

450CLC Excavator



OPERATOR'S MANUAL

450CLC Excavator

OMT187112 ISSUE F3 (ENGLISH)

CALIFORNIA

Proposition 65 Warning

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

If this product contains a gasoline engine:

⚠ WARNING

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

The State of California requires the above two warnings.

Additional Proposition 65 Warnings can be found in this manual.

**Worldwide Construction
And Forestry Division**

LITHO IN U.S.A.

Introduction

Introduction

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

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

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

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

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I.N.) in the Machine Numbers Section. Accurately record all the numbers to help in tracing the machine should it be

stolen. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place off the machine.

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 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.

Introduction

EMISSIONS CONTROL WARRANTY STATEMENT FOR NEW JOHN DEERE CONSTRUCTION EQUIPMENT (U.S. AND CANADA)

To determine if the engine in your machine qualifies for the additional warranties set forth below, look for the "Engine Information" label located on your engine. If you reside in the United States and the engine label states: "Engine conforms to US EPA regulations on heavy duty non road diesel cycle engines," you are entitled to the "U.S. Emission Control Warranty Statement." If you reside in California, and the engine label states: "Engine conforms to California regulations on heavy duty non road diesel cycle engines," you are entitled to the "California Emission Control Warranty Statement."

U.S. EPA EMISSIONS CONTROL WARRANTY STATEMENT

Emissions control-related parts and components are warranted by John Deere for five years or 3000 hours of operation, whichever occurs first. John Deere further warrants that the engine covered by this warranty was designed, built, and equipped so as to conform at the time of sale with all U.S. emissions standards at the time of manufacture, and that it is free of defects in materials and workmanship which would cause it not to meet these standards within the period of five years or 3000 hours of operations, whichever occurs first.

Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete machine warranty, less emissions-related parts and components, is provided separately as "John Deere "Secure Warranty" For New Construction Products."

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT YOUR WARRANTY RIGHTS AND OBLIGATIONS

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

Your emissions control system includes:

Fuel Metering System
Fuel Injection System

Air Induction System
Intake Manifold
Turbocharger System
Charge Air Cooling System

Miscellaneous Items used in Above Systems

Where a warrantable condition exists, i.e. failure due to defect in John Deere-supplied material and/or workmanship, John Deere will repair your heavy-duty engine at no cost to you including diagnosis, parts and labor

JOHN DEERE'S WARRANTY COVERAGE:

The emission control system of your heavy-duty engine is warranted for five years or 3000 hours of operation, whichever occurs first. If any emission-related part on your engine is defective, the part will be repaired or replaced by John Deere. Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete machine warranty, less emissions-related parts and components, is provided separately as the "John Deere "Secure Warranty" For New Construction Products."

OWNER'S WARRANTY RESPONSIBILITIES:

As the heavy-duty engine owner, you are responsible for the performance of the required maintenance as outlined in the

Operator's Manual. John Deere recommends that you retain all receipts covering maintenance on your heavy-duty engine, but John Deere cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

However, as the heavy-duty engine owner, you should be aware that John Deere may deny you warranty coverage if your heavy-duty engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

Your engine is designed to operate on diesel fuel only. Use of any other fuel may result in your engine no longer operating in compliance with California's emissions requirements.

You are responsible for initiating the warranty process. The CARB suggests that you present your machine to the nearest authorized John Deere dealer as soon as a problem is suspected. The warranty repairs should be completed by the service dealer as expeditiously as possible.

If you have any questions regarding your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400, or the State of California Air Resources Board, Mobile Source Operation Division, PO Box 8001, El Monte, CA 91731-2900

The warranty period begins on the date the machine is delivered to an ultimate purchaser, or when otherwise put into service. John Deere warrants to the ultimate purchaser and each subsequent purchaser that the engine is designed, built and equipped so as to conform with all applicable regulations adopted by the Air Resources Board, and that it is free from defects in materials and workmanship which would cause the failure of a warranted part.

Any warranted part which is scheduled for replacement as required maintenance by the operator's manual is warranted by John Deere for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement point, the part shall be repaired or replaced under warranty. Any such part repaired or replaced under warranty is warranted for the remainder of the period prior to the first scheduled replacement point for that part.

Any warranted part which is not scheduled for replacement as required maintenance, or which is scheduled only for regular inspection to the effect of repairing or replacing as necessary, is warranted for the warranty period.

Repair or replacement of a warranted part will be performed at no charge to you by an authorized John Deere dealer. You will not be charged for diagnostic labor which leads to the determination that a warranted part is defective, if the diagnostic work is performed by a John Deere dealer.

John Deere is liable for damages to other engine components caused by failure under warranty of any warranted part.

John Deere is NOT liable for travel or mileage on extended emissions warranty service calls.

Any replacement part may be used in the performance of any maintenance or repairs, and such use will not reduce the warranty obligations of John Deere. However, the use of add-on or modified parts are grounds for disallowing a warranty claim.

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Introduction

EPA Non-road Emissions Control Warranty Statement—Compression Ignition

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

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

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

JOHN DEERE'S WARRANTY RESPONSIBILITY

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

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

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

EMISSION WARRANTY EXCLUSIONS

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

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

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

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

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

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Introduction



JOHN DEERE

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

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

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

JOHN DEERE'S WARRANTY RESPONSIBILITY

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

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

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

EMISSION WARRANTY EXCLUSIONS

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

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

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

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

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

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

TS1721—UN—17DEC12

Introduction

CARB Non-road Emissions Control Warranty Statement—Compression Ignition

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**JOHN DEERE**

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

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

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

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT:

The California Air Resources Board (CARB) is pleased to explain the emission-control system warranty on 2013 through 2015 off-road diesel engines. In California, new off-road engines must be designed, built and equipped to meet the State's stringent anti-smog standards. John Deere must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

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

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

EMISSIONS WARRANTY EXCLUSIONS:

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

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

Introduction

JOHN DEERE'S WARRANTY RESPONSIBILITY:

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

<p>Air Induction System</p> <ul style="list-style-type: none"> • Intake manifold • Turbocharger • Charge air cooler <p>Fuel Metering system</p> <ul style="list-style-type: none"> • Fuel injection system <p>Exhaust Gas Recirculation</p> <ul style="list-style-type: none"> • EGR valve <p>Catalyst or Thermal Reactor Systems</p> <ul style="list-style-type: none"> • Catalytic converter • Exhaust manifold 	<p>Emission control labels</p> <p>Particulate Controls</p> <ul style="list-style-type: none"> • Any device used to capture particulate emissions • Any device used in the regeneration of the capturing system • Enclosures and manifolding • Smoke Puff Limiters <p>Positive Crankcase Ventilation (PCV) System</p> <ul style="list-style-type: none"> • PCV valve • Oil filler cap 	<p>Advanced Oxides of Nitrogen (NOx) Controls</p> <ul style="list-style-type: none"> • NOx absorbers and catalysts <p>SCR systems and urea containers/dispensing systems</p> <p>Miscellaneous Items used in Above Systems</p> <ul style="list-style-type: none"> • Electronic control units, sensors, actuators, wiring harnesses, hoses, connectors, clamps, fittings, gasket, mounting hardware
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Any warranted emissions-related part scheduled for replacement as required maintenance is warranted by John Deere for the period of time prior to the first scheduled replacement point for the part. Any warranted emissions-related part not scheduled for replacement as required maintenance or scheduled only for regular inspection is warranted by John Deere for the stated warranty period.

OWNER'S WARRANTY RESPONSIBILITIES:

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

The off-road diesel engine is designed to operate on diesel fuel as specified in the Fuels, Lubricants and Coolants section in the Operators Manual. Use of any other fuel may result in the engine no longer operating in compliance with applicable emissions requirements.

The owner is responsible for initiating the warranty process, and should present the machine to the nearest authorized John Deere dealer as soon as a problem is suspected. The warranty repairs should be completed by the authorized John Deere dealer as quickly as possible.

Emissions regulations require the customer to bring the unit to an authorized servicing dealer when warranty service is required. As a result, John Deere is NOT liable for travel or mileage on emissions warranty service calls.

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Introduction



JOHN DEERE

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

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

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

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT:

The California Air Resources Board (CARB) is pleased to explain the emission-control system warranty on 2013 through 2015 off-road diesel engines. In California, new off-road engines must be designed, built and equipped to meet the State's stringent anti-smog standards. John Deere must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

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

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

EMISSIONS WARRANTY EXCLUSIONS:

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

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

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TS1722 —UN—17DEC12

Introduction

JOHN DEERE'S WARRANTY RESPONSIBILITY:

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

Air Induction System

- Intake manifold
- Turbocharger
- Charge air cooler

Fuel Metering system

- Fuel injection system

Exhaust Gas Recirculation

- EGR valve

Catalyst or Thermal Reactor Systems

- Catalytic converter
- Exhaust manifold

Emission control labels

Particulate Controls

- Any device used to capture particulate emissions
- Any device used in the regeneration of the capturing system
- Enclosures and manifolding
- Smoke Puff Limiters

Positive Crankcase Ventilation (PCV) System

- PCV valve
- Oil filler cap

Advanced Oxides of Nitrogen (NOx) Controls

- NOx absorbers and catalysts

SCR systems and urea containers/dispensing systems

Miscellaneous Items used in Above Systems

- Electronic control units, sensors, actuators, wiring harnesses, hoses, connectors, clamps, fittings, gasket, mounting hardware

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

OWNER'S WARRANTY RESPONSIBILITIES:

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

The off-road diesel engine is designed to operate on diesel fuel as specified in the Fuels, Lubricants and Coolants section in the Operators Manual. Use of any other fuel may result in the engine no longer operating in compliance with applicable emissions requirements.

The owner is responsible for initiating the warranty process, and should present the machine to the nearest authorized John Deere dealer as soon as a problem is suspected. The warranty repairs should be completed by the authorized John Deere dealer as quickly as possible.

Emissions regulations require the customer to bring the unit to an authorized servicing dealer when warranty service is required. As a result, John Deere is NOT liable for travel or mileage on emissions warranty service calls.

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TS1723 —UN—17DEC12

Introduction

Technical Information Feedback Form

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

SEND TO: John Deere Dubuque Works
18600 South John Deere Road
Attn: Publications, Dept. 324
Dubuque, IA 52004-0538
USA

FAX NUMBER: 1-563-589-5800 (USA)

Publication Number: _____

Page Number: _____

Ideas, Comments: _____

Name: _____

Phone: _____

Email Address: _____

THANK YOU!

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

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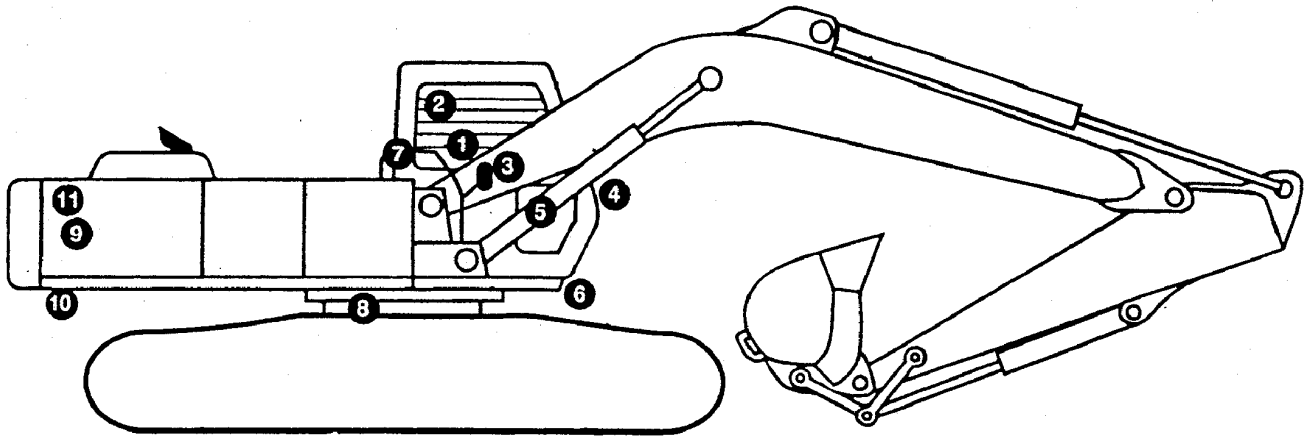
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Contents

Safety—Safety and Operator Conveniences

Safety and Operator Convenience Features



T140544

T140544—UN—26MAR01

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

- 1. Seat belt.** A seat belt is provided for the operator.
- 2. Window Guarding.** Window bars prevent contact with a moving boom.
- 3. Rearview Mirrors.** Rearview mirrors offer the operator a view of activity behind him.
- 4. Secondary Exit.** The front window provides a large exit path if the cab door is blocked in an emergency situation. A secondary exit tool is also provided.
- 5. Pilot Control Shutoff.** A lever near the cab exit reminds the operator to deactivate hydraulic functions before leaving the machine.
- 6. Steps.** Wide, slip-resistant steps make entry and exit easier. Steps also provide a place to clean shoes.
- 7. Handholds.** Large, conveniently placed handholds make it easy to enter or exit the operator's station or service area.
- 8. Swing Brake.** Swing brake engages automatically when the swing is not operated. Helps secure upperstructure when transporting the machine.
- 9. Bypass Start Protection.** Shielding over the starter helps prevent dangerous bypass starting.
- 10. Travel Alarm.** Alerts bystanders of machine movement when travelling.
- 11. Engine Fan Guard.** A secondary fan guard inside the engine compartment helps prevent contact with the engine fan blades.

