KR46761.00007F3 -19-04DEC14-1/1

T204926 —UN—07DEC04

T204927 —UN—07DEC04

## Control Lever Pattern Operation

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

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

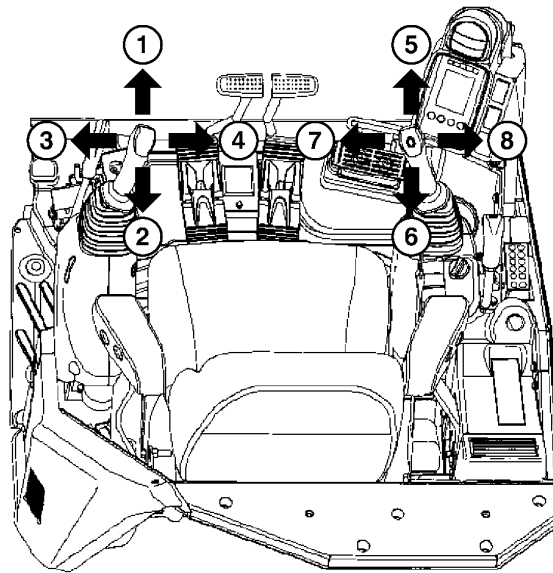
The machine comes equipped from the factory with the excavator control lever pattern. A label, with both the excavator and backhoe control lever patterns, is located inside the cab.

Check the patterns on the label and then carefully operate the control levers to verify the pattern on machine.

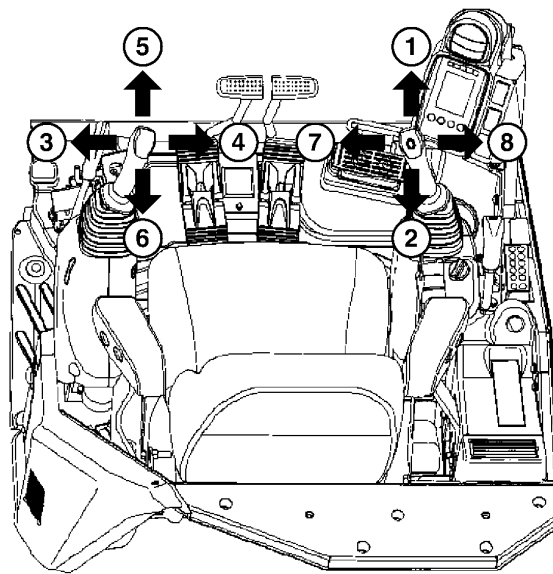
To change the pattern from excavator to backhoe, see Control Lever Pattern Conversion in this section.

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

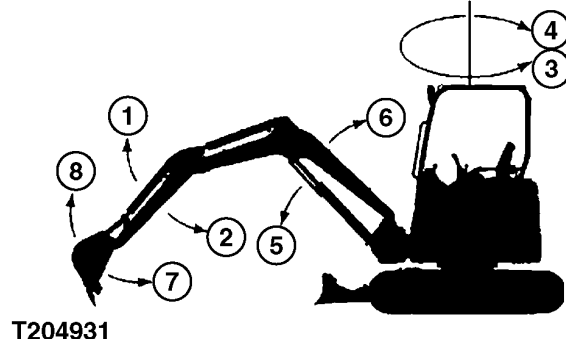
- |               |               |
|---------------|---------------|
| 1—Arm Out     | 5—Boom Down   |
| 2—Arm In      | 6—Boom Up     |
| 3—Swing Left  | 7—Bucket Load |
| 4—Swing Right | 8—Bucket Dump |



Excavator Control Lever Pattern



Backhoe Control Lever Pattern



T204931

Boom, Arm, Bucket Movement

TX1126572 —UN—27NOV12

TX1126574 —UN—27NOV12

T204931 —UN—07DEC04

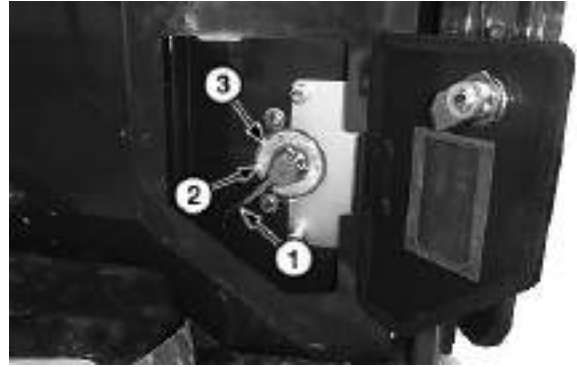
JS93577,0000043 -19-19DEC12-1/1

### Control Lever Pattern Conversion

Machine pilot control levers can be changed from standard excavator control pattern to backhoe control pattern.

To change control pattern:

1. Park machine on a level surface.
2. Run engine at slow idle speed without load for 3 minutes.
3. Turn key switch to OFF to stop engine. Remove key from switch.
4. Pull pilot control shutoff lever up to locked position.
5. Control pattern selector lever (1) is located under seat. Open panel to access selector lever.
6. Rotate selector lever to desired control pattern position. (Lever must be aligned with arrow on selected control pattern and detented in order to function as expected.)
7. Close panel.



Control Pattern Selector Lever

- 1— Control Pattern Selector Lever
- 2— Excavator Position
- 3— Backhoe Position

8. Verify selected pattern is visible through sight hole.

KR46761,00007A2 -19-13DEC12-1/1

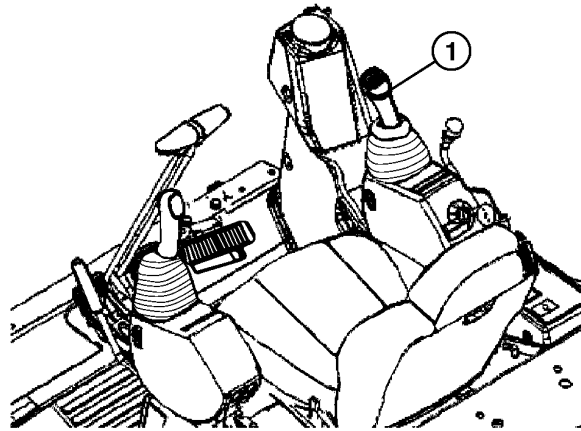
TX1125779A —JUN—16NOV12

### Multi-Function Control Lever

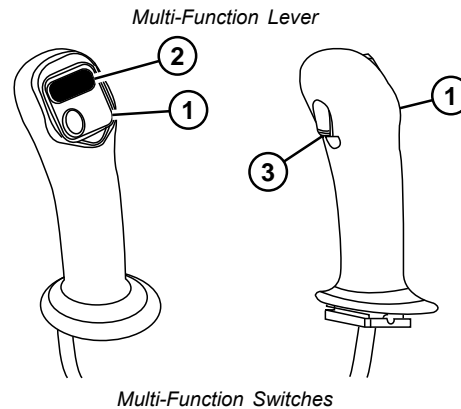
1. Move slide switch (2) of multi-function right control lever (1) to the right or left to operate front-end attachment such as hydraulic breaker.
2. When switch (3) of right control lever is pushed, it operates the same as when slide switch is moved to the left. (This switch operation is convenient for using hydraulic breaker.)

In case slide switch and switch are pushed simultaneously, switch operation has priority.

- 1— Multi-Function Right Control Lever      3— Switch  
2— Slide Switch



TX1127714 —UN—10DEC12

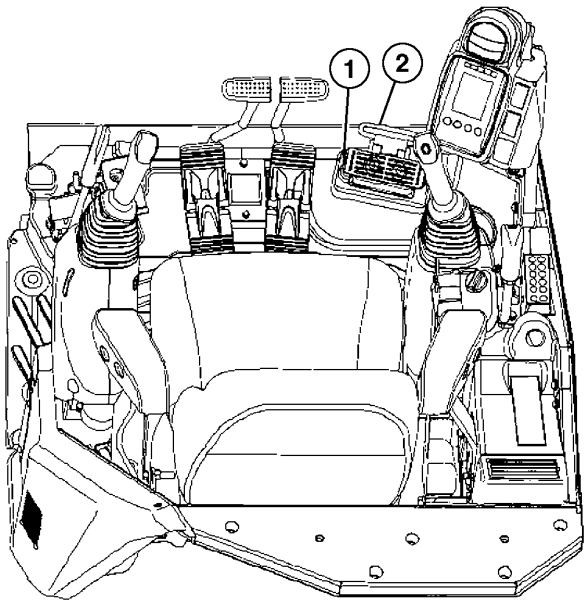


TX1127715 —UN—07DEC12

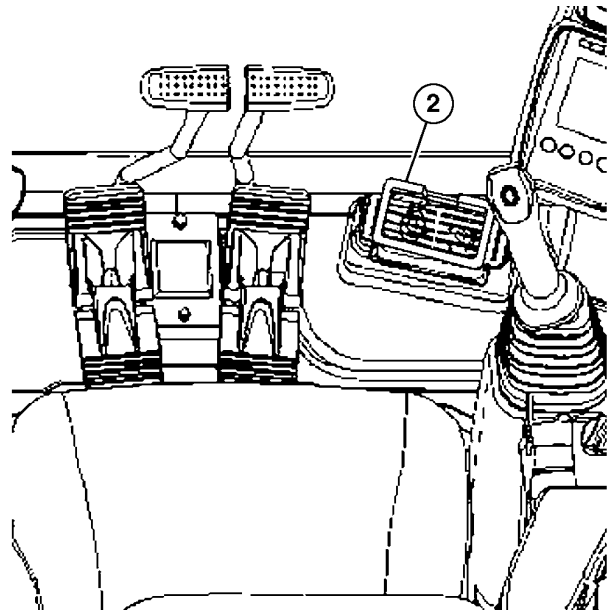
JS93577,000005B -19-19DEC12-1/1



## Boom-Swing Pedal



Unlocked Position



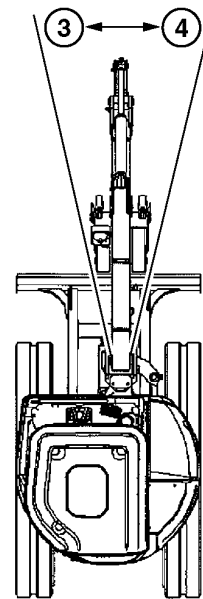
Locked Position

**CAUTION:** Avoid injury from unexpected machine movement. Keep boom-swing pedal locked during travel and when not in use.

1. Lift pedal cover (2) to unlock boom-swing pedal (1).
2. Push on left side of pedal to swing left (3).
3. Push on right side of pedal to swing right (4).
4. Lower pedal cover to lock boom-swing pedal when not in use.

1— Boom-Swing Pedal  
2— Pedal Cover

3— Swing Left  
4— Swing Right



Swing Direction

TX1125969 —UN—20NOV12

TX1125960 —UN—20NOV12

TX1125961 —UN—20NOV12

KR46761,00007A7 -19-19DEC12-1/1

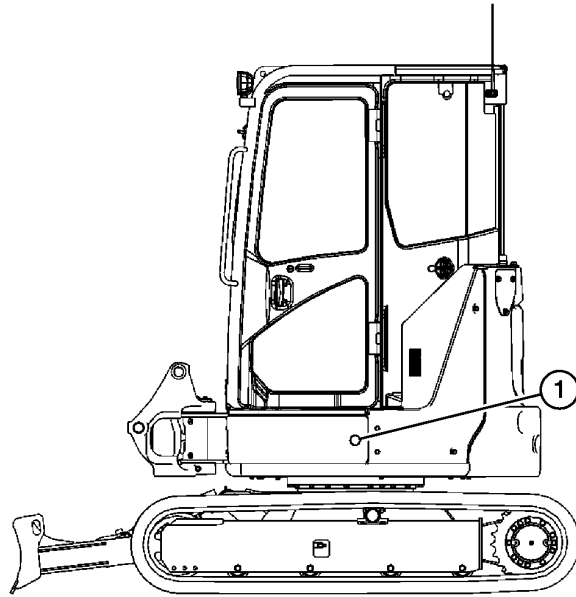
## Positioning Auxiliary Line Selector Valve

**IMPORTANT: Prevent possible machine damage. Stop the engine and move pilot control shutoff lever to locked (rearward) position before moving the selector valve.**

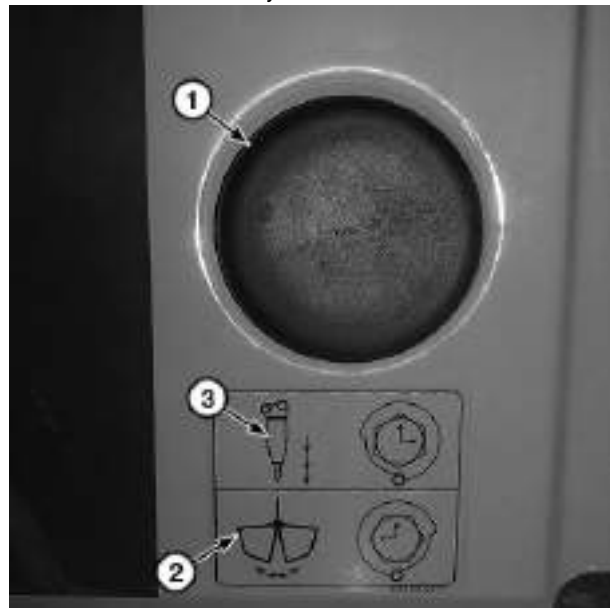
1. Stop engine.
2. Remove selector valve plug (1) to access selector valve. Selector valve must be positioned according to the type of attachment to be operated:
  - Position 2: Operating a crusher or other double actuating cylinder attachment requiring two actions such as OPEN/CLOSE operation.
  - Position 3: Operating a breaker or other single actuating cylinder attachment requiring only ON/OFF operation.

1—Selector Valve Plug  
2—OPEN/CLOSE (for double actuating cylinder attachment)

3—ON/OFF (for single actuating cylinder attachment)



Auxiliary Line Selector Valve



Auxiliary Line Selector Positions

TX1126259 —JUN—20NOV12

TX1126264A —JUN—19NOV12

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### Operating Backfill Blade

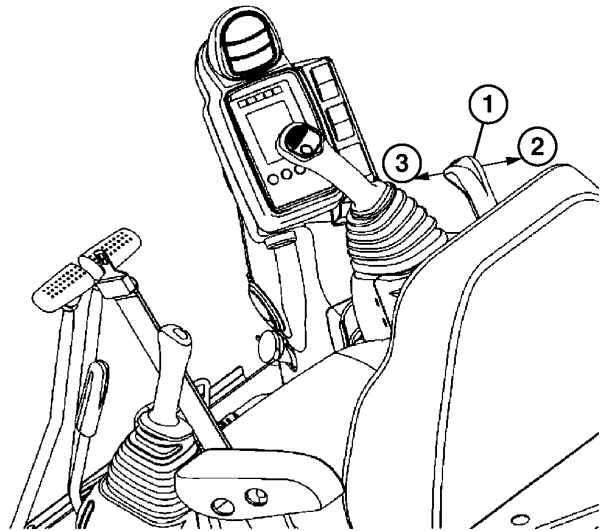
Pull blade lever (1) rearward to raise blade (2).

Push blade lever forward to lower blade (3).

When the blade lever is released, it automatically returns to neutral, keeping the blade in position until the lever is moved again.

1— Blade Lever  
2— Blade Raise

3— Blade Lower



Blade Lever

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TX1126429—UN—21NOV12

### Operating Angle Blade—If Equipped

Pull angle blade lever (3) rearward to raise angle blade (4).

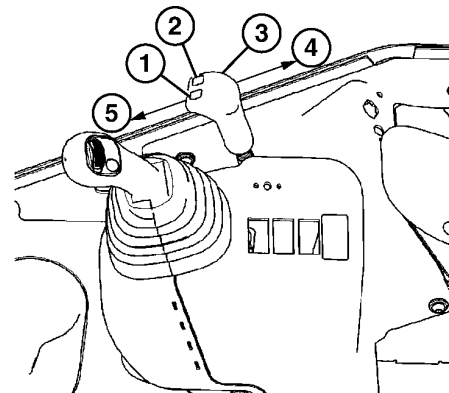
Push angle blade lever forward to lower angle blade (5).

Push angle left turn switch (1) to angle blade left.

Push angle right turn switch (2) to angle blade right.

1— Angle Left Turn Switch  
2— Angle Right Turn Switch  
3— Angle Blade Lever

4— Angle Blade Raise  
5— Angle Blade Lower



Angle Blade Lever

KR46761,00007B7 -19-05DEC12-1/1

TX1126386—UN—21NOV12

### Operating Tips—Backfill Blade

- Use blade only for moving loose material and for backfilling.
- Load the blade evenly.

- Do not use blade to dig.
- Do not run the machine into a load.
- Do not use the blade to stabilize machine.

OOU1032,00015D2 -19-08DEC14-1/1

## Operating in Water and Mud

Be careful not to operate machine in water or mud above upper track shoe surface (1), causing swing bearing and rotary manifold to be submerged.

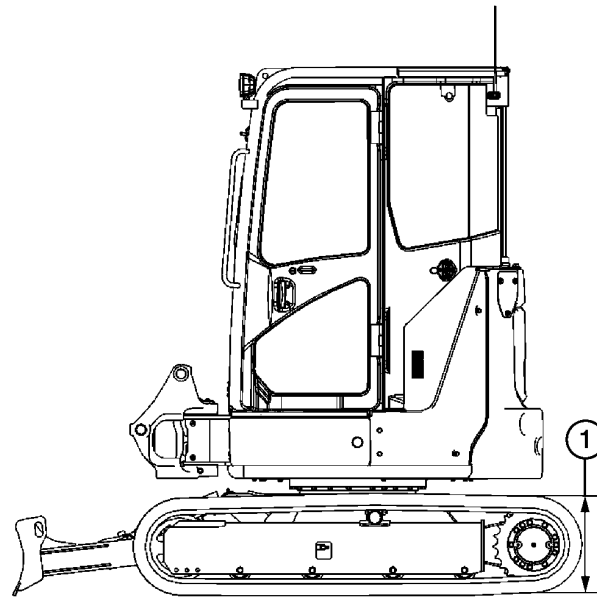
### Specification

Upper Track Shoe  
Surface (operable water  
depth)—Distance..... 485 mm  
7.1 in.

If the swing bearing and rotary manifold are submerged, remove cover from underneath center of machine. Remove drain plug to drain water and mud.

Clean swing gear area. Install plug and cover. Lubricate swing bearing and swing bearing gear. See Lubricate Swing Bearing. (Section 3-8.) See Lubricate Swing Bearing Gear. (Section 3-9.)

1—Upper Track Shoe Surface



TX1126256—JUN—20NOV12

Upper Track Shoe Surface

KR46761,00007B3 -19-26APR13-1/1

## Selecting Correct Track

**IMPORTANT: Avoid damaging tracks. Using rubber tracks or rubber pads on rough ground may result in pads being damaged.**

Rubber tracks and rubber pads are designed for flat, hard surfaces only. Do not use on rough ground such as rocks, sand, or gravel.

Check track shoe bolts periodically for tightness.

OOU1032,00015DF -19-09DEC14-1/1

## Driving Up a Steep or Slippery Slope

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

1. Wear seat belt.

2. Position undercarriage so travel motors will be on uphill end of machine.

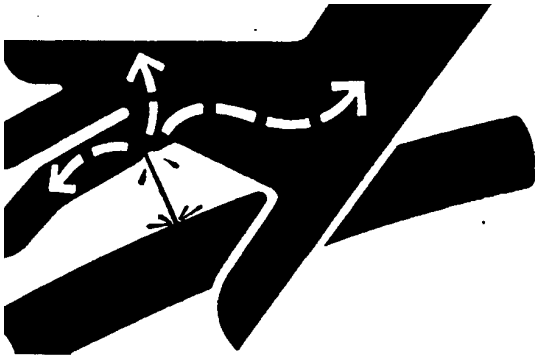
3. Push bucket into the ground.

4. When boom is on uphill end of machine; pull machine using boom and arm cylinder to help travel motors.

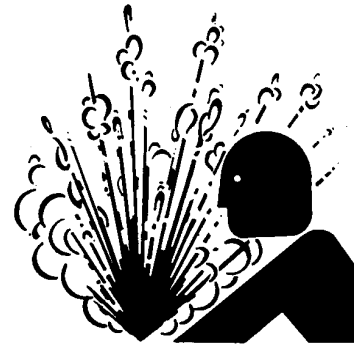
When boom is on downhill end of machine; push machine using boom and arm cylinder to help travel motors.

VD76477,00001F4 -19-09JAN12-1/1

### Lower Boom With Engine Stopped



Pressurized Fluids



Pressurized Fluids

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

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

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

High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. Slowly loosen cap to release pressure.

1. Loosen hydraulic tank filler cap (1) to relieve pressure.



Hydraulic Tank Filler Cap

1— Hydraulic Tank Filler Cap

Continued on next page

KR46761,00007BD -19-13DEC12-1/2

X9811 —UN—23AUG88

TS281 —UN—15APR13

TX1126061A —UN—16NOV12

- Remove cap screws (2) and cover (3) to access control valve.

**Lowering boom with empty bucket:**

- Loosen relief valve (4) slowly to lower boom.
- After the bucket is lowered to the ground, tighten relief valve to specification.

**Specification**

Relief Valve—Torque..... 70—80 N·m  
51.6—59.0 lb.-ft.

**Lowering boom with full bucket:**

- Make an alignment mark on relief valve and adjusting screw (5).
- Loosen lock nut (6).
- Loosen adjusting screw slowly to lower boom.
- After the bucket is lowered to the ground, align marks on relief valve and adjusting screw. Tighten lock nut to specification.

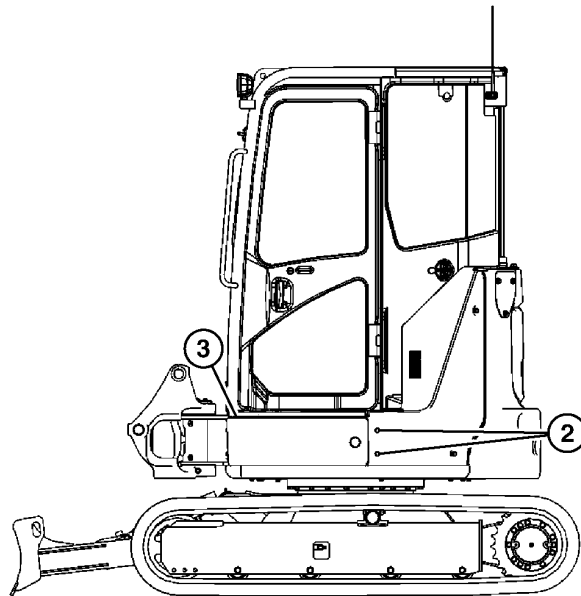
**Specification**

Lock Nut—Torque..... 28—32 N·m  
20.7—23.6 lb.-ft.

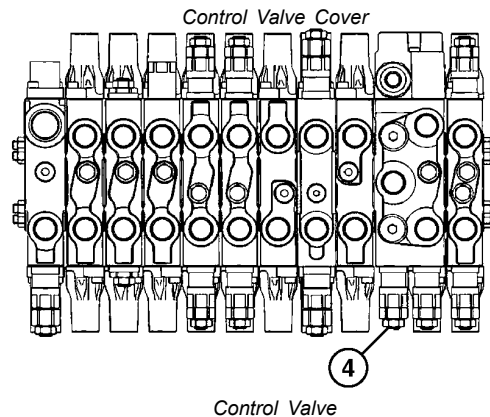
- Install cap screws and cover. Tighten hydraulic tank filler cap.

- 2— Cap Screw (2 used)
- 3— Cover
- 4— Relief Valve

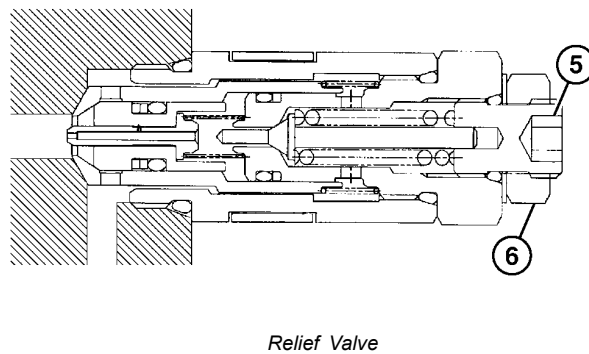
- 5— Adjusting Screw
- 6— Lock Nut



TX1126656 —UN—27NOV12



TX1126659 —UN—27NOV12



TX1126664 —UN—27NOV12

KR46761.00007BD -19-13DEC12-2/2

## Parking

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

1. Park machine on a level surface.
2. Lower bucket and blade to the ground.
3. Turn auto-idle switch off.
4. Run engine at slow idle without load for 5 minutes to cool engine.
5. Turn key switch to OFF position. Remove key from switch.
6. Pull pilot control shutoff lever (1) to locked position.
7. Close windows and cab door, if equipped.
8. Lock all access doors and compartments.

1— Pilot Control Shutoff Lever



*Lever in Locked Position*

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## Loading and Unloading for Transport

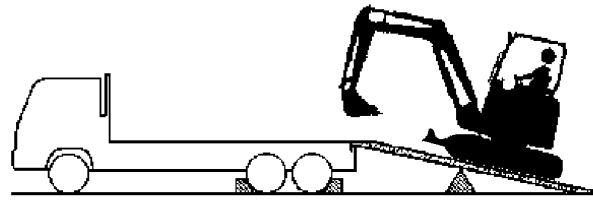
**CAUTION:** Avoid possible injury from unexpected machine movement. Use extra care to prevent tip over or unexpected movement when loading and unloading machine for transport. Observe these rules when loading and unloading machine:

- Always wear seat belt.
- Locate trailer on a level and stable surface. Chock trailer wheels.
- Use loading ramps. Keep ramps at a low angle and firmly attached to trailer.

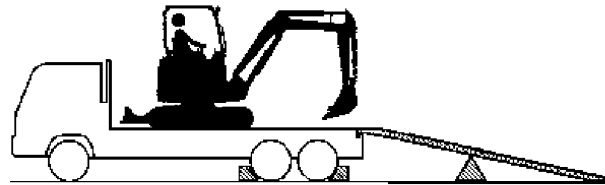
1. When loading machine, use bucket for support with angle of arm to boom at 90°.

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

2. Position machine on trailer (centerline of machine over centerline of trailer).
3. Once machine is loaded on trailer, rotate upperstructure so front attachment is facing rearward.
4. Lower boom until bucket rests on trailer bed.
5. Lower blade to rest on trailer bed.
6. Stop engine.
7. Secure bucket, blade, and track frame to trailer with chains or cables. Do not allow chains or cables to come into contact with rubber tracks, hydraulic hoses, or hydraulic lines.



Loading Machine On Trailer



Machine On Trailer

8. Verify overall height of load on trailer.
9. When unloading machine, use bucket for support with angle of arm to boom at 90°.

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TX1179621 —UN—04DEC14

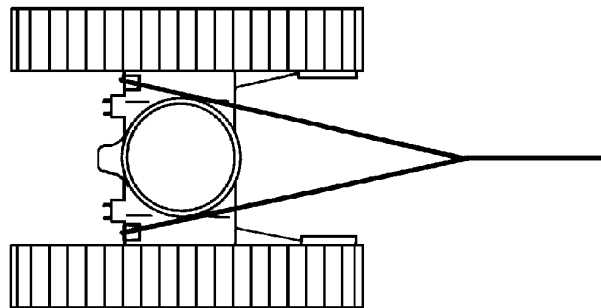
TX1179825 —UN—04DEC14

## Towing Machine a Short Distance

**CAUTION:** Prevent possible injury from tow line breaking. Do not tow machine with damaged chains, frayed cables, slings, straps, or wire tow lines.

**Always wear gloves when handling cables, straps, or wire tow lines.**

Attach tow line to track frame of machine being towed, and of towing machine. Slowly tow machine.



T121986

Towing Machine

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T121986 —UN—24JUN99

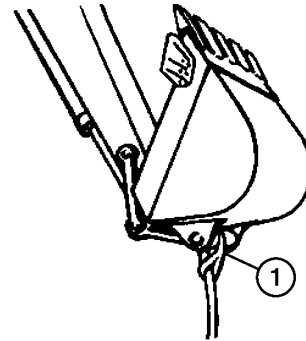


## Lifting

**CAUTION:** Prevent possible injury when lifting. Observe these rules when lifting machine. See *Use Special Care When Lifting Objects.* (Section 1-3.)

- Never move a load over a person's head.
- Never use machine to lift people.
- Keep everyone clear of raised loads.
- Do not exceed lift capacity limits. See *Miscellaneous Specifications.* (Section 4-6.)
- Never attach sling or chain to bucket teeth.
- Use tether lines to guide loads.
- Use hand signals to communicate with others.
- Never move load suddenly.
- Keep all persons away from raised load until blocks are supporting it or load is sitting on the ground.

1. Use proper rigging to attach and stabilize loads.
  2. Without bucket loop: Curl bucket and retract arm. Fasten sling or chain to bucket pivot pin (1).
  - With bucket loop: Curl bucket and retract arm. Fasten sling or chain to bucket loop (2).
3. Coordinate hand signals with signal person before starting.
4. Know location of all persons in working area.
5. Attach a hand line to load and make sure person holding hand line is away from load.
6. Check stability by carefully doing a trial lift:
  - Park machine close to load.
  - Attach load to machine.
  - Raise load 50 mm (2 in.) above ground.
  - Swing load all the way to one side.
  - While keeping load close to ground, move it away from machine.
  - If there is any indication of reduced stability of machine, lower load to ground.
7. Lift load only as high as necessary.



Without Bucket Loop



With Bucket Loop

1— Bucket Pivot Pin

2— Bucket Loop

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TX1144666 —UN—24OCT13

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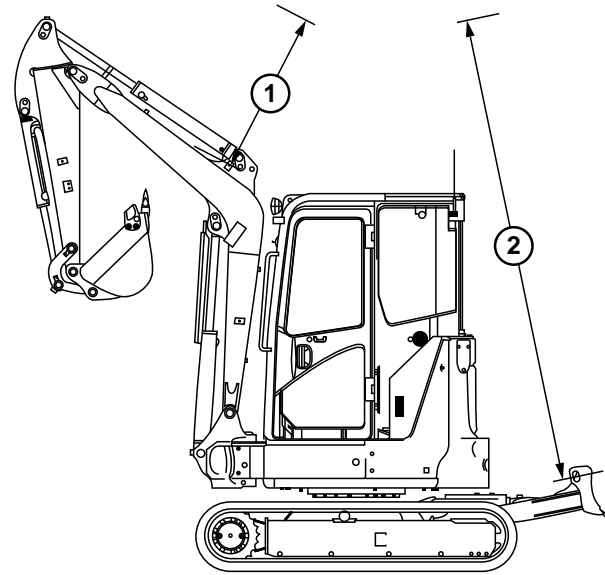
## Lifting Machine

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

Keep all personnel clear of raised load.

*NOTE: Refer to decals on machine for correct lifting points. There are two lift points on each side of the undercarriage.*

1. Swing the upperstructure so the blade is positioned to the rear.
2. Fully retract blade cylinder. If equipped with angle blade, position blade straight.
3. Fully extend the boom, arm, and bucket cylinders.
4. Position the boom straight ahead of the upperstructure.
5. Turn key switch to OFF. Remove key from switch.
6. Pull the pilot control shutoff lever to the locked position.
7. Attach appropriate lifting device to boom eye (1) and blade eyes (2).
8. Slowly lift the machine.



Machine Position

1— Boom Eye

2— Blade Eye (2 used)

### Specification

35G Excavator—Canopy—Operating Weight.....	3520 kg 7760 lb.
Cab—Operating Weight .....	3690 kg 8135 lb.
Canopy, Long Arm—Operating Weight .....	3783 kg 8340 lb.
Cab, Long Arm—Operating Weight .....	3953 kg 8715 lb.

TX1125909 —JUN—16NOV12

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# Maintenance—Machine

## Diesel Fuel

Consult your local fuel distributor for properties of the diesel fuel available in your area.

In general, diesel fuels are blended to satisfy the low temperature requirements of the geographical area in which they are marketed.

Diesel fuels specified to EN 590 or ASTM D975 are recommended. Renewable diesel fuel produced by hydrotreating animal fats and vegetable oils is basically identical to petroleum diesel fuel. Renewable diesel that meets EN 590 or ASTM D975 is acceptable for use at all percentage mixture levels.

### Required Fuel Properties

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

**Cetane number of 45 minimum.** Cetane number greater than 47 is preferred, especially for temperatures below  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ) or elevations above 1500 m (5000 ft.).

**Cold Filter Plugging Point (CFPP)** should be at least  $5^{\circ}\text{C}$  ( $9^{\circ}\text{F}$ ) below the expected lowest temperature or **Cloud Point** below the expected lowest ambient temperature.

**Fuel lubricity** should pass a maximum scar diameter of 0.52 mm as measured by ASTM D6079 or ISO 12156-1. A maximum scar diameter of 0.45 mm is preferred.

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

### Sulfur content for engines that meet Interim Tier 4, Final Tier 4, Stage III B, and Stage IV Engines

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

**IMPORTANT: Do not mix used diesel engine oil or any other type of lubricating oil with diesel fuel.**

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

KR46761,0000E23 -19-17DEC14-1/1

## Diesel Fuel Specifications

The engine in this machine is designed to operate only with ultra low sulfur diesel (ULSD) fuel. Use of fuel other than ULSD will reduce the efficiency and durability of the engine, will harm and permanently damage the

engine's advanced emissions control systems, reduce fuel economy, and possibly prevent the engine from running at all. Emission-related warranties are likely to be rendered void by the use of fuel that does not meet these specifications.

OUT4001,000060A -19-10JAN12-1/1

## Lubricity of Diesel Fuel

Most diesel fuels manufactured in the United States, Canada, and the European Union have adequate lubricity to ensure proper operation and durability of fuel injection system components. However, diesel fuels manufactured in some areas of the world may lack the necessary lubricity.

**IMPORTANT: Make sure the diesel fuel used in your machine demonstrates good lubricity characteristics.**

Fuel lubricity should pass a maximum scar diameter of 0.52 mm as measured by ASTM D6079 or ISO 12156-1. A maximum scar diameter of 0.45 mm is preferred.

If fuel of low or unknown lubricity is used, add John Deere Fuel-Protect Diesel Fuel Conditioner (or equivalent) at the specified concentration.

### Lubricity of BioDiesel Fuel

Fuel lubricity can improve significantly with BioDiesel blends up to B20 (20% BioDiesel). Further increase in lubricity is limited for BioDiesel blends greater than B20.

DX,FUEL5 -19-07FEB14-1/1

## BioDiesel Fuel

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

Before using fuel containing BioDiesel, review the BioDiesel Use Requirements and Recommendations in this Operator's Manual.

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

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

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

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

John Deere approved fuel conditioners, which contain detergent and dispersant additives, are required when using BioDiesel blends from B10—B20, and are recommended when using lower BioDiesel blends.

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

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

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

John Deere approved fuel conditioners, which contain detergent and dispersant additives, are required when using BioDiesel blends from B10—B20, and are recommended when using lower BioDiesel blends.

## BioDiesel Use Requirements and Recommendations

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

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

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

The fuel filter can require more frequent replacement, when using BioDiesel fuel, particularly if switching from diesel. Check engine oil level daily prior to starting engine. A rising oil level can indicate fuel dilution of the engine oil. BioDiesel blends up to B20 must be used within 90 days of the date of BioDiesel manufacture. BioDiesel blends above B20 must be used within 45 days from the date of BioDiesel manufacture.

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

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

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

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

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

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

Continued on next page

DX,FUEL7 -19-15MAY13-1/2

- Possible reduction in water separator efficiency
- Possible damage to paint if exposed to BioDiesel
- Possible corrosion of fuel injection equipment
- Possible elastomeric seal and gasket material degradation (primarily an issue with older engines)
- Possible high acid levels within fuel system
- Because BioDiesel blends above B20 contain more ash, using blends above B20 can result in more rapid

ash loading and require more frequent cleaning of the Exhaust Filter (if present)

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

DX,FUEL7 -19-15MAY13-2/2

## Supplemental Diesel Fuel Additives

Diesel fuel can be the source of performance or other operational problems for many reasons. Some causes include poor lubricity, contaminants, low cetane number, and a variety of properties that cause fuel system deposits. These and others are referenced in other sections of this Operator's Manual.

To optimize engine performance and reliability, closely follow recommendations on fuel quality, storage, and handling, which are found elsewhere in this Operator's Manual.

To further aid in maintaining performance and reliability of the engine's fuel system, John Deere has developed a family of fuel additive products for most global markets. The primary products include Fuel-Protect Diesel Fuel Conditioner (full feature conditioner in winter and summer formulas) and Fuel-Protect Keep Clean (fuel injector deposit removal and prevention). Availability of these and other products varies by market. See your local John Deere dealer for availability and additional information about fuel additives that might be right for your needs.

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## Fuel Filters

The importance of fuel filtration cannot be overemphasized with modern fuel systems. The combination of increasingly restrictive emission regulations and more efficient engines requires fuel system to operate at much higher pressures. Higher pressures can only be achieved using fuel injection components with very close tolerances. These close

manufacturing tolerances have significantly reduced capacities for debris and water.

John Deere brand fuel filters have been designed and produced specifically for John Deere engines.

To protect the engine from debris and water, always change engine fuel filters as specified in this manual.

DX,FILT2 -19-14APR11-1/1

## Minimizing the Effect of Cold Weather on Diesel Engines

John Deere diesel engines are designed to operate effectively in cold weather.

However, for effective starting and cold-weather operation, a little extra care is necessary. The following information outlines steps that can minimize the effect that cold weather may have on starting and operation of your engine. See your John Deere dealer for additional information and local availability of cold-weather aids.

### Use Winter Grade Fuel

When temperatures fall below 0 °C (32 °F), winter grade fuel (No. 1-D in North America) is best suited for cold-weather operation. Winter grade fuel has a lower cloud point and a lower pour point.

**Cloud point** is the temperature at which wax begins to form in the fuel. This wax causes fuel filters to plug. **Pour point** is the lowest temperature at which movement of the fuel is observed.


*NOTE: On average, winter grade diesel fuel has a lower Btu (heat content) rating. Using winter grade fuel may reduce power and fuel efficiency, but should not cause any other engine performance effects. Check the grade of fuel being used before troubleshooting for low-power complaints in cold-weather operation.*

### Air Intake Heater

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

### Ether

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

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

### Coolant Heater

An engine block heater (coolant heater) is an available option to aid cold weather starting.

### Seasonal Viscosity Oil and Proper Coolant Concentration

Use seasonal grade viscosity engine oil based on the expected air temperature range between oil changes and a proper concentration of low silicate antifreeze as recommended. (See DIESEL ENGINE OIL and ENGINE COOLANT requirements in this section.)