JH91824,000021E -19-27FEB09-1/1

Safety—General Precautions

Recognize Safety Information

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

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

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

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



TI 133555 —UN—15APR13

TI 133558 —19—28AUG00

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

Follow Safety Instructions

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

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



TI 133556 —UN—24AUG00

TX03679,00016F9 -19-03JAN07-1/1

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.

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

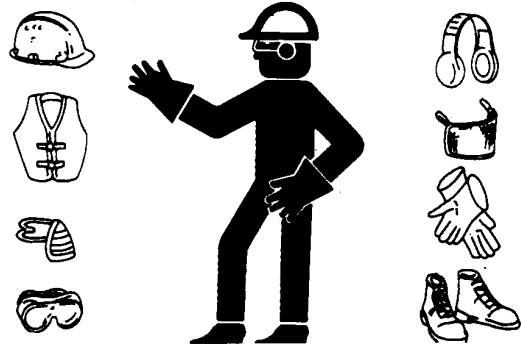
Safety—General Precautions

Wear Protective Equipment

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

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

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



TS206—UN—15APR13

TX03679,00016D0 -19-03JAN07-1/1

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.

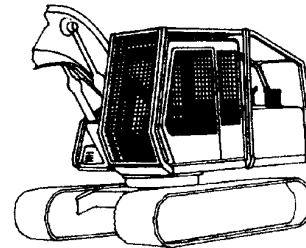
Always contact an authorized dealer before making machine modifications that change the intended use, weight or balance of the machine, or that alter machine controls, performance or reliability.

AM40430,00000A9 -19-20AUG09-1/1

Add Cab Guarding for Special Uses

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

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



T133733—UN—15SEP00

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

Safety—General Precautions

Inspect Machine

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

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



T6607AQ —UN—15APR13

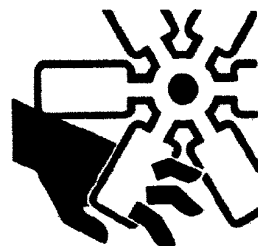
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Stay Clear of Moving Parts

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

TX03679,00016D2 -19-03JAN07-1/1

Avoid High-Pressure Fluids

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

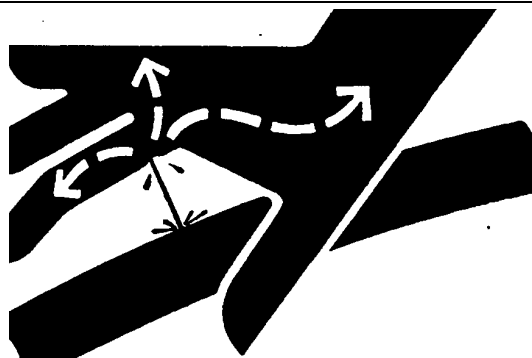
Replace worn or damaged hose assemblies immediately with John Deere approved replacement parts.

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

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

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

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar



X9811 —UN—23AUG88

with this type of injury should reference a knowledgeable medical source. Such information is available in English from Deere & Company Medical Department in Moline, Illinois, U.S.A., by calling 1-800-822-8262 or +1 309-748-5636.

DX,FLUID -19-12OCT11-1/1

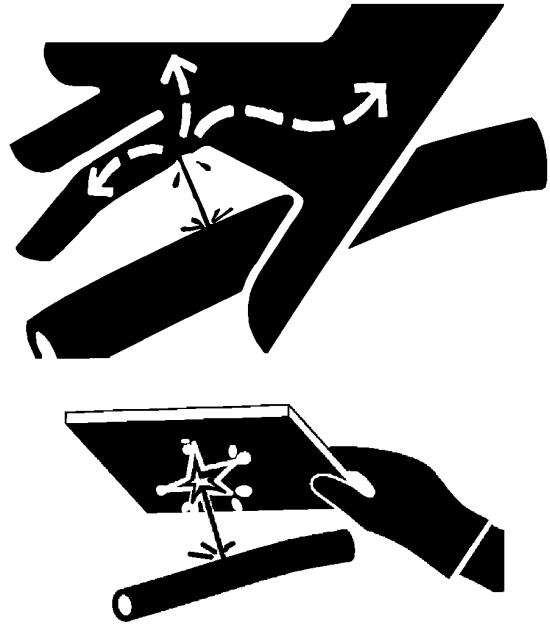
Safety—General Precautions

Avoid High-Pressure Oils

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

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

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



T133509 —UN—15APR13

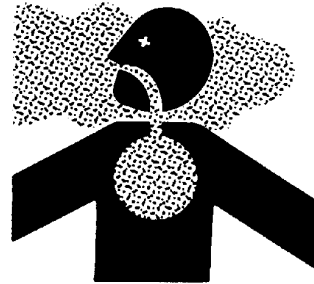
T133840 —UN—20SEP00

TX03679,00016D3 -19-03NOV08-1/1

Beware of Exhaust Fumes

Prevent asphyxiation. Engine exhaust fumes can cause sickness or death.

If you must operate in an enclosed space, provide adequate ventilation. Use an exhaust pipe extension to remove the exhaust fumes or open doors and windows to bring outside air into the area.



T133546 —UN—24AUG00

TX03679,00016D4 -19-03NOV08-1/1

Safety—General Precautions

Prevent Fires

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

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

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

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



T133553 —UN—07SEP00



T133554 —UN—07SEP00



TX03679,00016F5 -19-03NOV08-1/1

T133552 —UN—15APR13

Prevent Battery Explosions

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

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

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



TX03679,000174A -19-03NOV08-1/1

TS204 —UN—15APR13

Handle Chemical Products Safely

Exposure to hazardous chemicals can cause serious injury. Under certain conditions, lubricants, coolants, paints and adhesives used with this machine may be hazardous.

If uncertain about safe handling or use of these chemical products, contact your authorized dealer for a Material Safety Data Sheet (MSDS) or go to internet website <http://www.jdmsds.com>. The MSDS describes physical and health hazards, safe use procedures, and emergency response techniques for chemical substances. Follow



MSDS recommendations to handle chemical products safely.

TX03679,00016D7 -19-03JAN07-1/1

T133580 —UN—25AUG00

Safety—General Precautions

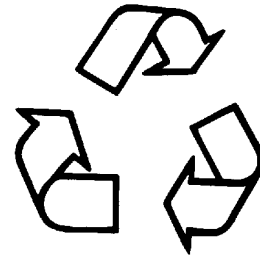
Dispose of Waste Properly

Improper disposal of waste can threaten the environment. Fuel, oils, coolants, filters and batteries used with this machine may be harmful if not disposed of properly.

Never pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants can damage the atmosphere. Government regulations may require using a certified service center to recover and recycle used refrigerants.

If uncertain about the safe disposal of waste, contact your local environmental or recycling center or your authorized dealer for more information.



TI133567 —UN—25AUG00

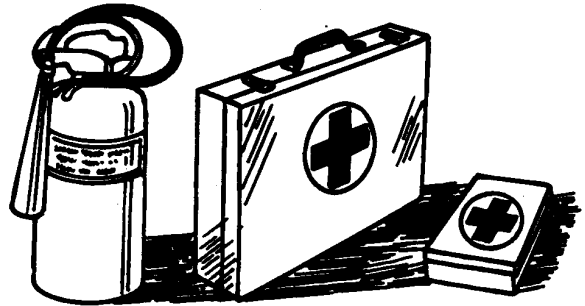
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Prepare for Emergencies

Be prepared if an emergency occurs or a fire starts.

Keep a first aid kit and fire extinguisher handy.

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



TS291 —UN—15APR13

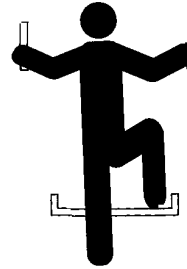
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Safety—Operating Precautions

Use Steps and Handholds Correctly

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

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



T133468 —UN—15APR13

TX03679,00016F2 -19-24APR13-1/1

Start Only From Operator's Seat

Avoid unexpected machine movement. Start engine only while sitting in operator's seat. Ensure 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.



T133715 —UN—15APR13

TX03679,0001799 -19-22APR10-1/1

Use and Maintain Seat Belt

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

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

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



USE SEAT BELT

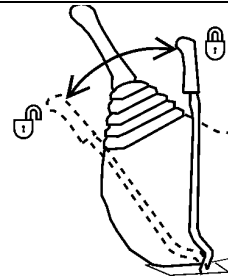
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DW90712,0000181 -19-29JUN06-1/1

Prevent Unintended Machine Movement

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

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



T133863 —UN—20SEP00

TX03679,0001746 -19-24JAN07-1/1

Safety—Operating Precautions

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 starting work.

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

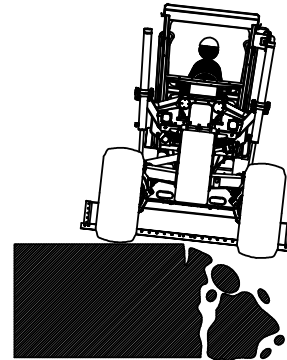
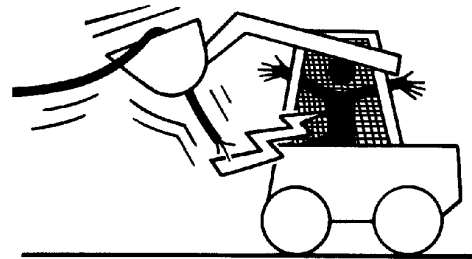
Avoid boom or attachment contact with overhead obstacles or overhead electrical lines. Never move machine closer than 3 m (10 ft) plus twice the line insulator length to overhead wires.

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

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

Avoid working under over-hanging embankments or stockpiles that could collapse under or on machine.

Reduce machine speed when operating with tool on or near ground when obstacles may be hidden (e.g., during



snow removal or clearing mud, dirt, etc.). At high speeds hitting obstacles (rocks, uneven concrete or manholes) can cause a sudden stop. Always wear your seat belt.

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T192984 —UN—26AUG03

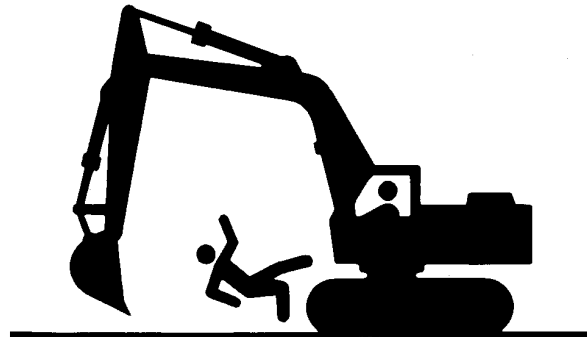
T141904 —UN—15MAY01

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.



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T7273AH —UN—08JUN90

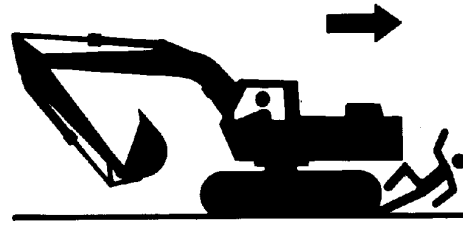
Safety—Operating Precautions

Avoid Backover Accidents

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

Be certain travel alarm is working properly.