### Diesel Fuel Flow Additive

Use John Deere Fuel-Protect Diesel Fuel Conditioner (winter formula), which contains anti-gel chemistry, or equivalent fuel conditioner to treat non-winter grade fuel (No. 2-D in North America) during the cold-weather season. This generally extends operability to about 10 °C (18 °F) below the fuel cloud point. For operability at even lower temperatures, use winter grade fuel.

**IMPORTANT: Treat fuel when outside temperature drops below 0 °C (32 °F). For best results, use with untreated fuel. Follow all recommended instructions on label.**

### BioDiesel

When operating with BioDiesel blends, wax formation can occur at warmer temperatures. Begin using John Deere Fuel-Protect Diesel Fuel Conditioner (winter formula) at 5 °C (41 °F) to treat BioDiesel fuels during the cold-weather season. Use B5 or lower blends at temperatures below 0 °C (32 °F). Use only winter grade petroleum diesel fuel at temperatures below -10 °C (14 °F).

### Winterfronts

Use of fabric, cardboard, or solid winterfronts is not recommended with any John Deere engine. Their use can result in excessive engine coolant, oil, and charge air temperatures. This can lead to reduced engine life, loss of power and poor fuel economy. Winterfronts may also put abnormal stress on fan and fan drive components potentially causing premature failures.

If winterfronts are used, they should never totally close off the grill frontal area. Approximately 25% area in the center of the grill should remain open at all times. At no time should the air blockage device be applied directly to the radiator core.

### Radiator Shutters

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

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

For more information, see your John Deere dealer.

DX,FUEL10 -19-15MAY13-1/1

### Testing Diesel Fuel


A fuel analysis program can help to monitor the quality of diesel fuel. The fuel analysis can provide critical data such as cetane number, fuel type, sulfur content, water content, appearance, suitability for cold weather

operations, bacteria, cloud point, acid number, particulate contamination, and whether the fuel meets specification.

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

DX,FUEL6 -19-14APR11-1/1

### Handling and Storing Diesel Fuel

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

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

Keep all storage tanks as full as practicable to minimize condensation.

Ensure that all fuel tank caps and covers are installed properly to prevent moisture from entering. Monitor water content of the fuel regularly.

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

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

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

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

DX,FUEL4 -19-15FEB13-1/1

### 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 both conventional and synthetic lubricants.

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

DX,ALTER -19-11APR11-1/1

### Lubricant Storage

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

Use clean containers to handle all lubricants.

Store lubricants and containers in an area protected from dust, moisture, and other contamination. Store containers on their side to avoid water and dirt accumulation.

Make certain that all containers are properly marked to identify their contents.

Properly dispose of all old containers and any residual lubricant they may contain.

DX,LUBST -19-11APR11-1/1

## Mixing of Lubricants

In general, avoid mixing different brands or types of oil. Oil manufacturers blend additives in their oils to meet certain specifications and performance requirements.

Mixing different oils can interfere with the proper functioning of these additives and degrade lubricant performance.

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

DX,LUBMIX -19-18MAR96-1/1

## John Deere Break-In Plus™ Engine Oil — Interim Tier 4, Final Tier 4, Stage IIIB, and Stage IV

New engines are filled at the factory with John Deere Break-In Plus™ Engine Oil. During the break-in period, add John Deere Break-In Plus™ Engine Oil, 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.

During the initial operation of a new or rebuilt engine, change the oil and filter between a minimum of 100 hours and maximum equal to the interval specified for John Deere Plus-50™ II oil.

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

If John Deere Break-In Plus™ Engine Oil is not available, use an SAE 10W-30 viscosity grade diesel engine oil meeting one of the following:

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

- API Service Category CJ-4
- ACEA Oil Sequence E9
- ACEA Oil Sequence E6

If one of these oils is used during the initial operation of a new or rebuilt engine, change the oil and filter between a minimum of 100 hours and a maximum of 250 hours.

**IMPORTANT: Do not use any other engine oils during the initial break-in of a new or rebuilt engine.**

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 or other diesel engine oil as recommended in this manual.

DX,ENOIL16 -19-15JUN10-1/1



### Diesel Engine Oil — Interim Tier 4, Final Tier 4, Stage IIIB, and Stage IV

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

**John Deere Plus-50™ II is the recommended engine oil.**

Extended service intervals may apply when John Deere Plus-50™ II engine oil is used. Refer to the engine oil drain interval table and consult your John Deere dealer for more information.

If John Deere Plus-50™ II engine oil is not available, engine oil meeting one or more of the following may be used:

- API Service Category CJ-4
- ACEA Oil Sequence E9
- ACEA Oil Sequence E6

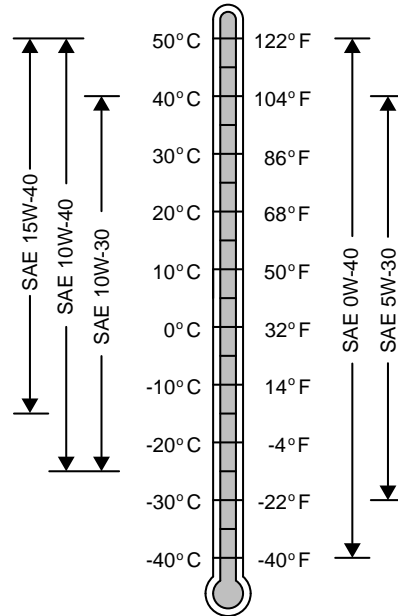
DO NOT use engine oil containing more than 1.0% sulfated ash, 0.12% phosphorus, or 0.4% sulfur.

**Multi-viscosity diesel engine oils are preferred.**

Diesel fuel quality and fuel sulfur content must comply with all existing emissions regulations for the area in which the engine operates.

**IMPORTANT: Use only ultra low sulfur diesel (ULSD) fuel with a maximum sulfur content of 15 mg/kg (15 ppm).**

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



Oil Viscosities for Air Temperature Ranges

TS1691—UN—18JUL07

DX,ENOil14 -19-15JUN10-1/1

## Engine Oil and Filter Service Intervals — Interim Tier 4, Final Tier 4, Stage IIIB, and Stage IV Engines

Recommended oil and filter service intervals are based on a combination of oil pan capacity, type of engine oil and filter used, and sulfur content of the diesel fuel. Actual service intervals also depend on operation and maintenance practices.

Use oil analysis to evaluate the condition of the oil and to aid in selection of the proper oil and filter service interval. Contact your John Deere dealer for more information on engine oil analysis.

Change the oil and oil filter at least once every 12 months even if the hours of operation are fewer than the otherwise recommended service interval.

**Diesel fuel sulfur content** affects engine oil and filter service intervals. Higher fuel sulfur levels reduce oil and filter service intervals.

Use of diesel fuel with sulfur content less than 15 mg/kg (15 ppm) is **REQUIRED**.

**IMPORTANT: To avoid engine damage:**

- **Reduce oil and filter service intervals by 50% when using BioDiesel blends greater than B20. Oil analysis may allow longer service intervals.**

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

- **Use only approved oil types.**

### Approved Oil Types:

- John Deere Plus-50™ II
- "Other Oils" include API CJ-4, ACEA E9, and ACEA E6

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

- *Use of diesel fuel with sulfur content less than 15 mg/kg (15 ppm)*
- *Use of John Deere Plus-50™ II oil*
- *Use of an approved John Deere oil filter*

Engine Oil and Filter Service Intervals	
John Deere Plus-50™ II	500 hours
Other Oils	250 hours
Oil analysis may extend the service interval of "Other Oils" to a maximum not to exceed the interval of Plus-50™ II oils.	

DX,ENOIL15,IT4,120toMAX -19-07FEB14-1/1

## Oil Filters

Filtration of oils is critically important for proper operation and lubrication. John Deere brand oil filters have been designed and produced specifically for John Deere applications.

John Deere filters adhere to engineering specifications for quality of the filter media, filter efficiency rating, strength

of the bond between the filter media and the element end cap, fatigue life of the canister (if applicable), and pressure capability of the filter seal. Non-John Deere branded oil filters might not meet these key John Deere specifications.

Always change oil filters regularly as specified in this manual.

DX,FILT1 -19-11APR11-1/1

## Hydraulic Oil

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

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

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

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

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

### Low Temperature Operation

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

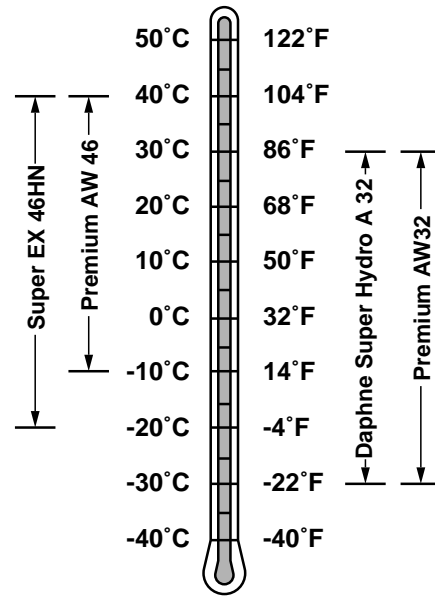
### Seasonal Hydraulic Flushing

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

The following oil is preferred:

#### 2000 hour change interval:

- Zinc-Free Super EX 46HN oil from John Deere
- Zinc-Free Daphne Super Hydro A 32 (For low temperature operation.)



Hydraulic Oil

**IMPORTANT: Avoid damage to the machine. Zinc-based oils must not be mixed with 2000 hour zinc-free oils.**

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

Premium AW oil: AW46 or AW32 (for low temperature operation)

#### Biodegradable Hydraulic Oil:

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

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

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### Travel Gear Case Oil

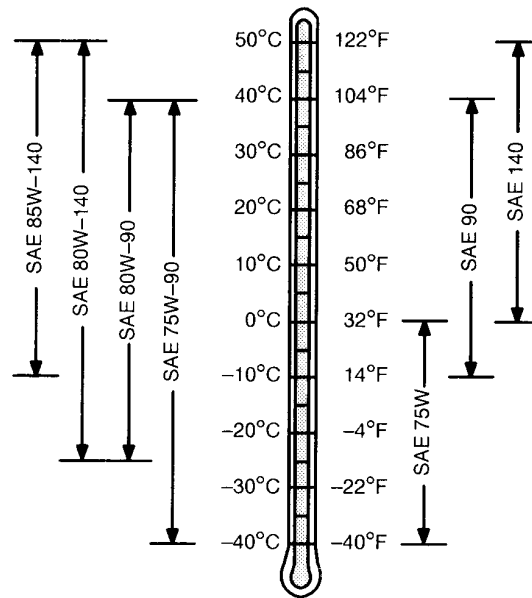
Use oil viscosity based on the expected air temperature range during the period between oil changes.

The following oils are preferred:

- John Deere GL-5 Gear Lubricant
- John Deere EXTREME-GARD™

Other oils may be used if they meet the following:

- API Service Category GL-5



Travel Gear Case Oil

EXTREME-GARD is a trademark of Deere & Company

KR46761.0000806 -19-22OCT14-1/1

TS1653—UN—14MAR96

### Grease

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

**John Deere SD Polyurea Grease is preferred.**

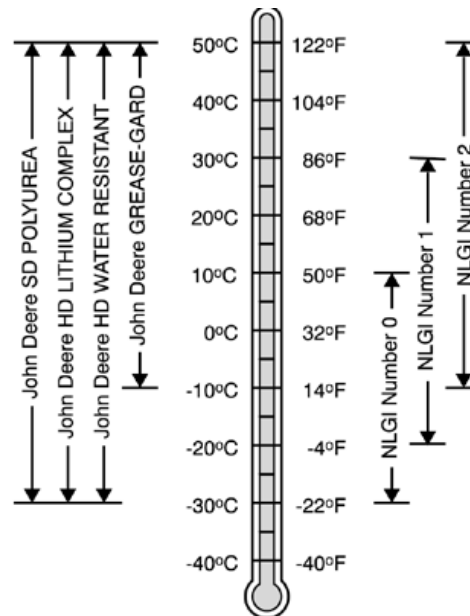
The following greases are also recommended:

- John Deere HD Lithium Complex Grease
- John Deere HD Water Resistant Grease
- John Deere GREASE-GARD™

Other greases may be used if they meet the following:

- NLGI Performance Classification GC-LB

**IMPORTANT: Some types of grease thickeners are not compatible with others. Consult your grease supplier before mixing different types of grease.**



Greases for Air Temperature Ranges

GREASE-GARD is a trademark of Deere & Company

DX,GRE1 -19-14APR11-1/1

TS1673—UN—31OCT03

## Diesel Engine Coolant (engine without wet sleeve cylinder liners)

### Preferred Coolants

The following pre-mix engine coolants are preferred:

- John Deere COOL-GARD™ II
- John Deere COOL-GARD II PG

COOL-GARD II pre-mix coolant is available in several concentrations with different freeze protection limits as shown in the following table.

COOL-GARD II pre-mix	Freeze Protection Limit
COOL-GARD II Water-Base	0 °C (32 °F)
COOL-GARD II 20/80	-9 °C (16 °F)
COOL-GARD II 30/70	-16 °C (3 °F)
COOL-GARD II 50/50	-37 °C (-34 °F)
COOL-GARD II 55/45	-45 °C (-49 °F)
COOL-GARD II PG 60/40	-49 °C (-56 °F)
COOL-GARD II 60/40	-52 °C (-62 °F)

Not all COOL-GARD II pre-mix products are available in all countries.

Use COOL-GARD II PG when a non-toxic coolant formulation is required.

### Additional Recommended Coolants

The following engine coolant is also recommended:

- John Deere COOL-GARD II Concentrate in a 40—60% mixture of concentrate with quality water.

**IMPORTANT: When mixing coolant concentrate with water, do not use less than 40% or greater than 60% concentration of coolant. Less than 40% gives inadequate additives for corrosion protection. Greater than 60% can result in coolant gelation and cooling system problems.**

### Other Coolants

Other ethylene glycol or propylene glycol base coolants may be used if they meet one of the following specifications:

*COOL-GARD is a trademark of Deere & Company*

- Pre-mix coolant meeting ASTM D6210 requirements
- Coolant concentrate meeting ASTM D6210 requirements in a 40—60% mixture of concentrate with quality water
- Pre-mix coolant meeting ASTM D3306 requirements
- Coolant concentrate meeting ASTM D3306 requirements in a 40—60% mixture of concentrate with quality water

If coolant meeting one of these specifications is unavailable, use a coolant concentrate or pre-mix coolant that has a minimum of the following chemical and physical properties:

- Is formulated with a nitrite-free additive package
- Protects the cooling system metals (cast iron, aluminum alloys, and copper alloys such as brass) from corrosion

### Water Quality

Water quality is important to the performance of the cooling system. Distilled, deionized, or demineralized water is recommended for mixing with ethylene glycol and propylene glycol base engine coolant concentrate.

### Coolant Drain Intervals

Drain and flush the cooling system and refill with fresh coolant at the indicated interval, which varies with the coolant used.

When COOL-GARD II or COOL-GARD II PG is used, the drain interval is 6 years or 6000 hours of operation.

If a coolant other than COOL-GARD II or COOL-GARD II PG is used, reduce the drain interval to 2 years or 2000 hours of operation.

**IMPORTANT: Do not use cooling system sealing additives or antifreeze that contains sealing additives.**

**Do not mix ethylene glycol and propylene glycol base coolants.**

**Do not use coolants that contain nitrites.**

DX,COOL18 -19-15MAY13-1/1

## Water Quality for Mixing with Coolant Concentrate

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

Water quality is important to the performance of the cooling system. Distilled, deionized, or demineralized water is recommended for mixing with ethylene glycol and propylene glycol base engine coolant concentrate.

All water used in the cooling system should meet the following minimum specifications for quality:

Chlorides	<40 mg/L
Sulfates	<100 mg/L
Total solids	<340 mg/L
Total dissolved I hardness	<170 mg/L
pH	5.5—9.0

**IMPORTANT: Do not use bottled drinking water because it often contains higher concentrations of total dissolved solids.**

### Freeze Protection

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

Ethylene Glycol	Freeze Protection Limit
40%	-24 °C (-12 °F)
50%	-37 °C (-34 °F)
60%	-52 °C (-62 °F)
Propylene Glycol	Freeze Protection Limit
40%	-21 °C (-6 °F)
50%	-33 °C (-27 °F)
60%	-49 °C (-56 °F)

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

DX,COOL19 -19-15MAY13-1/1

## Supplemental Coolant Additives

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

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

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

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

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

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

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

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

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

## Operating in Warm Temperature Climates

John Deere engines are designed to operate using recommended engine coolants.

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

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

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

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

DX,COOL6 -19-15MAY13-1/1

### 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.



SERVICEGARD™ Part Number 75240



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

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

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TS1733—UN—04SEP13

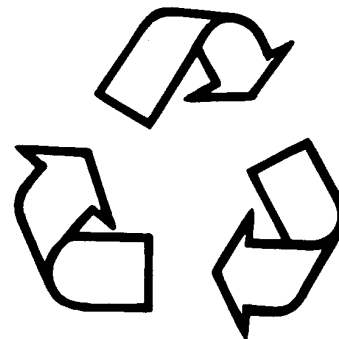
### Disposing of Coolant

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 your local environmental or recycling center, or from your authorized John Deere dealer.



Recycle Waste

OUT4001,0000685 -19-09JUL10-1/1

TS1133—UN—15APR13

# Maintenance—Periodic Maintenance

## Service Machine at Specified Intervals

Lubricate and make service checks and adjustments at intervals shown on the periodic maintenance chart (1) and on the following pages.

Perform service on items at multiples of the original requirement. For example, at 500 hours also service those items (if applicable) listed under 250 hours, 100 hours, 50 hours, and 10 hours or daily.

1— Periodic Maintenance Chart



Periodic Maintenance Chart

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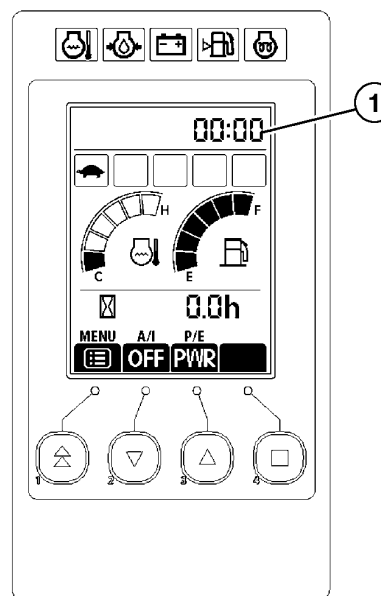
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## Check the Hour Meter Regularly

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

Intervals on the periodic maintenance chart are for operating in normal conditions. If you operate your machine in difficult conditions, you should service it at SHORTER INTERVALS.

1— Hour Meter



Hour Meter

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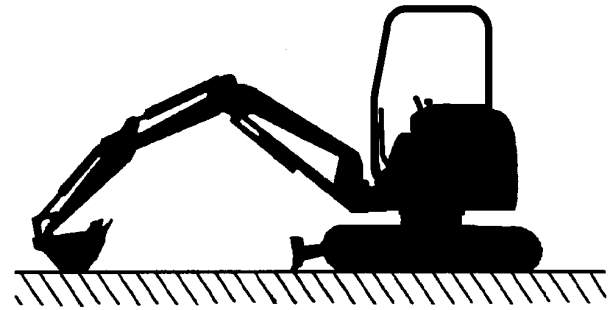
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### Prepare Machine for Maintenance

Before performing maintenance procedures given in the following sections and before leaving the operator's seat, position machine as shown unless another position is specified in the procedure.

1. Park machine on a level surface as shown.
2. Stop engine.
3. Move pilot shutoff lever to locked (UP) position.



T121197

Machine Position

T121197 —UN—21APR99

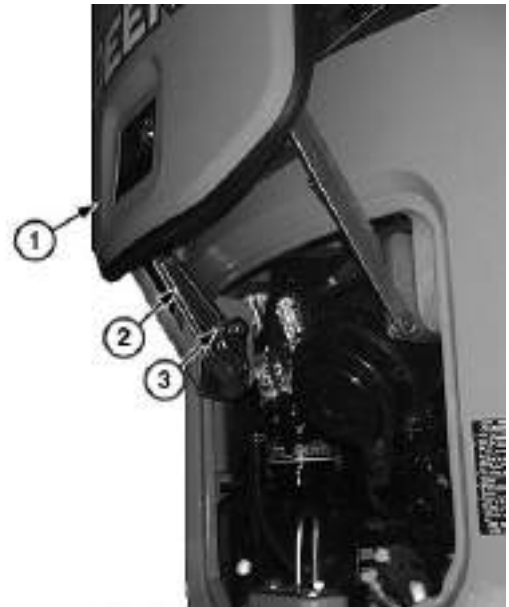
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### Engine Access Door

**CAUTION:** Prevent possible injury from unexpected component movement. Always keep access door in the locked position when servicing the engine area.

1. Pull latch to unlock engine access door (1).
2. Raise door and lock stopper (3) securely into locking arm (2).
3. To close, raise door slightly and push on locking arm to release stopper. Lower door and latch securely.

1— Engine Access Door                      3— Stopper  
2— Locking Arm



Engine Access Door

TX1125971A —UN—16NOV12

KR46761,00007A8 -19-15NOV12-1/1

### Open Maintenance Access Doors

1. Push release button to open maintenance access door (1).

**⚠ CAUTION: Prevent injury from unexpected component movement. Always engage locking arm (2) in bracket when working in maintenance compartment.**

2. Open door and lock stopper (3) securely into locking arm (2).

1— Maintenance Access Door    3— Stopper  
2— Locking Arm



Side Maintenance Access Door



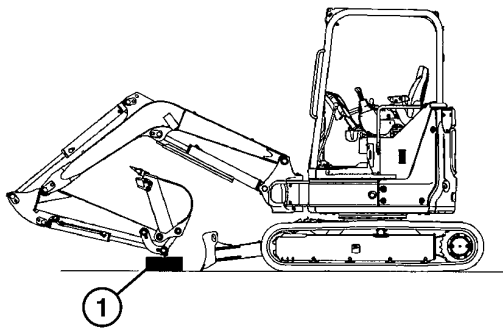
Front Maintenance Access Door

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## Tilting Operator's Station



Machine Position

1— Wooden Block

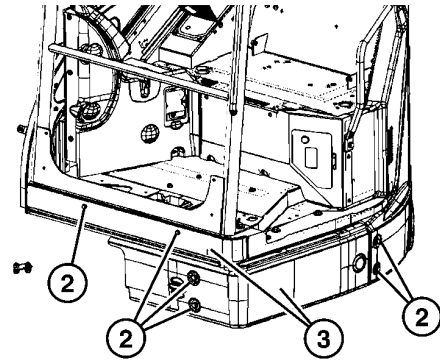
2— Cap Screw (6 used)

### Raising Operator's Station

**IMPORTANT: Avoid machine damage. Do not use other methods for tilting the operator's station.**

**Avoid damaging tilt mechanism or operator's station. Raise and lower the operator's station slowly.**

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



Operator's Station Covers

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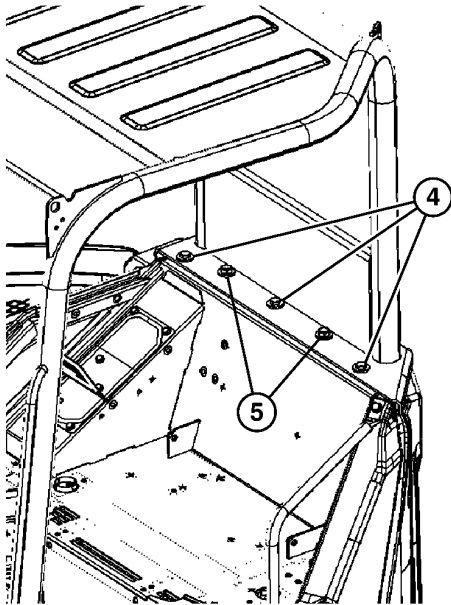
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3— Cover (2 used)

2. Lower boom to position bucket on wooden block (1) as shown.
3. Lower blade to ground.
4. Ensure pilot shutoff lever is in locked (UP) position.
5. Stop engine. Remove key from key switch. Close and lock cab door, if equipped.
6. Remove cap screws (2) and covers (3).

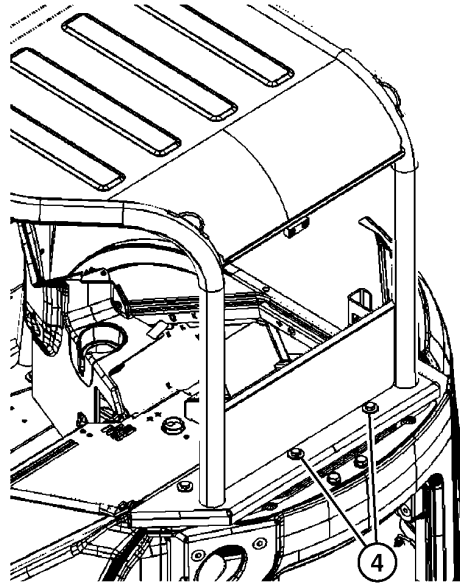
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Canopy Machine (inside shown)

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Canopy Machine (outside shown)

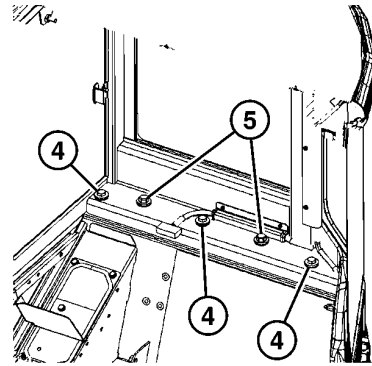
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**CAUTION:** Avoid possible personal injury and machine damage. Do NOT remove cap screws (5). Removal of cap screws will cause cab or canopy to separate from floor, resulting in machine damage and personal injury.

**NOTE:** If equipped with canopy, remove two additional operator station mounting cap screws (4) from outside rear of canopy.

7. Remove operator station mounting cap screws (4) from rear of machine, behind operator's seat.

4— Operator Station Mounting Cap Screw—Canopy (5 used); Cab (3 used)      5— Cap Screw (2 used)



Cab Machine (inside shown)

TX1127544 —UN—07DEC12

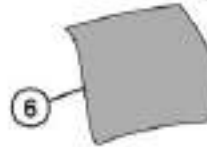
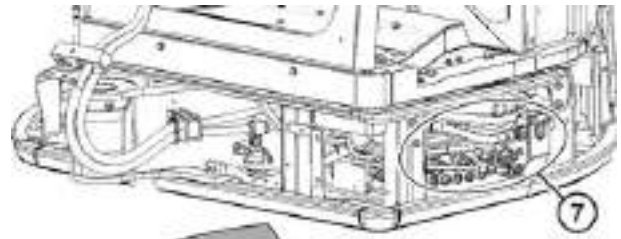
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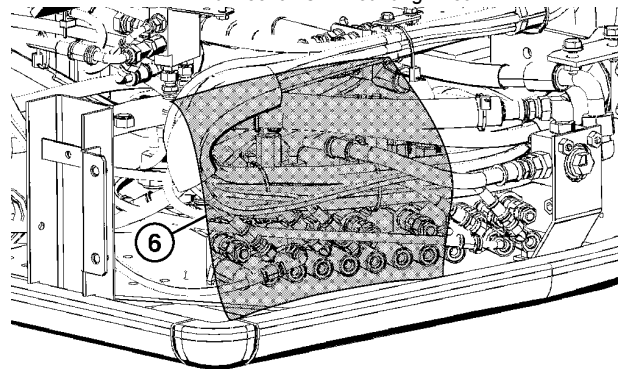
8. Install rubber hose protector (6) at tilt mechanism mounting area (7) to prevent damage to hoses.
9. Insert tilt mechanism (8) into machine frame.

6— Rubber Hose Protector  
7— Tilt Mechanism Mounting  
Area

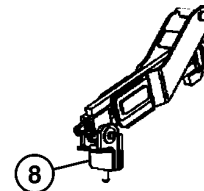
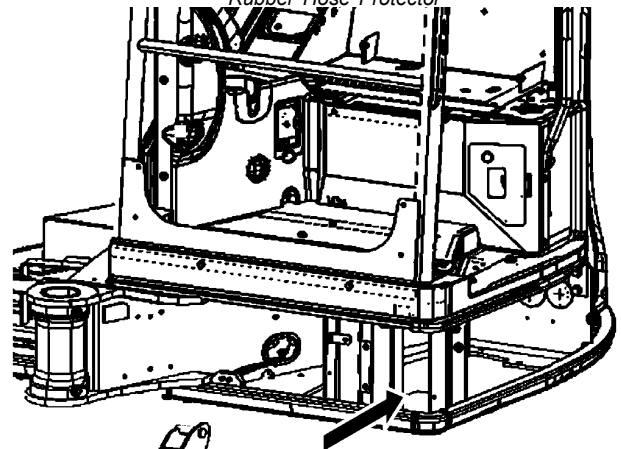
8— Tilt Mechanism



Tilt Mechanism Mounting Area



Rubber Hose Protector



Tilt Mechanism

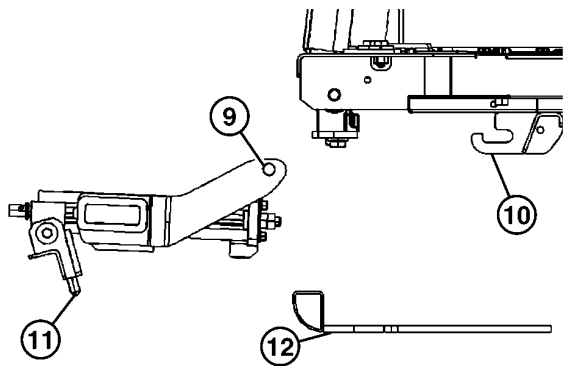
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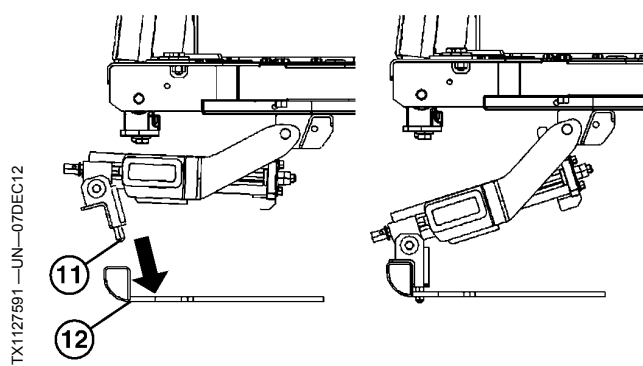
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Tilt Mechanism Pin and Latch

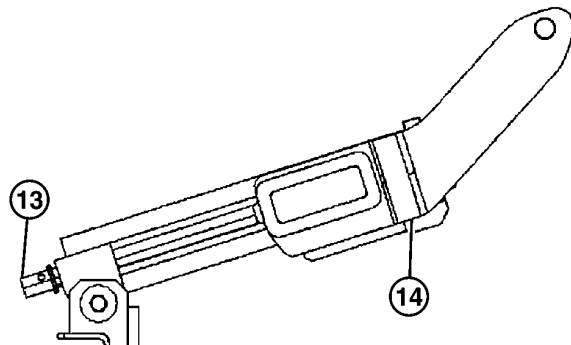


Installed Position

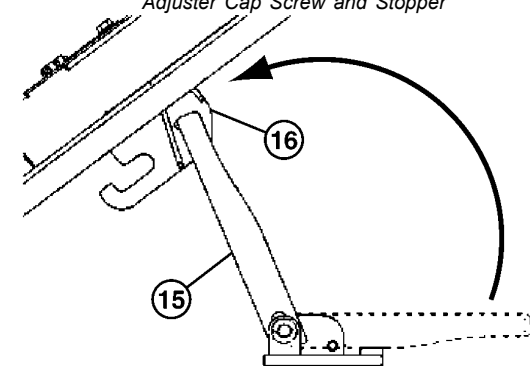
10. Install tilt mechanism pin (9) securely into latch (10).
11. Install pin (11) into hole (12).
12. Rotate adjuster cap screw (13) counterclockwise to raise operator's station until it contacts stopper (14).

**CAUTION:** Prevent injury from unexpected machine movement. Ensure locking bar (15) and tilt mechanism are securely in place before starting work under tilted operator's station.

13. Install locking bar (15) into locking bar bracket (16).
14. Secure locking bar. Slowly rotate adjuster caps screw clockwise until operator's station rests on locking bar.



Adjuster Cap Screw and Stopper



Locking Bar and Bracket

- |                       |                         |
|-----------------------|-------------------------|
| 9— Tilt Mechanism Pin | 13— Adjuster Cap Screw  |
| 10— Latch             | 14— Stopper             |
| 11— Pin               | 15— Locking Bar         |
| 12— Hole              | 16— Locking Bar Bracket |

Continued on next page

KR46761,00006FC -19-17DEC12-4/5

TX1127591—UN—07DEC12

TX1127711—UN—07DEC12

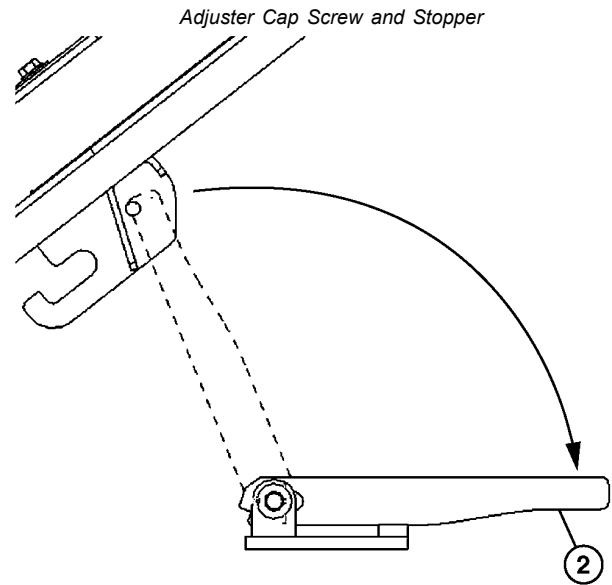
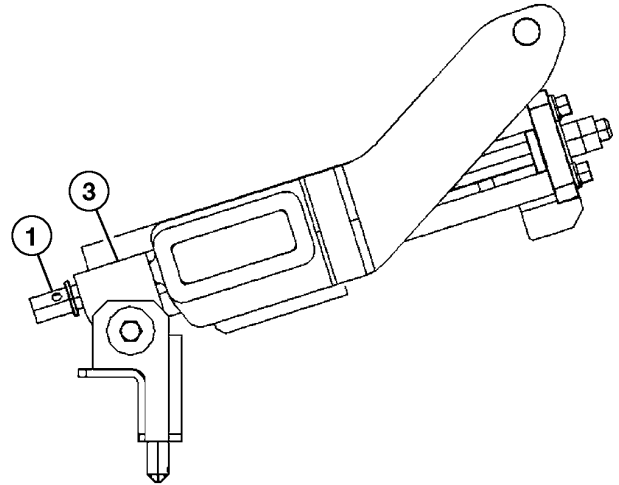
TX1127594—UN—07DEC12

TX1127599—UN—07DEC12

### Lowering Operator's Station

1. Rotate adjuster cap screw (1) counterclockwise to raise operator's station enough to lower locking bar (2) to stored position.
2. Rotate adjuster cap screw clockwise to lower operator's station until it contacts stopper (3).
3. Remove tilt mechanism.
4. Install cap screws and covers.

1— Adjuster Cap Screw                      3— Stopper  
 2— Locking Bar



TX112717—UN—07DEC12

TX112718—UN—07DEC12

KR46761,00006FC -19-17DEC12-5/5

### Fuel Tank

**CAUTION:** Fuel is flammable and may ignite if spilled on hot engine. To prevent injury, handle fuel carefully. If engine is hot or running, **DO NOT** fill the fuel tank. **DO NOT** smoke while filling fuel tank or working on fuel system.

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

To avoid condensation, fill the fuel tank at the end of each work day. Shut off engine before filling.

#### Specification

Fuel Tank—Capacity..... 42.0 L  
 11.1 gal.

KR46761,00006C4 -19-23OCT12-1/1

### Check Washer Fluid Level

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

Check level in washer fluid reservoir (1) and fill as required.

1—Washer Fluid Reservoir



Washer Fluid Reservoir

TX1125945A—UN—16NOV12

KR46761,00006C5 -19-14DEC12-1/1

### Hydraulic Breaker and Crusher Attachments

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

This excavator is factory filled with 46HN extended life zinc-free hydraulic oil. Avoid servicing this excavator with products that do not meet this specification. If oils have been

mixed or if alternate service oils are desired, the complete hydraulic system needs to be totally flushed by an authorized dealer.

Hydraulic breaker or crusher operation subjects the machine's hydraulic system to possible contamination and accelerated deterioration. The hydraulic return filter and hydraulic oil must be replaced more often to prevent damage to hydraulic pumps and other hydraulic components. Use of different attachments may shorten oil change interval. Use this table for reference.

Bucket, Breaker, and Crusher Attachments			
Attachment	Percentage of Operating Time	Hydraulic Return Filter Change Interval	Hydraulic Oil Change Interval
Bucket	100%	500 hours	2000 hours
Breaker or Crusher	100%	250 hours	1000 hours

KR46761,00006C6 -19-24SEP12-1/1



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

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

Engine, hydraulic, power train, and coolant samples should be taken from each system on a periodic basis, before a filter or fluid change interval. Certain systems require more frequent sampling. Consult your authorized John Deere dealer on a maintenance program for your specific application. Your authorized John Deere dealer has the sampling products and expertise to assist you in lowering your overall operating costs through fluid sampling.



TX1003513A —JN—20FEB06

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

## Service Intervals

<b>Model:</b> 35G (PIN: 1FF035GX_ _K270001— )		<b>Hour Meter Reading:</b>	
<b>PIN/Serial Number:</b>			
<b>SERVICE INTERVALS</b>			
Service your machine at intervals shown on this chart. Also, perform service on items at multiples of the original requirement. For example, at 2000 hours also service those items (if applicable) listed under 1000 hours, 500 hours, 250 hours, 50 hours, and 10 hours or daily.			
<b>FLUID SAMPLING</b>			
Take fluid samples from each system as indicated on this form. The manufacturer of the fluid analysis kits will provide maintenance recommendations based upon the results of the fluid analysis and the operating information you supply. Regular fluid sampling extends the operational life of your machine.			
<b>As Required</b>			
<input type="checkbox"/> Clean radiator core and oil cooler	<input type="checkbox"/> Check and adjust air conditioner belt—if equipped		
<input type="checkbox"/> Check and clean engine air cleaner dust unloader valve	<input type="checkbox"/> Check and adjust track sag		
<input type="checkbox"/> Replace engine air filter elements			
<b>Every 10 Hours or Daily</b>			
<input type="checkbox"/> Check engine oil level	<input type="checkbox"/> Check bucket teeth		
<input type="checkbox"/> Check hydraulic tank oil level	<input type="checkbox"/> Check seat belt		
<input type="checkbox"/> Drain water and sediment from fuel tank sump	<input type="checkbox"/> Lubricate bucket and link pins		
<input type="checkbox"/> Drain water and sediment from primary fuel filter and water separator	<input type="checkbox"/> Lubricate front end pin joints		
<input type="checkbox"/> Check engine coolant level			
<b>Initial Service—50 Hours<sup>1</sup></b>			
<input type="checkbox"/> Check and adjust fan belt tension			
<b>Every 100 Hours</b>			
<input type="checkbox"/> Lubricate bucket and link pins	<input type="checkbox"/> Check and adjust fan belt tension		
<input type="checkbox"/> Lubricate front end pin joints			
<b>Initial Service—250 Hours<sup>2</sup></b>			
<input type="checkbox"/> Replace hydraulic tank oil filter			
<b>Every 250 Hours</b>			
<input type="checkbox"/> Lubricate swing bearing	<input type="checkbox"/> Drain water and sediment from hydraulic tank		
<input type="checkbox"/> Check travel gear case oil level	<input type="checkbox"/> Take engine oil sample		
<b>Every 500 Hours</b>			
<input type="checkbox"/> Drain and refill engine oil and replace filter	<input type="checkbox"/> Replace final fuel filter		
<input type="checkbox"/> Lubricate front end pin joints	<input type="checkbox"/> Replace hydraulic tank oil filter		
<input type="checkbox"/> Lubricate swing bearing gear	<input type="checkbox"/> Take travel gear case oil sample		
<input type="checkbox"/> Lubricate control lever universal joint	<input type="checkbox"/> Take hydraulic oil sample		
<input type="checkbox"/> Lubricate blade pins	<input type="checkbox"/> Take engine coolant sample		
<input type="checkbox"/> Replace primary fuel filter and water separator	<input type="checkbox"/> Take diesel fuel sample		
<b>Every 1000 Hours</b>			
<input type="checkbox"/> Replace pilot system oil filter	<input type="checkbox"/> Check and adjust engine valve lash		
<input type="checkbox"/> Drain and refill travel gear case oil	<input type="checkbox"/> Check starter and alternator		
<b>Every 2000 Hours</b>			
<input type="checkbox"/> Drain and refill hydraulic tank oil	<input type="checkbox"/> Drain, flush, and refill engine cooling system		

<sup>1</sup>Perform initial service once after first 50 hours of operation.

<sup>2</sup>Perform initial service once after first 250 hours of operation.

## Required Parts

REQUIRED PARTS						
Insure machine performance and availability; use only genuine John Deere parts. Verify part numbers are current and that any associated parts are also on hand, i.e., filter O-rings.						
Description	Part Number	Initial Service— 250 Hours <sup>1</sup>	Every 250 Hours	Every 500 Hours	Every 1000 Hours	Every 2000 Hours
Hydraulic Tank Oil Filter Element	AT308568	1		1	1	1
Engine Oil Filter Element	MIU800650			1	1	1
Final Fuel Filter Element	MIU801267			1	1	1
Primary Fuel Filter and Water Separator	MIU801025			1	1	1
Pilot System Oil Filter Element	4294130				1	1
Engine Rocker Arm Cover Gasket	M811429				1	1
Engine Air Filter Element—Primary	FYD00001540	As Required				
Engine Air Filter Element—Secondary	FYD00000374	As Required				
Engine Air Cleaner Dust Unloader Valve	FYD00005808	As Required				
Cab Fresh Air Filter—If Equipped	4673287	As Required				
Cab Recirculating Air Filter—If Equipped	4684045	As Required				
John Deere Plus-50™ II Engine Oil	TY26674 <sup>2</sup>			7.2 L (1.9 gal.)	7.2 L (1.9 gal.)	7.2 L (1.9 gal.)
API GL-5 Gear Oil	TY6296 <sup>2</sup>				1.2 L (0.3 gal.)	1.2 L (0.3 gal.)
Hitachi SUPER EX 46HN Hydraulic Oil	2908-050 <sup>2</sup>					32.0 L (8.5 gal.)
COOL-GARD™ II Pre-Mix	TY26575					3.9 L (1.0 gal.)
<b>Fluid Analysis Kits<sup>3</sup></b>						
Diesel Engine Oil	AT346594		1	1	1	1
Hydraulic Oil	AT346594			1	1	1
Travel Gear Case Oil	AT346594			2	2	2
Diesel Fuel	AT180344			1	1	1
Engine Coolant	TY26873			1	1	1
<sup>1</sup> Perform initial service once after first 250 hours of operation.						
<sup>2</sup> For recommended oil viscosities based on operating temperatures, see Maintenance—Machine. (Section 3-1.)						
<sup>3</sup> Based on fluid analysis results, intervals may need to be adjusted for your operating conditions. Consult your local John Deere dealer.						

Plus-50 is a trademark of Deere & Company  
COOL-GARD is a trademark of Deere & Company

KR46761,0000718 -19-20JAN15-1/1

## Maintenance—As Required

### Clean Radiator Core and Oil Cooler

**CAUTION:** Prevent possible injury from flying debris. Reduce compressed air to less than 210 kPa (2.1 bar) (30 psi) when using for cleaning purposes. Clear area of bystanders,

guard against flying debris, and wear personal protection equipment including eye protection.

Clean the radiator core and oil cooler with compressed air or water. Blow air straight through fins to avoid bending them.

KR46761,00006CA -19-30NOV12-1/1

### Check and Clean Air Cleaner Dust Unloader Valve

**IMPORTANT:** Avoid machine damage. A missing, damaged, or hardened air cleaner dust unloader valve (1) will make the dust cup precleaner ineffective, causing very short element life. Valve should suck closed when engine is running.

*NOTE: If operating in high dust conditions, squeeze dust valve every 2 hours of operation to release dust.*

1. Open engine access door to access air cleaner dust unloader valve (1).
2. Squeeze air cleaner dust unloader valve to remove dust from the air cleaner.
3. Check condition of dust unloader valve. Replace if hardened or damaged.
4. Close engine access door.

1— Air Cleaner Dust Unloader Valve



Air Cleaner Dust Unloader Valve

TX1128490A—UN—19DEC12

KR46761,0000802 -19-21DEC12-1/1

## Replace Engine Air Filter

**IMPORTANT:** Prevent possible engine damage. Do not clean engine air filter. Replace filter when air restriction indicator is illuminated on monitor. To prevent dirt from being sucked up into engine, do not remove filter when engine is running.

**Do not start engine without engine air filter installed.**

1. Open engine access door to access engine air filter (2).
2. Release engine air filter cover latches (1) to unlock cover.
3. Remove engine air filter.

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

4. Clean the inside of the filter canister.
5. Install engine air filter, making sure filter element is centered in canister.

**IMPORTANT:** Prevent possible engine damage. If engine access door does not fit flush to air filter housing, engine air filter is not properly seated in housing.

6. Install cover and secure latches.
7. Close engine access door.

1— Latch (2 used)

2— Engine Air Filter



Engine Air Filter Cover



Engine Air Filter

TX1128450A —UN—19DEC12

TX1128451A —UN—19DEC12

KR46761,00007FF -19-21DEC12-1/1

## Check and Adjust Air Conditioner Belt—If Equipped

Visually inspect the air conditioner compressor belt (1) for wear and correct tension. Replace if necessary.

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

1. Check air conditioner compressor belt tension by depressing the midpoint between the tension pulley (2) and air compressor pulley (3) with thumb. Deflection (4) must be within specification.

### Specification

Air Conditioner Compressor Belt—Deflection (4).....	8—10 mm 0.32—0.39 in.
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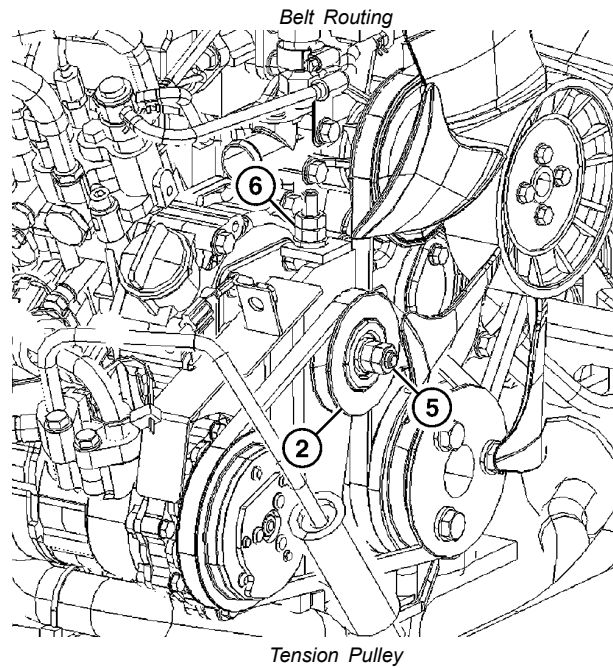
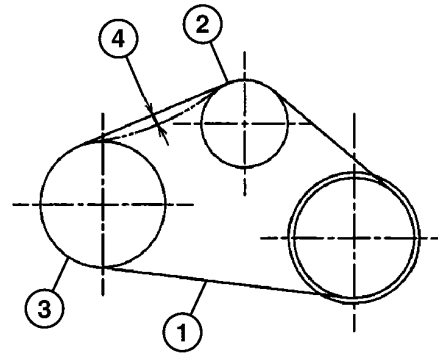
Air Conditioner Compressor Belt—Depressing Force.....	98 N 10 kg-force 22 lb.-force
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2. If tension is not within specification, loosen cap screw (5) on front of tension pulley.
3. Move tension pulley by turning adjusting cap screw (6). Adjust until tension meets specification.
4. Tighten cap screw on front of tension pulley.

### Specification

Cap Screw—Torque.....	45 N·m 33.2 lb.-ft.
-----------------------	------------------------

- |                                    |                        |
|------------------------------------|------------------------|
| 1— Air Conditioner Compressor Belt | 4— Deflection          |
| 2— Tension Pulley                  | 5— Cap Screw           |
| 3— Air Compressor Pulley           | 6— Adjusting Cap Screw |



TX1129669 —UN—18JAN13

TX1129670 —UN—18JAN13

KR46761,0000814 -19-21JAN13-1/1

### Check Track Sag—Rubber Track

1. Rotate upperstructure 90° and lower bucket to raise tracks off ground.
2. Keep the angle (1) between boom and arm 90—110° and position the bucket's round side on the ground.
3. Raise pilot control shutoff lever to locked (UP) position.

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

4. Place block under frame to support machine.
5. Lower pilot control shutoff lever to unlocked (DOWN) position.
6. Rotate track so track joint is positioned at the upper center of the track.
7. Stop engine.
8. Measure track sag distance (2) from bottom of center roller to inner ridge of rubber track.

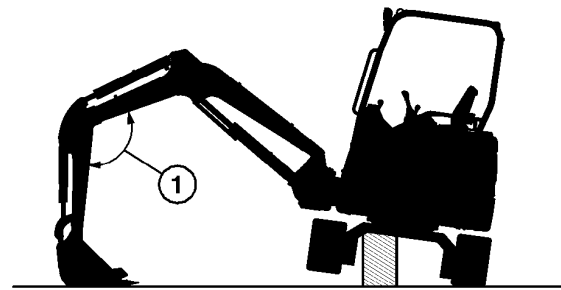
**Specification**

Track—Sag.....10—15 mm  
0.4—0.6 in.

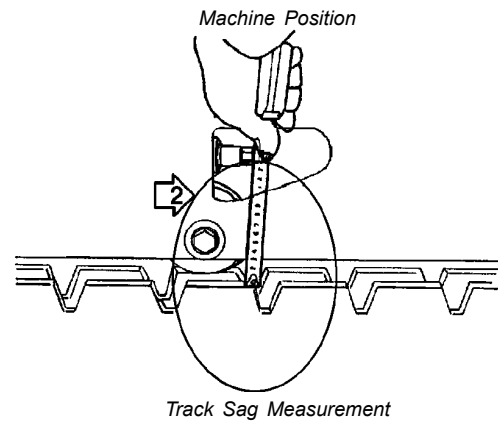
9. If not to specification, adjust track sag. See Adjust Track Sag in this section.
10. Repeat check on other side of machine.

1— Boom-to-Arm Angle

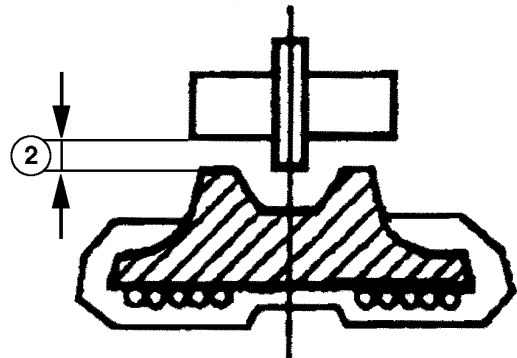
2— Track Sag Distance



T204987



Track Sag Measurement



Track Sag Distance

KR46761,00006D1 -19-02DEC14-1/1

T204987 —UN—30NOV04

TX1127697 —UN—07DEC12

TX1127766 —UN—10DEC12

### Check Track Sag—Steel Track—If Equipped

1. Rotate upperstructure 90° and lower bucket to raise track off ground.
2. Keep the angle (1) between boom and arm 90—110° and position the round side of the bucket on the ground.
3. Raise pilot control shutoff lever to locked (UP) position.

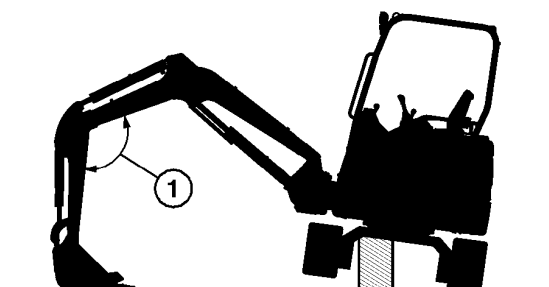
**CAUTION:** Prevent possible injury from unexpected machine movement. Place blocks under machine frame to support machine while measuring track sag.

4. Place blocks under machine frame to support machine.
5. Lower pilot control shutoff lever to unlocked (DOWN) position.
6. Rotate track forward two full rotations and then in reverse two full rotations.
7. Stop engine.
8. Measure distance (2) at middle track roller from bottom of track frame to top surface of track shoe.

**Specification**

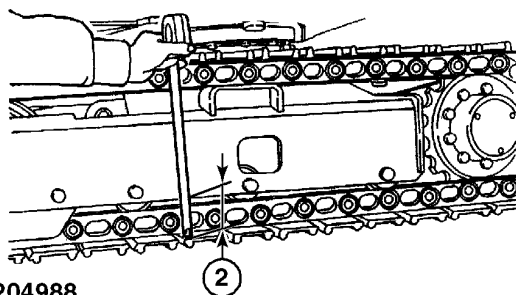
Track—Sag.....120—140 mm  
4.7—5.5 in.

9. If not to specification, adjust track sag. See Adjust Track Sag in this section.
10. Repeat check on other side of machine.



T204987

Boom-to-Arm Angle



T204988

Measure Distance

1— Boom-to-Arm Angle

2— Track Frame-to-Track Shoe Distance

T204987—UN—30NOV04

T204988—UN—30NOV04

KR46761,00006D2 -19-04JAN13-1/1



## Adjust Track Sag

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

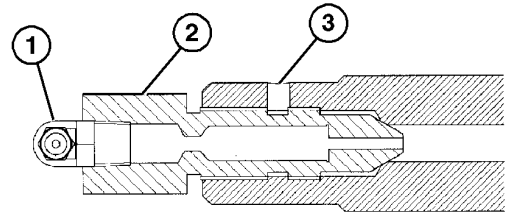
To tighten track, connect a grease gun to grease fitting (1) (located through access hole [4] in track frame). Add grease until sag is within recommended limits.

**CAUTION:** Prevent possible serious injury from high pressure grease penetrating your skin. Do not remove grease fitting (1) from valve (2). If grease does not escape immediately from the vent hole when check valve is loosened, slowly drive machine in forward and reverse direction until grease escapes. **DO NOT** disassemble parts until you know the correct procedure and have the correct tools. See your authorized John Deere dealer.

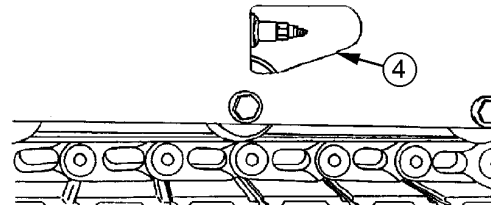
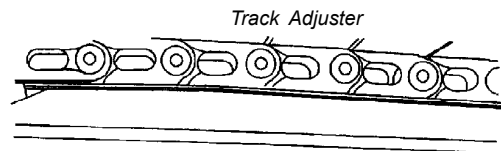
If an accident occurs, see a doctor immediately. Any oil injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury may call Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

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

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



T204989



T121713

Steel Track Shown

1— Grease Fitting  
2— Valve

3— Bleed Hole  
4— Access Hole

KR46761,00006D3 -19-10DEC12-1/1

T204989—UN—30NOV04

T121713—UN—10JUN99

# Maintenance—Every 10 Hours or Daily

## Check Engine Oil Level

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

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

1. Park machine on level surface.
2. Shut off engine and allow oil to drain into oil pan for 10 minutes.
3. Open engine cover.
4. Make sure dipstick (1) is fully seated.
5. Remove dipstick to check oil level.

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

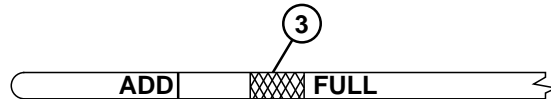
**AFTER THE ENGINE HAS BEEN RUN:** Allow the oil to drain into the oil pan for 10 minutes before checking the oil level. The engine oil level must be above the ADD mark after 10 minutes have passed.

**IMPORTANT: If oil level is low, the engine can be damaged. DO NOT operate the engine when oil level is below the ADD mark.**

6. If oil level is below ADD mark, remove filler cap (2) and add oil as necessary. See Diesel Engine Oil. (Section 3-1.)
7. Install dipstick and close engine cover.



Oil Dipstick and Filler Cap



1— Dipstick  
2— Filler Cap

3— Cross-Hatch Area

TX1126289A —UN—19NOV12

T216546 —UN—29NOV05

JS93577,0000053 -19-10DEC12-1/1

## Check Hydraulic Tank Oil Level

**IMPORTANT:** Prevent damage to hydraulic system components. Do not run engine without oil in hydraulic tank.

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

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

1. Park machine on a level surface with arm cylinder fully retracted and bucket cylinder fully extended. Lower bucket and blade to ground.
2. Stop engine.
3. Check oil level on hydraulic oil sight gauge (1) on hydraulic tank. Oil must be between marks on window.

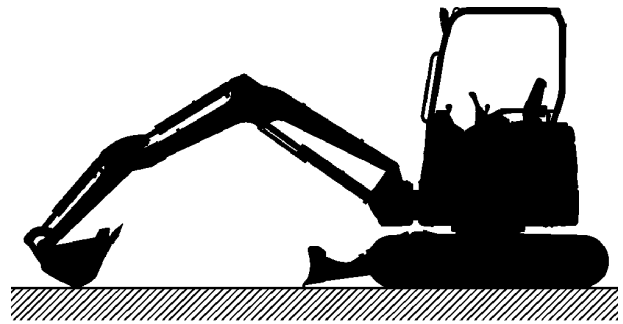
### If Necessary, Add Oil:

1. Open front maintenance access cover.

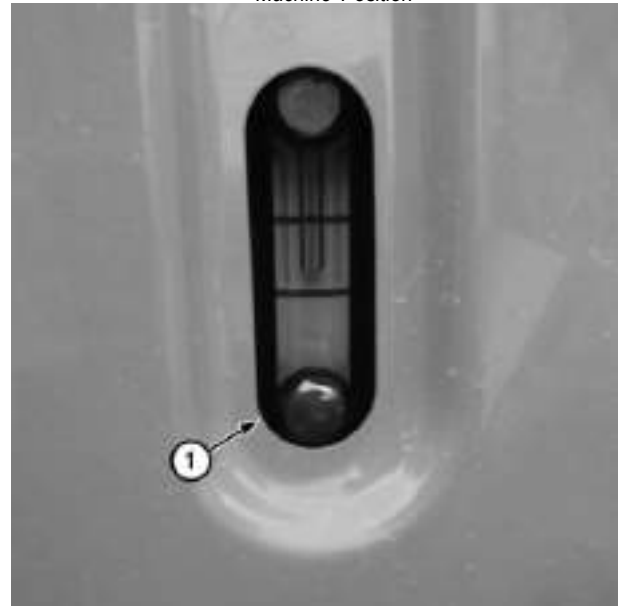
**CAUTION:** Avoid injury. High pressure release of oil from pressurized system can cause serious burns or penetrating injury. Relieve pressure by **SLOWLY** loosening cap.

2. Slowly turn hydraulic tank filler cap (2) counterclockwise to relieve pressure. Remove cap.
3. Add oil. See Hydraulic Oil. (Section 3-1.)
4. Install hydraulic tank filler cap. Close maintenance access cover.

1—Hydraulic Oil Sight Gauge    2—Hydraulic Tank Filler Cap



Machine Position



Hydraulic Oil Sight Gauge



Hydraulic Tank Filler Cap

TX1127481—UN—05DEC12

TX1125778A—UN—16NOV12

TX1126094A—UN—16NOV12

KR46761,00006CD -19-15FEB13-1/1

### Drain Water and Sediment from Fuel Tank Sump

*NOTE: Fuel tank drain valve is located under machine directly below fuel tank.*

1. Loosen cap screws (1) and rotate cover (2).

*NOTE: Drain waste into a container. Dispose of waste properly.*

2. Open drain valve (3) for several seconds to drain water and sediment into a container. Dispose of waste properly.
3. Close drain valve.
4. Install cover and tighten cap screws.



Fuel Tank Drain Valve

1— Cap Screw (2 used)  
2— Cover

3— Drain Valve

KR46761,00007D1 -19-11DEC12-1/1

TX1126058A—UN—16NOV12

### Drain Water and Sediment from Primary Fuel Filter and Water Separator

1. Open right rear service door to access primary fuel filter and water separator assembly (1).
2. Close fuel shutoff valve (2).

*NOTE: Drain waste into a container. Dispose of waste properly.*

3. Open drain valve (3) to extract water from fuel system. Drain fluid until water and sediment is removed. Collect waste in a container and dispose of waste properly.
4. Close drain valve.
5. Open fuel shutoff valve.
6. Bleed fuel system. See Bleed Fuel System. (Section 4-1.)
7. Close right rear service door.



Primary Fuel Filter and Water Separator

1— Primary Fuel Filter and Water Separator Assembly  
2— Fuel Shutoff Valve  
3— Drain Valve

JS93577,0000036 -19-30NOV12-1/1

TX1126326A—UN—20NOV12

### Check Engine Coolant Level

With the engine cold, coolant level must be between the FULL and LOW marks on the coolant recovery tank (2).

If coolant is below the LOW mark, add coolant to the coolant recovery tank.

**CAUTION:** Prevent possible injury from hot spraying water. **DO NOT** remove radiator filler cap (1) unless engine is cool. Then turn cap slowly to the stop. Release all pressure before you remove cap.

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

If coolant recovery tank is full and radiator is low, check for leaks in radiator cap and hose connections between radiator and coolant recovery tank.



Coolant Recovery Tank

1—Radiator Filler Cap

2—Coolant Recovery Tank

Coolant level must be at bottom of the radiator filler neck.

JS93577,000005F -19-10DEC12-1/1

TX1125853A—UN—16NOV12

### Check Bucket Teeth

**CAUTION:** Guard against injury from flying pieces of metal; wear goggles or safety glasses.

*NOTE:* Alternate buckets may use different tooth assemblies.

Check bucket teeth for wear. Replace tooth if tooth wear is below 65 mm (2.6 in.)

KR46761,0000764 -19-04DEC14-1/1

### Check Seat Belt

Seat belt (1) and mounting hardware (2) must be inspected for wear or damage before operating the machine. Replace the belt or mounting hardware if worn or damaged.

Replace the complete seat belt assembly every 3 years regardless of appearance.

1—Seat Belt

2—Mounting Hardware



Seat Belt

KR46761,000076E -19-21NOV12-1/1

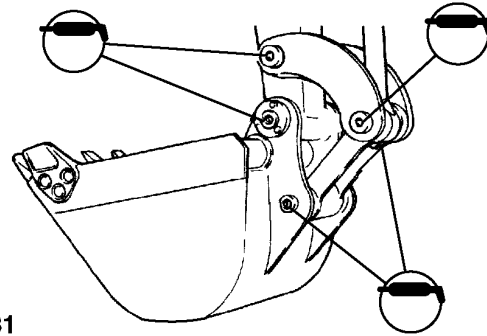
TX1126028A—UN—21NOV12

### Lubricate Bucket and Link Pins

Lubricate bucket and link pins (5 points) until grease escapes from joints. See Grease. (Section 3-1.)

Lubricate every 10 hours when working in mud and water.

Lubricate every 10 hours for first 50 hours of operation and then at 100 hour intervals thereafter.



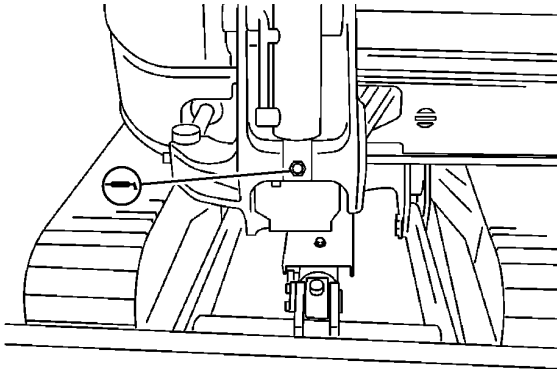
T205831

Bucket and Link Pins

T205831 —UN—07DEC04

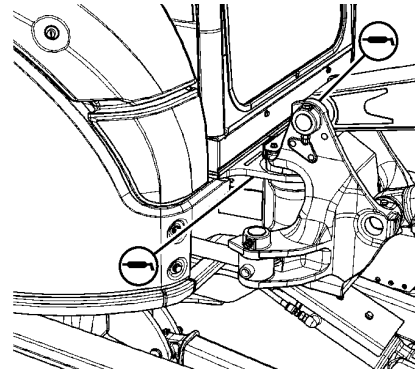
KR46761,0000DFB -19-02DEC14-1/1

### Lubricate Front End Pin Joints



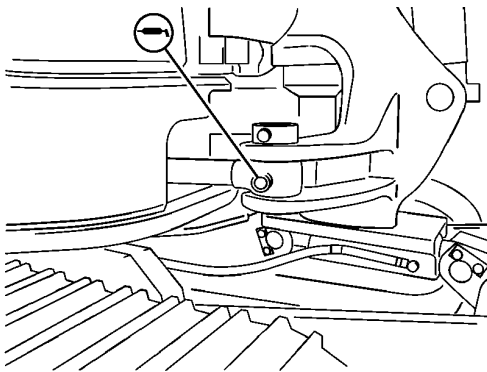
Boom Cylinder Bottom Side

TX1127732 —UN—07DEC12



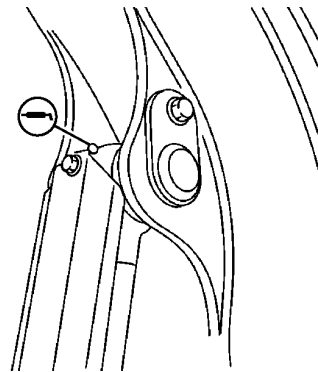
Boom Foot and Swing Post

TX1127733 —UN—07DEC12



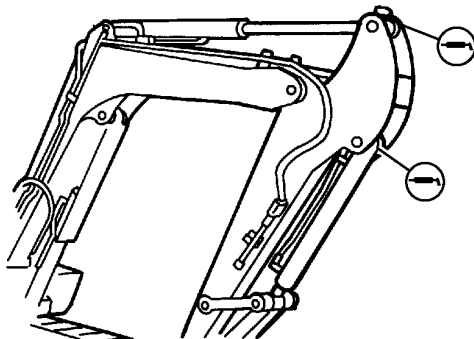
Boom Swing Cylinder

TX1127734 —UN—07DEC12



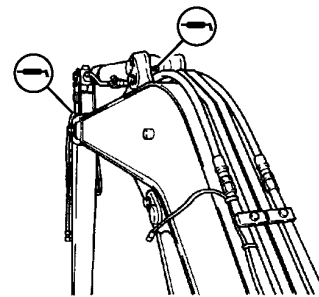
Boom Cylinder Rod Side

TX1127735 —UN—07DEC12



Arm Cylinder Rod Side, Bucket Cylinder Bottom Side

TX1127737 —UN—07DEC12



Boom and Arm Joint Pin, Arm Cylinder Bottom Side

TX1127738 —UN—07DEC12

Lubricate front end pin joints (10 points) until grease escapes from joints. See Grease. (Section 3-1.)

Lubricate every 10 hours when working in mud and water.

Lubricate every 10 hours for first 50 hours of operation.

Lubricate every 50 hours when using hydraulic breaker.

Lubricate every 100 hours for first 500 hours of operation and then at 500 hour intervals thereafter.

KR46761,0000760 -19-06JAN15-1/1

# Maintenance—Initial Service - 50 Hours

## Check and Adjust Fan Belt Tension

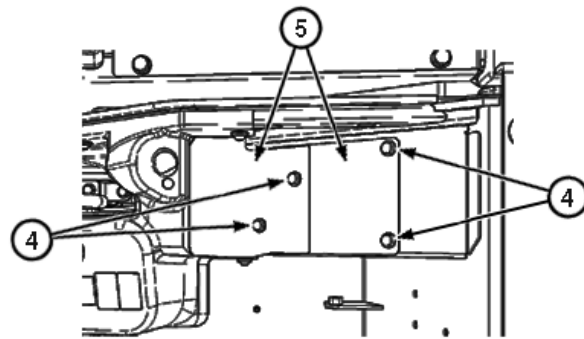
1. Loosen cap screws (4) and remove covers (5) to open checking port.
2. Check belt regularly for wear. Replace if necessary.
3. Check belt tension with belt tension gauge at midway between alternator (2) and fan pulley (1).

### Specification

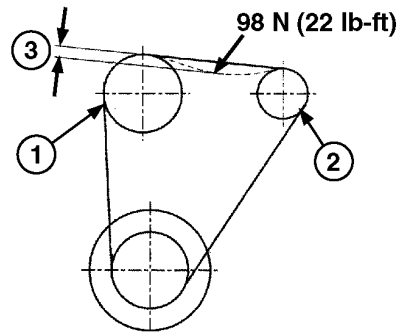
Fan Belt—Deflection (3)..... 7—9 mm at 98 N  
 0.27—0.35 in. at 22 lb.-ft.

4. If fan belt deflection (3) is not within specification, loosen adjusting cap screw (6) and mounting cap screw (7).
5. Move alternator until tension is correct.
6. Tighten cap screws and install covers.

- |                        |                        |
|------------------------|------------------------|
| 1— Fan Pulley          | 5— Cover (2 used)      |
| 2— Alternator          | 6— Adjusting Cap Screw |
| 3— Fan Belt Deflection | 7— Mounting Cap Screw  |
| 4— Cap Screw (4 used)  |                        |

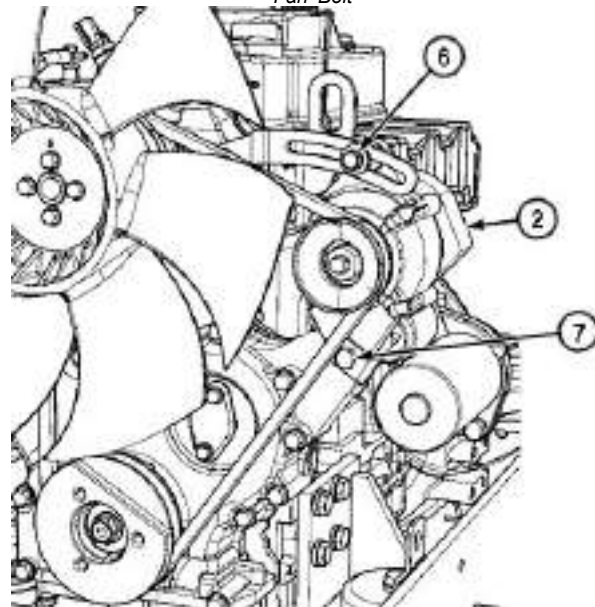


Checking Port Cover



T205324

Fan Belt



Alternator, Adjusting Cap Screw, and Mounting Cap Screw

KR46761,00006D5 -19-11DEC12-1/1

TX1127176 —UN—04DEC12

T205324 —UN—08DEC04

TX1127178 —UN—03DEC12



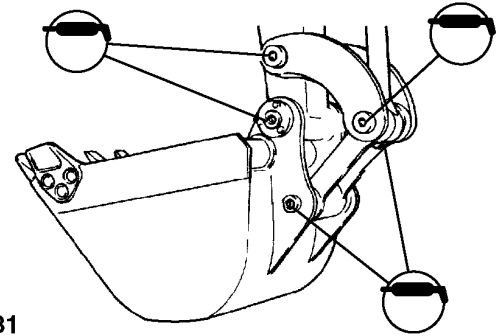
## Maintenance—Every 100 Hours

### Lubricate Bucket and Link Pins

Lubricate bucket and link pins (5 points) until grease escapes from joints. See Grease. (Section 3-1.)

Lubricate every 10 hours when working in mud and water.

Lubricate every 10 hours for first 50 hours of operation and then at 100 hour intervals thereafter.



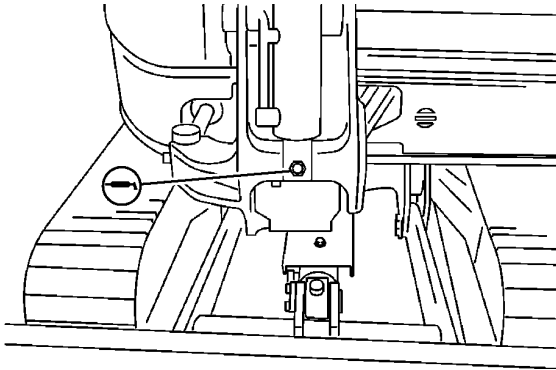
T205831

*Bucket and Link Pins*

T205831 —UN—07DEC04

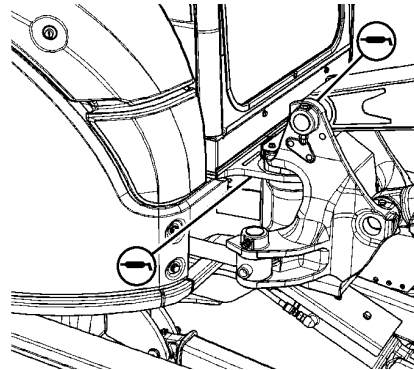
KR46761,0000DFB -19-02DEC14-1/1

### Lubricate Front End Pin Joints



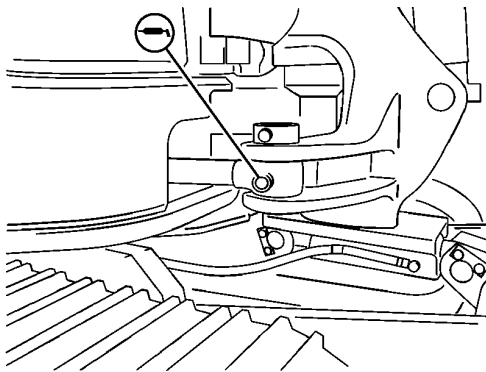
Boom Cylinder Bottom Side

TX1127732 —UN—07DEC12



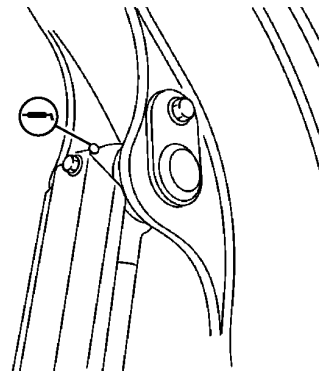
Boom Foot and Swing Post

TX1127733 —UN—07DEC12



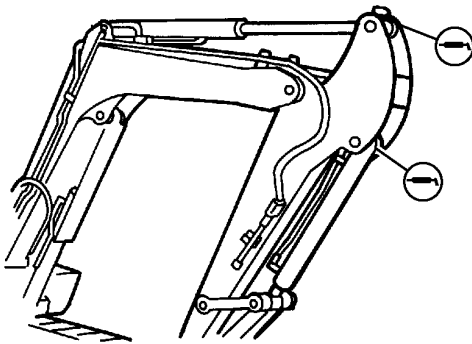
Boom Swing Cylinder

TX1127734 —UN—07DEC12



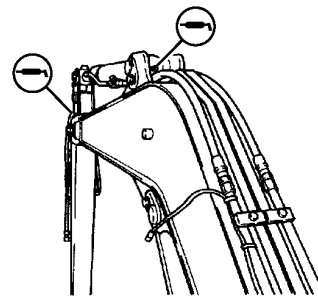
Boom Cylinder Rod Side

TX1127735 —UN—07DEC12



Arm Cylinder Rod Side, Bucket Cylinder Bottom Side

TX1127737 —UN—07DEC12



Boom and Arm Joint Pin, Arm Cylinder Bottom Side

TX1127738 —UN—07DEC12

Lubricate front end pin joints (10 points) until grease escapes from joints. See Grease. (Section 3-1.)

Lubricate every 10 hours when working in mud and water.

Lubricate every 10 hours for first 50 hours of operation.

Lubricate every 50 hours when using hydraulic breaker.

Lubricate every 100 hours for first 500 hours of operation and then at 500 hour intervals thereafter.

KR46761,0000760 -19-06JAN15-1/1

### Check and Adjust Fan Belt Tension

1. Loosen cap screws (4) and remove covers (5) to open checking port.
2. Check belt regularly for wear. Replace if necessary.
3. Check belt tension with belt tension gauge at midway between alternator (2) and fan pulley (1).

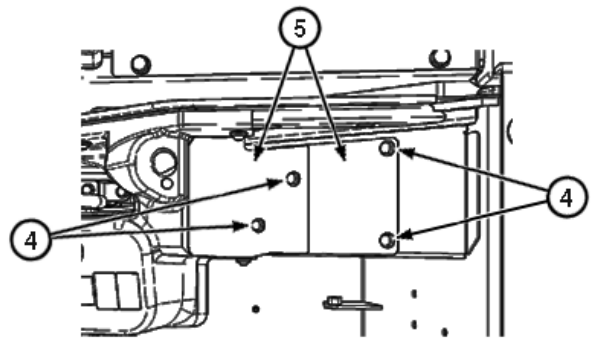
**Specification**

Fan Belt—Deflection (3)..... 7—9 mm at 98 N  
 0.27—0.35 in. at 22 lb.-ft.

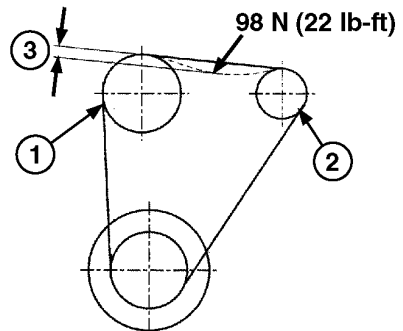
4. If fan belt deflection (3) is not within specification, loosen adjusting cap screw (6) and mounting cap screw (7).
5. Move alternator until tension is correct.
6. Tighten cap screws and install covers.