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



T133548 —UN—24AUG00

TX03679,00016F3 -19-03JAN07-1/1

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. Properly attach ramps to truck bed. Avoid trucks with steel beds because tracks slip more easily on steel.

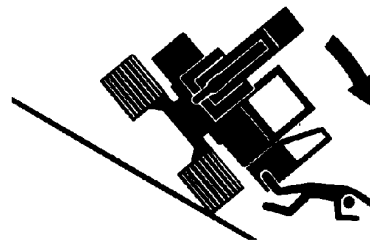
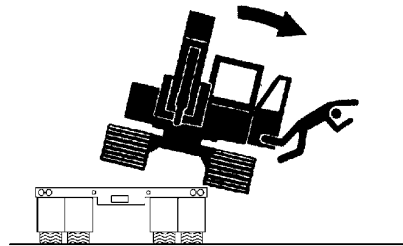
Be careful on slopes. Use extra care on soft, rocky or frozen ground. Machine may slip sideways in these conditions. When traveling up or down slopes, keep the bucket on uphill side and just above ground level.

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**



T133716 —19—17APR13

T133545 —UN—15SEP00

T133803 —UN—27SEP00

TX03679,00016DF -19-24JAN07-1/1

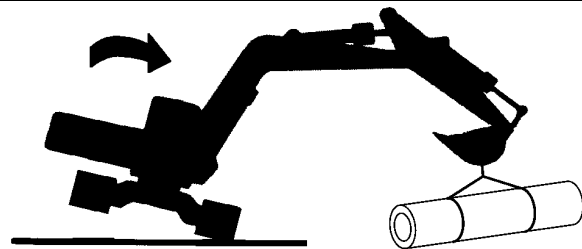
Use Special Care When Lifting Objects

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.

T133839 —UN—27SEP00

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

Safety—Operating Precautions

Add and Operate Attachments Safely

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

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

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

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

DW90712,0000182 -19-29JUN06-1/1

Safety—Maintenance Precautions

Park and Prepare for Service Safely

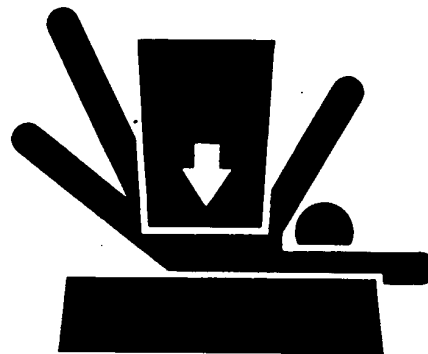
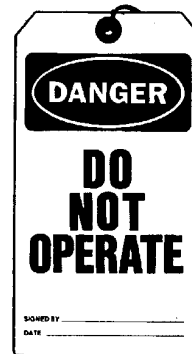
Warn others of service work. Always park and prepare your machine for service or repair properly.

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

Securely support machine or equipment before working under it.

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

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



T133332 —19—17APR13

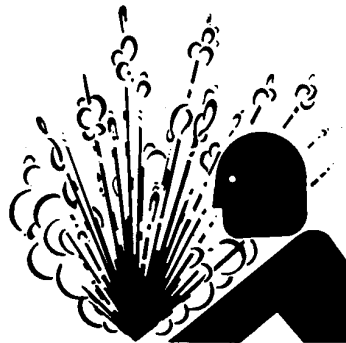
TS229 —UN—23AUG88

TX03679,00016E9 -19-24JAN07-1/1

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

Safety—Maintenance Precautions

Remove Paint Before Welding or Heating

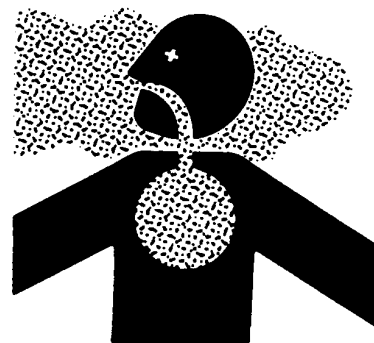
Avoid potentially toxic fumes and dust.

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 or disconnect positive battery cable. Separate harness connectors to engine and vehicle microprocessors.

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

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



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

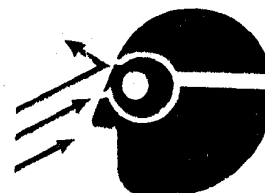
TX03679,00016D5 -19-25APR08-1/1

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 may dislodge chips at high velocity.

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

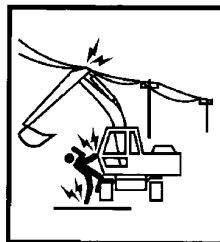


TX03679,0001745 -19-03JAN07-1/1

T133738—UN—15APR13

Safety—Safety Signs

Safety Signs



! DANGER

Serious injury or death can result from contact with electric lines. Never move any part of unit or load closer to electric line than 3M (10 FT.) plus twice the line insulator length.

! WARNING

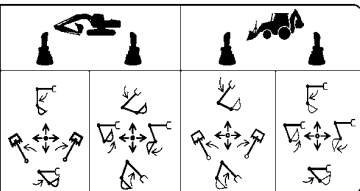
- AVOID SERIOUS CRUSHING INJURY FROM BOOM
- NEVER place any part of body beyond window bars or frame. It could be crushed by the boom if boom control lever is accidentally bumped or otherwise engaged.
- DO NOT remove window bars. If window is missing or broken, replace immediately.

T145965

! CAUTION

Alternate control patterns are available for this machine. Always verify control response before operating.

T201019



! CAUTION

- AVOID DEATH OR SERIOUS INJURY - READ AND UNDERSTAND THE OPERATOR'S MANUAL AND SAFETY MANUAL PRIOR TO OPERATING THIS MACHINE.
- Controls may be changed for attachment or operator preference. Try control pattern before operating.
- Always lower working tools to the ground and engage hydraulic control lockout lever before leaving operator's seat.
- Keep riders off machine.
- Avoid contact between boom/attachments and overhead obstacles whenever operating, travelling or transporting machine.
- Keep bystanders clear of machine, especially before moving boom, swinging upperstructure or travelling.
- Upperstructure position affects travel direction. Try pedals or levers to determine travel direction before moving machine.
- Avoid tipping - Do not lift or move objects that exceed machine stability.
- Avoid parking machine on an incline.

T145967



! DANGER

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

T145968

! CAUTION

PRESSURIZED
DO NOT OPEN HOT

Remove Slowly
15 P.S.I.
4T173810

! CAUTION

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

T187535

! CAUTION

PRESSURIZED TANK
CAP REMOVAL

1. Insert 4mm Allen Wrench in base and turn to release locking pin.
2. Slowly turn cap counter clockwise 2 to 3 degrees to relieve pressure. Pressure may suddenly cause cap to lift off tank.
3. To replace, align notches and turn clockwise.

T187710

! WARNING

Operator may swing or reverse machine
STAY CLEAR

T145969

T188684

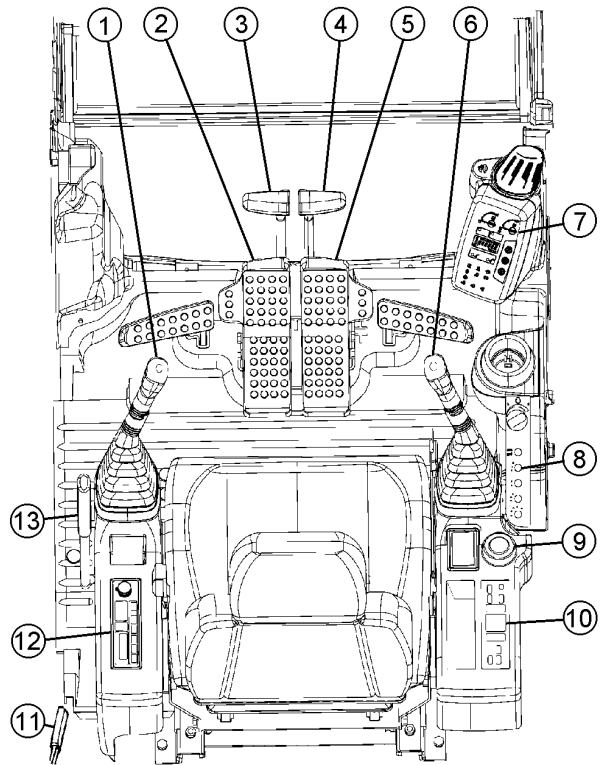
T188684 —19—26MAR03

TX14740,00003F -19-27MAR03-1/1

Operation—Operator's Station

Pedals, Levers, and Panels

- | | |
|-------------------------------------------------------------|---------------------------------------|
| 1— Left Control Lever/Horn Switch (on top of lever) | 8— Switch Panel |
| 2— Left Travel Pedal | 9— Key Switch |
| 3— Left Travel Lever | 10— Air Conditioner Panel—If Equipped |
| 4— Right Travel Lever | 11— Cab Door Release Lever |
| 5— Right Travel Pedal | 12— Radio |
| 6— Right Control Lever/Power Boost Switch (on top of lever) | 13— Pilot Control Shut-Off Lever |
| 7— Monitor Panel | |



T136132—UN—18DEC00

TX14740,0001C8E -19-11MAY06-1/1

Operation—Operator's Station

Monitor Panel

1. Engine Coolant Temperature Gauge:

IMPORTANT: If needle points to "RED" zone, idle engine to bring back needle to "GREEN" zone before stopping engine. If needle continues to rise, shut engine OFF.

2. Fuel Gauge: Fuel machine before needle reaches "E".

3. Display Select Switch: Press switch to display Hour Meter, Trip Meter 1 or Trip Meter 2 information in that order on the monitor display.

4. Set Switch: Press switch to change settings in Trip Meter 1 or Trip Meter 2.

5. Work Mode Switch: Press switch to select Dig Mode or Dig Mode II.

Dig Mode- - - - -Used in normal digging operations.

Dig Mode II- - - - - Used in trench digging operations (faster swing and slower boom).

6. Fuel Level Indicator:

IMPORTANT: DO NOT allow machine to be run out of fuel. Engine will not start until air has been completely purged from fuel system.

Indicator will light when approximately 80 liters (20 gal) of fuel remain.

7. Air Filter Restriction Indicator: Indicator will light when the air filter elements are clogged.

8. Alternator Voltage Indicator: Indicator will light with no or low alternator output.

9. Check Engine Indicator: Indicator will flash when the engine derate reaches 50% due to the following conditions: Low fuel pressure, high fuel temperature, crank sensor fault, defective fuel injection pump ECU, or a failure in ECU to injection pump ECU communications.

10. Hydraulic Oil Filter Restriction Indicator—If Equipped: Indicator will light when main hydraulic filter element is restricted.

11. Precision Mode Indicator: Indicator will light when Precision Mode is selected.

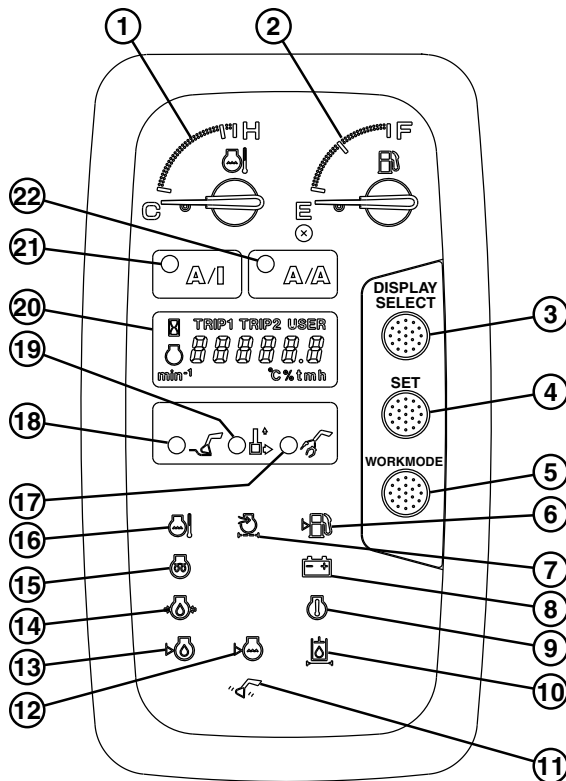
12. Engine Coolant Level Indicator: Indicator will light if engine coolant level is low in recovery bottle.