- 1— Fan Pulley
- 2— Alternator
- 3— Fan Belt Deflection
- 4— Cap Screw (4 used)

- 5— Cover (2 used)
- 6— Adjusting Cap Screw
- 7— Mounting Cap Screw

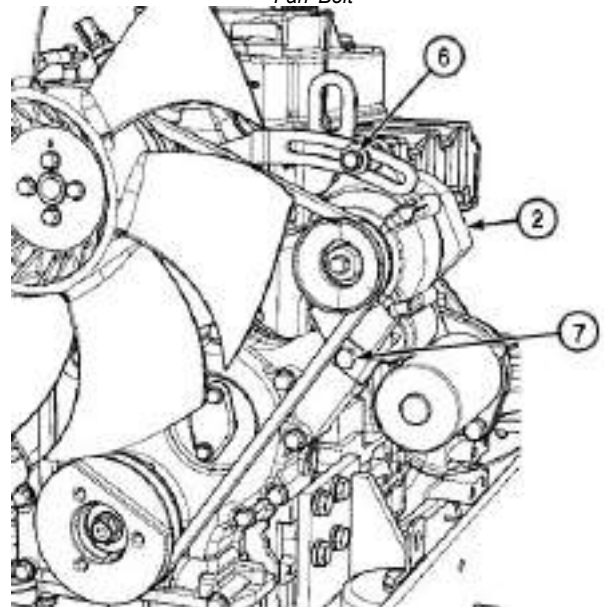


Checking Port Cover



T205324

Fan Belt



Alternator, Adjusting Cap Screw, and Mounting Cap Screw

KR46761,00006D5 -19-11DEC12-1/1

TX1127176 —UN—04DEC12

T205324 —UN—09DEC04

TX1127176 —UN—03DEC12

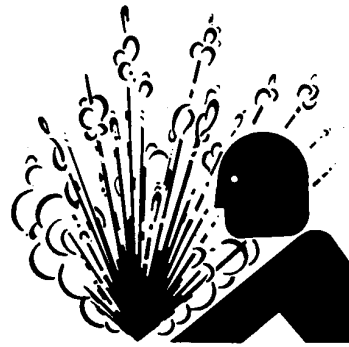
# Maintenance—Initial Service - 250 Hours

## Replace Hydraulic Tank Oil Filter

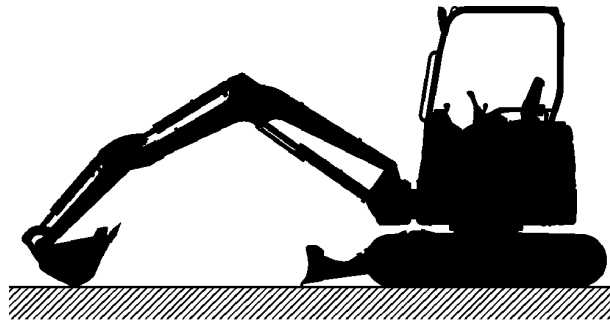
*NOTE: Perform this service at the first 250 hours of operation and then at 500 hour intervals thereafter.*

**⚠ CAUTION:** High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. Slowly loosen cap to release pressure.

1. Park machine on a level surface with arm cylinder fully retracted and bucket cylinder fully extended. Lower bucket and blade to ground.
2. Stop engine.



Pressurized Fluids



Machine Position

Continued on next page

KR46761,00006D8 -19-27DEC12-1/2

TS281—UN—15APR13

TX1127481—UN—05DEC12

3. Slowly loosen hydraulic tank filler cap (7) to release hydraulic pressure. Remove cap.
4. Loosen cap screws (1) to remove filter cover (2) and O-ring (3).
5. Hold down filter cover against light spring load when removing cap screws.
6. Remove spring (4), valve (5), and filter element (6).

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

7. Discard element and O-ring.
8. Install new filter element, valve, and spring.
9. Fill new filter with oil. See Hydraulic Oil. (Section 3-1.)
10. Install filter cover and new O-ring.
11. Install cap screws.

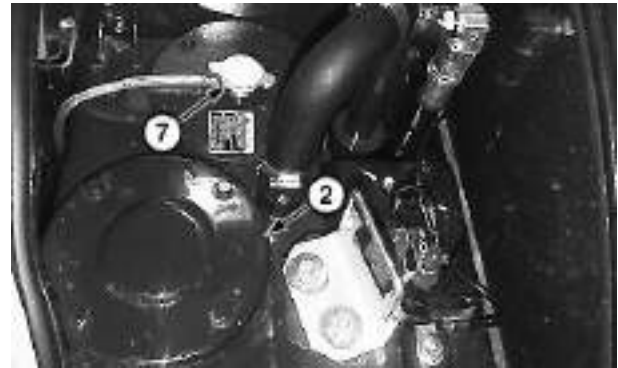
**Specification**

Cap Screw—Torque.....10 N·m  
7.4 lb.-ft.

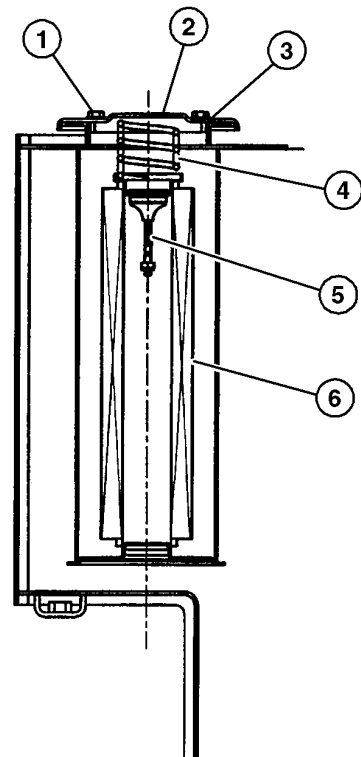
**IMPORTANT: Avoid hydraulic pump damage. Hydraulic system must be bled whenever the hydraulic oil filter is changed.**

12. Bleed hydraulic system. See Bleed Hydraulic System. (Section 4-1.)

- |                       |                              |
|-----------------------|------------------------------|
| 1— Cap Screw (4 used) | 5— Valve                     |
| 2— Filter Cover       | 6— Filter Element            |
| 3— O-Ring             | 7— Hydraulic Tank Filler Cap |
| 4— Spring             |                              |



Hydraulic Tank Filler Cap and Cover



Filter Element

T205001

KR46761,00006D8 -19-27DEC12-2/2

TX1126348A —UN—05DEC12

T205001 —UN—30NOV04

# Maintenance—Every 250 Hours

## Lubricate Swing Bearing

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

*NOTE:* Lubricate the swing bearing gear at 500 hours.

1. Park machine on a level surface.
2. Lower the bucket to the ground.
3. Stop the engine.
4. Pull the pilot control shutoff lever to the locked position.
5. Turn key switch to OFF. Remove key from switch.
6. Lubricate swing bearing with 2—3 shots of grease at grease fitting. See Grease. (Section 3-1.)
7. Start engine. Raise bucket several inches off the ground and rotate upperstructure 90 degrees (1/4 turn).
8. Repeat steps 2—7 seven times. It is not necessary to start the engine the last time.



Swing Bearing Location

TX1126063A —UN—19NOV12

KR46761.00006D6 -19-04FEB15-1/1

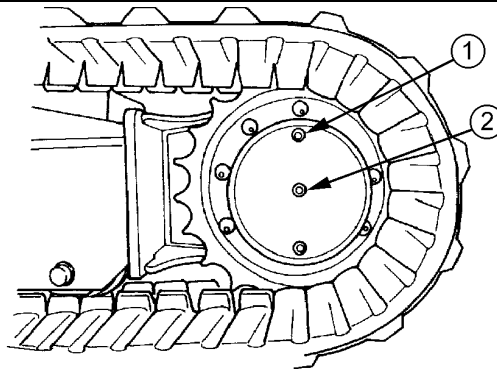
## Check Travel Gear Case Oil Level

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

**CAUTION:** High-pressure release of oils from pressurized system can cause serious burns. Wait for travel gear case oil to cool. Keep body and face away from fill plug (1). Gradually loosen fill plug to release pressure.

3. After travel gear case has cooled, slowly loosen fill plug (1) to release air to relieve pressure.
4. Remove check plug (2). Oil must be to bottom of hole.
5. If necessary, remove fill plug and add oil until oil flows out of check plug hole. See Travel Gear Case Oil. (Section 3-1.)
6. Wrap threads of plugs with sealing-type tape. Install plugs. Tighten plugs to specification.

**Specification**  
 Fill Plug—Torque.....50 N·m  
 36.9 lb.-ft.



Travel Gear Case

1—Fill Plug

2—Check Plug

Check Plug—Torque.....16 N·m  
 11.8 lb.-ft.

7. Check second travel gear case oil level.

T121259 —UN—22APR99

KR46761.00007B2 -19-04FEB15-1/1

## Drain Water and Sediment from Hydraulic Tank

**⚠ CAUTION:** High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. Slowly loosen cap to release pressure.

1. Slowly loosen hydraulic tank filler cap (1) to release pressure.
2. Remove access panel (2).
3. Loosen drain valve (3) for several seconds to drain water and sediment into a container. Do not remove valve completely. Dispose of waste properly.
4. Tighten drain valve and hydraulic tank filler cap.
5. Install panel.

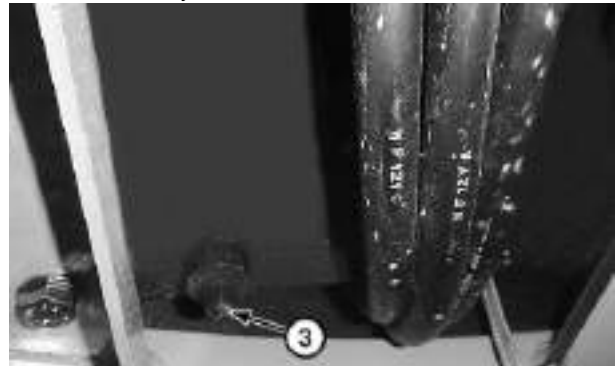
1— Hydraulic Tank Filler Cap      3— Drain Valve  
2— Access Panel



Hydraulic Tank Filler Cap



Hydraulic Drain Valve Access Panel



Hydraulic Tank Drain Valve

KR46761,00006D7 -19-12DEC12-1/1

## Take Engine Oil Sample

See your authorized dealer.

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

# Maintenance—Every 500 Hours

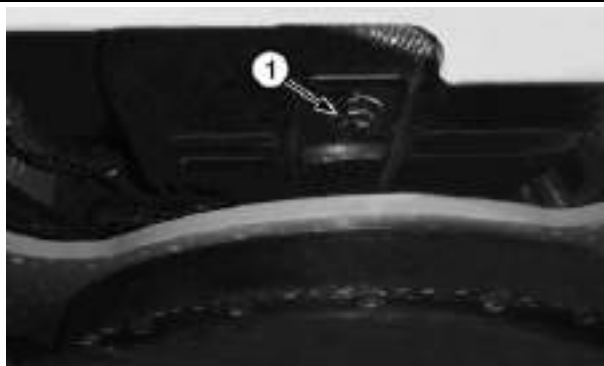
## Drain and Refill Engine Oil and Replace Filter

1. Run engine to warm oil.
2. Park machine on a level surface and stop engine.
3. Remove drain valve (1) from engine oil pan. Allow oil to drain into a container. Dispose of waste oil properly.
4. Turn engine oil filter (3) counterclockwise to remove. Clean mounting surface on base.
5. Apply thin film of oil to rubber gasket of new filter.
6. Install new filter. Turn filter clockwise by hand until gasket touches mounting surface.
7. Tighten filter.
8. Install drain valve.
9. Remove engine oil fill cap (4).

### Specification

Engine—Oil Capacity  
with Filter Change..... 7.2 L  
1.9 gal.

10. Fill engine with oil. For specific engine oil, see Diesel Engine Oil. (Section 3-1.)
11. Install fill cap.
12. Start engine. Engine oil pressure indicator on monitor must go out immediately. If not, stop engine immediately and find the cause.
13. Stop engine. Check oil level on engine oil dipstick (2).
14. Check for any leakage at filter. Tighten filter just enough to stop leakage.



Engine Oil Drain Valve



Engine Oil Dipstick, Fill Cap, and Filter

1— Drain Valve  
2— Engine Oil Dipstick

3— Engine Oil Filter  
4— Engine Oil Fill Cap

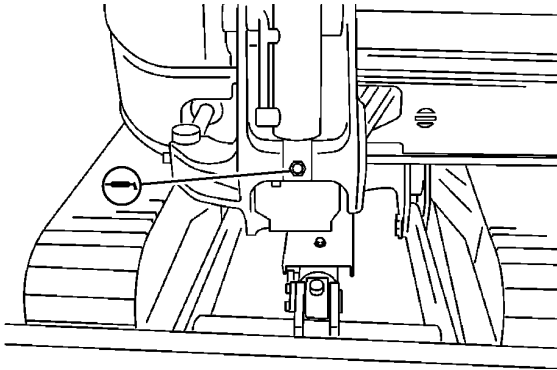
TX1126050A —UN—16NOV12

TX1126091A —UN—16NOV12

KR46761,000077C -19-27DEC12-1/1

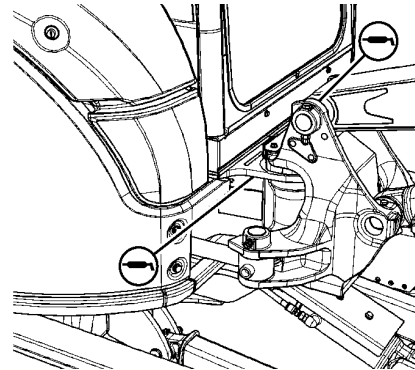


### Lubricate Front End Pin Joints



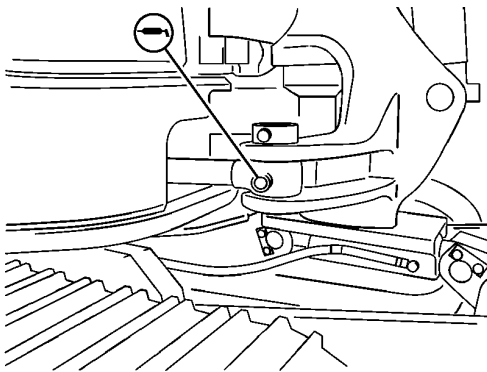
Boom Cylinder Bottom Side

TX1127732 —UN—07DEC12



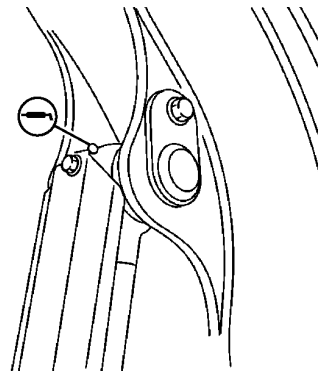
Boom Foot and Swing Post

TX1127733 —UN—07DEC12



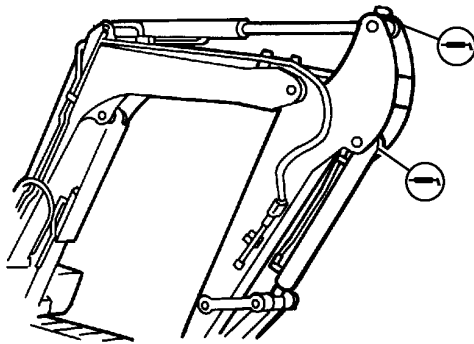
Boom Swing Cylinder

TX1127734 —UN—07DEC12



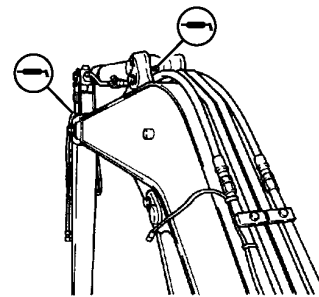
Boom Cylinder Rod Side

TX1127735 —UN—07DEC12



Arm Cylinder Rod Side, Bucket Cylinder Bottom Side

TX1127737 —UN—07DEC12



Boom and Arm Joint Pin, Arm Cylinder Bottom Side

TX1127738 —UN—07DEC12

Lubricate front end pin joints (10 points) until grease escapes from joints. See Grease. (Section 3-1.)

Lubricate every 10 hours when working in mud and water.

Lubricate every 10 hours for first 50 hours of operation.

Lubricate every 50 hours when using hydraulic breaker.

Lubricate every 100 hours for first 500 hours of operation and then at 500 hour intervals thereafter.

KR46761,0000760 -19-06JAN15-1/1

### Lubricate Swing Bearing Gear

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

1. Park and position machine on level surface.
2. Turn key switch to off. Remove key from key switch.

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

3. Lubricate swing bearing gear. See Grease. (Section 3-1.)
4. Start engine. Raise bucket approximately 200 mm (8 in.) off the ground. Rotate upperstructure 90 degrees (1/4 turn).



Swing Bearing Gear

5. Repeat procedure 2—4 four times. It is not necessary to start engine the last time.

KR46761,00006DB -19-04FEB15-1/1

TX1126198A —UN—19NOV12

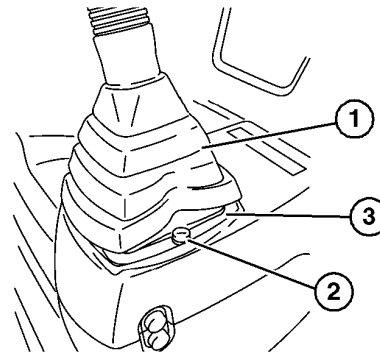
### Lubricate Control Lever Universal Joint

1. Lift boot (1). Remove cap screws (2).
2. Remove bracket (3).
3. Lubricate points shown.
4. Install bracket and screws.
5. Install boot.

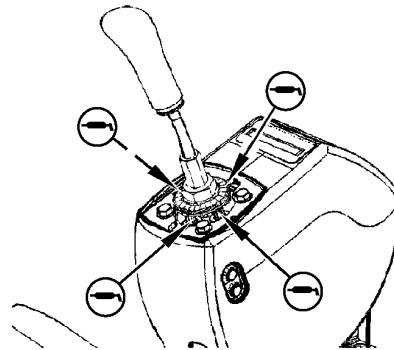
1— Boot  
2— Cap Screw (2 used)

3— Bracket

T205011



Control Lever



Four Points

KR46761,00006DC -19-04DEC14-1/1

T205011 —UN—30NOV04

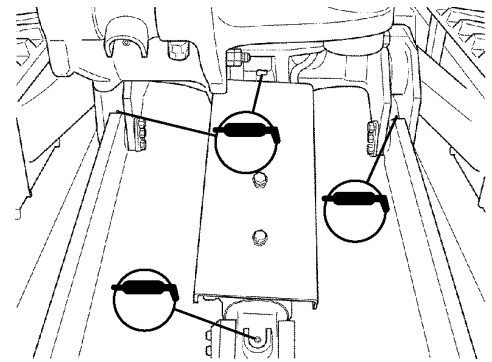
TX1127786 —UN—10DEC12

### Lubricate Blade Pins

Lubricate blade pins until grease escapes from joint. See Grease. (Section 3-1.)

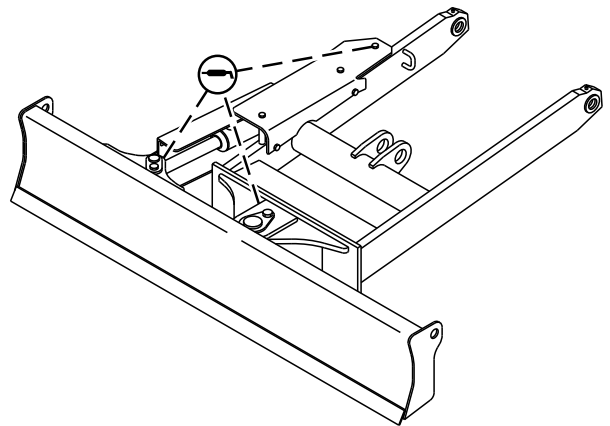
Lubricate until grease escapes from fitting. See Grease. (Section 3-1.)

T205163



Blade Pins—Four Points

T205163 —UN—09DEC04



Angle Blade Fittings—Three Points

TX1128518 —UN—20DEC12

KR46761,00006DF -19-21DEC12-1/1

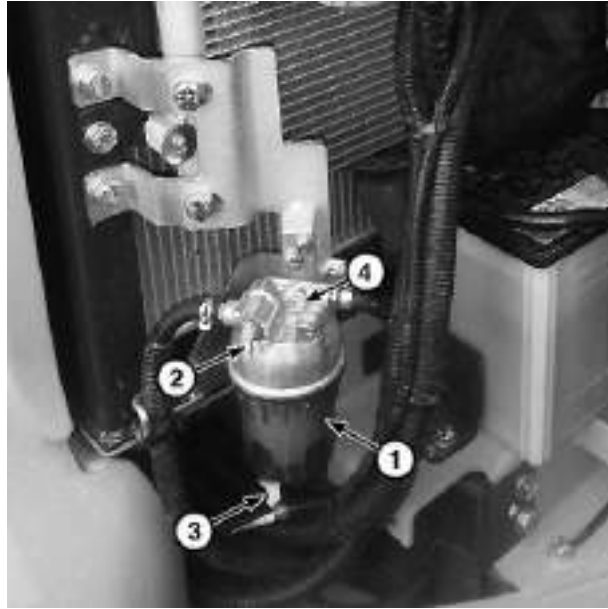
## Replace Primary Fuel Filter and Water Separator

1. Ensure key switch is in the OFF position.
2. Open right rear service door to access primary fuel filter and water separator assembly (1).
3. Close fuel shutoff valve (2).
4. Thoroughly clean exterior of primary fuel filter and water separator assembly and surrounding area.
5. Loosen drain valve (3) and air bleed plug (4) to relieve pressure and drain water and contaminants from water separator bowl into a suitable container. Dispose of waste properly.
6. Close drain valve and air bleed plug.
7. Remove water separator bowl from filter element. Clean and dry separator bowl.
8. Inspect bowl. Replace if necessary.
9. Remove filter element and seal from mounting base and discard.

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

**Only lubricate filter seal with diesel fuel before installing.**

10. Install new filter element.
11. Install water separator bowl. Tighten 1/2 turn after seal contacts mounting base.



Primary Fuel Filter and Water Separator Assembly

- |   |                   |
|---|-------------------|
| 1— Primary Fuel Filter and Water Separator Assembly | 3— Drain Valve    |
| 2— Fuel Shutoff Valve                               | 4— Air Bleed Plug |

12. Open fuel shutoff valve.
13. Bleed fuel system. See Bleed Fuel System. (Section 4-1.)
14. Close right rear service door.

TX1126445A—UN—21NOV12

KR46761\_0000770 -19-03JAN13-1/1

## Replace Final Fuel Filter

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

1. Ensure key switch is in the OFF position.

**NOTE:** Fuel shutoff valve is located on the primary fuel filter and water separator assembly.

2. Close fuel shutoff valve.
3. Open engine access door (1) to access final fuel filter assembly (2).
4. Thoroughly clean exterior of final fuel filter assembly and surrounding area.
5. Remove filter element from mounting base and discard.

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

**Only lubricate filter seal with diesel fuel before installing.**

6. Install new filter element. Tighten 1/2 turn after seal contacts mounting base.
7. Open fuel shutoff valve.
8. Bleed fuel system. See Bleed Fuel System. (Section 4-1.)



Final Fuel Filter Assembly

1— Engine Access Door

2— Final Fuel Filter Assembly

9. Close service doors.

TX1126450A —UN—21NOV12

KR46761,00006DD -19-03JAN13-1/1

## Replace Hydraulic Tank Oil Filter

**CAUTION:** High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. Slowly loosen cap to release pressure.

1. Park machine on a level surface with arm cylinder fully retracted and bucket cylinder fully extended. Lower bucket and blade to ground.
2. Stop engine.



Pressurized Fluids



Machine Position

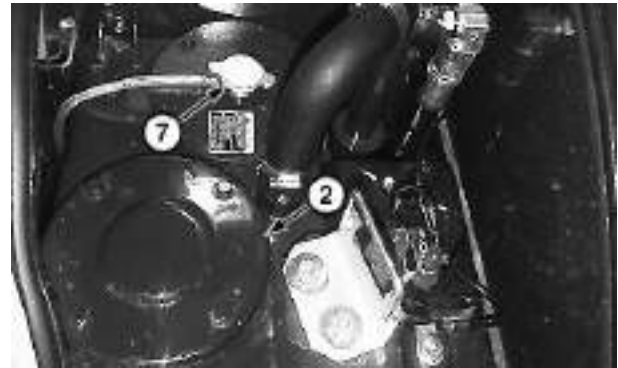
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KR46761,00007B5 -19-27DEC12-1/2

TS281—UN—15APR13

TX1127481—UN—05DEC12

3. Slowly loosen hydraulic tank filler cap (7) to release hydraulic pressure. Remove cap.
4. Loosen cap screws (1) to remove filter cover (2) and O-ring (3).
5. Hold down filter cover against light spring load when removing cap screws.
6. Remove spring (4), valve (5), and filter element (6).
7. Discard element and O-ring.
8. Install new filter element, valve, and spring.
9. Fill new filter with oil. See Hydraulic Oil. (Section 3-1.)
10. Install filter cover and new O-ring.
11. Install cap screws.



Hydraulic Tank Filler Cap and Cover

TX1126348A —UN—05DEC12

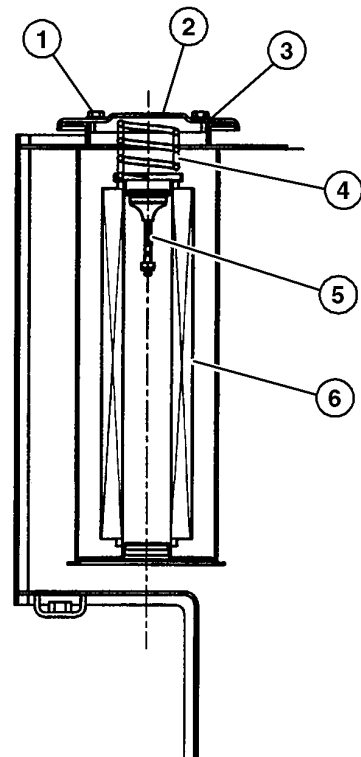
**Specification**

Cap Screw—Torque.....10 N·m  
7.4 lb.-ft.

**IMPORTANT: Avoid hydraulic pump damage.**  
**Hydraulic system must be bled whenever the hydraulic oil filter is changed.**

12. Bleed hydraulic system. See Bleed Hydraulic System. (Section 4-1.)

- |                       |                              |
|-----------------------|------------------------------|
| 1— Cap Screw (4 used) | 5— Valve                     |
| 2— Filter Cover       | 6— Filter Element            |
| 3— O-Ring             | 7— Hydraulic Tank Filler Cap |
| 4— Spring             |                              |



T205001

Filter Element

T205001 —UN—30NOV04

KR46761,00007B5 -19-27DEC12-2/2

### Take Fluid Samples

See your authorized dealer for taking the following fluid samples:

- Hydraulic Oil

- Travel Gear Case
- Coolant
- Diesel Fuel

KR46761,00006E1 -19-10DEC14-1/1

# Maintenance—Every 1000 Hours

## Replace Pilot System Oil Filter



Pressurized Fluids

**CAUTION:** High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. Slowly loosen cap to release pressure.

1. Open right front service door.
2. Slowly loosen hydraulic tank filler cap (1) to release pressure.

*NOTE: Pilot system oil filter access panel (2) is under the left rear of machine.*

3. Remove access panel (2) to access pilot system oil filter (3).

1—Hydraulic Tank Filler Cap      3—Pilot System Oil Filter  
2—Access Panel



TS281—UN—15APR13

Hydraulic Tank Filler Cap

TX1126061A—UN—16NOV12



TX1126124A—UN—16NOV12

Access Panel



TX1126060A—UN—19NOV12

Pilot System Oil Filter

Continued on next page

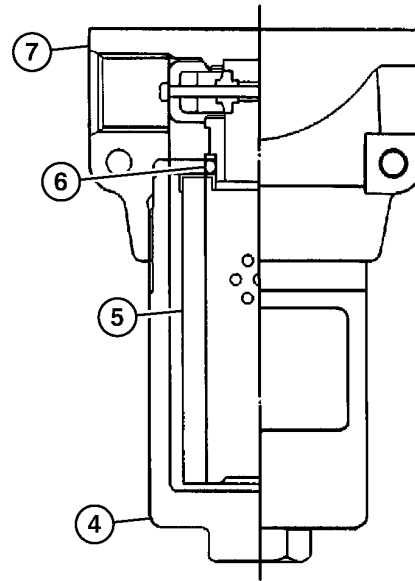
KR46761,00006E3 -19-12DEC12-1/2



4. Turn filter case (4) counterclockwise to remove from filter head (7).
5. Pull down on filter element (5) while moving it back and forth to remove.
6. Remove and discard O-ring (6).
7. Apply a thin film of clean oil to new O-ring and install in filter head.
8. Install new filter element by moving it back and forth while pushing it upward.
9. Install filter case.
10. Install hydraulic tank filler cap.

**IMPORTANT: Avoid hydraulic pump damage.**  
**Hydraulic system must be bled whenever the pilot oil filter is changed.**

11. Bleed hydraulic system. See Bleed Hydraulic System. (Section 4-1.)
12. Install access panel and close right front service door.



Pilot System Oil Filter Element

4— Filter Case  
5— Filter Element

6— O-Ring  
7— Filter Head

KR46761,00006E3 -19-12DEC12-2/2

TX1126190—UN—20NOV12

### Drain and Refill Travel Gear Case Oil

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

**CAUTION:** High-pressure release of oils from pressurized system can cause serious burns. Wait for travel gear case oil to cool. Keep body and face away from fill plug (1). Gradually loosen fill plug to release pressure.

3. After travel gear case has cooled, slowly loosen fill plug (1) to release air to relieve pressure.

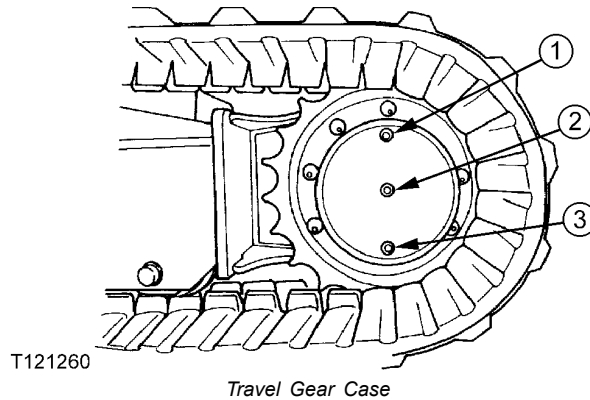
**NOTE:** Drain waste into a container. Dispose of waste properly.

4. Remove drain plug (3). Allow oil to drain into a container. Dispose of waste oil properly.
5. Wrap threads of drain plug with a sealing-type tape. Install plug. Tighten plug to specification.

**Specification**

Drain and Fill Plug—Torque.....	50 N·m 36.9 lb.-ft.
Check Plug—Torque.....	16 N·m 11.8 lb.-ft.

6. Remove fill plug and check plug (2).
7. Add oil until oil flows out of check plug hole. See Swing Gear Case and Travel Gear Case Oils. (Section 3-1.)



1— Fill Plug  
2— Check Plug

3— Drain Plug

**Specification**

Travel Gear Case—Oil Capacity (each).....	0.6 L 0.2 gal.
---	-------------------

8. Wrap threads of check plug and fill plug with sealing-type tape. Install plugs. Tighten plugs to specification.
9. Change oil of second travel gear case.

KR46761,00006E2 -19-04FEB15-1/1

### Check and Adjust Engine Valve Lash

See your authorized dealer for engine valve clearance adjustment.

CED,OUO1032,2768 -19-06APR10-1/1

### Check Starter and Alternator

See your authorized dealer for inspection and repair.

KR46761,0000768 -19-01OCT12-1/1

# Maintenance—Every 2000 Hours

## Drain and Refill Hydraulic Tank Oil

*NOTE: Change factory fill hydraulic oil after first 2000 hours. Change every 2000 hours thereafter if using super EX 46HN. If using alternative oils, see Hydraulic Oil. (Section 3-1.)*

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

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

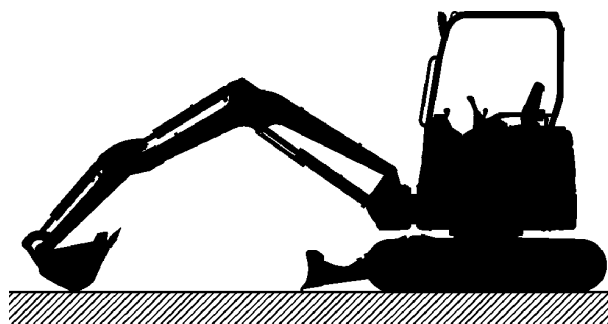
This excavator is factory filled with 46HN extended life zinc-free hydraulic oil. Avoid servicing this excavator with products that do not meet this specification. If oils have been mixed or if alternate service oils are desired, the complete hydraulic system needs to be totally flushed by an authorized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

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

**CAUTION:** Avoid personal injury from high pressure fluid. High pressure release of oil from pressurized system can cause serious burns or penetrating injury. Slowly loosen hydraulic tank cap to release pressure.

2. Slowly loosen cap (1) to release pressure. Remove cap.
3. Remove hydraulic tank cover (4).
4. Drain oil using a suction pump.

1—Hydraulic Tank Filler Cap      4—Hydraulic Tank Cover



Machine Position



Pressurized Fluids



Hydraulic Tank Filler Cap and Cover

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KR46761,00006E4 -19-26APR13-1/3

TX1127481 —UN—05DEC12

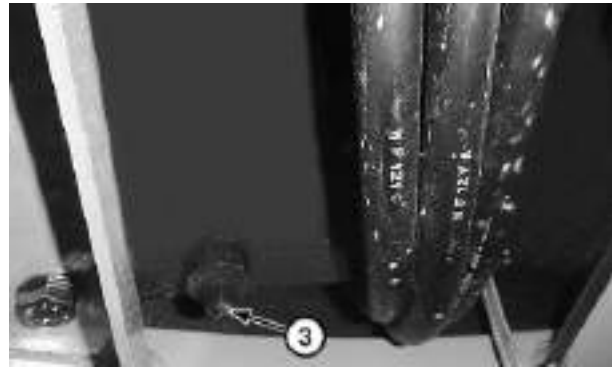
T5281 —UN—15APR13

TX1126824A —UN—28NOV12



TX1126131A —UN—16NOV12

*Hydraulic Tank Drain Valve Access Panel*

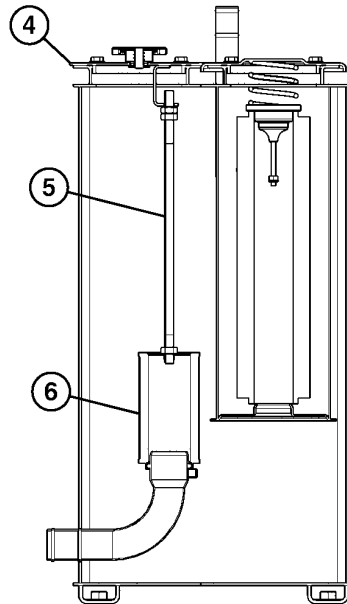


TX1126059A —UN—16NOV12

*Hydraulic Tank Drain Valve*

5. Remove access panel (2).
6. Slowly loosen drain valve (3). Allow oil to drain into a container. Dispose of waste oil properly.
7. Remove suction filter (6) with rod (5).
8. Clean inside of tank and suction filter.
9. Replace hydraulic tank oil filter. See Replace Hydraulic Oil Tank Filter. (Section 3-7.)
10. Install suction filter with rod.
11. Tighten drain valve.

- |                               |                   |
|-------------------------------|-------------------|
| 2— Access Panel               | 5— Rod            |
| 3— Hydraulic Tank Drain Valve | 6— Suction Filter |
| 4— Hydraulic Tank Cover       |                   |



TX1126828A —UN—29NOV12

*Filter Assembly*

Continued on next page

KR46761,00006E4 -19-26APR13-2/3

12. Add oil until it is between marks on hydraulic oil level sight gauge (7). See Hydraulic Oil. (Section 3-1.)

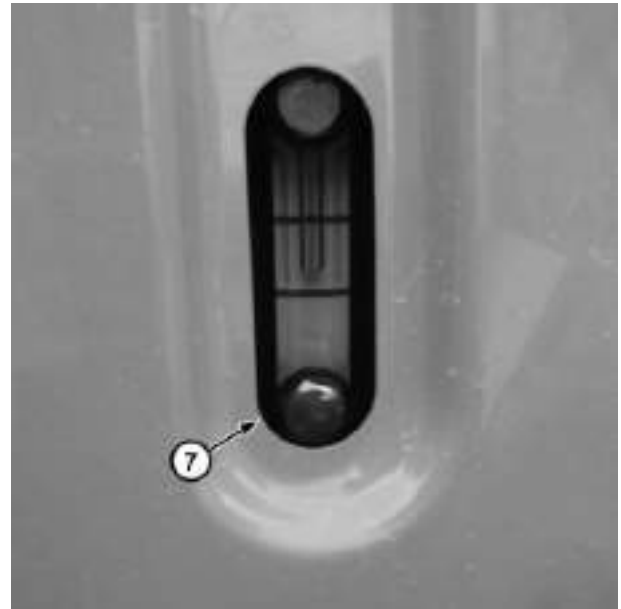
**Specification**

Hydraulic Tank—Oil  
Capacity..... 32.0 L  
8.5 gal.

**IMPORTANT: Avoid hydraulic pump damage.  
Hydraulic system must be bled whenever  
the hydraulic oil is changed.**

13. Bleed hydraulic system. See Bleed Hydraulic System. (Section 4-1.)
14. Install hydraulic tank filler cap, cover, and access panel.

**7— Hydraulic Oil Level Sight Gauge**



Hydraulic Oil Level Sight Gauge

TX1126826A —UN—28NOV12

KR46761,00006E4 -19-26APR13-3/3

## Drain Cooling System

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

Shut off engine. Only remove radiator cap when cool enough to touch with bare hands. Slowly loosen radiator cap to first stop to relieve pressure before removing completely.

1. Open right rear service door. Check coolant hoses for cracks and leaks. Replace if necessary.
2. Tighten clamps.
3. Check radiator and oil cooler for dirt, grease, leaks, and loose or broken mountings. Clean radiator and oil cooler fins.

**CAUTION:** Prevent possible injury from hot spraying water. DO NOT remove radiator cap unless engine is cool. Then remove cap slowly.

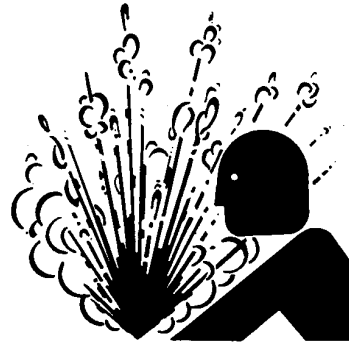
4. Slowly turn radiator cap (1) to release pressure. Remove cap.
5. Remove access panel (2) to access radiator drain valve (3).

**NOTE:** Drain waste into a container. Dispose of waste properly.

6. Turn radiator drain valve counterclockwise to open valve. Allow coolant to drain into a container. Dispose of waste coolant properly.
7. Close radiator drain valve and install cover.
8. Install radiator cap. Close right rear service door.

1—Radiator Cap  
2—Access Panel

3—Radiator Drain Valve



Pressurized Fluids



Radiator Cap



Access Panel



Radiator Drain Valve

TS281—UN—15APR13

TX1125751A—UN—16NOV12

TX1126310A—UN—20NOV12

TX1126057A—UN—20NOV12

KR46761,000077B -19-16JAN15-1/1

### Cooling System Fill and Deaeration Procedure

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

Shut off engine. Only remove radiator cap when cool enough to touch with bare hands. Slowly loosen radiator cap to relieve pressure before removing completely.

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

Use only permanent-type low silicate ethylene glycol base antifreeze in coolant solution. Other types of antifreeze may damage cylinder seals.

John Deere COOL-GARD™ II Pre-Mix coolant is recommended when adding new coolant to cooling system.

Follow directions on container for correct mixture ratio.

**FREEZING TEMPERATURES:** Fill with permanent-type, low silicate, ethylene glycol antifreeze (without stop-leak additive) and clean, soft water.

#### Fill

**CAUTION:** Prevent possible injury from hot spraying water. **DO NOT** remove radiator cap unless engine is cool. Then remove cap slowly.

Remove radiator cap to relieve pressure. Fill recovery tank to above the FULL mark. Replace radiator cap.

#### Deaeration

The cooling system requires several warm-up and cool down cycles to deaerate. It will NOT deaerate during

*COOL-GARD is a trademark of Deere & Company*



Pressurized Fluids

normal operation. Only during warm-up and cool down cycles will the system deaerate.

1. Start engine. Run engine until coolant reaches a warm temperature.
2. Stop engine. Allow coolant to cool.
3. Check coolant level at recovery tank.
4. Repeat steps 1—3 until recovery tank coolant level is repeatedly at the same level (stabilized).

**NOTE:** The level of the coolant in the cooling system **MUST BE** repeatedly checked after all drain and refill procedures to insure that all air is out of the system which allows the coolant level to stabilize. Check coolant level only when the engine is cold.

5. If necessary, fill recovery tank to above the MIN COLD mark.

#### Specification

Cooling System—Capacity.....	3.9 L
	1.0 gal.

TS281 —UN—15APR13

KR46761,00007A3 -19-16JAN15-1/1

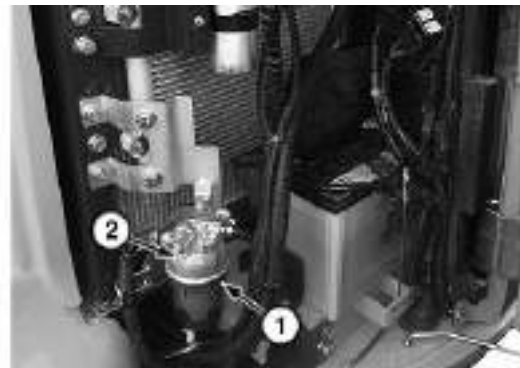
## Miscellaneous—Machine

### Bleed Fuel System

**NOTE:** This procedure should be performed after each fuel filter change or when the engine has run out of fuel.

This machine is equipped with an electric fuel solenoid pump.

1. Make sure the fuel tank is full.
2. Open right rear service door to access primary fuel filter and water separator assembly (1).
3. Check that fuel shutoff valve (2) is open.
4. Turn key switch to ON position for 10—15 seconds. The electric fuel solenoid pump will start to bleed air.
5. Wait 30 seconds before trying to start the engine.
6. Start the engine. Check the fuel supply system for fuel leaks. If the engine does not start, repeat procedure again.



Fuel System

1—Primary Fuel Filter and Water Separator Assembly      2—Fuel Shutoff Valve

7. Close service door.

KR46761,00007B0 -19-14DEC12-1/1

TX112632A—UN—20NOV12

### Do Not Service or Adjust Injection Nozzles or High Pressure Fuel Pump

If injection nozzles are not working correctly or are dirty, the engine will not run normally. (See your authorized dealer for service.)

Changing the injection pump in any way not approved by the manufacturer will end the warranty. (See your copy of the John Deere warranty on this machine.)

Do not service an injection pump that is not operating correctly. (See your authorized injection pump service center.)

TX,90,FF3116 -19-07SEP06-1/1

### Do Not Service Control Valves, Cylinders, Pumps, or Motors

Special tools and information are needed to service control valves, cylinders, pumps, or motors.

If these parts need service, see your authorized John Deere dealer.

TX,90,DH2537 -19-20JUL12-1/1

### Precautions for Alternator and Regulator

When batteries are connected, follow these rules:

1. Disconnect negative (-) battery cable when you work on or near alternator or regulator.
2. DO NOT TRY TO POLARIZE ALTERNATOR OR REGULATOR.
3. Be sure alternator wires are correctly connected BEFORE you connect batteries.
4. Do not ground alternator output terminal.
5. Do not disconnect or connect any alternator or regulator wires while batteries are connected or while alternator is operating.
6. Connect batteries or a booster battery in the correct polarity (positive [+] to positive [+] and negative [-] to negative [-]).
7. Do not disconnect the batteries when engine is running and alternator is charging.
8. Disconnect battery cables before you connect battery charger to the batteries. If machine has more than one battery, each battery must be charged separately.

CED,OUO1021,185 -19-05NOV08-1/1



### Using Booster Batteries—12-Volt System

Before boost starting, machine must be properly shut down to prevent unexpected machine movement when engine starts.

**⚠ CAUTION:** Prevent possible injury from exploding battery. An explosive gas is produced while batteries are in use or being charged. Keep flames or sparks away from the battery area. Make sure the batteries are charged in a well ventilated area.

**IMPORTANT:** The machine electrical system is a 12-volt negative (-) ground. Use only 12-volt booster batteries.

1. Connect one end of the positive cable to the positive terminal of the machine batteries and the other end to the positive terminal of the booster batteries.
2. Connect one end of the negative cable to the negative terminal of the booster batteries. Connect other end of the negative cable to the machine as far away from the machine batteries as possible.
3. Start engine.
4. Immediately after starting engine disconnect end of the negative cable from the machine. Then disconnect the other end of the negative cable from the negative terminal of the booster batteries.
5. Disconnect positive cable from booster batteries and machine batteries.



Using Booster Batteries

TS204—UN—15APR13

OUT4001,00000E1 -19-12,JUL13-1/1

## Handling, Checking, and Servicing Batteries Carefully

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

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

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

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 15—30 minutes. Get medical attention immediately.

If acid is swallowed:

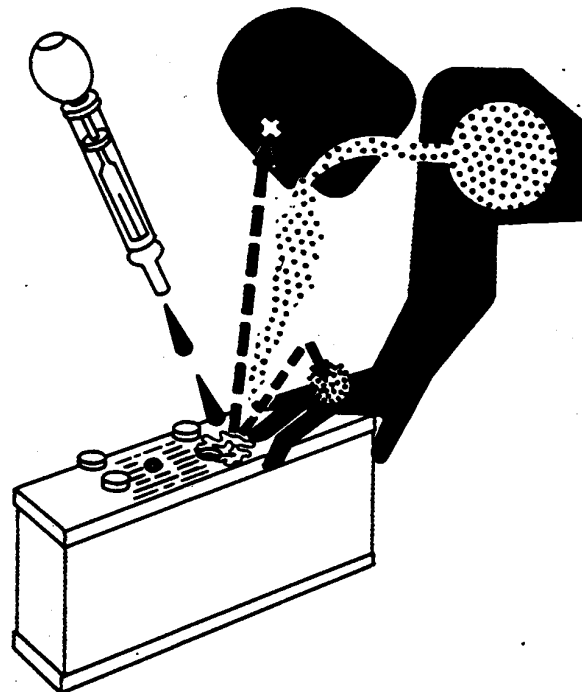
1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 1.9 L (2 quarts).
3. Get medical attention immediately.

**WARNING:** Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. **Wash hands after handling.**

If electrolyte spills on the floor, use one of the following mixtures to neutralize the acid: 0.5 kg (1 lb) baking soda in 4 L (1 gal) water, or 0.47 L (1 pt) household ammonia in 4 L (1 gal) water.



Exploding Battery Gas



Battery Electrolyte

**IMPORTANT:** Do not overfill the battery cells.

Check the specific gravity of electrolyte in each battery cell.

Continued on next page

TX03679,0001788 -19-05MAR13-1/2

TS204—UN—15APR13

TS203—UN—23AUG88

See your authorized dealer for JT05460 SERVICEGARD™ battery and coolant tester. Follow directions included with the tester.

A fully charged battery will have a corrected specific gravity reading of 1.260. If the reading is below 1.200, charge the battery.



Battery and Coolant Tester

SERVICEGARD is a trademark of Deere & Company

TX03679,0001788 -19-05MAR13-2/2

T85402 —UN—10NOV88

### Using Battery Charger

**CAUTION:** Prevent possible injury from exploding battery. Do not charge a battery if the battery is frozen or it may explode. Warm battery to 16°C (60°F) before charging.

Turn off charger before connecting or disconnecting it.

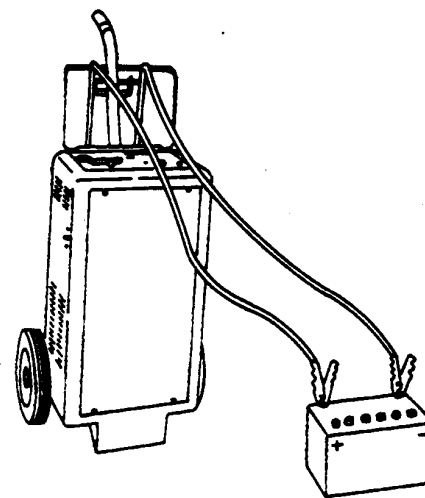
**IMPORTANT:** Do not use battery charger as a booster if a battery has a 1.150 specific gravity reading or lower.

**Disconnect battery ground (-) clamp before you charge batteries in the machine to prevent damage to electrical components.**

A battery charger may be used as a booster to start engine.

Ventilate the area where batteries are being charged.

Stop or cut back charging rate if battery case feels hot, or is venting electrolyte. Battery temperature must not exceed 52°C (125°F).



TS204 —UN—15APR13

N36890 —UN—07OCT88

OUT4001,0000239 -19-30APR08-1/1

## Replacing the Battery

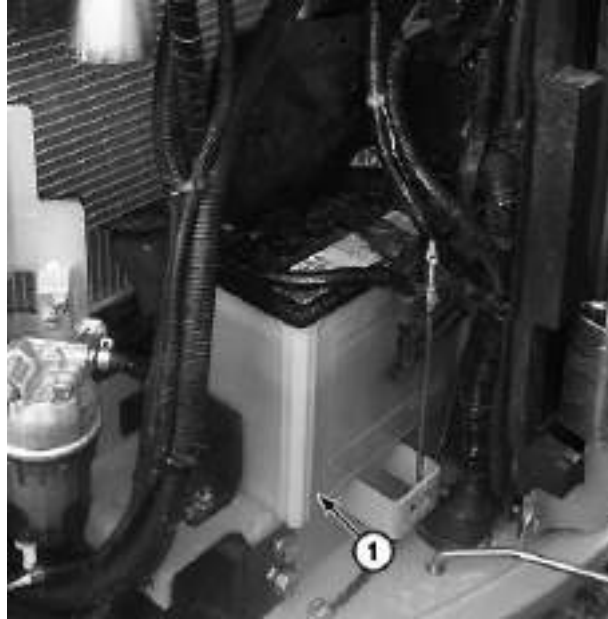
Your machine has one 12-volt battery (1) with negative (-) ground. Battery must meet one of the specifications below.

### Specification

Battery—Cold Cranking  
Amps at -18°C (0°F)..... 490 amps

If battery malfunctions, replace battery with one of the same type. For example, replace a malfunctioned maintenance-free battery with a new maintenance-free battery. Different types of batteries may have different rates of charge. This difference could overload the battery and cause it to malfunction.

### 1— Battery



Battery Location

TX1125721A —UN—16NOV12

KR46761,00006E8 -19-21DEC12-1/1

## 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. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

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

1. Remove paint before welding or heating.

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

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

2. Disconnect the negative (-) battery cable(s).
3. Disconnect the positive (+) battery cable(s).
4. Cover, protect, or move any wiring harness sections away from welding area.

For any repairs, see your authorized dealer.

VD76477,00005A0 -19-26FEB15-1/1

## Bleed Hydraulic System

1. Park and position machine on level surface.

**IMPORTANT: Avoid hydraulic pump damage. Perform the hydraulic system bleeding procedure every time you change the hydraulic filter, pilot system oil filter, or change hydraulic tank oil.**

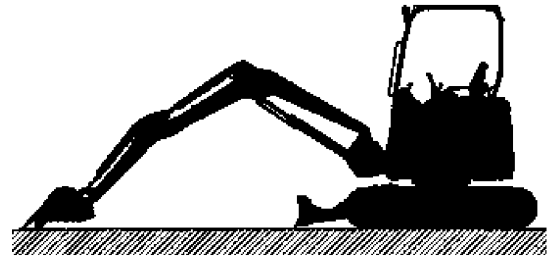
**Do not operate any hydraulic functions, including unlocking pilot control shutoff lever, until you complete 1—5 in this procedure.**

2. Loosen air bleed plug (1).
3. Purge air and tighten air bleed plug to specification.

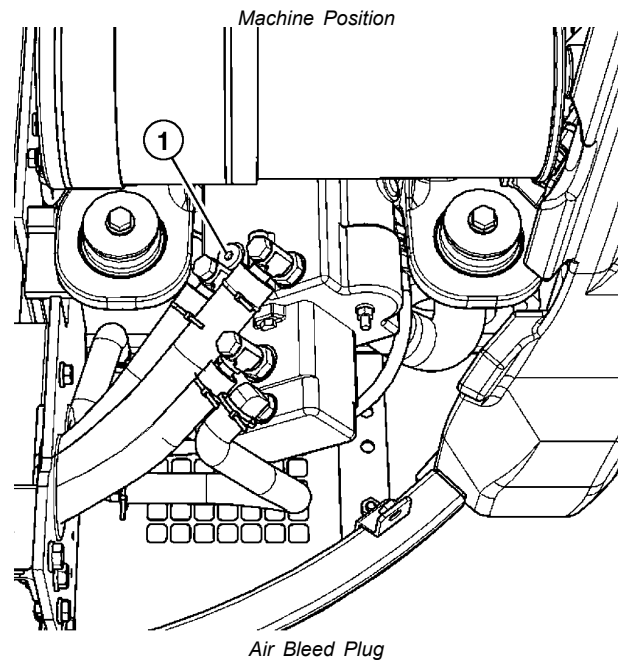
### Specification

Air Bleed Plug—Torque..... 30—40 N·m  
22—29 lb.-ft.

4. Turn engine speed control dial to slow idle position.
5. Start engine. Run for 5—10 seconds to ensure oil flow to hydraulic pump. Stop engine.
6. Check the hydraulic oil level at sight gauge. Add hydraulic oil if necessary. For specific hydraulic oil, see Hydraulic Oil. (Section 3-1.)
7. Start the engine again. Confirm oil level is above minimum point in hydraulic oil sight gauge. Run engine for approximately 1 minute to circulate oil through the system.
8. Stop engine and check hydraulic oil level. Add oil if necessary.
9. Start engine again. Operate each cylinder and swing motor repeatedly for 10—15 minutes to purge air from hydraulic system.
10. Park machine on a level surface and position machine with cylinders fully retracted.
11. Stop engine. Check hydraulic oil level. Add oil if necessary.



T205418



1— Air Bleed Plug

JS93577,0000054 -19-27DEC12-1/1

T205418—UN—09DEC04

TX1127207—UN—03DEC12

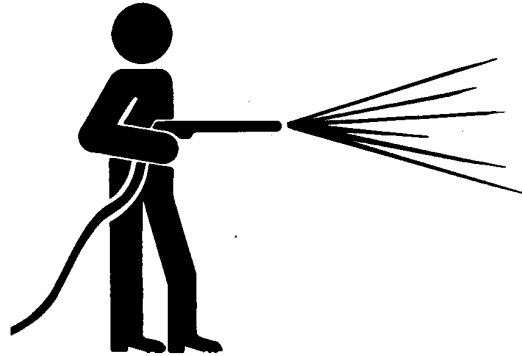
### Clean Machine Regularly

Remove any grease, oil, fuel, or debris build-up to avoid possible injury or machine damage.

**IMPORTANT: Directing pressurized water at electronic/electrical components or connectors, bearings and hydraulic seals, fuel injection pumps or other sensitive parts and components may cause product malfunctions. Reduce pressure and spray at a 45 to 90 degree angle.**

High pressure washing (greater than 1379 kPa (13.8 bar) (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. Fins may bend.



Clean Machine Regularly

T6642EJ—JN—18OCT88

TX03679.00017E0 -19-05MAR13-1/1

### Adding 12-Volt Accessories

**IMPORTANT: This machine has a 24-volt electrical system. Installing 12-volt accessories without addition of 24-volt to 12-volt converter may cause battery failure.**

**This machine is equipped with a 12-volt, 5-amp outlet.**

When possible, use 24-volt accessories. If 12-volt accessories are added, use a 24-volt to 12-volt converter. Converters are available from your John Deere dealer.

Converter capacity requirements depend on the load of the accessories installed. Follow electronic dealer

and manufacturer's recommendations to determine the capacity of the converter required and its installation requirements. If standard equipment, verify if amperage is adequate for application.

**IMPORTANT: DO NOT connect an accessory to one battery. Connecting a 12-volt accessory to one battery will cause one battery to overcharge, and the other battery to undercharge, causing battery failure.**

TX,90,DH3734 -19-29MAY14-1/1

## Connecting and Disconnecting Auxiliary Lines

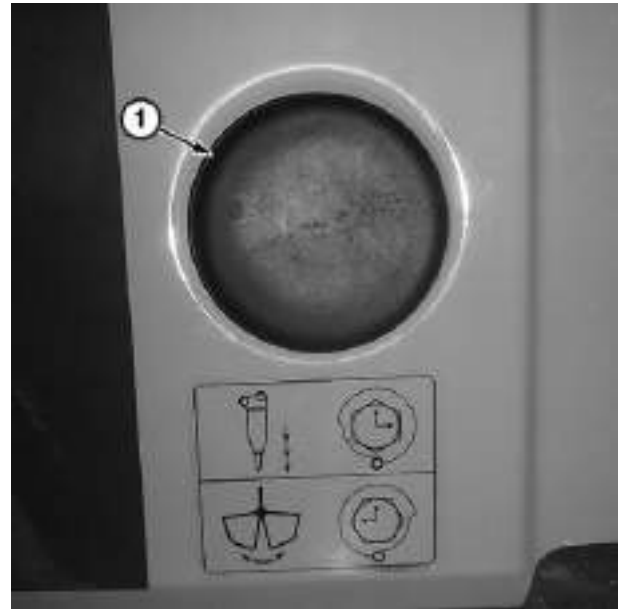
*NOTE: The right and left side is determined while operator is sitting in the seat facing forward, looking at the boom and arm.*

This procedure will reduce the amount of required effort to connect and disconnect auxiliary hydraulic lines.

1. Move the bucket clamp (thumb) to the storage position (up) with 25.4 mm (1 in.) of cylinder rod exposed.

*NOTE: If the rod is completely bottomed out, this procedure will not work.*

2. Turn machine off.
3. On left side of machine switch auxiliary line selector valve (1) to breaker mode.
4. Disconnect LEFT side hydraulic quick coupler.
5. Disconnect RIGHT side hydraulic quick coupler.
6. Change attachment. Once attachment is in place, shut machine off.
7. Connect RIGHT side hydraulic coupler.
8. Connect LEFT side hydraulic coupler.
9. If necessary, switch auxiliary line selector valve for the particular type of attachment.



Auxiliary Line Selector Valve

1— Auxiliary Line Selector Valve

10. Operate machine.

TX1127929A —UN—11DEC12

KR46761,00006EB -19-17DEC12-1/1

## Replacing Fuses

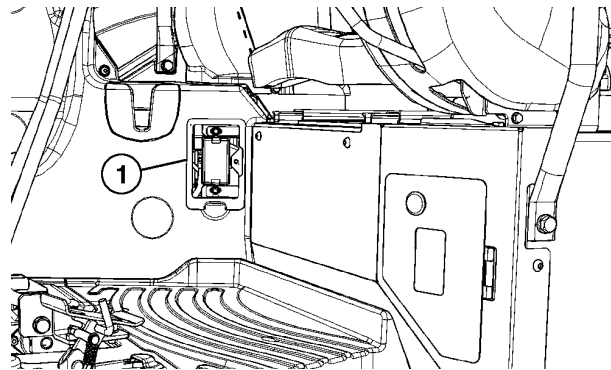
The fuse panel (1) is located under the right control lever.

Remove cover to access fuse panel.

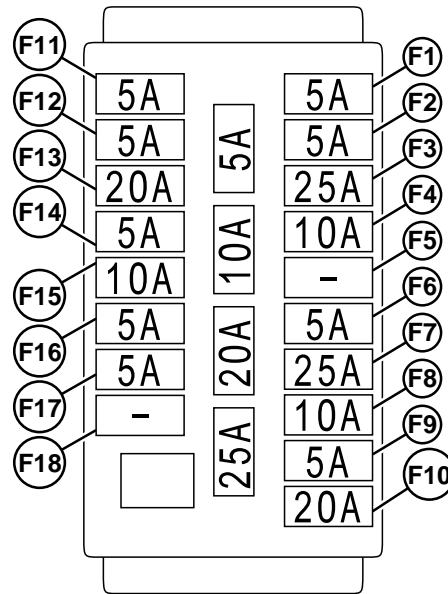
**IMPORTANT: Install fuse with correct amperage rating to prevent electrical system damage from overload.**

Amperage Rating	Color
1	Black
3	Violet
4	Pink
5	Tan
7-1/2	Brown
10	Red
15	Light Blue
20	Yellow
25	Natural (white)
30	Light Green

- |   |  |
|---|--|
| 1—Fuse Panel                                | F10— POWER SOCKET 20 Amp Fuse                |
| F1— HORN 5 Amp Fuse                         | F11— MONITOR ACC 5 Amp Fuse                  |
| F2— MONITOR B, RADIO 5 Amp Fuse             | F12— A/C PANEL, CAB 5 Amp Fuse (if equipped) |
| F3— LIGHT 25 Amp Fuse                       | F13— CAB SOCKET 20 Amp Fuse (if equipped)    |
| F4— MAIN RELAY 10 Amp Fuse                  | F14— TRAVEL RELAY 5 Amp Fuse                 |
| F5— NOT USED                                | F15— OPTION, ALARM 10 Amp Fuse               |
| F6— START 5 Amp Fuse                        | F16— ENGINE 5 Amp Fuse                       |
| F7— A/C 25 Amp Fuse (if equipped)           | F17— PILOT SHUT OFF 5 Amp Fuse               |
| F8— WIPER, WASHER 10 Amp Fuse (if equipped) | F18— NOT USED                                |
| F9— TRAVEL ILLUMI 5 Amp Fuse                |  |



Fuse Panel



Fuse Block

KR46761.00007DE -19-27DEC12-1/2

TX1127750 —JUN—10DEC12

TX1127637 —JUN—06DEC12

- |                        |                                      |
|------------------------|--------------------------------------|
| F60— Start 50 Amp Fuse | F62— Glow Plug 60 Amp Fuse           |
| F61— Main 60 Amp Fuse  | F63— Engine Control Unit 30 Amp Fuse |



Fuse Block

KR46761.00007DE -19-27DEC12-2/2

TX1128274A —JUN—17DEC12



## Clean Cab Fresh Air and Cab Recirculating Air Filters—If Equipped

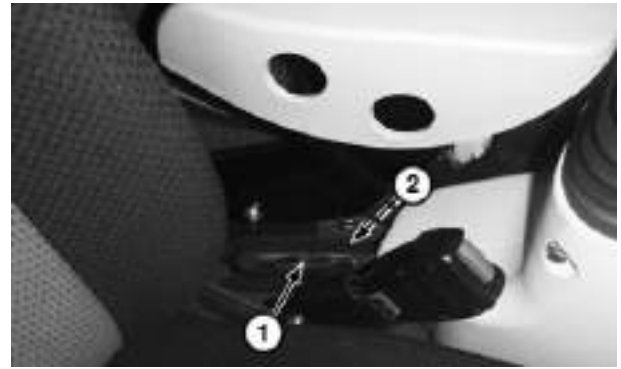
*NOTE: Replace filters after the sixth cleaning.*

### Removing Cab Fresh Air Filter:

1. Grasp filter tab (1) located on left side of operator's seat.
2. Remove cab fresh air filter (2).

1— Filter Tab

2— Cab Fresh Air Filter



Cab Fresh Air Filter

Continued on next page

JS93577.0000065 -19-18DEC12-1/2

TX1128057A —UN—13DEC12

**Removing Cab Recirculating Air Filter:**

1. Unlock panel (1) located under left side of operator's seat.
2. Grasp filter tab (2) to remove cab recirculating air filter (3).

**Cleaning Filters:**

1. Clean filters by lightly tapping filters to remove dirt and debris.
2. Use vacuum if needed.
3. Install filters and panel.

1— Panel  
2— Filter Tab

3— Cab Recirculating Air Filter



Access Panel



Cab Recirculating Air Filter

TX1128047A —UN—13DEC12

TX1128052A —UN—13DEC12

JS93577.0000065 -19-18DEC12-2/2

## Replacing Bucket Teeth

**⚠ CAUTION:** Guard against injury from flying pieces of metal; wear goggles or safety glasses.

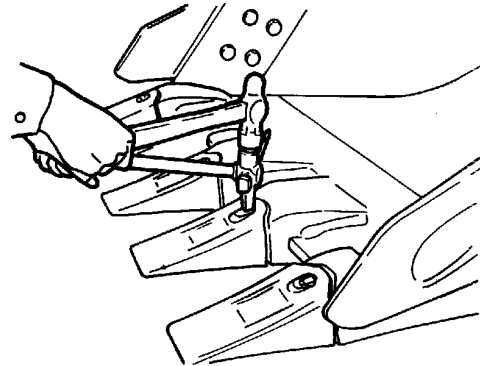
**IMPORTANT:** Check bucket teeth periodically so that wear does not extend to the bucket tooth shank.

1. Use a hammer and drift to drive out spring pin (1).

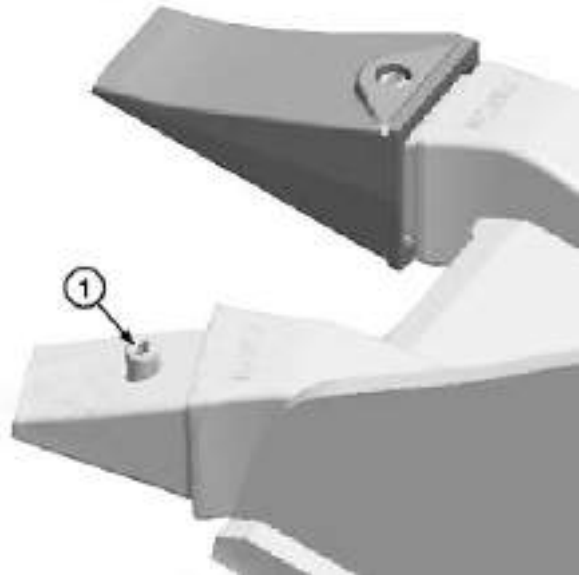
*NOTE:* Alternate buckets may use different tooth assemblies.

2. Remove tooth.
3. Position new tooth over tooth shank.
4. Drive spring pin fully into hole.

1— Spring Pin



Bucket Teeth



Spring Pin

TX1127885—UN—11DEC12

TX1127863A—UN—11DEC12

JS93577,0000060 -19-18DEC12-1/1

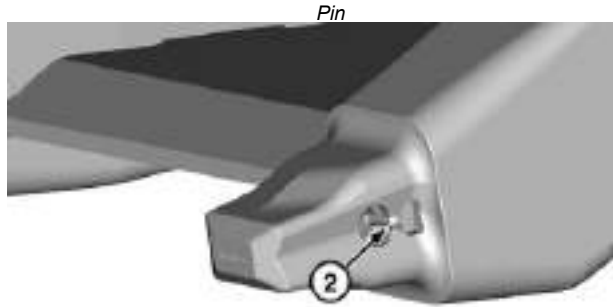
### Replacing Bucket Teeth—TK Series

**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°.

1—Pin

2—Rubber Lock (2 used)



Pin

Rubber Lock

TX1150806 —JUN—10JAN14

TX1150895 —JUN—10JAN14

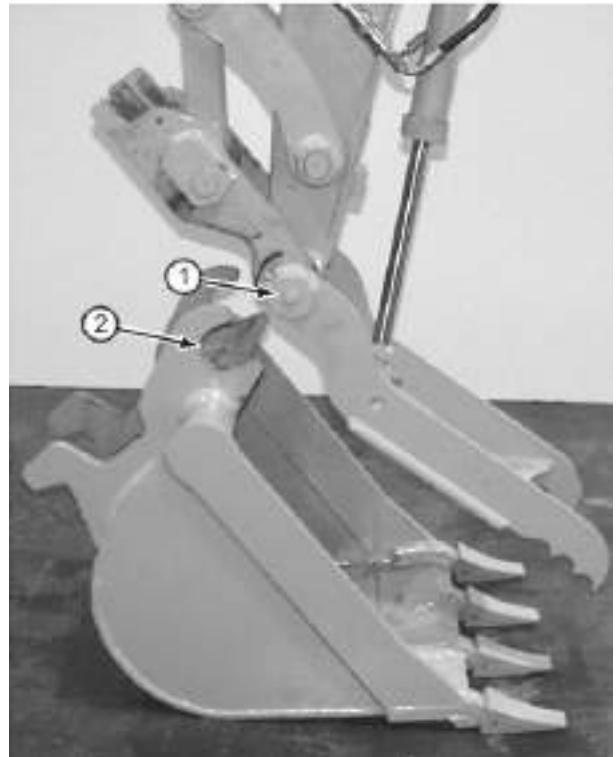
DB84312,00000BC -19-20JAN14-1/1

### Installing Bucket With Quick Coupler

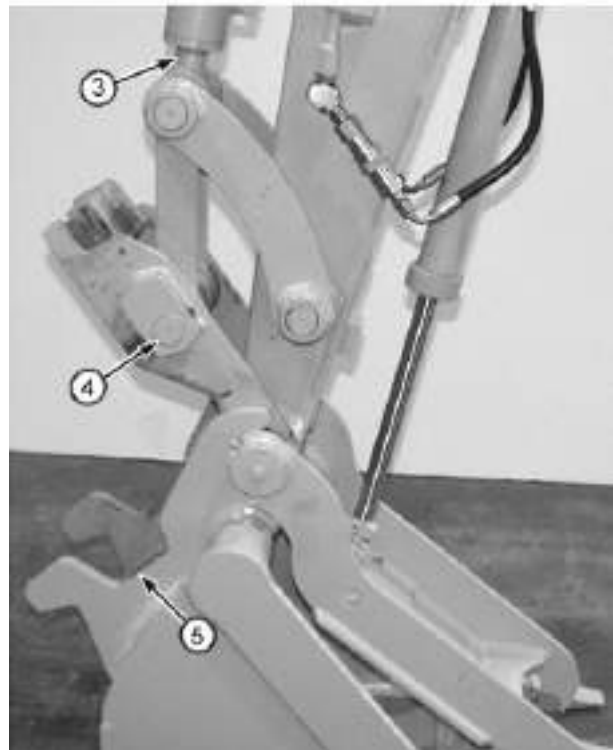
1. Position bucket and machine on a flat level surface.
2. Slowly lower boom and maneuver arm to insert arm pivot pin (1) into open end of bucket ears (2).
3. Extend bucket cylinder (3) until the square pin boss (4) rests on the flat surface of bucket ears (5).

1— Arm Pivot Pin  
2— Bucket Ear (2 used)  
3— Bucket Cylinder

4— Square Pin Boss  
5— Bucket Ear (2 used)



Machine Shown With Optional Thumb Attachment



Quick Coupler

Continued on next page

JS93577.0000068 -19-18DEC12-1/2

T123697B —UN—19AUG99

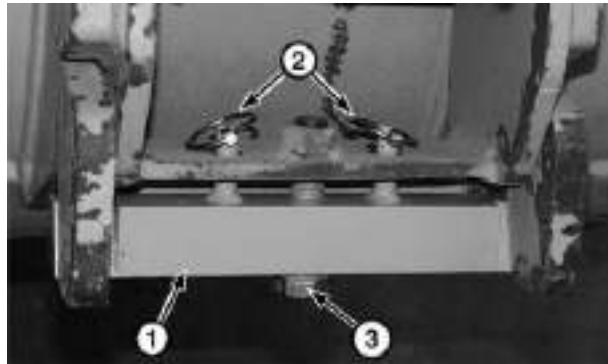
T123698B —UN—19AUG99

4. Install bucket or attachment and wedge bar (1). Two lynch pins (2) are installed on rear of mechanical quick coupler.
5. Tighten cap screw (3) to specification.

**Specification**

Cap Screw—Torque..... 135 N·m  
100 lb.-ft.

- 1—Wedge Bar  
2—Lynch Pin (2 used)                      3—Cap Screw



Wedge Bar and Lynch Pins

T190378C—UN—11JUL00

JS93577,0000068 -19-18DEC12-2/2

### Track Sag General Information

To maximize undercarriage life, keep track sag within specification. Tracks may require adjustment several times during a working day due to changing soil type and moisture content.

Adjust tracks in the actual operating conditions.

**TIGHT TRACK:** Packing causes a tight track. If material packs in the undercarriage, adjust tracks with the material packed in the components.

While the track spring will recoil and the machine can continue to operate with a tight track, continued operation will result in excessive pin and bushing wear, sprocket

popping, tooth tip wear, and excessive loads on the entire undercarriage and travel drive system.

Machine productivity and fuel consumption are also adversely affected because increased horsepower is needed to move the machine.

**LOOSE TRACK:** A loose track has more side to side motion, increasing side wear on the links, rollers and front idler. An excessively loose track will slap at high ground speeds, resulting in high impact loads on the sprocket teeth, bushings, and carrier rollers.

04T,90,M197 -19-18JUL06-1/1

### Check Track Shoe Hardware

Tracks shoes should be checked periodically for loose or missing cap screws and nuts. For shoes with missing or loose cap screws and nuts, remove shoes and clean the mating surface of shoes and links before tightening cap screws and nuts. The cap screws should be replaced because they have been stretched to yield previously.

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

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

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

3. Install nuts with the rounded corners against milled surface of link and chamfered side is away from link.

Check that nuts are square with the milled surface of link and there is full contact between nut and milled surface. As necessary, hold the nut so it does not turn.

4. Starting at any cap screw, tighten all cap screws in sequence to the torque specification, then 1/2 turn (180°) more.

KR46761,000076A -19-17DEC12-1/1

## Rubber Track Care

**CAUTION:** Prevent possible injury from unexpected machine movement. A machine with rubber track is less stable than a machine with steel shoes, as the edge of the rubber track may bend when bucket is loaded, especially when digging over the side.

When you drive the machine:

- Do not operate on sharp, rocky, uneven surfaces.

**NOTE:** The rubber track has a thin rubber film on its inner surface when it is new. It is normal for the film to come off when track rubs against rollers.

- Keep the rubber track free of oil, gasoline, etc. Avoid traveling on oil to reduce the chance of slipping.
- If machine is parked or stored for more than 90 days, park in an area out of direct sunlight.
- When transporting a machine with rubber tracks, always fasten the right and left track frames securely to the trailer. Do not allow tie down chains to come into direct contact with rubber track pads.

TX,55,DH5376 -19-25JAN07-1/1

## Removing and Installing Rubber Track

### Removing Rubber Track

1. Rotate upperstructure 90° and lower bucket to raise track off ground.
2. Keep the angle between boom and arm 90—100° and position round side of the bucket on the ground.

**CAUTION:** Prevent possible injury from unexpected machine movement. Place blocks under machine frame to support machine while removing and installing track.

3. Place blocks under machine frame to support machine.

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

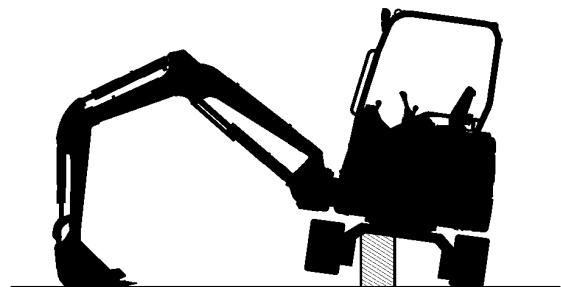
4. To loosen track, slowly turn valve (2) counterclockwise. Grease will escape through the bleed hole (3).

**CAUTION:** Prevent potential injury from front idler. Do not stand in front of idler during removal of track. Front idler may come off unexpectedly.

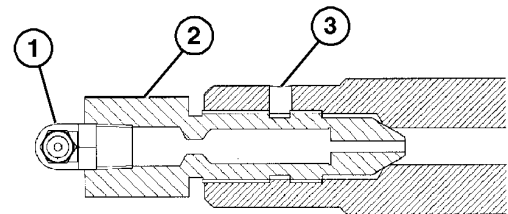
5. Insert two or three steel pipes (4) into gaps among lower rollers, track frame, and rubber track. Rotate track slowly in reverse to lift track off idler. Pry track off idler.
6. Install the rubber track on the sprocket first. Position the other end of the rubber track on the front idler.
7. While rotating the sprocket in reverse, push on the rubber track to force it on the idler.

1— Grease Fitting  
2— Valve

3— Bleed Hole  
4— Steel Pipe (2 or 3 used)

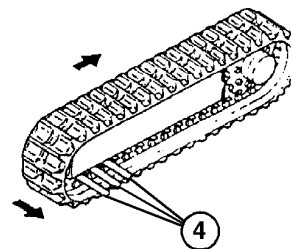


Machine Position



T204989

Track Adjuster



T204991

Track Direction

Continued on next page

JS93577,000005C -19-18DEC14-1/2

TX1127722 —UN—07DEC12

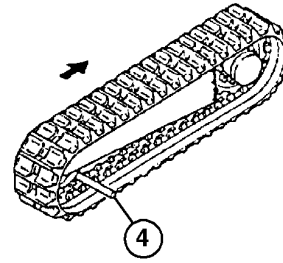
T204989 —UN—30NOV04

T204991 —UN—30NOV04

### Installing Rubber Track

1. Insert a steel pipe (4) into gaps among lower rollers, track frame, and rubber track and rotate slowly in reverse to force the rubber track onto the idler.
2. Check that the rubber track is correctly engaged with the sprocket and idler.
3. Adjust track sag. See Adjust Track Sag. (Section 3-3.)
4. Repeat check on other side of machine.