13. Engine Oil Level Indicator: Indicator will light if engine oil level is low.

14. Engine Oil Pressure Indicator:

IMPORTANT: If light comes on while operating, stop engine immediately.

Indicator will light and buzzer will sound when engine oil pressure is low. Stop engine immediately.



- | | |
|-----------------------------------------------------------|-----------------------------------------|
| 1—Engine Coolant Temperature Gauge | 12—Engine Coolant Level Indicator |
| 2—Fuel Gauge | 13—Engine Oil Level Indicator |
| 3—Display Select Switch | 14—Engine Oil Pressure Indicator |
| 4—Set Switch | 15—Pre-Heat Indicator (not used) |
| 5—Work Mode Switch | 16—Engine Coolant Temperature Indicator |
| 6—Fuel Level Indicator | 17—Attachment Mode Indicator (not used) |
| 7—Air Filter Restriction Indicator | 18—Dig Mode Indicator |
| 8—Alternator Voltage Indicator | 19—Dig Mode II Indicator |
| 9—Check Engine Indicator | 20—Monitor Display |
| 10—Hydraulic Oil Filter Restriction Indicator—If Equipped | 21—Auto-Idle Indicator |
| 11—Precision Mode Indicator | 22—Auto-Acceleration Indicator |

NOTE: Cold oil, low oil level, or extreme off level operation may cause indicator to light.

15. Pre-Heat Indicator: Not used.

16. Engine Coolant Temperature Indicator:

IMPORTANT: DO NOT stop engine when light comes on or temperature will rise further. Reduce load and run engine at slow idle. If light stays ON, stop engine.

Continued on next page

VD76477,0000106 -19-29JUN06-1/2

Operation—Operator's Station

Indicator will light and buzzer will sound when engine coolant overheats. Reduce load immediately and run engine at slow idle. Inspect for debris around radiator. Check coolant level in the radiator recovery tank.

17. Attachment Mode Indicator: Not used.

18. Dig Mode Indicator: Indicator will light when Dig Mode is selected.

19. Dig Mode II Indicator: Indicator will light when Dig Mode II is selected.

20. Monitor Display: Displays Hour Meter, Trip Meter 1, and Trip Meter 2 information.

21. Auto-Idle Indicator: Indicator will light when the auto-idle/auto-acceleration switch is turned to the A/I or the A/A position. Indicator will flash when engine is started and either auto-idle or auto-acceleration mode is already activated.

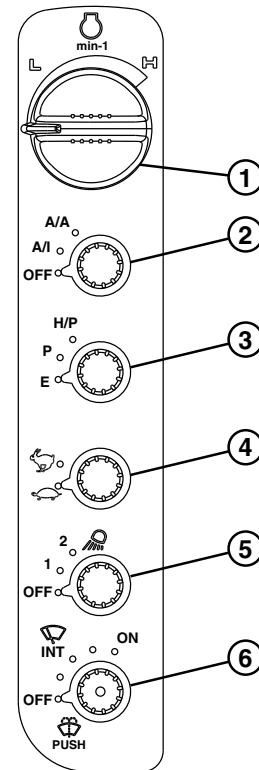
22. Auto-Acceleration Indicator: Indicator will light when the auto-idle/auto-acceleration switch is turned to the A/A position. Indicator will flash when engine is started and auto-acceleration mode is already activated.

VD76477,0000106 -19-29JUN06-2/2

Front Switch Panel

- 1— Engine Speed Dial
- 2— Auto-Idle/Auto-Acceleration Switch
- 3— Power Mode Switch

- 4— Travel Speed Switch
- 5— Operating Lights Switch
- 6— Washer/Wiper Switch



T136155—UN—18DEC00

TX14740,0001C90 -19-24JAN07-1/1

Operation—Operator's Station

Front Switch Panel Functions

1. Engine RPM Dial: Turn dial clockwise to increase engine speed or counterclockwise to decrease engine speed.

2. Auto-Idle/Auto-Acceleration Switch: With engine on, move auto-idle/auto-acceleration switch to A/I. Auto-idle indicator will light when auto-idle is on.

The engine will run at the engine rpm dial setting for 4 seconds after turning key switch ON. The auto-idle system will then slow the engine to auto-idle engine speed.

The auto-idle circuit automatically reduces engine speed after 4 seconds when control levers are placed in neutral position.

Engine speed increases to engine rpm dial setting when any control lever is operated.

Engine rpm will change depending on rpm dial setting and position of control levers. Typically used for grading operations.

Turn auto-idle/auto-acceleration switch OFF and set engine rpm dial to improve machine control in difficult work areas, loading and unloading.

3. Power Mode Switch: Move switch to select engine speed mode.

H/P (High Power) Mode

Use H/P mode when extra horse power is needed for rolling in the arm in excavation work.

P Mode

Use P mode when general digging work is needed.

E (Economy) Mode

Use E mode to improve fuel efficiency and reduce noise level with a small difference in engine speed.

4. Travel Speed Switch: Turn switch to select fast or slow speed travel.

5. Operating Lights Switch: Turn switch to first position to turn on operating light. Monitor panel will also light.

Turn light switch to second position to turn on boom light, cab lights, and operating light. Monitor panel lights will go off.

6. Wiper Switch: Wiper switch has several positions:

OFFWiper automatically stops operating and is retracted.

INT ... Wiper operates intermittently at the interval selected by the switch position.

ON Wiper operates continuously

NOTE: The wiper and washer do not operate unless the upper front window is completely closed. Alarm will sound if either washer or wiper is operated with the window open.

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

TX14740,0001C92 -19-24JAN07-1/1

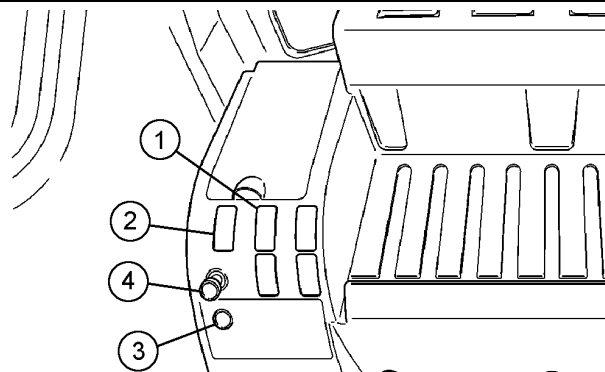
Rear Switch Panel

1. Boom Mode Switch: When switch is ON, boom rod end relief valve pressure is reduced. This prevents lifting the undercarriage while arming in. When switch is OFF the machine operates normally.

2. Precision Mode Switch: When switch is ON all hydraulic functions operate at slower than normal speed with an increase in boom circuit pressures.

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

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



1— Boom Mode Switch
2— Precision Mode Switch

3— Accessory Power Port
4— Lighter

T140857—UN—27JUN01

TX14740,0001D08 -19-30MAR01-1/1

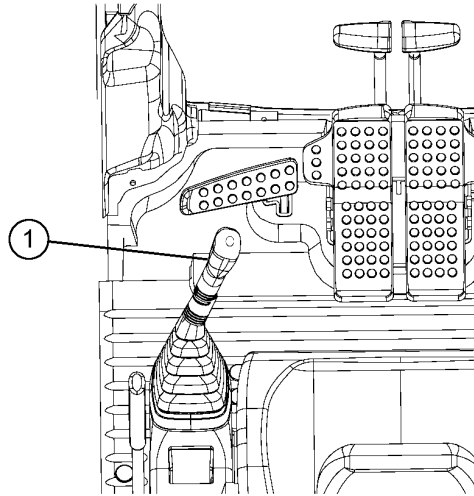
Operation—Operator's Station

Horn

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

Sound horn to alert persons nearby before starting engine.

1— Horn Switch



TX14740,0001CEA -19-19MAR01-1/1

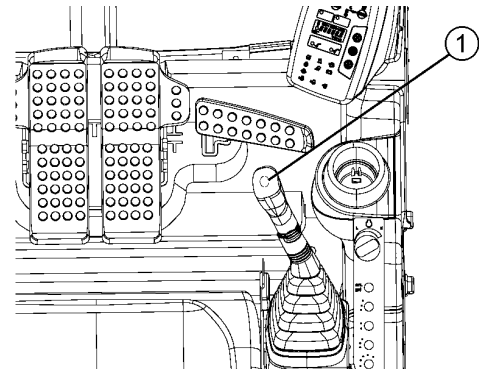
T140123 —UN—20MAR01

Power Boost Switch

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

Power boost is automatically activated when using only the boom function.

1— Power Boost Switch



TX,35,DH5156 -19-05JAN00-1/1

T136158 —UN—18DEC00

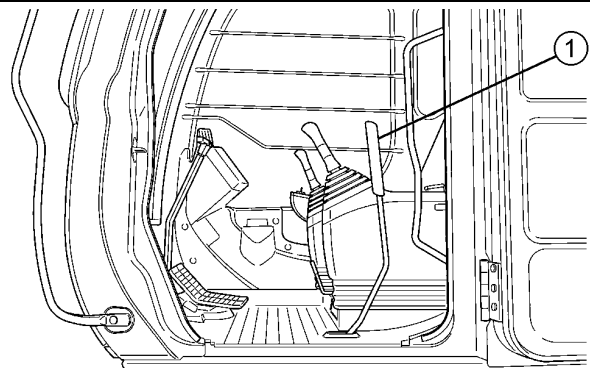
Pilot Shutoff Lever

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

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

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

1— Pilot Control Shut-Off Lever



Lever In Locked Position

TX14740,0001C93 -19-24JAN07-1/1

T136162 —UN—18DEC00

Operation—Operator's Station

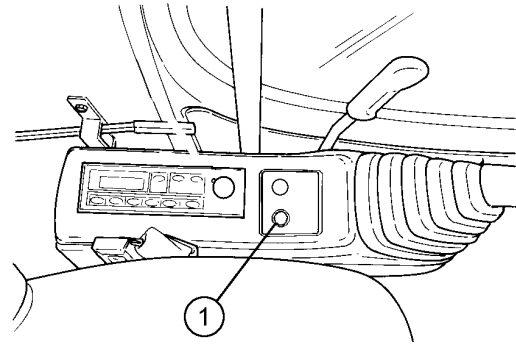
Travel Alarm and Travel Alarm Cancel Switch

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

After the initial 15 second alarm, alarm can be silenced by depressing the travel alarm cancel switch (1).

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

1—Travel Alarm Cancel Switch



T140078 —UN—20MAR01

TX14740.0001CE9 -19-11MAY06-1/1

Cab Heater and Air Conditioner

1. Blower OFF Switch: Press OFF switch to turn blower off. When blower OFF switch is pressed, all displays on the monitor display will disappear and the blower will stop in both the auto and manual modes.

2. Blower Fan Speed Switches: Press blower switches to select desired blower fan speed. Selected fan speed will be displayed on the bottom of the monitor display.

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

4. Temperature Control Switches: Press switches to set temperature. The temperature will be displayed on the center of the monitor display. Press both "A" and "V" switches at the same time and hold for 5 seconds to change the temperature mode (Centigrade—Fahrenheit).

5. Mode Switch: Press to select desired air vent. Selected air vent is displayed on the top of the monitor display.

6. AUTO A/C Switch: Press AUTO switch to turn AUTO and A/C indicators on. Air flow-in temperature at the vent, blower speed, vent locations and fresh air port are automatically controlled. Press AUTO switch again to turn off indicator light and select manual mode. Air flow-in temperature at the vent, blower speed, vent locations and fresh air port can be manually selected.

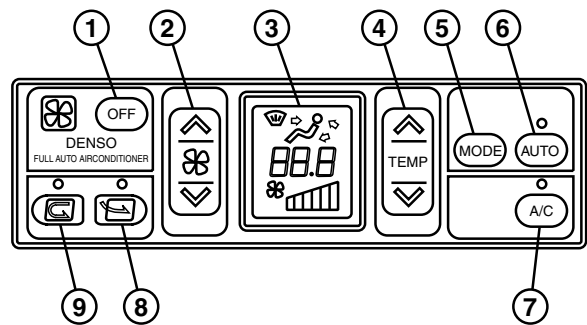
7. A/C Switch: Air conditioner will turn on when A/C switch is pressed and fan display of the blower switch is on. A/C indicator will also light.