4—Steel Pipe



T204992

Rubber Track Installation

JS93577,000005C -19-18DEC14-2/2

T204992—UN—30NOV04

### Converting the Track

The rubber track uses a different track adjuster than that used for the steel track.

**CAUTION:** Prevent possible injury from high-pressure grease. **DO NOT** attempt to

**disassemble the track adjuster before converting the track. See your authorized dealer.**

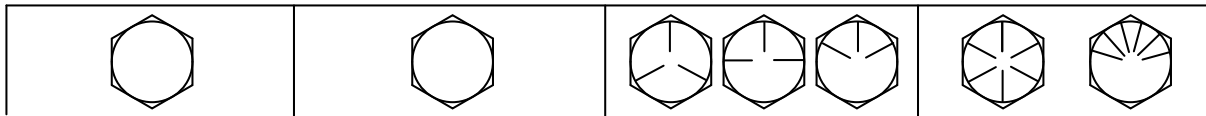
Change the track adjuster whenever converting the track. See your authorized dealer for correct track adjuster.

CED, TX14740, 6459 -19-18APR06-1/1



## Unified Inch Bolt and Screw Torque Values

TS1671 —UN—01MAY03



Bolt or Screw Size	SAE Grade 1				SAE Grade 2 <sup>a</sup>				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Lubricated <sup>b</sup>		Dry <sup>c</sup>		Lubricated <sup>b</sup>		Dry <sup>c</sup>		Lubricated <sup>b</sup>		Dry <sup>c</sup>		Lubricated <sup>b</sup>		Dry <sup>c</sup>	
	N-m	lb.-in.	N-m	lb.-in.	N-m	lb.-in.	N-m	lb.-in.	N-m	lb.-in.	N-m	lb.-in.	N-m	lb.-in.	N-m	lb.-in.
1/4	3.7	33	4.7	42	6	53	7.5	66	9.5	84	12	106	13.5	120	17	150
													N-m	lb.-ft.	N-m	lb.-ft.
5/16	7.7	68	9.8	86	12	106	15.5	137	19.5	172	25	221	28	20.5	35	26
									N-m	lb.-ft.	N-m	lb.-ft.				
3/8	13.5	120	17.5	155	22	194	27	240	35	26	44	32.5	49	36	63	46
			N-m	lb.-ft.	N-m	lb.-ft.	N-m	lb.-ft.								
7/16	22	194	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
	N-m	lb.-ft.														
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	305	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For plastic insert or crimped steel type lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application. Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Replace fasteners with the same or higher grade. If higher grade fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

<sup>a</sup>Grade 2 applies for hex cap screws (not hex bolts) up to 6 in. (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

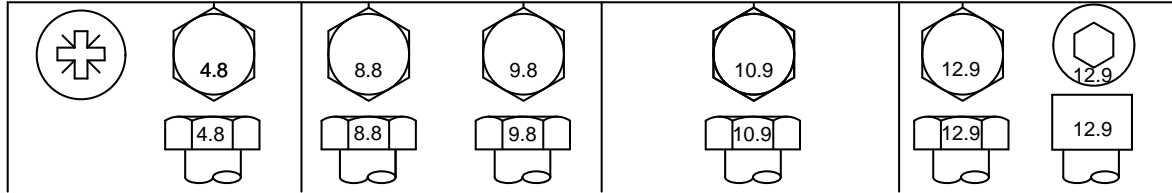
<sup>b</sup>"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

<sup>c</sup>"Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B, F13E or F13H zinc flake coating.

DX,TORQ1 -19-12JAN11-1/1

### Metric Bolt and Screw Torque Values

TS1670 —UN—01MAY03



Bolt or Screw Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated <sup>a</sup>		Dry <sup>b</sup>		Lubricated <sup>a</sup>		Dry <sup>b</sup>		Lubricated <sup>a</sup>		Dry <sup>b</sup>		Lubricated <sup>a</sup>		Dry <sup>b</sup>	
	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.
M6	4.7	42	6	53	8.9	79	11.3	100	13	115	16.5	146	15.5	137	19.5	172
M8	11.5	102	14.5	128	22	194	27.5	243	N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.
									32	23.5	40	29.5	37	27.5	47	35
M10	23	204	29	21	43	32	55	40	63	46	80	59	75	55	95	70
	N·m	lb.-ft.														
M12	40	29.5	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	46	80	59	120	88	150	110	175	130	220	165	205	150	260	190
M16	100	74	125	92	190	140	240	175	275	200	350	255	320	235	400	300
M18	135	100	170	125	265	195	330	245	375	275	475	350	440	325	560	410
M20	190	140	245	180	375	275	475	350	530	390	675	500	625	460	790	580
M22	265	195	330	245	510	375	650	480	725	535	920	680	850	625	1080	800
M24	330	245	425	315	650	480	820	600	920	680	1150	850	1080	800	1350	1000
M27	490	360	625	460	950	700	1200	885	1350	1000	1700	1250	1580	1160	2000	1475
M30	660	490	850	625	1290	950	1630	1200	1850	1350	2300	1700	2140	1580	2700	2000
M33	900	665	1150	850	1750	1300	2200	1625	2500	1850	3150	2325	2900	2150	3700	2730
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2770	4750	3500

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

<sup>a</sup>"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20

and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

<sup>b</sup>"Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.

DX,TORQ2 -19-12JAN11-1/1

# Miscellaneous—Operational Checkout

## Operational Checkout

This procedure is used to check operation of machine. It is designed so you can do a walk around inspection, check machine operation, and perform specific checks from the operator's seat.

If there is a problem with machine, diagnostic information in this checkout will help pinpoint the probable cause. This information may allow you to perform a simple adjustment to correct the problem. Use the table of contents to help find adjustment procedures.

A location will be required which is level and has adequate space to complete checks. No tools or equipment are needed to perform checkout.

Complete necessary visual checks (oil levels, oil condition, external leaks, loose hardware, linkage, wiring) prior to doing checkout. The machine must be at operating temperature for many of the checks.

Read each check completely before performing. If no problem is found, you will be instructed to go to the next check. If a problem is indicated, you will be referred to a procedure for adjustment, repair, or replacement.

The monitor can be used to perform diagnostic and operational checks. The monitor can display engine speed, pressures, and diagnostic trouble codes (DTCs).

KR46761,000080C -19-26APR13-1/45

## Diagnostic Trouble Code Check

KR46761,000080C -19-26APR13-2/45

### Display and Clear Trouble Codes

Always check for diagnostic trouble codes and correct them before performing operational checkout.

Diagnostic trouble codes can be displayed by using one of the following methods:

- Monitor
- Service ADVISOR™

*LOOK: Are diagnostic trouble codes present?*

*Service ADVISOR is a trademark of Deere & Company*

**YES:** Correct all diagnostic trouble codes before proceeding.

**NO:** Proceed with operational checkout.

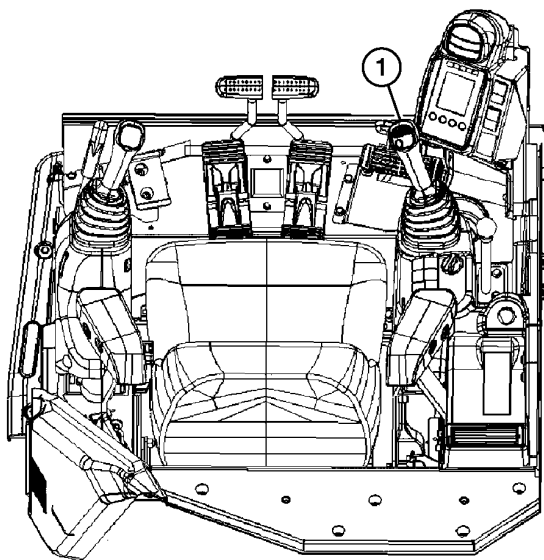
KR46761,000080C -19-26APR13-3/45

## Operational Checks—Key Switch Off, Engine Off Checks

Continued on next page

KR46761,000080C -19-26APR13-4/45

Horn Circuit Check



TX1126265 —UN—28NOV12

Horn Button

**1—Horn Button**

Key switch in OFF position.

Press horn button (1) on top of right pilot control lever.

*LISTEN:* Does horn sound?

**YES:** Go to next check.

**NO:** Check horn relay 5 A fuse (F1).

IF OK: See your authorized dealer.

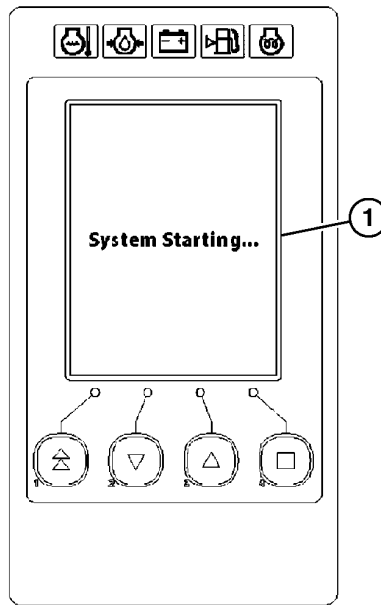
KR46761,000080C -19-26APR13-5/45

Operational Checks—Key Switch On, Engine Off Checks

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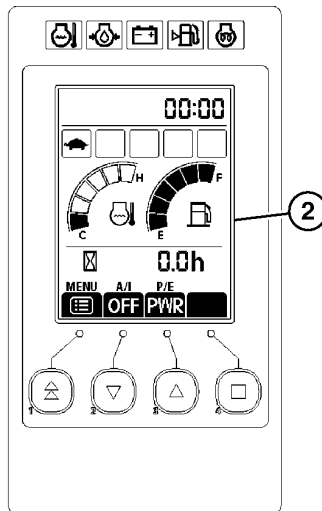
KR46761,000080C -19-26APR13-6/45

Monitor Start-Up Check



TX1126278 —UN—28NOV12

System Starting Screen



TX1126267 —UN—28NOV12

Default Screen

- 1— System Starting Screen
- 2— Default Screen

When the key switch is turned to the ON position, the system starting screen (1) displays for 2 seconds and then default screen (2) is displayed.

Turn key switch to ON position.

*LOOK: Does monitor display system starting screen?*

*LOOK: Does default screen with hour meter appear after system starting screen disappears?*

**YES:** Go to next check.

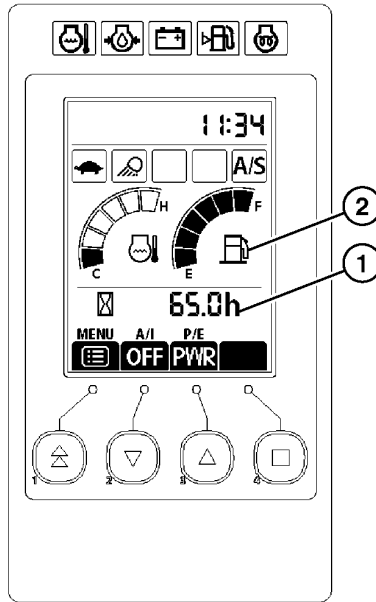
**NO:** Check monitor, radio 5 A fuse (F2).

**IF OK:** See your authorized dealer.

Continued on next page

KR46761,000080C -19-26APR13-7/45

**Hour Meter and Fuel Gauge Checks**



TX1126286 —UN—06DEC12

Monitor Panel

- 1— Hour Meter
- 2— Fuel Gauge

Turn key switch to ON position and wait until default screen is displayed.

*LOOK: Does hour meter (1) display machine hours?*

*LOOK: Does fuel gauge (2) display correct fuel level?*

**YES:** Go to next check.

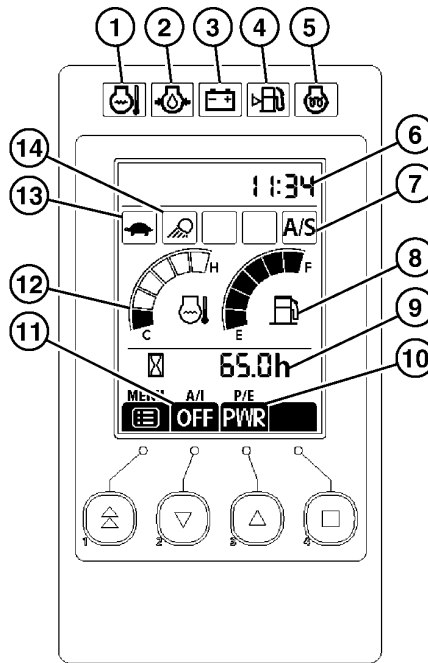
**NO:** Check monitor, radio 5 A fuse (F2).

IF OK: See your authorized dealer.

Continued on next page

KR46761,000080C -19-26APR13-8/45

Monitor and Gauges Checks



TX1126288 —UN—06DEC12

Default Screen

- 1— Overheat Indicator
- 2— Engine Oil Pressure Indicator
- 3— Alternator Indicator
- 4— Fuel Level Indicator
- 5— Engine Preheat Indicator
- 6— Time Indicator
- 7— Auto-Shutdown Indicator
- 8— Fuel Gauge
- 9— Hour Meter
- 10— Power Mode Indicator
- 11— Auto-Idle Mode Indicator
- 12— Engine Coolant Temperature Gauge
- 13— Travel Speed Indicator
- 14— Work Light Indicator

**IMPORTANT:** Prevent possible engine damage. Glow plugs are automatically controlled by the engine controller when the key is turned ON. Do not start the engine until the engine preheat indicator (5) disappears on the monitor. Indicator will not appear if ambient air temperature is above 0°C (32°F).

**NOTE:** If engine coolant temperature is below 30°C (86°F) engine temperature gauge needle may not move.

Turn key switch to ON position.

**LOOK:** Does engine coolant temperature gauge (12) display correct engine coolant temperature?

**LOOK:** Does fuel gauge (8) display correct fuel level?

**LOOK:** Does hour meter (9) display machine hours?

**LOOK:** Does travel speed indicator (13) display correct travel mode?

**LOOK:** Does power mode indicator (10) display correct power mode?

**LOOK:** Does engine preheat indicator (5) appear on monitor and then disappear after glow plugs reach specific temperature?

**YES:** Go to next check.

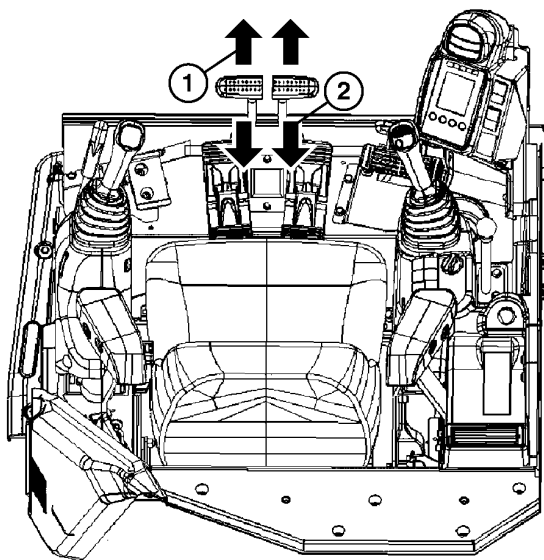
**NO:** Monitor does not turn ON. Check monitor, radio 5 A fuse (F2).

**IF OK:** See your authorized dealer.

Continued on next page

KR46761,000080C -19-26APR13-9/45

**Travel Lever and Pedal  
Neutral Checks**



TX1126525 —UN—06DEC12

*Travel Levers and Pedals*

- 1— Forward**
- 2— Rearward**

Push both travel levers and pedals forward (1), then release.

Pull both travel levers and pedals rearward (2), then release.

*FEEL:* Do levers and pedals require equal effort to operate in forward and reverse?

*LOOK:* Do levers and pedals return to neutral at the same time when released?

**YES:** Go to next check.

**NO:** See your authorized dealer.

Continued on next page

KR46761,000080C -19-26APR13-10/45



Light Circuit Checks



TX1127524A —UN—06DEC12

Right Switch Panel

- 1— Work Light Switch
- 3— Travel Speed Switch
- 4— Engine Speed Dial

Press work light switch (1) to the ON position.

*LOOK: Is work light indicator illuminated on monitor panel and are machine work lights on?*

*LOOK: Does switch panel illuminate?*

*LOOK: Do machine work lights stay on and switch panel stay illuminated?*

**YES:** Go to next check.

**NO:** Check work light relay 25 A fuse (F3).

IF OK: See your authorized dealer.

Continued on next page

KR46761,000080C -19-26APR13-11/45

Windshield Wiper Control  
Check—Cab Only



TX1126274A —UN—29NOV12

Right Switch Panel

- 1— Work Light Switch
- 2— Windshield Wiper and Washer Switch
- 3— Travel Speed Switch
- 4— Engine Speed Dial

Turn windshield wiper and washer switch (2) to center position.

*LOOK:* Does wiper operate continuously?

Turn windshield wiper and washer switch to OFF position.

*LOOK:* Does wiper arm stop?

**YES:** Go to next check.

**NO:** Check windshield wiper 20 A fuse (F13) and radio, wiper, washer switch 10 A fuse (F8).

**IF OK:** See your authorized dealer.

Continued on next page

KR46761,000080C -19-26APR13-12/45

Windshield Washer  
Control Check—Cab Only



TX1126274A —UN—29NOV12

Right Switch Panel

- 1— Work Light Switch
- 2— Windshield Wiper and Washer Switch
- 3— Travel Speed Switch
- 4— Engine Speed Dial

**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.

Press and hold windshield wiper and washer switch (2) to washer position.

**LOOK:** Is washer fluid supplied to windshield?

**YES:** Go to next check.

**NO:** Check washer fluid level. See Check Washer Fluid Level. (Section 3-2.)

**NO:** Check windshield wiper 20 A fuse (F13) and radio, wiper, washer switch 10 A fuse (F8).

IF OK: See your authorized dealer.

Continued on next page

KR46761,000080C -19-26APR13-13/45

**Windshield Wiper Circuit  
Check—Cab Only**

*NOTE: The wiper cannot operate with the upper front window open. The washer can operate with the upper front window open. When closing window, check that window upper left corner makes good contact with the cab.*



TX1126274A —UN—29NOV12

*Right Switch Panel*

- 1—Work Light Switch**
- 2—Windshield Wiper and Washer Switch**
- 3—Travel Speed Switch**
- 4—Engine Speed Dial**

Raise upper front window and lock in open position. See Front (Secondary Exit) Window—If Equipped. (Section 2-1.)

Press windshield wiper and washer switch (2) to center position.

*LISTEN: Does wiper circuit click?*

*LOOK: Does wiper remain stationary in park position?*

**YES:** Go to next check.

**NO:** Check windshield wiper 20 A fuse (F13) and radio, wiper, washer switch 10 A fuse (F8).

IF OK: See your authorized dealer.

Continued on next page

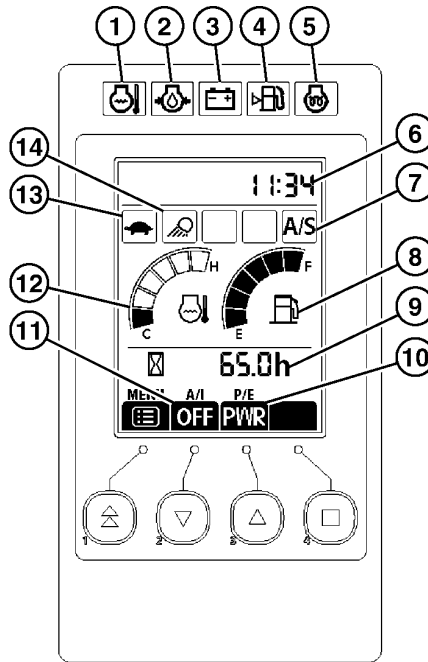
KR46761,000080C -19-26APR13-14/45

**Engine Preheat Circuit Check**

**IMPORTANT:** Prevent possible engine damage. Glow plugs are automatically controlled by the engine controller when the key is turned ON. Do not start the engine until the engine preheat indicator (5) disappears on the monitor. Indicator will not appear if ambient air temperature is above 0°C (32°F).

**YES:** Go to next check.

**NO:** Check glow plug 60 A fuse (F62).



TX1126288 —UN—06DEC12

Monitor Screen

- 1— Overheat Indicator
- 2— Engine Oil Pressure Indicator
- 3— Alternator Indicator
- 4— Fuel Level Indicator
- 5— Engine Preheat Indicator
- 6— Time Indicator
- 7— Auto-Shutdown Indicator
- 8— Fuel Gauge
- 9— Hour Meter
- 10— Power Mode Indicator
- 11— Auto-Idle Mode Indicator
- 12— Coolant Gauge
- 13— Travel Speed Indicator
- 14— Work Light Indicator

Turn key switch to the ON position.

**LOOK:** Does engine preheat indicator (5) appear on monitor and then disappear after glow plugs reach specific temperature?

IF OK: See your authorized dealer.

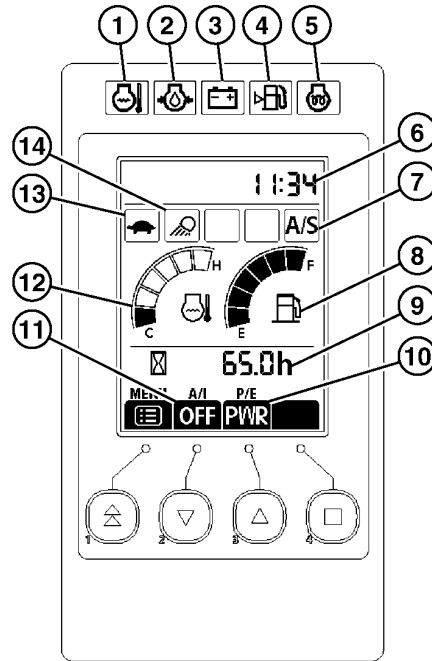
KR46761,000080C -19-26APR13-15/45

**Operational Checks—Key Switch On, Engine On Checks**

Continued on next page

KR46761,000080C -19-26APR13-16/45

Monitor and Gauge  
Circuit Checks



TX1126288 —UN—06DEC12

Monitor Screen

- 1— Overheat Indicator
- 2— Engine Oil Pressure Indicator
- 3— Alternator Indicator
- 4— Fuel Level Indicator
- 5— Engine Preheat Indicator
- 6— Time Indicator
- 7— Auto-Shutdown Indicator
- 8— Fuel Gauge
- 9— Hour Meter
- 10— Power Mode Indicator
- 11— Auto-Idle Mode Indicator
- 12— Engine Coolant Temperature Gauge
- 13— Travel Speed Indicator
- 14— Work Light Indicator

**IMPORTANT:** Avoid engine damage. If engine oil pressure indicator (2) comes on after engine starts. Turn off machine immediately.

Start engine.

*LOOK:* Do all alarm indicators remain off after engine starts?

*LOOK:* Does engine coolant temperature gauge (12) display correct engine coolant temperature?

*LOOK:* Does fuel gauge (8) display correct fuel level?

**YES:** Go to next check.

**NO:** Engine oil pressure indicator. Immediately stop engine and check engine oil level. See Check Engine Oil Level. (Section 3-4.)

**NO:** Alternator alarm indicator displayed. Check alternator drive belt.

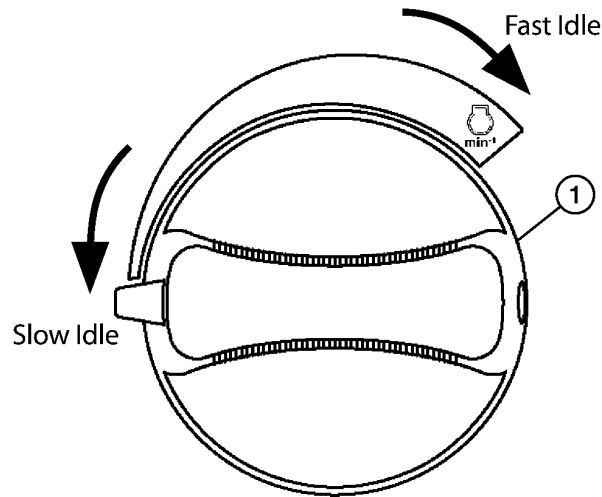
See Check Starter and Alternator. (Section 3-10.)

IF OK: See your authorized dealer.

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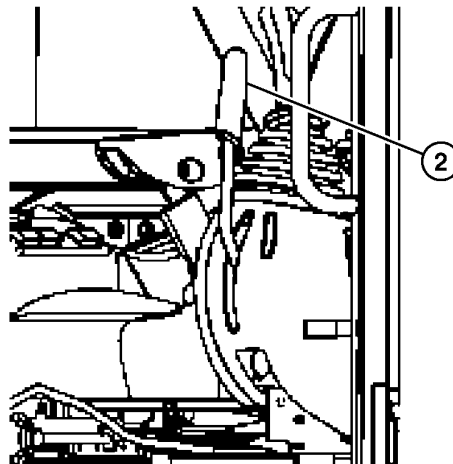
KR46761,000080C -19-26APR13-17/45

**Pilot Shutoff Circuit Check**



TX1126347 —UN—29NOV12

Engine Speed Dial



TX1126346 —UN—29NOV12

Pilot Shutoff Lever (locked position shown)

- 1— Engine Speed Dial
- 2— Pilot Shutoff Lever

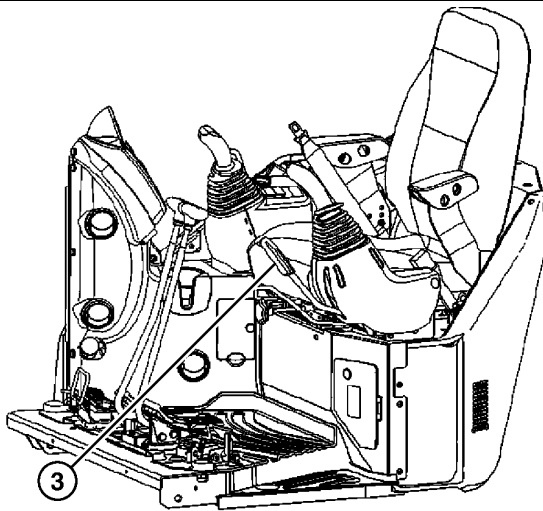
**CAUTION:** Avoid possible injury. Machine may move during this check. Make sure area is clear and large enough to operate all machine functions.

Turn engine speed dial (1) to slow idle position.  
Place pilot shutoff lever (2) in locked (UP) position.  
Slowly actuate dig and travel functions.

**LOOK:** Do dig and travel functions operate?

**YES:** See your authorized dealer.

**NO:** Continue check.



TX1126357 —UN—28NOV12

*Pilot Shutoff Lever (unlocked position shown)*

**3— Pilot Shutoff Lever**

Place pilot shutoff lever (3) in unlocked (DOWN) position.

Slowly actuate dig and travel functions.

*LOOK: Do dig and travel functions operate?*

**YES:** Go to next check.

**NO:** See your authorized dealer.

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KR46761,000080C -19-26APR13-19/45

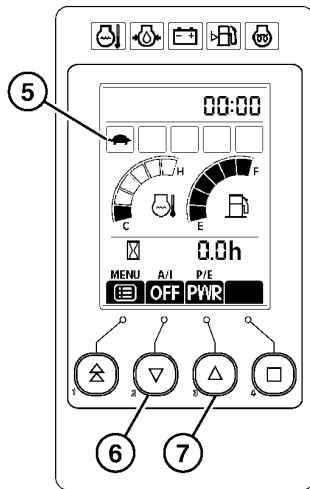


Engine Speed Dial Check



TX1127524A —UN—06DEC12

Right Switch Panel



TX1126360 —UN—29NOV12

Monitor

- 1— Work Light Switch
- 2— Travel Speed Switch
- 3— Engine Speed Dial
- 4— Engine Speed Dial
- 5— Travel Speed Indicator
- 6— Auto-Idle Button
- 7— Power Mode Button

Press auto-idle button (6) until A/I OFF is displayed on monitor.

Place pilot shutoff lever in locked (UP) position.

Turn engine speed dial (4) to fast idle position.

*LISTEN: Does engine speed increase?*

Turn engine speed dial to slow idle position.

*LISTEN: Does engine speed decrease?*

**YES:** Go to next check.

**NO:** Check monitor, radio 5 A fuse (F2).

IF OK: See your authorized dealer.

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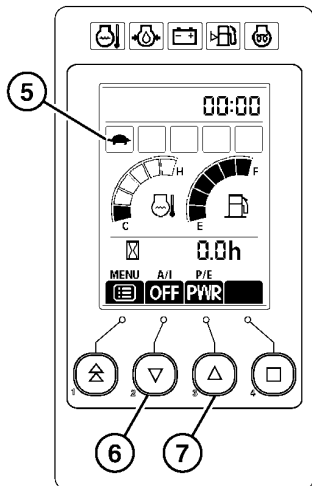
KR46761,000080C -19-26APR13-20/45

**ECO (economy) Mode  
and PWR (power) Mode  
Checks**



TX1127524A —UN—06DEC12

Right Switch Panel



TX1126360 —UN—29NOV12

Power Mode

- 1— Work Light Switch
- 3— Travel Speed Switch
- 4— Engine Speed Dial
- 5— Travel Speed Indicator
- 6— Auto-Idle Button
- 7— Power Mode Button

Press power mode button (7) until PWR (power) mode is displayed on monitor.

Press auto-idle button (6) until A/I OFF is displayed on monitor.

Turn engine speed dial (4) to fast idle position.

Press power mode button until ECO (economy) mode is displayed on monitor.

*LOOK/LISTEN: Does engine speed decrease?*

Press power mode button until PWR (power) mode is displayed on monitor.

*LOOK/LISTEN: Does engine speed increase?*

**YES:** Go to next check.

**NO:** See your authorized dealer.

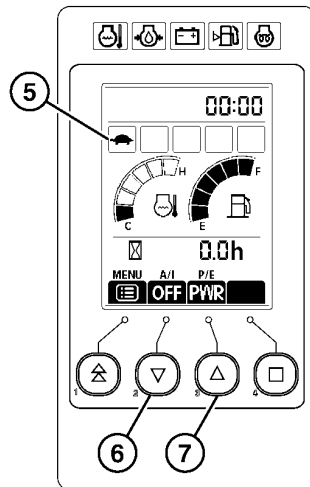
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KR46761,000080C -19-26APR13-21/45

Auto-Idle Circuit Check



TX1127524A —UN—06DEC12



TX1126360 —UN—29NOV12

Power Mode

- 1— Work Light Switch
- 3— Travel Speed Switch
- 4— Engine Speed Dial
- 5— Travel Speed Indicator
- 6— Auto-Idle Button
- 7— Power Mode Button

Turn engine speed dial (4) to fast idle position.

Press power mode button (7) until PWR (power) mode is displayed on monitor.

Press auto-idle button (6) until A/I OFF is displayed on monitor.

Place pilot shutoff lever in unlocked (DOWN) position.

Press auto-idle button until A/I ON is displayed on monitor.

*LOOK/LISTEN: Does engine speed decrease after 4—6 seconds?*

**⚠ CAUTION: Prevent possible injury from unexpected machine movement. Clear all persons from the area before operating machine.**

Continued on next page

KR46761,000080C -19-26APR13-22/45

Miscellaneous—Operational Checkout

Slowly actuate dig function.

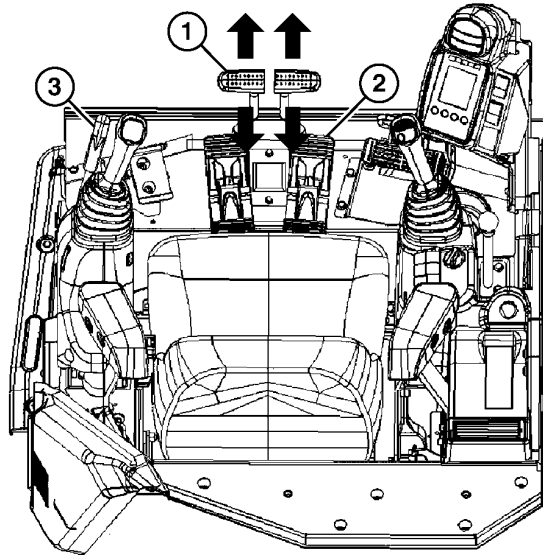
*LOOK/LISTEN:* Does engine speed return to fast idle?

**YES:** Go to next check.

**NO:** See your authorized dealer.

KR46761,000080C -19-26APR13-23/45

Travel Alarm Circuit Check



TX1126368 —UN—28NOV12

*Travel Control Levers and Pedals*

- 1— Travel Lever (2 used)
- 2— Travel Pedal (2 used)
- 3— Pilot Shutoff Lever

**CAUTION:** Prevent possible injury from unexpected machine movement.  
Clear all persons from the area before operating machine.

Place pilot shutoff lever (3) in unlocked (DOWN) position.

Push travel levers or pedals forward.

*LISTEN:* Does travel alarm sound?

Push travel pedals or pull levers rearward.

*LISTEN:* Does travel alarm sound?

**YES:** Go to next check.

**NO:** Check travel alarm/auxiliary power 10 A fuse (F15).

IF OK: See your authorized dealer.

Continued on next page

KR46761,000080C -19-26APR13-24/45

**Travel Alarm Cancel  
Switch Circuit Check**



TX1126370A —UN—28NOV12

*Travel Alarm Cancel Switch*

- 1— Monitor**
- 2— Travel Alarm Cancel Switch**

**⚠ CAUTION: Prevent possible injury from unexpected machine movement.  
Clear all persons from the area before operating machine.**

*NOTE: Travel alarm must operate for this check.*

Place pilot shutoff lever in unlocked (DOWN) position.

Push travel pedals or levers and allow travel alarm to operate for a minimum of 12 seconds.

*LISTEN: Does travel alarm sound?*

While continuing travel, push travel alarm cancel switch (2).

*LISTEN: Does travel alarm stop sounding?*

**YES:** Go to next check.

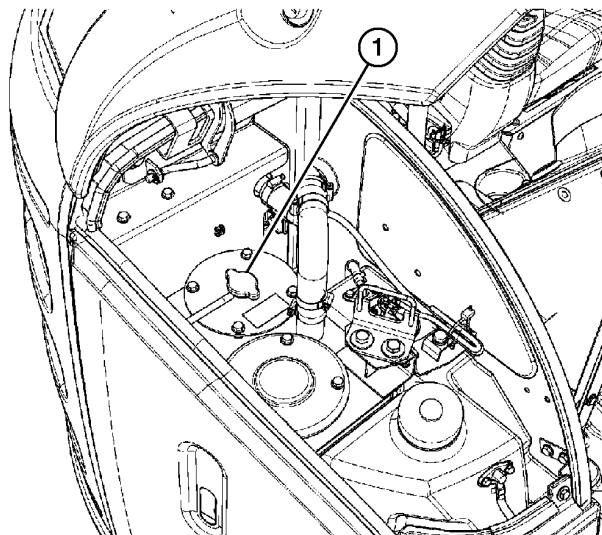
**NO:** Check travel alarm/auxiliary power 10 A fuse (F15).

IF OK: See your authorized dealer.

Continued on next page

KR46761,000080C -19-26APR13-25/45

**Hydraulic Oil Tank  
Pressurization Check**



TX1126372 —UN—28NOV12

*Hydraulic Oil Tank*

**1—Hydraulic Oil Tank Fill Cap**

**IMPORTANT:** The pressurized oil tank creates pressure at the inlet to the hydraulic pumps. If tank cover does not seal, hydraulic pumps could cavitate and be damaged.

Raise boom to full height, then lower boom to ground.

Slowly loosen hydraulic oil tank fill cap (1) until air is heard. Do not remove cap completely.

*LISTEN:* Is air heard escaping from the hydraulic oil tank fill cap on hydraulic oil tank?

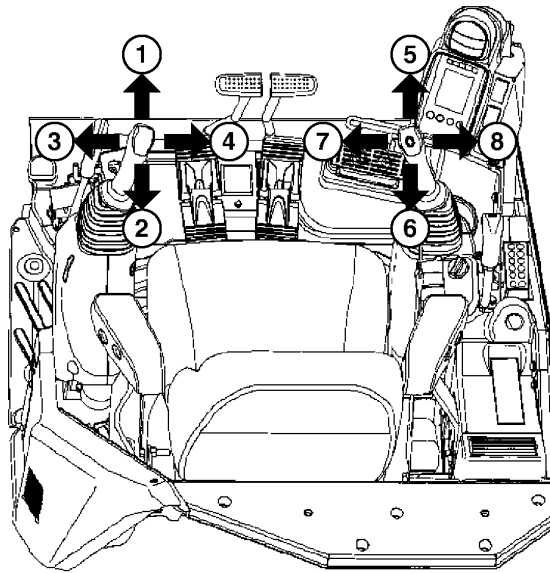
**YES:** Tighten hydraulic oil tank cap and go to next check.

**NO:** Replace hydraulic oil tank fill cap.

Continued on next page

KR46761,000080C -19-26APR13-26/45

**Pilot Control Pattern  
Check—ISO Excavator  
Pattern**



TX1126384 —UN—28NOV12

*Excavator Control Pattern*

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

**⚠ CAUTION:** Prevent possible injury from unexpected machine movement. Clear all persons from the area before operating machine.

Turn engine speed dial to slow idle position.

Place pilot shutoff lever in unlocked (DOWN) position.

Slowly move hydraulic levers to all positions.

*LOOK:* Do bucket, boom, arm, and swing move according to pattern?

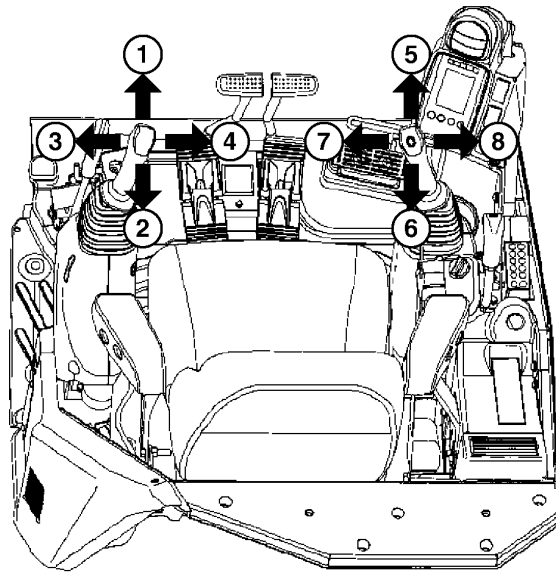
**YES:** Go to next check.