8. Fresh Air Mode Switch: Press fresh air mode switch to open fresh air vent and route outside air into the cab. Indicator will also light.

9. Recirculating Mode Switch: Press recirculating mode switch to close fresh air vent and circulate air already in cab. Indicator will also light.

Cab Heater Operation

1. Press AUTO switch , **or press AUTO switch again and:**
2. Press temperature control switch to set temperature.
3. Press mode switch for desired vent air flow.
4. Press blower switch to select desired blower speed.
5. Press fresh air mode switch to maintain the air vent in the fresh air circulation mode.
6. Press recirculating mode switch to maintain the air suction port in the circulation mode.
7. Press temperature control switches and blower switches to adjust cab temperature



- | | |
|-----------------------------------------------------------------------|------------------------------|
| 1— Blower OFF Switch | 6— AUTO A/C Switch |
| 2— Blower Fan Speed Switches | 7— A/C Switch |
| 3— Monitor Display | 8— Fresh Air Mode Switch |
| 4— Temperature Control Switches | 9— Recirculating Mode Switch |
| 5— Mode Switch (air flow to front and rear vents, and defroster vent) | |

Air Conditioner Operation

1. Press AUTO switch. The AUTO and A/C indicators will light, **or press AUTO switch again and:**
2. Press temperature control switch to set temperature.
3. Press mode switch for desired vent air flow.
4. Press blower switch to select desired blower speed.
5. Press fresh air mode switch to maintain the air vent in the fresh air circulation mode.
6. Press recirculating mode switch to maintain the air suction port in the circulation mode.
7. Press temperature control switches and blower switches to adjust cab temperature

Defroster Operation

1. Press AUTO switch. Temperature controlled air blows out, **or press AUTO switch again and:**
2. Press temperature control switch to set temperature.
3. Press fresh air vent switch to select fresh air circulation mode.
4. Press mode switch to select the front vents or the front and rear vents.
5. Adjust the louvers on front vent and defroster vent to control air flow direction.
6. Press temperature control switches and blower switches to adjust cab temperature.
7. Press A/C switch on if windows become clouded or if dehumidifying is required.

Operation—Operator's Station

Cab Heater and Air Conditioner Monitor Display Diagnostic Function

Press both "Λ" and "v" temperature control switches at the same time and hold for 3 seconds with the blower fan turned OFF to display the operating conditions of the sensors and dampers as shown below.

If any fault codes are detected through diagnoses, see your authorized dealer.

Monitor Display	
Code Displayed	Fault
E—	No fault
E11	Broken recirculation air sensor
E12	Short-circuited recirculation air sensor
E13	Broken fresh air sensor
E14	Short-circuited fresh air sensor
E15	Broken coolant temperature sensor
E16	Short-circuited coolant temperature sensor
E18	Short-circuited insulation sensor
E21	Broken air vent sensor
E22	Short-circuited air vent sensor
E43	Abnormal air vent damper
E44	Abnormal air mix damper
E45	Abnormal recirculation and fresh air damper
E51	Abnormal refrigerant pressure

NOTE: In case more than one fault is detected, press either "Λ" or "v" switch to display the fault code on the monitor display in order.

TX14740,0001D01 -19-29JUN06-1/1

Operating the AM/FM Radio

Press power switch (1) to turn radio on, and repeatedly press one of tuning switches (4) until desired station is reached. To preset a station, select the desired station using tuning switches. Press and hold station preset (6) for more than 2 seconds until an electronic tone is heard. The frequency of the preset station will be indicated on digital display (7).

Setting The Clock

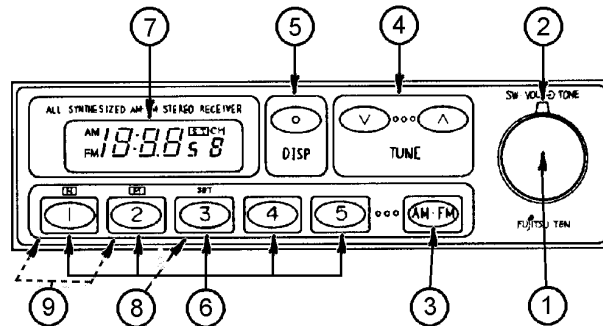
NOTE: In order to set the clock, digital display (7) must be in the time display mode.

While pressing display mode change switch (5) use time set switches (9) and set switch (8) to set the clock.

Press set switch (8) to reset the minute display to "00."

Press time set switch labeled 1 to set correct hour.

Press time set switch labeled 2 to set correct minute.



- 1— Power Switch/Volume Control Knob
- 2— Tone Adjustment Ring
- 3— AM/FM Switch
- 4— Tuning Switches
- 5— Display Mode Change Switch
- 6— Station Presets
- 7— Digital Display
- 8— Set Switch
- 9— Time Set Switches

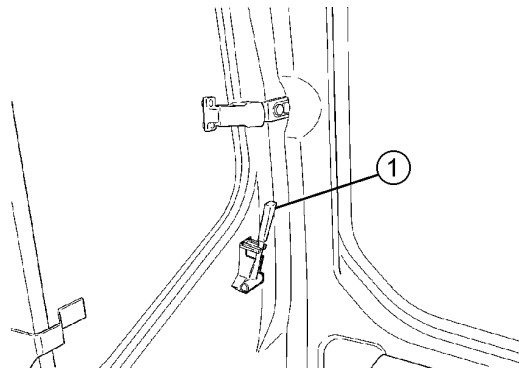
TX14740,0001C95 -19-11MAY06-1/1

Operation—Operator's Station

Secondary Exit Tool

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

1— Secondary Exit Tool



T137043 —UN—08JAN01

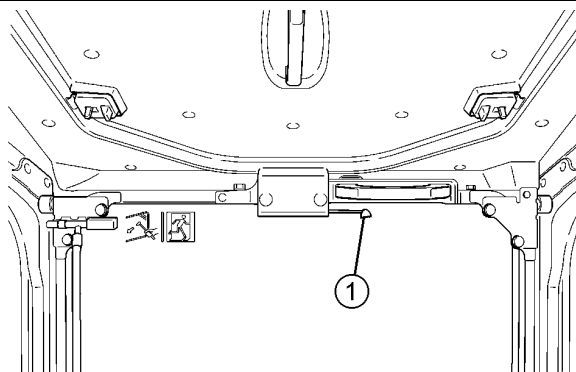
TX14740,0001C99 -19-08JAN01-1/1

Opening Upper Front (Secondary Exit) Window

NOTE: The washer and wiper cannot operate with the upper front window opened.

1. Press lock release lever (1).

1— Lock Release Lever



T136264 —UN—18DEC00

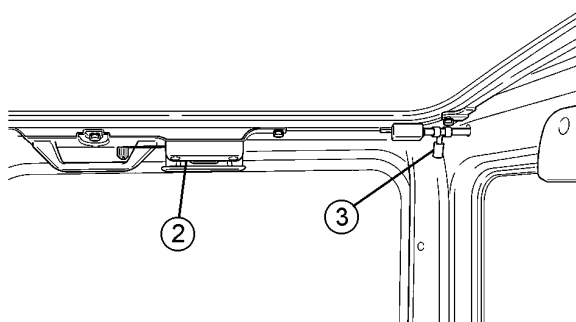
TX14740,0001C96 -19-08JAN01-1/2

2. While holding the upper and lower handles on the window, pull window up and back until it catches in auto lock (2) for convenient storage overhead.

CAUTION: Prevent possible injury from window closing. **DO NOT** rely on auto lock alone to hold the window in the up position. Always lock the pin in the cab frame boss hole.

3. Slide the lock pin (3) into the cab frame boss hole and turn to lock.

CAUTION: Prevent possible injury from window closing. Upper front window comes down very forcefully. Close window only when sitting on operator's seat. Guide window down slowly.



2— Auto Lock

3— Lock Pin

T136265 —UN—18DEC00

TX14740,0001C96 -19-08JAN01-2/2

Operation—Operator's Station

Removing and Storing the Lower Front Window

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

1. While pulling in on window, raise window to remove.



T136266—UN—18DEC00

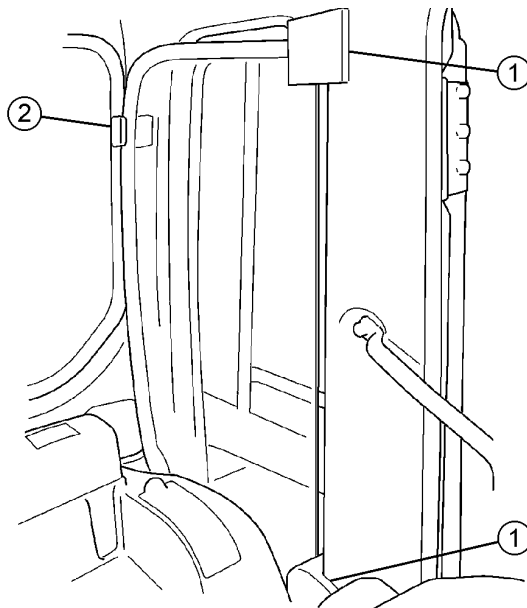
TX14740,0001C97 -19-28JUN06-1/2

2. Store window in rear-left storage area of cab. Install in protectors as shown.

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

1—Protector

2—Protector



T136267—UN—18DEC00

TX14740,0001C97 -19-28JUN06-2/2

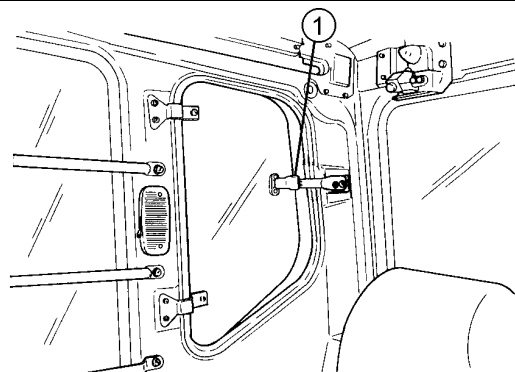
Opening Side Windows

CAUTION: Avoid serious crushing injury from boom. Never place any part of body beyond window bar or frame. It could be crushed by the boom if boom control lever is accidentally bumped or otherwise engaged.

DO NOT remove window bars. If window or bars are missing or broken, replace immediately.

Both right side window and cab door window can be opened.

1. Right-rear side window: Unlock the latch (1). Push joint part of latch to open window.
2. Cab door window: Slide front pane to the rear and rear pane to the front.



1—Latch

T136268—UN—18DEC00

TX14740,0001C98 -19-08JAN01-1/1

Operation—Operator's Station

Opening and Closing the Roof Exit Cover

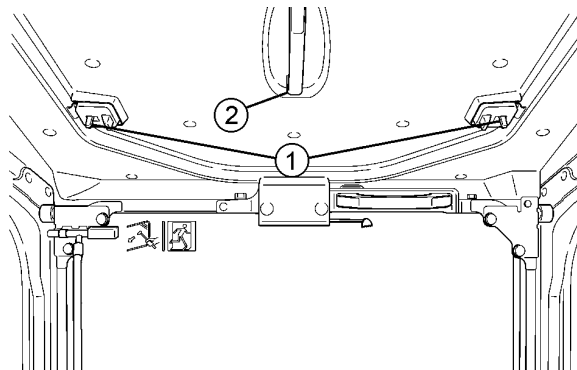
Opening:

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

Closing:

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

IMPORTANT: To maintain the impact resistance of the roof hatch, the following replacement guidelines are recommended. Replace the hatch if it has been impacted by fallen objects, or if there is visible damage, or if the transparent hatch has been in service for 5 years or more.



1— Lock Lever

2— Handle

T136270—UN—18DEC00

TX14740,0001C9A -19-11MAY06-1/1

Adjusting the Seat

Push down lever (1) while sitting or while pulling up on seat while standing to obtain desired height. Release lever. Push down lever while sitting on seat to adjust seat to desired angle. Release lever.

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

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

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

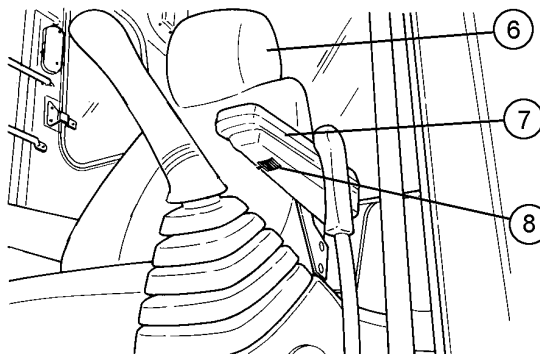
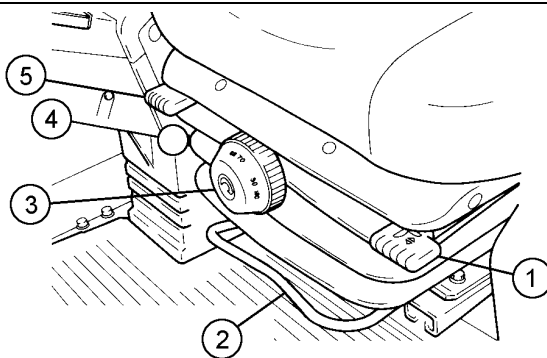
Pull up lever (5) to release backrest lock. Move backrest to desired position. Release lever.

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

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

Turn dial (8) to adjust angle of armrest.

- | | |
|-------------------------------------|------------------------------|
| 1— Seat Height And Angle Adjustment | 5— Backrest Adjustment |
| 2— Seat Fore-Aft Adjustment Handle | 6— Headrest Height and Angle |
| 3— Weight Adjustment Knob | 7— Armrest |
| 4— Lumbar Adjustment Ball | 8— Armrest Dial |



T140132—UN—02MAY01

T140133—UN—02MAY01

TX14740,0001CEC -19-29JUN06-1/1

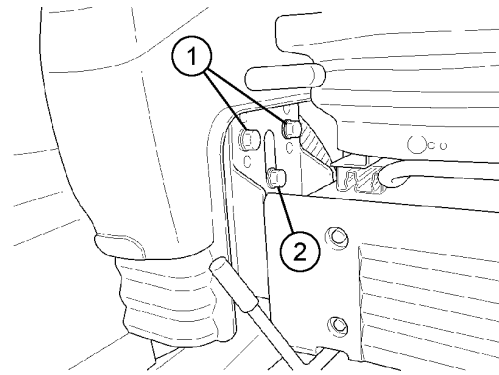
Operation—Operator's Station

Adjusting Console Height

1. Remove left and right console holding cap screws (1).
2. Loosen adjusting cap screw (2).
3. Adjust console height.
4. Tighten cap screws.

1— Holding Cap Screw

2— Adjusting Cap Screw



T142318 —JUN—25MAY01

TX14740,0001D1F -19-24MAY01-1/1

Operation—Operating the Machine

Before Starting Work

Review the operating precautions in the Safety Section of this manual.

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



T133566 —UN—24AUG00

DW90712,000016A -19-29JUN06-1/1

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.

Check condition of guards, shields, and covers

Overall Machine Checks

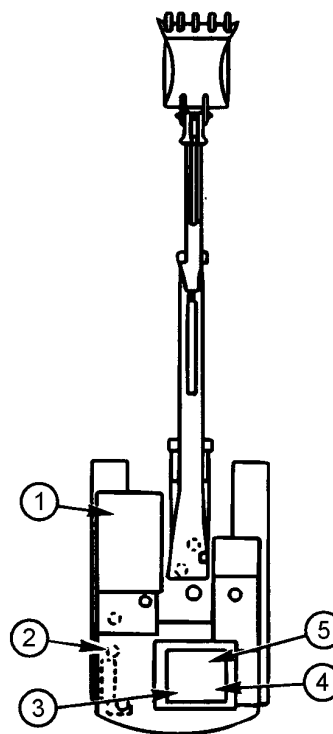
Check for worn or frayed electrical wires and loose or corroded connections.

Check for bent, broken, loose, or missing boom, bucket, sheet metal, track 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 Coolant Recovery Tank Level |
| 2— Check Hydraulic Oil Level | 5— Check Engine Oil Level |
| 3— Check/Clean Radiator And Oil Cooler Outer Fins | |



T141222 —UN—11APR01

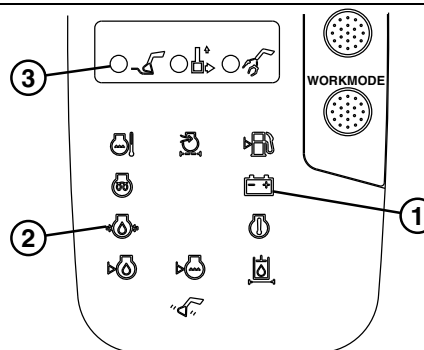
DW90712,000016B -19-29JUN06-1/1

Starting Engine

Before Starting the Engine

Turn key switch to ON position. All indicator lights will stay on for 3 seconds then go off except for alternator voltage indicator (1), engine oil pressure indicator (2), and dig mode indicator (3) which will continue to stay on.

- | | |
|----------------------------------|-----------------------|
| 1— Alternator Voltage Indicator | 3— Dig Mode Indicator |
| 2— Engine Oil Pressure Indicator | |



T140774 —UN—20APR01

Continued on next page

DW90712,000016C -19-29JUN06-1/2

Operation—Operating the Machine

Starting the Engine

1. Move engine rpm dial (1) to slow idle position.
2. Sound horn to alert persons nearby.

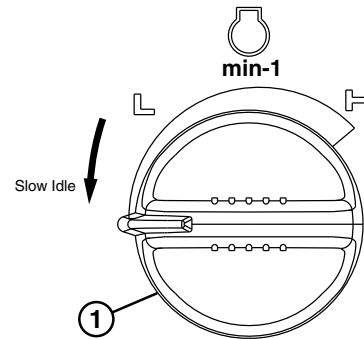
IMPORTANT: Prevent starter damage. Never operate starter for more than 20 seconds at a time. If engine fails to start, return key switch to OFF. Wait for about 2 minutes, then try again. After a false start, DO NOT turn key switch until engine stops.

3. Turn key switch to START. All indicator lights will stay on for approximately 3 seconds. Release key; switch will return to ON position.

After Starting Check

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 indicator lights should go out except for the dig mode indicator which will remain on. If they do not, stop the engine immediately. Find and correct the problem.



1— Engine RPM Dial

Warming the Engine

1. Run engine at 1/3 speed for 30 seconds. Do not run engine at fast or slow idle. Do not accelerate rapidly during warm-up.
2. Operate machine at less-than-normal loads and speeds until engine is at normal operating temperature.

DW90712,000016C -19-29JUN06-2/2

T136300—UN—24JAN01

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 the travel each cycle until full stroke is obtained.

5. Swing upperstructure so boom is perpendicular to tracks.

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

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

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

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

DW90712,000016D -19-29JUN06-1/1

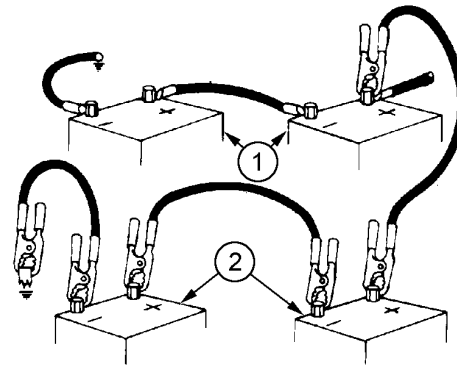
Using Booster Batteries—24 Volt System

Before boost starting, machine must be properly shut down to prevent unexpected machine movement when engine starts.

CAUTION: An explosive gas is produced while batteries are in use or being charged. Keep flames or sparks away from the battery area. Make sure the batteries are charged in a well ventilated area.

IMPORTANT: The machine electrical system is a 24-volt negative (-) ground. Connect two 12-volt booster batteries together in series as shown for 24 volts.

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 frame as far away from the machine batteries as possible.
3. Start engine.



Two Battery Application

1— Machine Batteries

2— Booster Batteries

4. Immediately after starting engine disconnect end of the negative (-) cable from the machine frame. Then disconnect the other end of the negative (-) cable from the negative terminal of the booster batteries.
5. Disconnect positive (+) cable from booster batteries and machine batteries.

DW90712.000016E -19-29JUN06-1/1

T137512—JUN—25JAN01

Operation—Operating the Machine

Travel Pedals and Levers

CAUTION: Keep bystanders clear of machine when traveling.

Keep bystanders clear of machine when traveling.

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

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

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

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

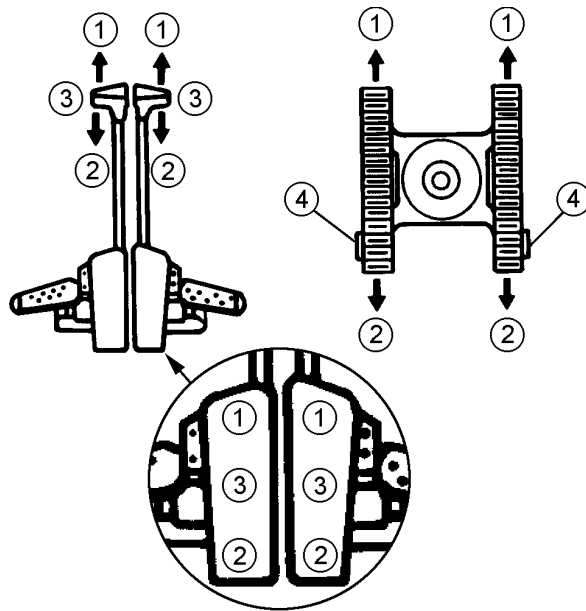
RIGHT TURN: Push down on front of left pedal or push left lever forward.

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

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

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

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



1— Forward Travel
2— Reverse Travel

3— Neutral Position
4— Travel Motors

COLD WEATHER OPERATION: Travel pedal and lever dampers are provided for smooth control. In extremely cold weather, pedal or lever effort will increase. Operate pedals or levers several times with pilot control shut-off lever in locked position.

DW90712,000016F -19-29JUN06-1/1

T137492—JUN—25JAN01

Control Lever Pattern Operation

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

Never place any part of the body beyond the window frame. Replace missing or broken windows immediately.

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

The machine comes equipped from the factory with the excavator control lever pattern and has the corresponding black-on-white labels installed on the left and right control consoles.

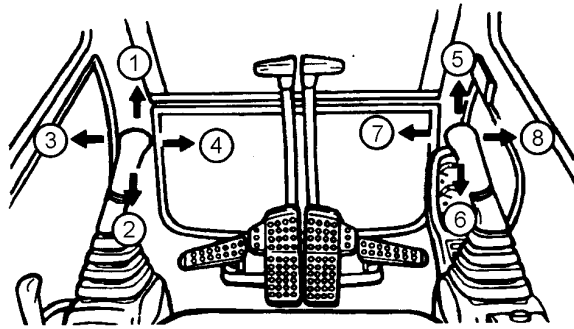
When changed to the backhoe control lever pattern the corresponding black-on-yellow labels must be installed on the left and right control consoles.

Check the pattern on the labels and then carefully operate the machine to verify that the correct labels are installed.

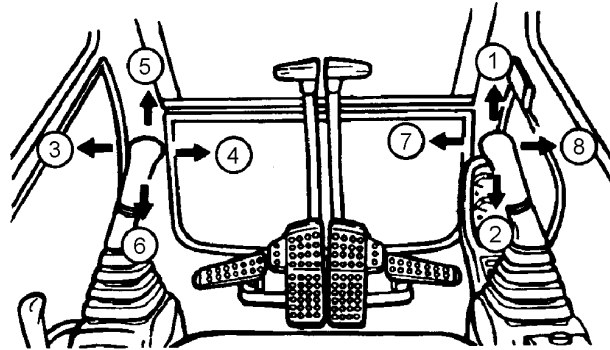
NOTE: A Control Pattern Selector Kit is available through parts, that when installed, changes the control lever pattern using a solenoid valve.