**NO:** See Control Lever Pattern Operation. (Section 2-3.)

Continued on next page

KR46761,000080C -19-26APR13-27/45

Pilot Control Pattern  
Check—SAE Backhoe  
Pattern



TX1126384 —UN—28NOV12

Backhoe Control Pattern

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

**CAUTION:** Prevent possible injury from unexpected machine movement.  
Clear all persons from the area before operating machine.

Turn engine speed dial to slow idle position.

Place pilot shutoff lever in unlocked (DOWN) position.

Slowly move hydraulic levers to all positions.

*LOOK:* Do bucket, boom, arm, and swing move according to pattern?

**YES:** Go to next check.

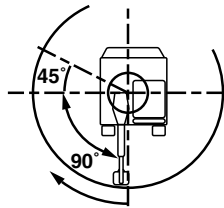
**NO:** See Control Lever  
Pattern Operation. (Section  
2-3.)

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KR46761,000080C -19-26APR13-28/45

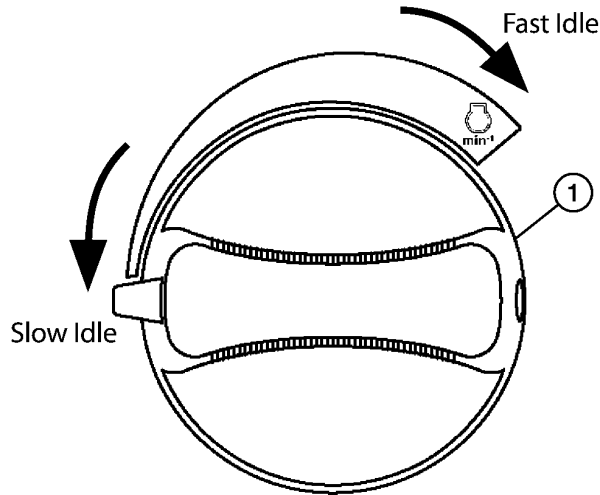


**Swing Dynamic Braking Check**



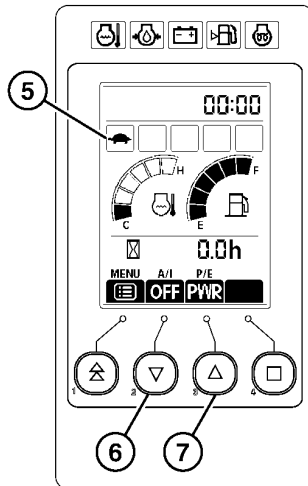
TX1095482 —UN—28JUN13

Swing Dynamic Braking



TX1126347 —UN—29NOV12

Engine Speed Dial



TX1126360 —UN—29NOV12

Monitor

- 1— Engine Speed Dial
- 5— Travel Mode Indicator
- 6— Auto-Idle Button
- 7— Power Mode Button

**CAUTION:** Avoid possible injury. Make sure area is clear and large enough to swing extended arm and bucket. Machine must be on level ground.

Position upperstructure with boom to the front.

Move arm to the extended position, bucket to the retracted position, and bucket-to-arm pivot pin at same level as boom-to-frame pivot pin.

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KR46761,000080C -19-26APR13-29/45

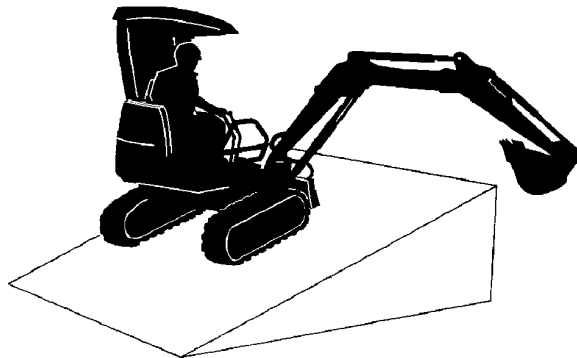
Miscellaneous—Operational Checkout

Turn engine speed dial (1) to fast idle position.  
 Press power mode button (7) until PWR (power) mode is displayed on monitor.  
 Fully actuate swing function. Swing clockwise 90 degrees and then release lever.  
*LOOK: Does upperstructure stop within 45 degrees (1/8 turn) or less after releasing lever?*  
 Position upperstructure with boom to the front.  
 Fully actuate swing function. Swing counterclockwise 90 degrees and then release lever.  
*LOOK: Does upperstructure stop within 45 degrees (1/8 turn) or less after releasing lever?*

**YES:** Go to next check.  
**NO:** See your authorized dealer.

KR46761,000080C -19-26APR13-30/45

**Swing Park Brake and Circuit Drift Checks**



TX1127528 —UN—06DEC12

*Machine Position*

Fill bucket with material to specification.

**Specification**

Material—Weight (approximate)..... 165 kg  
 365 lb.

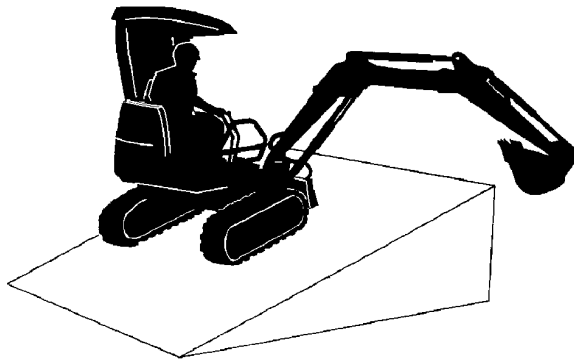
Position machine on a hillside with a slope of approximately 25%. If a hill is not available, raise one side of machine approximately 300 mm (1 ft) with the boom and then put a block under the track.  
 Move arm to the fully extended position.  
 Raise boom so arm-to-bucket pivot pin are the same height as boom-to-frame pivot pin.  
 Position upperstructure with cab over travel motors, perpendicular to tracks.  
 Turn engine speed dial to slow idle position.  
 Wait approximately 5 minutes with all functions in neutral.  
*NOTE: Function does not need to be fully actuated to disengage the swing park brake.*  
 Slowly actuate bucket load function to disengage the swing park brake. Do not hold the function over relief for more than 10 seconds.  
*LOOK: Does upperstructure hold position when swing park brake is engaged?*  
*LOOK: Does upperstructure move only slightly when swing park brake is disengaged?*  
 Swing upperstructure 180 degrees counterclockwise and repeat procedure.  
 Turn engine speed dial to slow idle position.  
 Wait approximately 5 minutes with all functions in neutral.  
 Slowly actuate bucket load function to disengage the swing park brake. Do not hold the function over relief for more than 10 seconds.  
*LOOK: Does upperstructure hold position when swing park brake is engaged?*  
*LOOK: Does upperstructure move only slightly when swing park brake is disengaged?*

**YES:** Go to next check.  
**NO:** See your authorized dealer.

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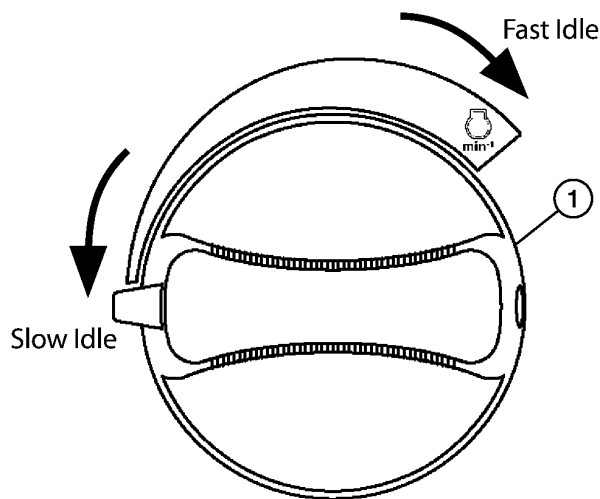
KR46761,000080C -19-26APR13-31/45

**Swing Power Check**



TX1127528 —UN—06DEC12

*Machine Position*



TX1126347 —UN—29NOV12

*Engine Speed Dial*

**1— Engine Speed Dial**

Fill bucket with material to specification.

**Specification**

Material —Weight (approximate)..... 165 kg  
 365 lb.

Position machine on a hillside with a slope of approximately 25%. If a hill is not available, raise one side of machine approximately 300 mm (1 ft.) with the boom and then put a block under the track.

Move arm to the fully extended position. Raise boom so arm-to-bucket pivot pin is the same height as boom-to-frame pivot pin.

Swing upperstructure clockwise so it is 90 degrees to the slope.

Turn engine speed dial (1) to fast idle position.

Actuate the swing function to swing uphill.

*LOOK: Does upperstructure swing uphill?*

Swing upperstructure 180 degrees counterclockwise and repeat procedure.

Turn engine speed dial to fast idle position.

Actuate the swing function to swing uphill.

*LOOK: Does upperstructure swing uphill?*

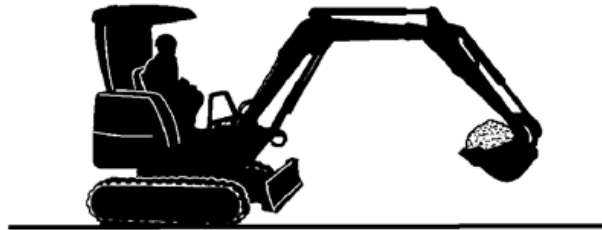
**YES:** Go to next check.

**NO:** See your authorized dealer.

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KR46761,000080C -19-26APR13-32/45

**Dig Function Drift Check**



TX1126392 —UN—28NOV12

*Dig Function Drift*

Fill bucket with material to specification.

**Specification**

Material —Weight (approximate)..... 165 kg  
 365 lb.

Position bucket at maximum reach with bucket pivot pin the same height as boom pivot pin.

Retract arm cylinder, then extend about 50 mm (2 in.).

Extend bucket cylinder, then retract about 50 mm (2 in.).

Fully retract blade cylinder.

Position boom to either full right or full left position for boom swing.

Stop engine.

Measure amount cylinders extend or retract in 5 minutes.

Measure distance from bottom of bucket to ground.

Compare measurements to specifications.

**Dig Function Drift Specifications—Specification**

Boom Cylinder—Drift.....	5 mm
	0.20 in.
Boom Swing Cylinder—Drift.....	3 mm
	0.12 in.
Blade Cylinder—Drift.....	3 mm
	0.12 in.
Arm Cylinder—Drift.....	8 mm
	0.31 in.
Bucket Cylinder—Drift.....	5 mm
	0.20 in.
Bottom of Bucket-To-Ground—Drift.....	100 mm
	4.0 in.

*LOOK: Is cylinder drift within specification?*

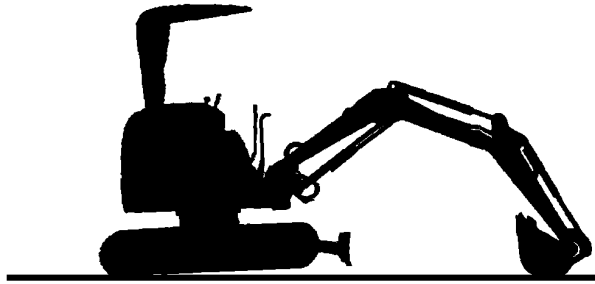
**YES:** Go to next check.

**NO:** See your authorized dealer.

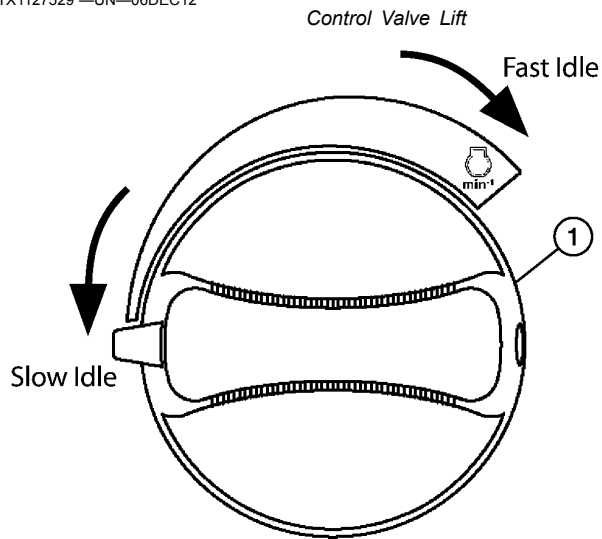
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KR46761,000080C -19-26APR13-33/45

**Control Valve Lift  
Check Test**



TX1127529 —UN—06DEC12



TX1126347 —UN—29NOV12

Engine Speed Dial

**1— Engine Speed Dial**

Turn engine speed dial (1) to slow idle position.

Position machine as shown.

Slowly lower boom, extend arm (retract cylinder), and dump bucket (retract cylinder).

*LOOK: Do functions move in opposite direction as pilot control levers are moved, then change direction as levers are moved farther?*

**YES:** See your authorized dealer.

**NO:** Go to next check.

Continued on next page

KR46761,000080C -19-26APR13-34/45

**Travel Speed Change Check**



TX1127524A —UN—06DEC12

*Right Switch Panel*

- 1— Work Light Switch**
- 3— Travel Speed Switch**
- 4— Engine Speed Dial**

Turn engine speed dial (4) to fast idle position.

Press travel speed switch (3) to slow speed (turtle) mode.

Actuate travel function to full speed.

Press travel speed switch to fast speed (rabbit) mode.

*LOOK: Does machine travel speed increase?*

Actuate a dig function and then return to neutral.

*LOOK: Does machine travel speed decrease and then increase as dig function is actuated and then released?*

Turn travel speed switch to slow speed (turtle) mode.

*LOOK: Does machine travel speed decrease?*

**YES:** Go to next check.

**NO:** Check travel solenoid 5 A fuse (F9) and travel speed relay 5 A fuse (F14).

IF OK: See your authorized dealer.

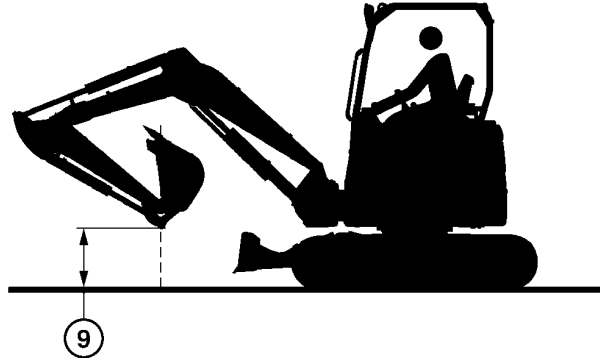
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KR46761,000080C -19-26APR13-35/45

**Travel System Tracking Check**

**⚠ CAUTION:** Prevent possible injury from unexpected machine movement. Clear all persons from the area before operating machine.

Warm hydraulic oil to operating temperature for this check.



TX1127597 —UN—06DEC12

*Machine Position*

**9— Bucket Height**

Fully extend arm cylinder and bucket cylinder.

Position boom so bucket height (9) is approximately 304 mm (12 in.) above ground.

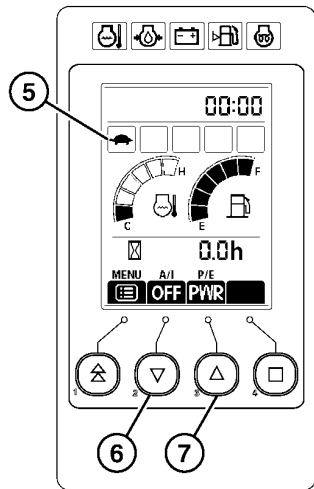


TX1127524A —UN—06DEC12

*Right Switch Panel*

Continued on next page

KR46761,000080C -19-26APR13-36/45



TX1126360 —UN—29NOV12

Monitor Panel

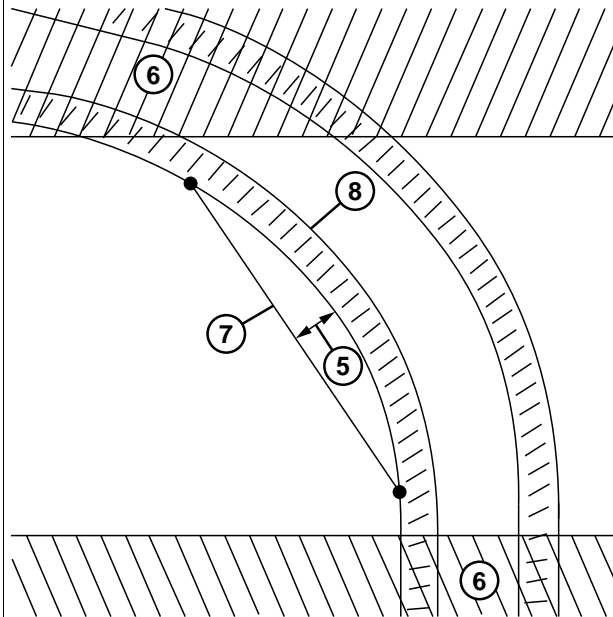
- 1— Work Light Switch
- 3— Travel Speed Switch
- 4— Engine Speed Dial
- 5— Travel Speed Indicator
- 6— Auto-Idle Button
- 7— Power Mode Button

Turn engine speed dial (4) to fast idle position.

Press auto-idle button (6) until A/I OFF is displayed on monitor.

Press travel speed switch (3) to fast speed (rabbit) mode.

Press power mode button (7) until PWR (power) is displayed on monitor.



TX1120481 —UN—17AUG12

Tracking Check

- 5— Distance of Mistrack
- 6— Acceleration and Deceleration Zone Approximately: 3—5 m (10—16 ft.)
- 7— Test Line Distance: 20 m (66 ft.)
- 8— Track Print

Operate machine at full travel forward speed on a flat and level surface approximately 30 m (99 ft.).

Continued on next page

KR46761,000080C -19-26APR13-37/45



Miscellaneous—Operational Checkout

**NOTE:** When machine mistracks right, hydraulic pump 1 circuit oil flow may be less than specification. When machine mistracks left, hydraulic pump 2 circuit oil flow may be less than specification.

Observe direction of mistrack.

Create a straight test line 20 m (66 ft.) (7) long between two points on track print (8).

Measure and record greatest distance of mistrack (5) between inside edge of track print and test line.

Repeat procedure in reverse travel.

**LOOK:** Is machine mistrack within specification?

**Specification**

Mistrack (steel track)—Distance.....	350 mm
	13.7 in.
Mistrack (rubber track)—Distance.....	200 mm
	7.8 in.

**YES:** Go to next check.

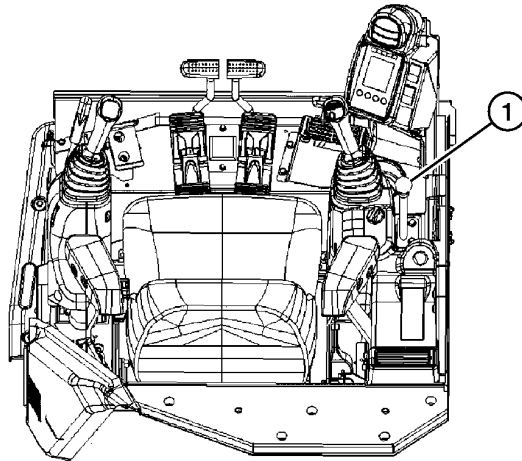
**NO:** Check track sag. See Check Track Sag—Rubber Track or Check Track Sag—Steel Track—If Equipped. (Section 3-4.)

IF OK: See your authorized dealer.

KR46761,000080C -19-26APR13-38/45

**Blade Function Check**

**CAUTION:** Prevent possible injury from unexpected machine movement. Clear all persons from the area before operating machine.



TX1126576 —UN—29NOV12

Blade Control Lever

**1—Blade Control Lever**

Run engine at slow idle.

Pull blade control lever (1) rearward.

**LOOK:** Does blade raise?

Release lever.

**LOOK:** Does lever return to neutral and the blade stop?

Push lever forward.

**LOOK:** Does blade lower?

Release lever.

**LOOK/FEEL:** Does lever return to neutral and the blade stop?

**YES:** Go to next check.

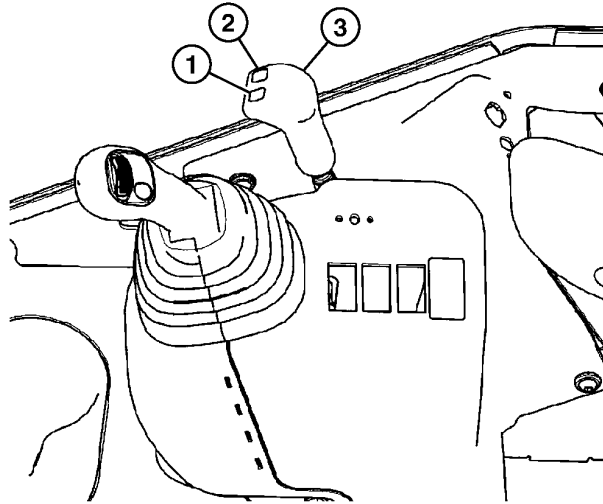
**NO:** See your authorized dealer.

Continued on next page

KR46761,000080C -19-26APR13-39/45

Angle Blade Check—If Equipped

**⚠ CAUTION:** Prevent possible injury from unexpected machine movement. Clear all persons from the area before operating machine.



TX1127527 —UN—06DEC12

Angle Blade Control

- 1— Angle Blade Switch (right)
- 2— Angle Blade Switch (left)
- 3— Blade Control Lever

Press angle blade switch (1).

*LOOK:* Does angle blade move to right position?

Press angle blade switch (2).

*LOOK:* Does angle blade move to left position?

**YES:** Go to next check.

**NO:** See your authorized dealer.

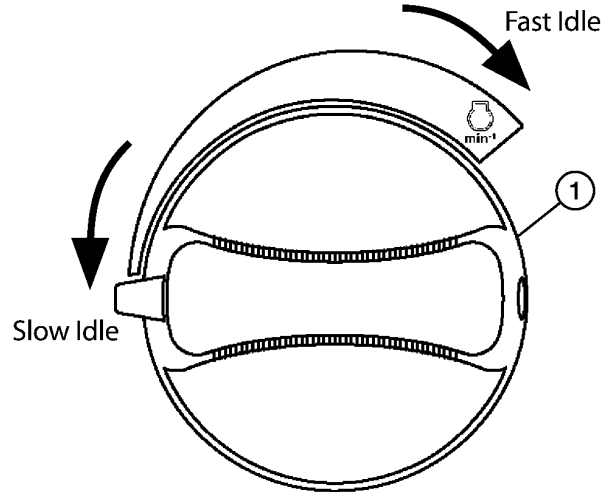
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KR46761,000080C -19-26APR13-40/45

Cycle Times Check

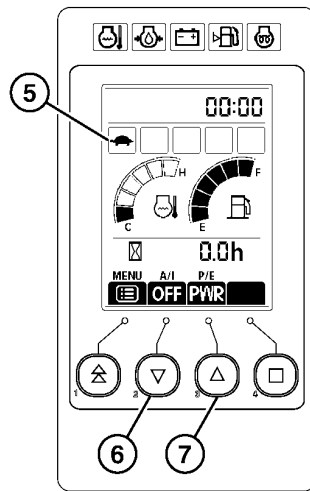
**CAUTION:** Prevent possible injury from unexpected machine movement. Clear all persons from the area before operating machine.

*NOTE:* Warm hydraulic oil to operating temperature for this check.



TX1126347 —UN—29NOV12

Engine Speed Dial



TX1126360 —UN—29NOV12

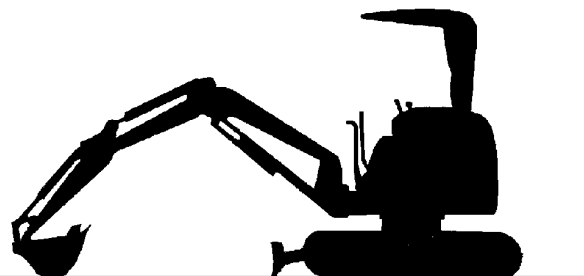
Monitor Panel

- 1— Engine Speed Dial
- 5— Travel Speed Indicator
- 6— Auto-Idle Mode Button
- 7— Power Mode Button

Turn engine speed dial (1) to fast idle position.

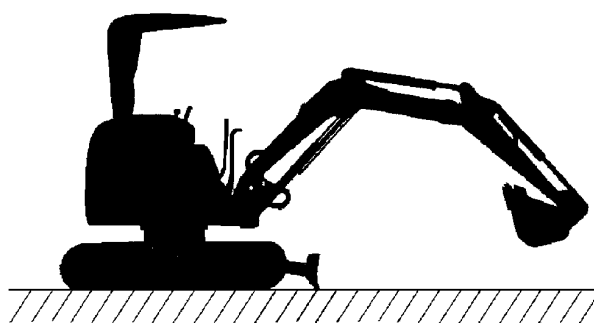
Press auto-idle button (6) until A/I OFF is displayed on monitor.

Press power mode button (7) until PWR (power) mode is displayed on monitor.



TX1127531 —UN—06DEC12

*Boom and Blade*



TX1127530 —UN—06DEC12

*Arm, Bucket, and Swing*

Move machine to position shown for each test.

Record cycle time for each function.

Continued on next page

KR46761,000080C -19-26APR13-42/45

**Cab—Specification**

Boom Raise (cylinder extend)—Cycle	
Time.....	2.3—2.9 sec.
Boom Lower (cylinder retract)—Cycle	
Time.....	2.0—2.6 sec.
Boom Swing (right)—Cycle Time.....	5.4—6.4 sec.
Boom Swing (left)—Cycle Time.....	7.2—8.2 sec.
Arm In (cylinder extend)—Cycle Time.....	3.0—3.6 sec.
Arm Out (cylinder retract)—Cycle Time.....	2.5—3.1 sec.
Bucket Load (cylinder extend)—Cycle	
Time.....	2.1—2.7 sec.
Bucket Dump (cylinder retract)—Cycle	
Time.....	1.3—1.9 sec.
Swing Left or Right, Three	
Revolutions—Cycle Time.....	18.3—21.3 sec.

**Canopy—Specification**

Boom Raise (cylinder extend)—Cycle	
Time.....	2.4—3.0 sec.
Boom Lower (cylinder retract)—Cycle	
Time.....	2.1—2.7 sec.
Boom Swing (right)—Cycle Time.....	5.7—6.7 sec.
Boom Swing (left)—Cycle Time.....	7.7—8.7 sec.
Arm In (cylinder extend)—Cycle Time.....	3.0—3.6 sec.
Arm Out (cylinder retract)—Cycle Time.....	2.5—3.1 sec.
Bucket Load (cylinder extend)—Cycle	
Time.....	2.1—2.7 sec.
Bucket Dump (cylinder retract)—Cycle	
Time.....	1.3—1.9 sec.
Swing Left or Right, Three	
Revolutions—Cycle Time.....	18.3—21.3 sec.

**Blade—Specification**

Blade Up (cylinder retract)—Cycle Time.....	1.6—2.6 sec.
Blade Down (cylinder extend)—Cycle	
Time.....	2.3—3.3 sec.
Angle Blade Swing Right (cylinder	
retract)—Cycle Time.....	1.5—2.5 sec.
Angle Blade Swing Left (cylinder	
extend)—Cycle Time.....	2.5—3.5 sec.

Continued on next page

KR46761,000080C -19-26APR13-43/45

**Steel Track—Specification**

Drive 20 m (65 ft.) (check in forward and reverse with travel speed switch in FAST position)—Cycle Time..... 15.6—18.6 sec.  
 Drive 20 m (65 ft.) (check in forward and reverse with travel speed switch in SLOW position)—Cycle Time..... 25.2—28.2 sec.  
 Track Raised for Three Revolutions (check in forward and reverse with travel mode switch in FAST position)—Cycle Time..... 10.0—13.0 sec.  
 Track Raised for Three Revolutions (check in forward and reverse with travel mode switch in SLOW position)—Cycle Time..... 16.4—19.4 sec.

**Rubber Track—Specification**

Drive 20 m (65 ft.) (check in forward and reverse with travel speed switch in FAST position)—Cycle Time..... 15.1—18.1 sec.  
 Drive 20 m (65 ft.) (check in forward and reverse with travel speed switch in SLOW position)—Cycle Time..... 24.4—27.4 sec.  
 Track Raised for Three Revolutions (check in forward and reverse with travel mode switch in FAST position)—Cycle Time..... 9.7—12.7 sec.  
 Track Raised for Three Revolutions (check in forward and reverse with travel mode switch in SLOW position)—Cycle Time..... 16.0—19.0 sec.

*LOOK: Does machine perform within specifications?*

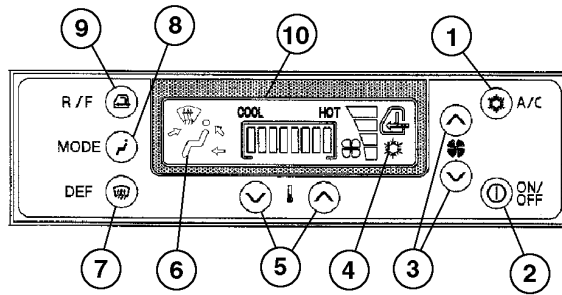
**YES:** Go to next check.

**NO:** See your authorized dealer.

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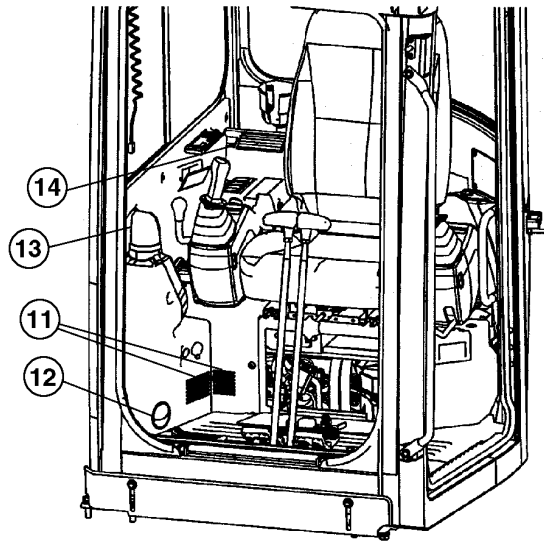
KR46761,000080C -19-26APR13-44/45

**Heater and Air Conditioning Circuit Check—Cab Only**



TX1040576 —UN—06MAY08

*Air Conditioner and Heater Control Panel*



TX1040577 —UN—06MAY08

*Air Conditioner and Heater Air Vents*

- 1— Air Conditioner Switch
- 2— Air Conditioner/Heater Control Power Switch
- 3— Blower Speed Switch
- 4— Air Conditioner Indicator
- 5— Temperature Control Switch
- 6— Vent Mode Indicator
- 7— Defroster Switch
- 8— Vent Mode Switch
- 9— Circulation and Fresh Air Mode Switch
- 10— Air Conditioner/Heater LCD Display
- 11— Foot Air Vent
- 12— Lower Front Air Vent
- 13— Upper Front Air Vent
- 14— Rear Air Vent

With engine running and at normal operating temperature.

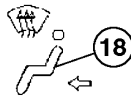
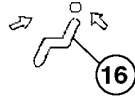
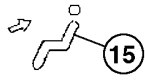
Push air conditioner/heater control power switch (2) ON.

*LOOK:* Does air conditioning/heater LCD display (10) light up?

Push the blower speed button (3) to increment through all four fan speeds.

*FEEL/LISTEN:* Does blower motor have four speeds?

Put blower speed to highest speed setting.



TX1041261 —UN—06MAY08

*Vent Mode Display*

- 15— Upper Front Air Vent (13)**
- 16— Upper Front and Rear Air Vent (13 and 14)**
- 17— All Air Vents (11—14)**
- 18— Foot and Lower Front Air Vent (11 and 12)**

Push vent mode switch (8) to upper front air vent (15) position.

*FEEL: Does air flow through the upper front vent?*

Push vent mode button again.

*FEEL: Does air flow through upper and rear vent?*

Push vent mode button again.

*FEEL: Does air flow through all vents (11—14)?*

Push vent mode button again.

*FEEL: Does air flow through lower and foot vent.*

Push temperature control switch (5) up arrow to for warm air.

*FEEL: Does warm air flow from vents?*

Push air conditioner switch (1) to ON position.

*LOOK: Does air conditioning indicator (4) come on?*

Push temperature control switch down arrow for cool air.

*FEEL: Does cool air flow from vents?*

**YES:** Operational checkout complete.

**NO:** Check air conditioner compressor/blower motor 25 A fuse (F7).

IF OK: See your authorized dealer.

KR46761,000080C -19-26APR13-46/45



## Miscellaneous—Troubleshooting

### Troubleshooting Procedure

*NOTE: Troubleshooting charts are arranged from the simplest to verify, to least likely, more difficult to verify. When diagnosing a problem, use all possible means to isolate the problem to a single component or system. Use the following steps to diagnose problems:*

*Step 1. Operational Checkout Procedure*

*Step 2. Troubleshooting Charts*

*Step 3. Adjustments*

*Step 4. See your authorized John Deere dealer.*

TX.TROUBLESHOOT -19-20JAN11-1/1

## Engine

Symptom	Problem	Solution
<b>Engine Cranks But Will Not Start Or Hard To Start</b>	No fuel	Add correct fuel. Bleed air.
	Incorrect fuel	Drain fuel tank and refill with correct fuel.
	Fuel filters restricted	Replace filters. Bleed air.
	Primary fuel filter and water separator restricted or not primed	Check primary fuel filter and water separator. Replace filter, prime filter, and bleed air from fuel system.
	Water in fuel tank	Check, drain, and refill.
	Low battery power	Charge or replace battery.
	Slow cranking speed (poor electrical connection)	Clean and tighten battery and starter connections.
	Incorrect engine oil	Drain crankcase and refill with correct oil.
	Fuel filter not installed correctly	Install new filter and O-ring. Ensure proper O-ring seal. Bleed air.
<b>Engine Will Not Crank</b>	Air filters restricted or dirty	Replace filter elements.
	Low battery power	Charge or replace battery.
	Corroded or loose battery connections	Clean battery terminals and connections.
<b>Engine Knocks, Runs Irregularly, Or Stops</b>	Fuse	Check MAIN RELAY 10 amp fuse (F4), START 5 amp fuse (F6), ENGINE 5 amp fuse (F16), PILOT SHUT OFF 5 amp (F17) and Engine Control Unit 30 amp fuse (F63).
	Air filters restricted or dirty	Replace filter elements.
	Fuel filters restricted	Replace filters. Bleed air. Clean fuel tank inlet screen.
	Air in fuel system	Bleed air from fuel system.
	Contaminated fuel	Drain fuel tank. Change primary fuel filter and water separator. Bleed air. Add clean fuel. Clean fuel tank inlet screen.
	Engine speed control system	See your authorized dealer.

Continued on next page

KR46761,00007FA -19-21DEC12-1/4

Symptom	Problem	Solution
<b>Excessive Fuel Consumption</b>	Fuel filter not installed correctly	Install new filter and O-ring. Ensure proper O-ring seal. Bleed air.
	Low crankcase oil level	Fill crankcase to proper oil level.
	Injection pump	See your authorized dealer.
	Air filters restricted or dirty	Replace filter elements.
	Poor fuel quality	Drain fuel and replace with quality fuel of the proper grade.
<b>Excessive Oil Consumption</b>	Leaks in fuel supply system	Locate source of leak and repair as required.
	Exhaust system restricted	See your authorized dealer.
	Poor fuel quality	Drain fuel and replace with quality fuel of the proper grade.
	Air filters restricted or dirty	Replace filter elements.
<b>Engine Idles Poorly</b>	Worn engine	See your authorized dealer.
	Poor fuel quality	Drain fuel and replace with quality fuel of the proper grade.
	Air in fuel system	Bleed air from fuel system.
	Air filters restricted or dirty	Replace filter elements.
	Fuel filters restricted	Replace filters. Bleed air.
	Engine speed control system	See your authorized dealer.
	Exhaust system restricted	See your authorized dealer.
	Fuel filter not installed correctly	Install new filter and O-ring. Ensure proper O-ring seal. Bleed air.
	Worn engine	See your authorized dealer.
	<b>Auto-Idle Does Not Work</b>	Idle is not above 1300 rpm
Auto-idle is off		Turn auto-idle to the A/I ON position.
Hydraulic functions operating		Release hydraulic functions for 10 seconds.
<b>Engine Not Developing Full Power</b>	Air filters restricted or dirty	Replace filter elements.

Continued on next page

KR46761,00007FA -19-21DEC12-2/4

*Miscellaneous—Troubleshooting*

Symptom	Problem	Solution
	Fuel filters restricted	Replace filters. Bleed air.
	Contaminated fuel	Drain fuel tank. Change primary fuel filter and water separator. Bleed air. Add clean fuel.
	Incorrect fuel	Drain fuel tank and refill with correct fuel.
	Fuel filter not installed correctly	Install new filter and O-ring. Ensure proper O-ring seal. Bleed air.
	Exhaust system restricted	See your authorized dealer.
	Worn engine	See your authorized dealer.
	Hydraulic issue	See your authorized dealer.
	Incorrect engine oil	Drain crankcase and refill with correct oil.
<b>Engine Oil Pressure Low</b>	Low crankcase oil level	Fill crankcase to proper oil level.
	Excessive oil temperature	See your authorized dealer.
	Incorrect engine oil	Drain crankcase and refill with correct oil.
	Worn engine	See your authorized dealer.
	Oil filter restricted	Replace filter.
<b>Engine Oil Pressure High</b>	Incorrect engine oil	Drain crankcase and refill with correct oil.
<b>Engine Coolant Temperature Above Normal</b>	Air filters restricted or dirty	Replace filter elements.
	Lack of coolant in cooling system	Fill cooling system to proper level.
	Radiator core and/or side screens dirty	Clean radiator as required.
	Engine overloaded	Reduce engine load.
	Low crankcase oil level	Fill crankcase to proper oil level.
	Loose recovery tank cap	Secure cap properly.
<b>Engine Emits Excessive Black Or Gray Exhaust Smoke</b>	Incorrect fuel	Drain fuel tank and refill with correct fuel.
	Restricted or dirty air intake or exhaust system	Clean air intake and exhaust system.

Continued on next page

KR46761,00007FA -19-21DEC12-3/4

Miscellaneous—Troubleshooting

Symptom	Problem	Solution
<b>Engine Emits Excessive White Exhaust Smoke</b>	Exhaust system is cracked or damaged	See your authorized dealer.
	Coolant temperature low	Check for proper thermostat temperature and operation. Replace if necessary.
	Incorrect fuel	Drain fuel tank and refill with correct fuel.
	Cold engine	Run engine until warm.
	Exhaust system is cracked or damaged	See your authorized dealer.

KR46761,00007FA -19-21DEC12-4/4

## Electrical System

Symptom	Problem	Solution
<b>No Electrical Functions</b>	Battery undercharged or dead	Recharge or replace.
	Fuse	Check Main 60 amp fuse (F61).
<b>Battery Undercharged</b>	Loose or corroded connections	Clean and tighten or replace battery.
<b>Battery Will Not Take A Charge</b>	Loose or corroded connections	Clean and tighten or replace battery.
	Weak battery	Replace both battery.
<b>Battery Uses Too Much Water</b>	Cracked battery case	Replace battery.
	High ambient temperature	Refill with distilled water and recharge battery.
<b>Cracked Battery Case</b>	No battery hold down clamp	Replace battery and install hold down clamp.
	Loose battery hold down clamp	Replace battery and tighten hold down clamp.
	Frozen battery	Replace battery. Keep battery fully charged in cold weather.
<b>Low Battery Output</b>	Low water level	Add distilled water and recharge battery.
	Dirty or wet battery top, causing discharge	Clean and wipe battery top dry.
	Corroded or loose battery cables	Clean and tighten battery cables.
	Broken battery post	Wiggle battery post by hand. If post wiggles or turns, replace battery.
<b>Starter Will Not Turn</b>	Battery undercharged or dead	Recharge or replace.
	Battery cables making poor connections	Clean and tighten connections.
	Starter	Repair or replace starter.
	Starter pinion jammed in flywheel gear	Repair or replace starter, or ring gear.
<b>Starter Turns But Will Not Crank Engine</b>	Starter	Repair or replace starter.
<b>Engine Cranks Slowly</b>	Battery cables damaged or broken internally	Inspect and replace cables.
	Battery or starter cable connections loose or corroded	Clean and tighten connections.
	Battery undercharged	Recharge or replace.

Continued on next page

KR46761,00007F7 -19-21DEC12-1/2

Miscellaneous—Troubleshooting

Symptom	Problem	Solution
	Starter	Repair or replace starter.
<b>Starter Continues To Run After Engine Starts</b>	Starter	Repair or replace starter.
	Key switch malfunction	Disconnect battery ground. Replace key switch.
	Starter relay	Disconnect battery ground. Replace starter relay.
<b>Charging Indicator Light On, Engine Running</b>	Loose or corroded electrical connections on battery, ground strap, starter, or alternator	Inspect, clean, or tighten electrical connections.
	Worn drive belt	Replace belt.
<b>Noisy Alternator</b>	Worn drive belt	Replace belt.
	Worn pulleys	Replace pulleys and belt.
	Pulley misaligned	Adjust alternator mount.
	Alternator bearing	Loosen alternator belts. Turn pulley by hand. If any roughness is felt, repair alternator.
<b>No Monitor Panel Indicators Or Gauges Work</b>	Fuse	Check MONITOR B, RADIO 5 amp fuse (F2), MONITOR ACC 5 amp fuse (F11), and Main 60 amp fuse (F61).
<b>No Switch Panel Switches Or Engine Speed Dial Work</b>	Fuse	Check TRAVEL ILLUMI 5 amp fuse (F9).
<b>Angle Blade Drift Too Great</b>	Angle blade moves when blade is not operated	Check lever switches.
		Check relays and fuses.
		Check solenoids.
<b>Angle Blade Not Operated</b>	One side of angle blade does not work	Check lever switches.
		Check relays and fuses.
		Check solenoids.
	Fuse	Check OPTION, ALARM 10 amp fuse (F15).

KR46761.00007F7 -19-21DEC12-2/2

**Hydraulic System**

Symptom	Problem	Solution
<b>No Hydraulic Functions</b>	Pilot shutoff lever	Place pilot shutoff lever in unlocked (DOWN) position.
	Low hydraulic oil level	Add correct oil.
	Fuse	Check PILOT SHUT OFF 5 amp fuse (F17), and replace if necessary.
	Suction screen restricted	Inspect and clean.
<b>Hydraulic Functions Are Slow Or Have Little Or No Power</b>	Low hydraulic oil level	Add correct oil.
	Cold oil	Perform hydraulic oil warm-up procedure.
	Incorrect oil	Drain hydraulic tank and refill with correct oil.
	Engine speed too slow	Increase engine speed.
	Suction screen restricted	Inspect and clean.
	Hydraulic tank cap/cover	Replace cap/cover.
	<b>Hydraulic Oil Overheats</b>	Incorrect oil
Restricted radiator or oil cooler		Clean and straighten fins.
Restricted filters		Install new filters.
Low hydraulic oil level		Add correct oil.
Contaminated oil		See your authorized dealer.
<b>Oil Foams</b>	High or low oil level	Correct level.
	Incorrect oil	Drain hydraulic tank and refill with correct oil.
	Air leak on oil line from reservoir	Repair leak.
	Water in oil	Drain hydraulic tank and refill with correct oil.
	Kinks or dents in oil lines	Inspect and correct.
	Contaminated oil	See your authorized dealer.

Continued on next page

KR46761,00007F8 -19-04JAN13-1/2



*Miscellaneous—Troubleshooting*

Symptom	Problem	Solution
<b>No Swing Function</b>	Pilot shutoff lever	Place pilot shutoff lever in unlocked (DOWN) position.
	Pilot control valve hoses pinched or kinked	Inspect and correct.
<b>Swing Function Is Jerky</b>	Lack of grease in swing bearing	Fill with grease.
	Rocks or mud jammed in track frame	Remove and repair.
<b>Slow Travel Speed Only</b>	Pilot control valve hoses pinched or kinked	Inspect and correct.
<b>Travel Is Jerky</b>	Engine speed too slow	Increase engine speed.
	Track sag adjustment	Adjust track sag.
	Rocks or mud jammed in track frame	Remove and repair.
<b>Engine Stops When Travel Or Control Lever Actuated</b>	Air filters restricted	Replace filter elements.
	Fuel filters restricted	Replace filters. Bleed air.
	Air in fuel system	Bleed air from fuel system.
<b>Angle Blade Drift Too Great</b>	Angle blade moves when blade is not operated	Check system relief and circuit relief valves.
<b>Angle Blade Not Operated</b>	One side of angle does not work	Check hose routing.
		Check center joint.
<b>Angle Blade Moves Slowly</b>	One side of angle blade does not work	Check hose routing.
		Check center joint.

KR46761,00007F8 -19-04JAN13-2/2

# Miscellaneous—Storage

## Prepare Machine for Storage

**IMPORTANT: Avoid machine damage, do not use biodiesel during machine storage. When using biodiesel blends, switch to petroleum diesel for long term storage.**

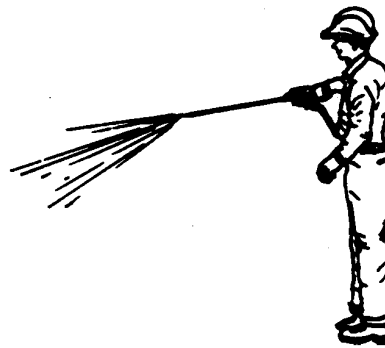
1. Before storage, operate engine on at least one complete tank of petroleum diesel fuel to purge the fuel system. Ensure that the fuel tank is full during storage to prevent water build up due to condensation.
2. Repair worn or damaged parts. Install new parts, if necessary, to avoid needless delays later.
3. Replace air cleaner elements.
4. Drain final fuel filter and water separator, primary fuel filter and water separator, and auxiliary fuel filter and water separator.

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

5. Wash the machine. Use low pressure wash operations (less than 1379 kPa [13.8 bar] [200 psi]) until 30 days after receipt of machine have elapsed. Paint areas to prevent rust. Replace decals, where needed.
6. Apply oil to track chains. Run machine back and forth several times. Park machine on a hard surface to prevent tracks from freezing to ground.

**IMPORTANT: LPS 3 Rust Inhibitor can destroy painted finish. DO NOT spray LPS 3 Rust Inhibitor on painted areas.**

*LPS 3 Rust Inhibitor is a trademark of Illinois Tool Works.*



T6613AM—UN—09FEB89

7. Retract all hydraulic cylinders, if possible. If not, coat exposed cylinder rods with LPS 3® Rust Inhibitor.
8. Lubricate all grease points.

**NOTE: If the batteries are kept disconnected for more than 1 month or when the batteries are reconnected, resetting of the controllers may be required. Contact your authorized John Deere dealer.**

9. Remove the batteries and store in a dry, protected place after charging fully. If not removed, disconnect the negative battery cable from the (—) terminal.
10. Store machine in a dry, protected place. If stored outside, cover with a waterproof material.
11. Place a DO NOT OPERATE tag on the right control lever.
12. Remove keys and lock all covers and doors.

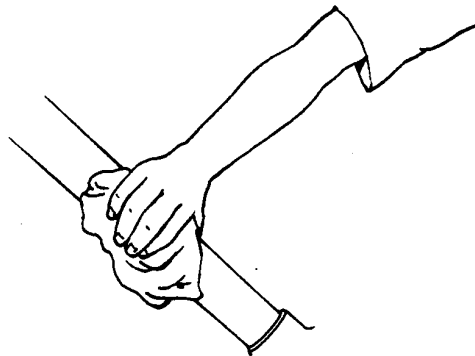
KR46761,00006F2 -19-14DEC12-1/1

## Monthly Storage Procedure

**CAUTION: Prevent possible injury or death from asphyxiation. Engine exhaust fumes can cause sickness or death. Start engine ONLY in a well-ventilated area.**

1. Drain water and sediment from fuel tank when air temperature is above freezing.
2. Remove LPS 3® Rust Inhibitor from cylinder rods with a cleaning solvent.

*LPS 3 Rust Inhibitor is manufactured by Holt Lloyd Corporation.*



T6191AA—UN—18OCT88

Continued on next page

TX,STORAGE,KEY -19-20JAN11-1/2

**IMPORTANT: Prevent possible engine damage.**

During cold temperatures, check fluidity of engine oil on dipstick. If the oil appears waxy or jelly-like rather than liquid, **DO NOT** attempt to start engine. Use external heat source to warm the crankcase until oil appears fluid.

3. Check all fluid levels. If low, check for leaks and add oil as required.
4. Check belts.
5. Check condition of all hoses and connections.
6. Check battery electrolyte level. Charge and install battery.
7. For machines with **tires**, check condition of tires and tire pressure.

For machines with **tracks**, check condition of tracks and track sag.

On crawler machines with non-sealed and non-lubricated track chains, apply oil to the pin-to-bushing joints. Run machine back and forth several times.

8. Park machine on a hard surface to prevent tracks from freezing to ground.
9. Fill fuel tank.
10. Pre-lubricate turbocharger bearings, if equipped:
  - a. Disconnect fuel shutoff fuse.
  - b. Crank engine for 10 seconds.
  - c. Connect fuel shutoff fuse.
11. Inspect engine compartment, and remove any foreign material that could have accumulated. Start engine



and run until it reaches operating temperature. Run at 1/2 speed for 5 minutes. Do not run at fast or slow idle.

- If engine fails to start or runs poorly after starting, change fuel filter(s). Bleed fuel system.

12. Operate all controls, levers, seat adjustments, and others.

**CAUTION: Prevent possible injury from unexpected machine movement. Clear the area of all persons before running machine through the operation procedure.**

13. Make sure that the area is clear to allow for movement. Cycle all hydraulic functions several times. Check condition of all hoses and connections.
14. Park the machine with cylinder rods retracted, if possible. Turn key switch to OFF.
15. Apply LPS 3 Rust Inhibitor to exposed cylinder rod areas.

TX,STORAGE,KEY -19-20JAN11-2/2

T6181AU—UN—18OCT88

## Miscellaneous—Serial Numbers

### Record Product Identification Number (PIN)

Purchase Date

Product Identification Number (PIN)

*NOTE: Record all 17 characters of the product identification number (PIN).*

The PIN plate (1) is located on the front right corner of the operator's station frame.

1—PIN Plate



Product Identification Number (PIN) Plate

TX1125761A—UN—13DEC12

JS93577,0000035 -19-14DEC12-1/1

### Record Engine Serial Number

Engine Serial Number

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

1—Engine Serial Number Plate



Engine Serial Number Plate

TX1125988A—UN—16NOV12

KR46761,00006F3 -19-26NOV12-1/1

### Keep Proof of Ownership

1. Maintain in a secure location an up-to-date inventory of all product and component serial numbers.
2. Regularly verify that identification plates have not been removed. Report any evidence of tampering to law enforcement agencies and order duplicate plates.
3. Other steps you can take:
  - Mark your machine with your own numbering system
  - Take color photographs from several angles of each machine

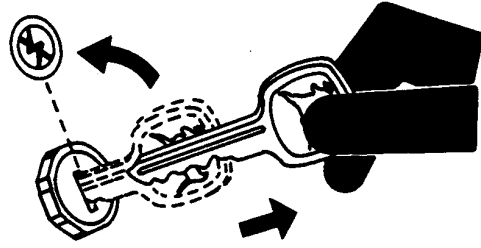


TS1680—UN—09DEC03

DX,SECURE1 -19-18NOV03-1/1

### Keep Machines Secure

1. Install vandal-proof devices.
2. When machine is in storage:
  - Lower equipment to the ground
  - Set wheels to widest position to make loading more difficult
  - Remove any keys and batteries
3. When parking indoors, put large equipment in front of exits and lock your storage buildings.
4. When parking outdoors, store in a well-lighted and fenced area.
5. Make note of suspicious activity and report any thefts immediately to law enforcement agencies.
6. Notify your John Deere dealer of any losses.



DX,SECURE2 -19-18NOV03-1/1

TS230—UN—24MAY89

## Miscellaneous—Specifications

### Engine Specifications

Item	Measurement	Specification
Yanmar 3TNV88F-EPHB	Type	4 Cycle Water Cooled
	Bore and Stroke	88.0 x 90.0 mm
		3.46 x 3.54 in.
	Cylinders	3
	Displacement	1.6 L
		100.2 cu. in.
	Power at 2400 rpm	17.4 kW
		23.3 hp
	Cooling Fan	Direct Drive Suction Fan
	Electrical system	12 Volt
Battery	12 Volt	

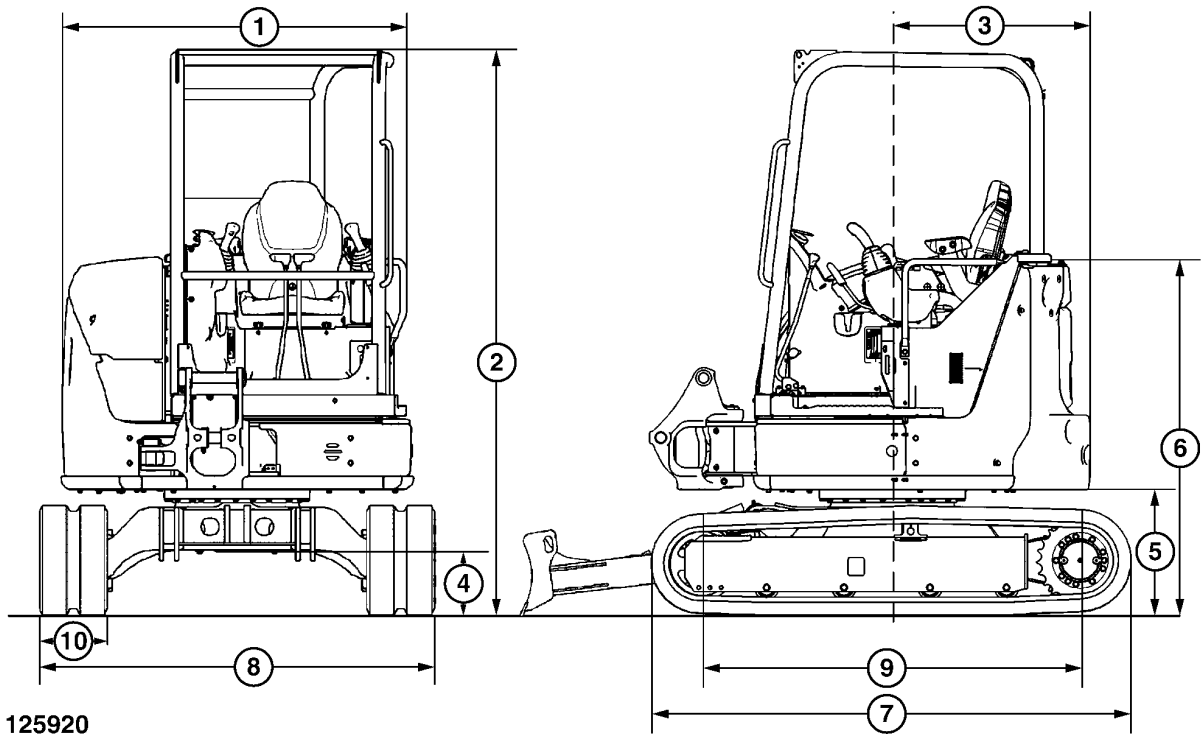
KR46761,00006F4 -19-27DEC12-1/1

### Drain and Refill Capacities

Item	Measurement	Specification
Fuel Tank	Capacity	42.0 L
		11.1 gal.
Cooling System	Capacity	3.9 L
		1.0 gal.
Engine	Oil Capacity, Including Filter Change	7.2 L
		1.9 gal.
Hydraulic Tank	Oil Capacity	32.0 L
		8.5 gal.
Hydraulic System	Oil Capacity	56.0 L
		14.8 gal.
Swing Bearing Gear	Oil Capacity	2.0 L
		0.5 gal.
Travel Gear Case (each)	Oil Capacity	0.6 L
		0.2 gal.

KR46761,00006F5 -19-16JAN15-1/1

**Machine Specifications**



**TX1125920**

- 1— Overall Width
- 2— Cab Height
- 3— Rear End Swing Radius
- 4— Minimum Ground Clearance
- 5— Counterweight Clearance
- 6— Engine Cover Height
- 7— Undercarriage Length
- 8— Undercarriage Width
- 9— Sprocket Center To Idler Center
- 10— Track Shoe Width

*NOTE: Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with PCSA and SAE standards. Except where otherwise noted these specifications*

*are based on a machine equipped with 300 mm (12 in.) shoes, 1.32 m (4 ft. 4 in.) arm, 0.11 m<sup>3</sup> (0.14 yd<sup>3</sup>) bucket, full fuel tank, 79 kg (175 lb.) operator and standard equipment.*

Item	Measurement	Specification
1—Upperstructure Width	Distance	1550 mm 5 ft. 1 in.
2—Machine	Transport Height—Canopy	2480 mm 8 ft. 2 in.
	Transport Height—Cab	2480 mm 8 ft. 2 in.
3—Rear End Swing Radius	Distance—Standard Counterweight	870 mm 2 ft. 10 in.
	Distance—Additional Counterweight	980 mm 3 ft. 2 in.
4—Minimum Ground Clearance	Distance	280 mm 0 ft. 11 in.
5—Counterweight Clearance	Distance	550 mm 1 ft. 10 in.
6— Engine Cover	Height	1530 mm 5 ft. 0 in.

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KR46761.00006F6 -19-27DEC12-1/2

TX1125920 —UN—16 NOV12

Miscellaneous—Specifications

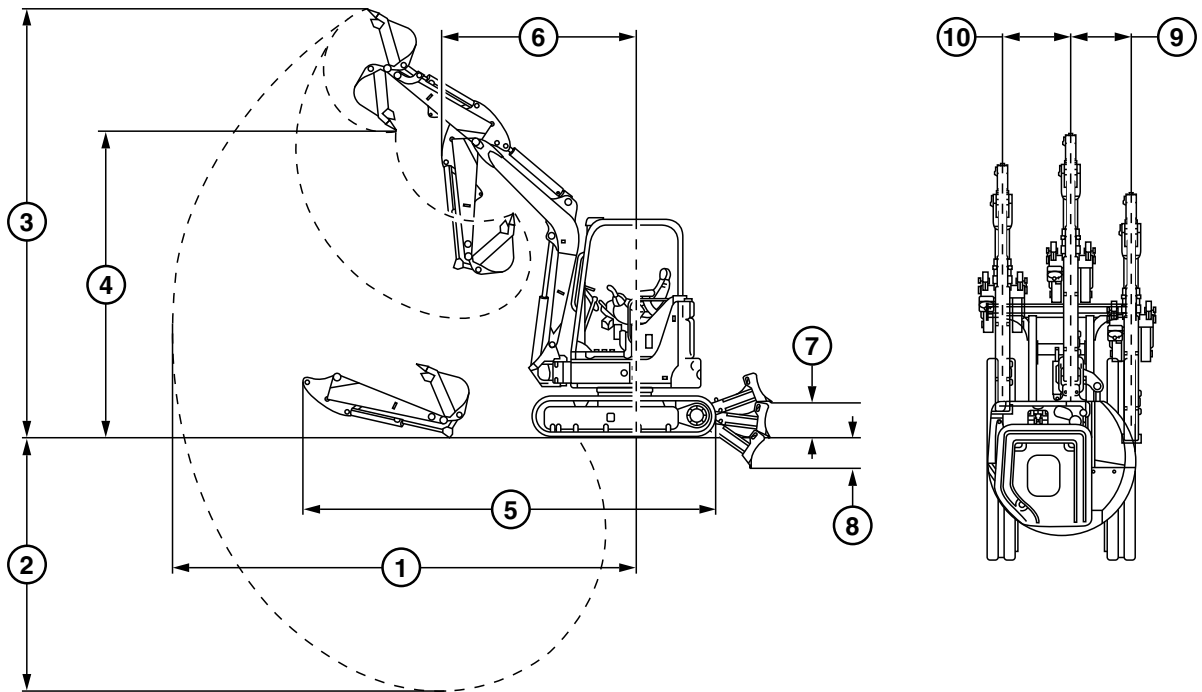
Item	Measurement	Specification
7—Undercarriage	Length	2110 mm 6 ft. 11 in.
8—Undercarriage	Width	1550 mm 5 ft. 1 in.
9—Sprocket Center To Idler Center	Distance	1660 mm 5 ft. 5 in.
10—Track Shoe—Rubber	Width	300 mm 1 ft. 0 in.

Item	Measurement	Specification
Machine	Operating Weight—Canopy	3520 kg 7760 lb.
	Operating Weight—Cab	3690 kg 8135 lb.
	Operating Weight—Canopy, Long Arm	3783 kg 8340 lb.
	Operating Weight—Cab, Long Arm	3953 kg 8715 lb.
	Basic Weight—Canopy	2360 kg 5200 lb.
	Basic Weight—Cab	2510 kg 5530 lb.

KR46761,00006F6 -19-27DEC12-2/2



**Working Ranges**



**TX1125924**

*Working Ranges*

- 1— Maximum Digging Reach
- 2— Maximum Digging Depth
- 3— Maximum Cutting Height
- 4— Maximum Dumping Height
- 5— Overall Transport Length
- 6— Minimum Swing Radius
- 7— Blade Bottom Highest Position (above ground level)
- 8— Blade Bottom Lowest Position (above ground level)
- 9— Boom Offset (left)
- 10— Boom Offset (right)

Item	Measurement	Specification
1—Maximum Digging Reach	Distance—Canopy or Cab	5210 mm 17 ft. 1 in.
	Distance—Long Arm	5520 mm 18 ft. 1 in.
2—Maximum Digging Depth	Depth—Canopy or Cab	3060 mm 10 ft. 0 in.
	Depth—Long Arm	3460 mm 11 ft. 4 in.
3—Maximum Cutting Height	Height—Canopy	4870 mm 16 ft. 0 in.
	Height—Canopy, Long Arm	4950 mm 16 ft. 3 in.
	Height—Cab	4700 mm 15 ft. 5 in.
	Height—Cab, Long Arm	4740 mm 15 ft. 7 in.
4—Maximum Dumping Height	Height—Canopy	3460 mm 11 ft. 4 in.
	Height—Canopy, Long Arm	3570 mm 11 ft. 9 in.

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KR46761,00006F7 -19-04JAN13-1/2

TX1125924 —UN—19NOV12

*Miscellaneous—Specifications*

Item	Measurement	Specification
	Height—Cab	3310 mm 10 ft. 10 in.
	Height—Cab, Long Arm	3390 mm 11 ft. 1 in.
5—Machine	Transport Length—Canopy or Cab	4640 mm 15 ft. 3 in.
	Transport Length—Long Arm	4750 mm 15 ft. 7 in.
6—Minimum Swing	Radius—Canopy	2080 mm 6 ft. 10 in.
	Radius—Canopy, Long Arm	2190 mm 7 ft. 2 in.
	Radius—Cab	2240 mm 7 ft. 4 in.
	Radius—Cab, Long Arm	2300 mm 7 ft. 7 in.
7—Blade Bottom Highest Position (above ground level)	Distance	360 mm 1 ft. 2 in.
8—Blade Bottom Lowest Position (above ground level)	Distance	400 mm 1 ft. 4 in.
9—Offset Distance To Right	Maximum Distance—Canopy	735 mm 2 ft. 5 in.
	Maximum Distance—Cab	700 mm 2 ft. 4 in.
10—Offset Distance To Left	Maximum Distance	610 mm 2 ft. 0 in.

KR46761,00006F7 -19-04JAN13-2/2

### Excavator Lift Capacity—KG (LB.) (Canopy, Standard Arm, Standard Counterweight, and Rubber Track with Blade)

Arm: 1.31 m (4 ft. 4 in.)	Blade: 1.45 m (5 ft. 9 in.)	Bucket: 80.0 kg (176.4 lb.)
Power Dig: On		
<b>LIFTING OVER FRONT</b>		
Load Point Height	Horizontal Distance from Centerline of Rotation	
m (ft.)	1.52 (5)	3.05 (10)
1.52 (5)		1207* (2662*)
Ground Line		1566* (3453*)
-1.52 (-5)	2989* (6589*)	1291* (2847*)
<b>LIFTING OVER SIDE</b>		
Load Point Height	Horizontal Distance from Centerline of Rotation	
m (ft.)	1.52 (5)	3.05 (10)
1.52 (5)		696 (1534)
Ground Line		640 (1412)
-1.52 (-5)	2070 (4563)	646 (1425)

35G Lift Capacities (canopy, standard arm, standard counterweight, and rubber track with blade)

\* Hydraulically Limited Capacities

KR46761.00006F8 -19-03JAN13-1/1

### Excavator Lift Capacity—KG (LB.) (Canopy, Standard Arm, Standard Counterweight, and Steel Track with Blade)

Arm: 1.31 m (4 ft. 4 in.)	Blade: 1.45 m (5 ft. 9 in.)	Bucket: 80.0 kg (176.4 lb.)
Power Dig: On		
<b>LIFTING OVER FRONT</b>		
Load Point Height	Horizontal Distance from Centerline of Rotation	
m (ft.)	1.52 (5)	3.05 (10)
1.52 (5)		1207* (2662*)
Ground Line		1566* (3453*)
-1.52 (-5)	2989* (6589*)	1291* (2847*)
<b>LIFTING OVER SIDE</b>		
Load Point Height	Horizontal Distance from Centerline of Rotation	
m (ft.)	1.52 (5)	3.05 (10)
1.52 (5)		728 (1606)
Ground Line		673 (1484)
-1.52 (-5)	2167 (4778)	679 (1497)

35G Lift Capacities (canopy, standard arm, standard counterweight, and steel track with blade)

\* Hydraulically Limited Capacities

KR46761.00006F9 -19-03JAN13-1/1

**Excavator Lift Capacity—KG (LB.)  
(Canopy, Long Arm, Standard Counterweight, and Rubber Track with Blade)**

<b>Arm:</b> 1.71 m (5 ft. 8 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)	
<b>Power Dig: On</b>			
<b>LIFTING OVER FRONT</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		1024* (2257*)	803* (1771*)
Ground Line	822* (1812*)	1500* (3307*)	896* (1976*)
-1.52 (-5)	2287* (5042*)	1428* (3149*)	
<b>LIFTING OVER SIDE</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		704 (1551)	803 (1771)
Ground Line	822* (1812*)	630 (1388)	896 (1976)
-1.52 (-5)	1995 (4398)	619 (1365)	

35G Lift Capacities (canopy, long arm, standard counterweight, and rubber track with blade)

\* Hydraulically Limited Capacities

KR46761,00006FA -19-03JAN13-1/1

**Excavator Lift Capacity—KG (LB.)  
(Canopy, Long Arm, Standard Counterweight,  
and Steel Track with Blade)**

<b>Arm:</b> 1.71 m (5 ft. 8 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)	
<b>Power Dig: On</b>			
<b>LIFTING OVER FRONT</b>			
<b>Load Point Height</b>	<b>Horizontal Distance From Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		1024* (2257*)	803* (1771*)
Ground Line	822* (1812*)	1500* (3307*)	896* (1976*)
-1.52 (-5)	2287* (5042*)	1428* (3149*)	
<b>LIFTING OVER SIDE</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		736 (1623)	391 (863)
Ground Line	822* (1812*)	662 (1460)	373 (822)
-1.52 (-5)	2092 (4612)	652 (1437)	

35G Lift Capacities (canopy, long arm, standard counterweight, and steel track with blade)

\* Hydraulically Limited Capacities

KR46761,00006FB -19-03JAN13-1/1

### Excavator Lift Capacity—KG (LB.) (Canopy, Standard Arm, Extra Counterweight, and Rubber Track with Blade)

<b>Arm:</b> 1.31 m (4 ft. 4 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)
<b>Power Dig: On</b>		
<b>LIFTING OVER FRONT</b>		
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline or Rotation</b>	
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>
1.52 (5)		1207* (2662*)
Ground Line		1566* (3453*)
-1.52 (-5)	2989* (6589*)	1291* (2847*)
<b>LIFTING OVER SIDE</b>		
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline or Rotation</b>	
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>
1.52 (5)		821 (1809)
Ground Line		765 (1686)
-1.52 (-5)	2441 (5381)	771 (1699)

35G Lift Capacities (canopy, standard arm, extra counterweight, and rubber track with blade)

\* Hydraulically Limited Capacities

KR46761.0000785 -19-03JAN13-1/1

### Excavator Lift Capacity—KG (LB.) (Canopy, Standard Arm, Extra Counterweight, and Steel Track with Blade)

<b>Arm:</b> 1.31 m (4 ft. 4 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)
<b>Power Dig: On</b>		
<b>LIFTING OVER FRONT</b>		
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>	
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>
1.52 (5)		1207* (2662*)
Ground Line		1566* (3453*)
-1.52 (-5)	2989* (6589*)	1291* (2847*)
<b>LIFTING OVER SIDE</b>		
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>	
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>
1.52 (5)		853 (1881)
Ground Line		797 (1758)
-1.52 (-5)	2538 (5596)	803 (1771)

35G Lift Capacities (canopy, standard arm, extra counterweight, and steel track with blade)

\* Hydraulically Limited Capacities

KR46761.0000786 -19-03JAN13-1/1

**Excavator Lift Capacity—KG (LB.)  
(Canopy, Long Arm, Extra Counterweight,  
and Rubber Track with Blade)**

<b>Arm:</b> 1.71 m (5 ft. 8 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)	
<b>Power Dig: On</b>			
<b>LIFTING OVER FRONT</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		1024* (2257*)	803* (1771*)
Ground Line	822* (1812*)	1500* (3307*)	896* (1976*)
-1.52 (-5)	2287* (5042*)	1428* (3149*)	
<b>LIFTING OVER SIDE</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		828 (1825)	446 (984)
Ground Line	822* (1812*)	754 (1662)	428 (944)
-1.52 (-5)	2287* (5042*)	743 (1639)	

35G Lift Capacities (canopy, long arm, extra counterweight, and rubber track with blade)

\* Hydraulically Limited Capacities

KR46761.0000787 -19-03JAN13-1/1

**Excavator Lift Capacity—KG (LB.)  
(Canopy, Long Arm, Extra Counterweight,  
and Steel Track with Blade)**

<b>Arm:</b> 1.71 m (5 ft. 8 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)	
<b>Power Dig: On</b>			
<b>LIFTING OVER FRONT</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		1024* (2257*)	803* (1771*)
Ground Line	822* (1812*)	1500* (3307*)	896* (1976*)
-1.52 (-5)	2287* (5042*)	1428* (3149*)	
<b>LIFTING OVER SIDE</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		860 (1897)	466 (1028)
Ground Line	822* (1812*)	787 (1734)	448 (987)
-1.52 (-5)	2287* (5042*)	776 (1711)	

35G Lift Capacities (canopy, long arm, extra counterweight, and steel track with blade)

\* Hydraulically Limited Capacities

KR46761.0000788 -19-03JAN13-1/1

**Excavator Lift Capacity—KG (LB.)  
(Cab, Standard Arm, Standard Counterweight, and Rubber Track with Blade)**

<b>Arm:</b> 1.31 m (4 ft. 4 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)
<b>Power Dig: On</b>		
<b>LIFTING OVER FRONT</b>		
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>	
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>
1.52 (5)		1207* (2662*)
Ground Line		1566* (3453*)
-1.52 (-5)	2989* (6589*)	1291* (2847*)
<b>LIFTING OVER SIDE</b>		
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>	
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>
1.52 (5)		738 (1628)
Ground Line		683 (1506)
-1.52 (-5)	2196 (4842)	689 (1518)

35G Lift Capacities (cab, standard arm, standard counterweight, and rubber track with blade)

\* Hydraulically Limited Capacities

JS93577.000001A -19-03JAN13-1/1

**Excavator Lift Capacity—KG (LB.)  
(Cab, Standard Arm, Standard Counterweight, and Steel Track with Blade)**

<b>Arm:</b> 1.31 m (4 ft. 4 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)
<b>Power Dig: On</b>		
<b>LIFTING OVER FRONT</b>		
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline or Rotation</b>	
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>
1.52 (5)		1207* (2662*)
Ground Line		1566* (3453*)
-1.52 (-5)	2989* (6589*)	1291* (2847*)
<b>LIFTING OVER SIDE</b>		
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline or Rotation</b>	
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>
1.52 (5)		771 (1700)
Ground Line		715 (1577)
-1.52 (-5)	2294 (5057)	721 (1590)

35G Lift Capacities (cab, standard arm, standard counterweight, and steel track with blade)

\* Hydraulically Limited Capacities

JS93577.000001B -19-03JAN13-1/1

**Excavator Lift Capacity—KG (LB.)  
(Cab, Long Arm, Standard Counterweight,  
and Rubber Track with Blade)**

<b>Arm:</b> 1.71 m (5 ft. 8 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)	
<b>Power Dig: On</b>			
<b>LIFTING OVER FRONT</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		1024* (2257*)	803* (1771*)
Ground Line	822* (1812*)	1500* (3307*)	896* (1976*)
-1.52 (-5)	2287* (5042*)	1428* (3149*)	
<b>LIFTING OVER SIDE</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		746 (1645)	397 (876)
Ground Line	822* (1812*)	672 (1481)	379 (835)
-1.52 (-5)	2121 (4677)	661 (1458)	

35G Lift Capacities (cab, long arm, standard counterweight, and rubber track with blade)

\* Hydraulically Limited Capacities

JS93577,000001C -19-03JAN13-1/1

**Excavator Lift Capacity—KG (LB.)  
(Cab, Long Arm, Standard Counterweight,  
and Steel Track with Blade)**

<b>Arm:</b> 1.71 m (5 ft. 8 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)	
<b>Power Dig: On</b>			
<b>LIFTING OVER FRONT</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		1024* (2257*)	803* (1771*)
Ground Line	822* (1812*)	1500* (3307*)	896* (1976*)
-1.52 (-5)	2287* (5042*)	1428* (3149*)	
<b>LIFTING OVER SIDE</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		778 (1716)	417 (919)
Ground Line	822* (1812*)	704 (1553)	398 (878)
-1.52 (-5)	2219 (4891)	694 (1530)	

35G Lift Capacities (cab, long arm, standard counterweight, and steel track with blade)

\* Hydraulically Limited Capacities

JS93577,000001D -19-03JAN13-1/1



**Excavator Lift Capacity—KG (LB.)  
(Cab, Standard Arm, Extra Counterweight, and Rubber Track with Blade)**

<b>Arm:</b> 1.31 m (4 ft. 4 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)
<b>Power Dig: On</b>		
<b>LIFTING OVER FRONT</b>		
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>	
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>
1.52 (5)		1207* (2662*)
Ground Line		1566* (3453*)
-1.52 (-5)	2989* (6589*)	1291* (2847*)
<b>LIFTING OVER SIDE</b>		
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>	
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>
1.52 (5)		863 (1902)
Ground Line		807 (1780)
-1.52 (-5)	2568 (5661)	813 (1792)

35G Lift Capacities (cab, standard arm, extra counterweight, and rubber track with blade)

\* Hydraulically Limited Capacities

JS93577.000001E -19-03JAN13-1/1

**Excavator Lift Capacity—KG (LB.)  
(Cab, Standard Arm, Extra Counterweight,  
and Steel Track with Blade)**

<b>Arm:</b> 1.31 m (4 ft. 4 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)
<b>Power Dig: On</b>		
<b>LIFTING OVER FRONT</b>		
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline or Rotation</b>	
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>
1.52 (5)		1207* (2662*)
Ground Line		1566* (3453*)
-1.52 (-5)	2989* (6589*)	1291* (2847*)
<b>LIFTING OVER SIDE</b>		
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline or Rotation</b>	
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>
1.52 (5)		895 (1974)
Ground Line		840 (1852)
-1.52 (-5)	2665* (5875*)	845 (1864)

35G Lift Capacities (cab, standard arm, extra counterweight, and steel track with blade)

\* Hydraulically Limited Capacities

JS93577.000001F -19-03JAN13-1/1

### Excavator Lift Capacity—KG (LB.) (Cab, Long Arm, Extra Counterweight, and Rubber Track with Blade)

<b>Arm:</b> 1.71 m (5 ft. 8 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)	
<b>Power Dig: On</b>			
<b>LIFTING OVER FRONT</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		1024* (2257*)	803* (1771*)
Ground Line	826* (1821*)	1500* (3307*)	896* (1976*)
-1.52 (-5)	2287* (5042*)	1428* (3149*)	
<b>LIFTING OVER SIDE</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		870 (1919)	472 (1041)
Ground Line	822* (1812*)	797 (1756)	454 (1000)
-1.52 (-5)	2287* (5042*)	786 (1733)	

35G Lift Capacities (cab, long arm, extra counterweight, and rubber track with blade)

\* Hydraulically Limited Capacities

JS93577,0000020 -19-03JAN13-1/1

### Excavator Lift Capacity—KG (LB.) (Cab, Long Arm, Extra Counterweight, and Steel Track with Blade)

<b>Arm:</b> 1.71 m (5 ft. 8 in.)	<b>Blade:</b> 1.45 m (5 ft. 9 in.)	<b>Bucket:</b> 80.0 kg (176.4 lb.)	
<b>Power Dig: On</b>			
<b>LIFTING OVER FRONT</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		1024* (2257*)	803* (1771*)
Ground Line	822* (1812*)	1500* (3307*)	896* (1976*)
-1.52 (-5)	2287* (5042*)	1428* (3149*)	
<b>LIFTING OVER SIDE</b>			
<b>Load Point Height</b>	<b>Horizontal Distance from Centerline of Rotation</b>		
<b>m (ft.)</b>	<b>1.52 (5)</b>	<b>3.05 (10)</b>	<b>4.57 (15)</b>
1.52 (5)		903 (1991)	492 (1084)
Ground Line	822* (1812*)	829 (1827)	473 (1043)
-1.52 (-5)	2287* (5042*)	818 (1804)	

35G Lift Capacities (cab, long arm, extra counterweight, and steel track with blade)

\* Hydraulically Limited Capacities

JS93577,0000021 -19-03JAN13-1/1

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