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

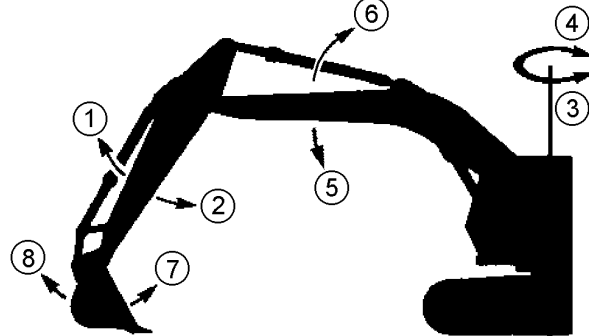
- | | |
|----------------|----------------|
| 1— Arm Out | 5— Boom Down |
| 2— Arm In | 6— Boom Up |
| 3— Swing Left | 7— Bucket Load |
| 4— Swing Right | 8— Bucket Dump |



Excavator Control Lever Pattern



Backhoe Control Lever Pattern



Boom, Arm, Bucket Movement

T137500—UN—25JAN01

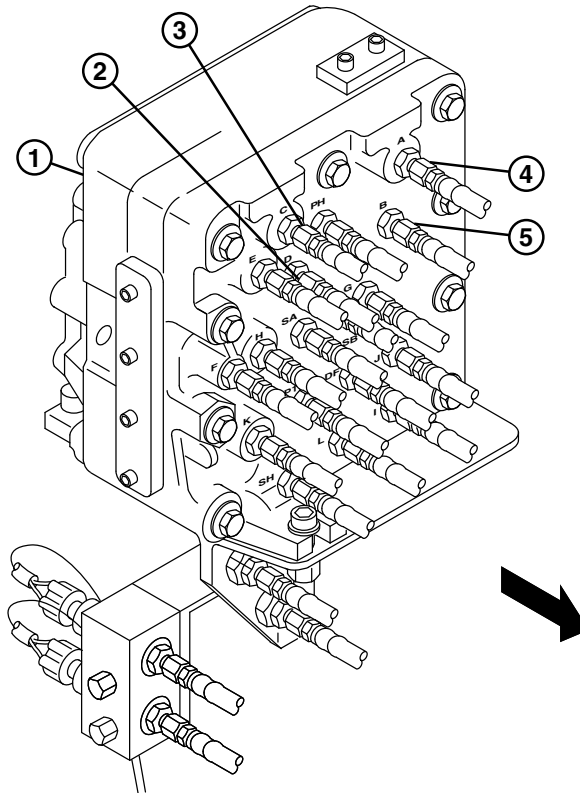
T137498—UN—25JAN01

T137499—UN—25JAN01

DW90712,0000170 -19-29JUN06-1/1

Operation—Operating the Machine

Control Lever Pattern Conversion



T142017

- 1— Pilot Signal Control Valve 2— Hose To Port D 4— Hose To Port A
 3— Hose To Port C 5— Hose To Port B

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

CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. **SLOWLY** loosen hydraulic cap to release air to relieve pressure.

3. SLOWLY loosen hydraulic cap to relieve air pressure.
4. Remove panel on top of machine to access pilot signal control valve.

NOTE: DO NOT use manufacturer's hose tags or markings on hose ends to identify hoses for this conversion procedure. The hoses must be switched on the pilot controller side (front) of the pilot signal control valve.

5. Disconnect and connect hoses on the pilot controller side (FRONT) of the pilot signal control valve as follows:
 - Switch hose to Port D (2) with hose to Port A (4).

- Switch hose to Port C (3) with hose to Port B (5).

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

CAUTION: Prevent injury from unexpected control lever function. Install new labels on control consoles.

6. When changing to the backhoe control lever pattern, remove the old labels and install the black-on-yellow labels on the left and right control consoles near base of control levers. Labels are enclosed in Operator Manual package.

When changing to the excavator control lever pattern, remove the old labels and install the black-on-white labels on the left and right control consoles.

Additional labels can be purchased from your authorized dealer.

A control pattern selector kit is available through service parts. When installed, it changes the control lever pattern using a solenoid valve.

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T142017 —UN—09MAY01

Operation—Operating the Machine

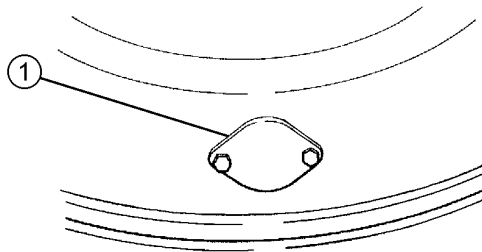
Operating In Water and Mud

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

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

Clean swing gear area. Install plug and cover. Grease swing gear and swing bearing. (See Section 3-7.)

1—Drain Plug



T136459—UN—18DEC00

DW90712,0000172 -19-29JUN06-1/1

Driving Up a Steep or Slippery Slope

CAUTION: Prevent possible injury from machine rollover. 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.

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Lifting

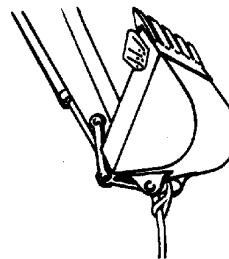
CAUTION: Lifting requires special care. Observe these rules when lifting with your machine:

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

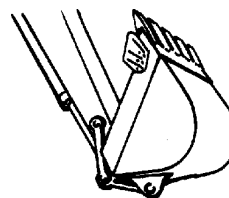
1. Use proper rigging to attach and stabilize loads.
2. Without bucket loop: Curl bucket and retract arm. Fasten sling or chain to bucket pivot pin.

With bucket loop: Curl bucket and retract arm. Fasten sling or chain to bucket loop.

3. Check stability by carefully doing a trial lift:
 - Raise load just off of ground
 - Swing load all the way to one side
 - Move load slowly away from machine
 - Lower load immediately if machine is not stable



Without Bucket Loop



With Bucket Loop

T133649—UN—02NOV00

T135070—UN—02NOV00

DW90712,0000174 -19-29JUN06-1/1

Operation—Operating the Machine

Lower Boom With Engine Stopped

When an engine stops during operation, an accumulator in the pilot circuit provides pilot pressure to lower the boom. Use the following procedure to lower the boom only if the accumulator is discharged.

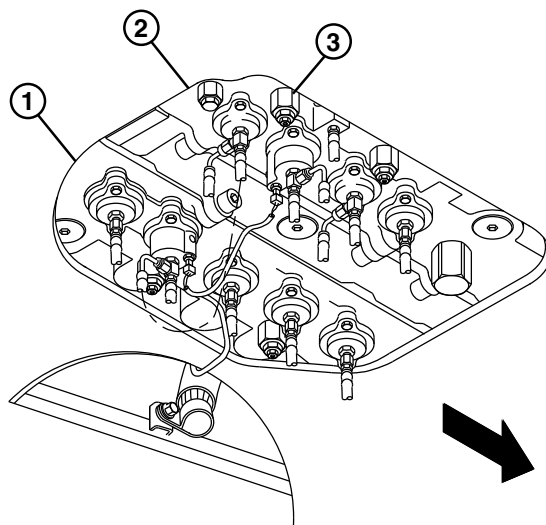
1. Slowly turn the boom up circuit relief valve assembly (3) out a maximum of one turn to lower the boom to the ground. Boom up circuit relief valve is at the bottom of the control valve in the 4-spool side.

NOTE: Turning the circuit relief valve assembly out opens a path for oil to flow from the head end of boom cylinders to the control valve return passage.

2. Tighten the circuit relief valve after boom is on the ground.

1— 5-Spool Control Valve
2— 4-Spool Control Valve

3— Boom Up Circuit Relief Valve Assembly



T140013

Boom Up Circuit Relief Valve

T140013—UN—16APR01

DW90712.0000175 -19-29JUN06-1/1

Parking the Machine

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

1. Park machine on a solid level surface.

During freezing weather, clean mud and dirt from tracks, rollers and track frames.

If tracks are frozen in the ground, slowly raise the machine using boom to free the tracks. Move machine carefully.

2. Lower equipment to the ground.
3. Turn auto-idle/auto-acceleration switch OFF.

IMPORTANT: Turbocharger can be damaged if procedure to shut down engine is not done properly.

4. Run engine with engine rpm dial at 1/3 position without load for 2 minutes.
5. Turn engine rpm dial to slow idle position.
6. Turn key switch to OFF. Remove key from switch.
7. Pull pilot shut-off lever to locked position.

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

8. Close windows, roof vent, and cab door.
9. Lock all access doors and compartments.

DW90712.0000176 -19-29JUN06-1/1

Prepare Machine for Loading On a Trailer

Before your machine can be loaded on a trailer for transporting, it must be broken down to the correct size and weight.

All local and state size and weight regulations must be met.

1. Remove counterweight.

2. Change track gauge from work to transport width. (See Section 2-2.)
3. Remove bucket. (See Section 4-1.)

DW90712.0000177 -19-29JUN06-1/1

Operation—Operating the Machine

Weights

Item	Measurement	Specification
Counterweight	Weight	8210 kg (18,100 lb)
Boom With Arm Cylinder	Weight	4090 kg (9,017 lb)
Arm With Bucket Cylinders And Linkage	Weight	With 2900 mm (9 ft 6 in.) Arm: 2305 kg (5,082 lb)
	Weight	With 3400 mm (11 ft 2 in.) Arm: 2280 kg (5,026 lb)
	Weight	With 3900 mm (12 ft 10 in.) Arm: 2460 kg (5,423 lb)
	Weight	With 4900 mm (16 ft 1 in.) Arm: 2350 kg (5,180 lb)

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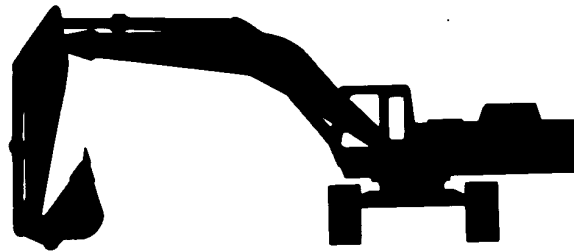
Counterweight Removal (With Hydraulic Removal Option)

IMPORTANT: This procedure must be performed with machine located on a level surface.

1. Park machine on a level surface.
2. Rotate upperstructure 90° and lower front attachment to the ground.
3. Stop engine.

CAUTION: Avoid personal injury from unexpected counterweight movement. **DO NOT** go directly under machine counterweight to remove or install counterweight covers or hardware. Enter the work area only from either **SIDE** of counterweight.

IMPORTANT: Do not attempt to remove or install counterweight with the track gauge in the narrow (transport) position. Before removing



T7708AA

T7708AA—UN—24FEB92

or installing the counterweight, the track gauge must be widened to the work position. To change the track gauge, see procedure in this section.

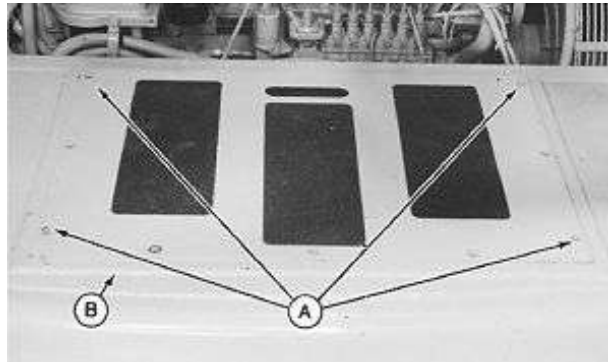
4. Open engine hood.

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5. Remove cap screws (A) to remove counterweight top cover plate (B).

A—Cap Screw

B—Cover Plate



T8172AE—UN—20FEB94

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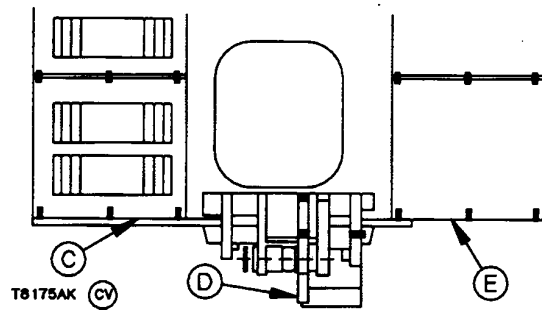
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Operation—Operating the Machine

6. Remove bottom covers (C and E).
7. Lift counterweight enough so weight of the counterweight is supported by the lifting device (D).

C—Bottom Cover
D—Lifting Device

E—Bottom Cover



View looking up from below machine

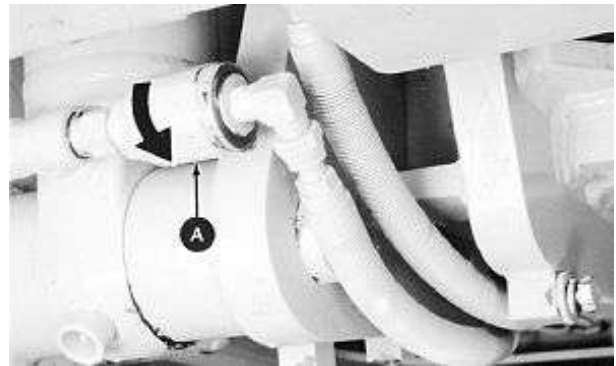
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T8175AK—UN—20FEB94

8. Set variable orifice (A) by turning in the direction of the arrow until closed. Then open orifice two turns. Adjust as required to achieve desired counterweight lowering speed. Every 1/8 turn of the variable orifice changes the lowering cycle time approximately 6 seconds.

IMPORTANT: Linkage pivot areas may bind if not properly lubricated resulting in failure of the counterweight lift cylinder to raise counterweight to full height.

9. Grease all pivot areas of counterweight lift linkage (three fittings at the bottom and one fitting at the top of the counterweight cylinder) the **FIRST TIME** and every third time the counterweight device is operated.



A—Variable Orifice

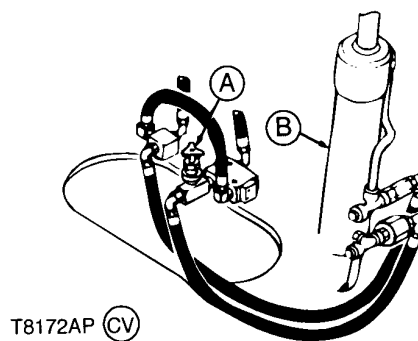
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T8172AF—UN—20FEB94

10. Turn the handle of shut-off valve (A) (located through opening under the engine) counterclockwise to open hydraulic pressure to counterweight lift cylinder (B).

A—Shut-off Valve

B—Lift Cylinder



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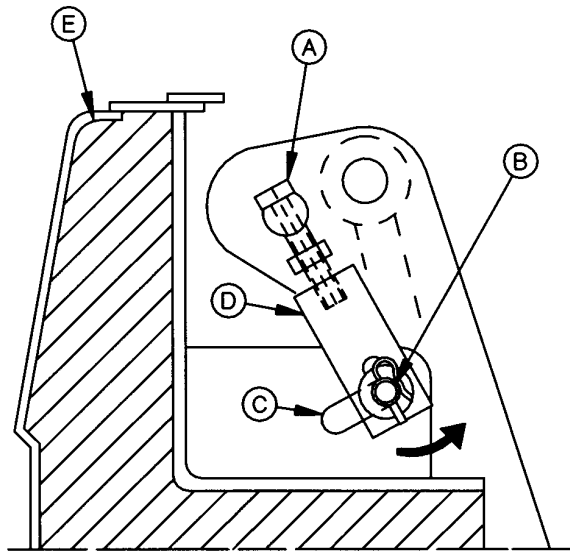
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T8172AP—UN—20FEB94

Operation—Operating the Machine

11. Loosen adjusting cap screws (A) and jam nuts to loosen lifting yokes (D) from counterweight pin brackets.
12. Slide the lifting yokes forward to the upward position of slot (C) away from the rear of counterweight (E).
13. Tighten adjusting cap screws enough to hold both lifting yokes in the forward position. Tighten jam nuts.

A—Adjusting Nut (2 used) D—Yoke (2 used)
 B—Yoke-To-Counterweight Pin (2 used)
 C—Slot



T8172AU (CV)

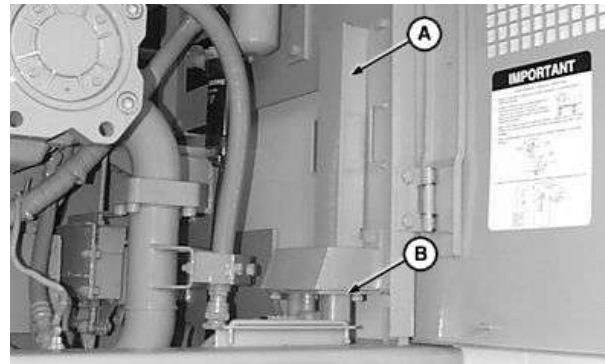
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14. Open left rear access door and pull off lever cover (A) of counterweight pilot control valve (B).
15. Start the engine. Run machine in “precision” work mode at slow idle.
16. Leave pilot shut-off lever in locked (UP) position.

CAUTION: To ensure good footing and visibility always stand on the machine service walk when operating counterweight pilot control valve.

17. Slowly move the counterweight pilot control valve lever UP and DOWN several times to check the response of cylinder control.



A—Cover

B—Control Valve

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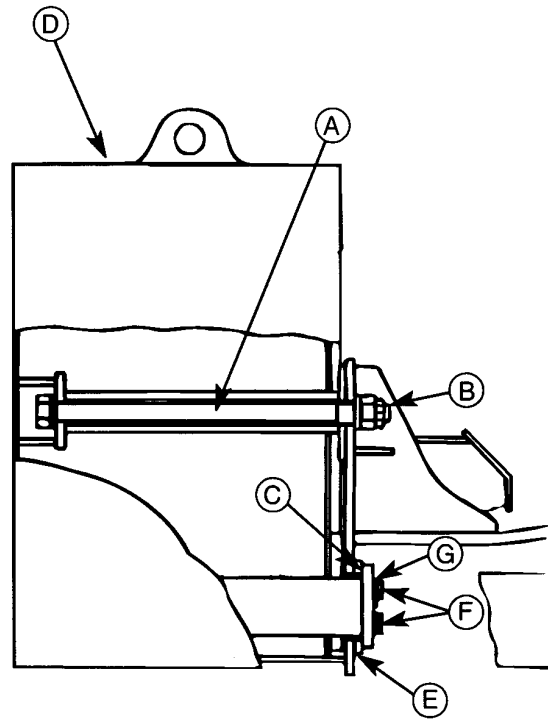
T107391—UN—06MAR97

Operation—Operating the Machine

18. Remove both lock pins from the slotted nuts (B) on the counterweight tie bolts (A).
19. Alternately loosen each counterweight tie bolt two or three turns.
20. Using a standard screwdriver, pry the corner of the lock plate (G) away from the head of each of the lower counterweight boss cap screws (F).
21. Loosen each cap screw 5 mm (0.20 in.)

A—Tie Bolt (2 used)
 B—Slotted Nut (2 used)
 C—Boss Plate (2 used)
 D—Counterweight

E—Shim (as required)
 F—Cap Screws (4 used)
 G—Lock Plate (2 used)



T8172AD (CV)

T8172AD—UN—20FEB04

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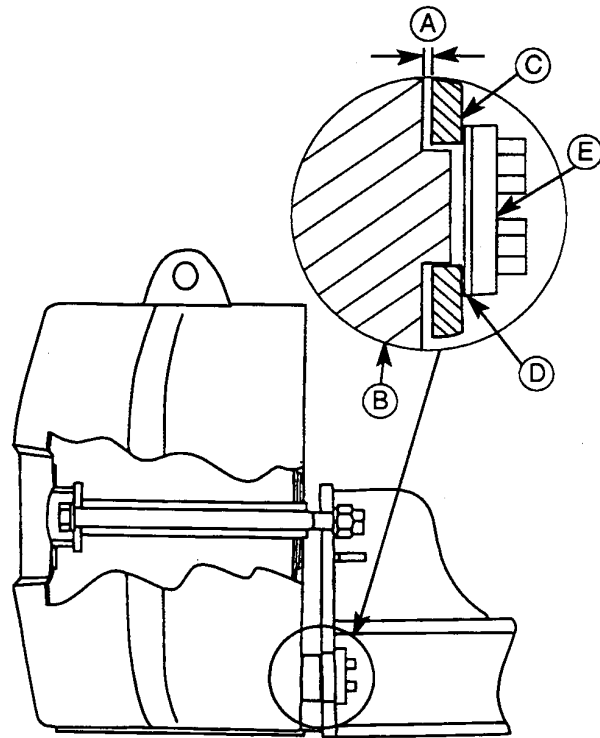
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Operation—Operating the Machine

NOTE: Lifting yokes must be in the forward position or highest point of the slot.

22. Slowly move the counterweight pilot valve lever UP until the counterweight bottom bosses (B) move away from the machine mainframe (C) approximately 5 mm (0.20 in.) (A). This will ensure that the weight of the counterweight is on the counterweight cylinder.

- A—5 mm (0.20 in.)
- B—Counterweight Boss
- C—Mainframe
- D—Shim
- E—Boss Plate



T8175AC (CV)

T8175AC—UN—20FEB84

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DW90712.0000179 -19-29JUN06-9/10

Operation—Operating the Machine

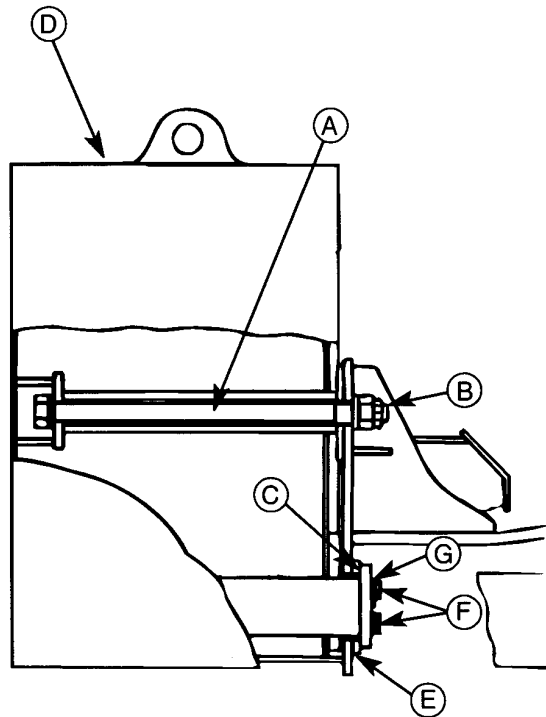
CAUTION: When the threads of the counterweight-to-mainframe tie bolt (A) disengage from the slotted nut (B), the slotted nut and slotted nut spacer may drop to the ground. Stay clear from under the machine when removing the tie bolts.

CAUTION: The counterweight weighs approximately 8210 kg (18,100 lb). Use an adequate lifting device when lifting the counterweight. Clear everyone from the area before removing or installing the counterweight.

Specification

Counterweight—Weight..... 8210 kg (18,100 lb)

23. To avoid binding, remove the large counterweight-to-mainframe tie bolts (A) by alternately turning each bolt one turn at a time.
24. Remove cap screws (F), plates (G), spacers and shims (E) from each counterweight boss. **To avoid binding, alternately loosen left hand and right hand counterweight boss cap screws two or three turns at a time.**
25. Slowly lower counterweight to the ground until all weight is removed from the linkage and the yokes move freely in their slots.
26. Remove counterweight yoke-to-link pins.
27. Tighten adjusting cap screw jam nut.
28. Raise counterweight cylinder to end of its stroke.
29. Store the yoke-to-link pins by attaching pins to the counterweight lift brackets.
30. Close hydraulic counterweight shut-off valve by turning valve handle clockwise.
31. Install top cover to the counterweight and two bottom covers to the machine mainframe.



T8172AD (CV)

- | | |
|------------------------|-----------------------|
| A—Tie Bolt (2 used) | E—Shim (as required) |
| B—Slotted Nut (2 used) | F—Cap Screw (4 used) |
| C—Boss Plate (2 used) | G—Lock Strap (2 used) |
| D—Counterweight | |

32. Install counterweight lift cylinder lower guard.
33. Install lever cover over counterweight pilot valve.
34. Close left rear access door and engine hood.

DW90712,0000179 -19-29JUN06-10/10

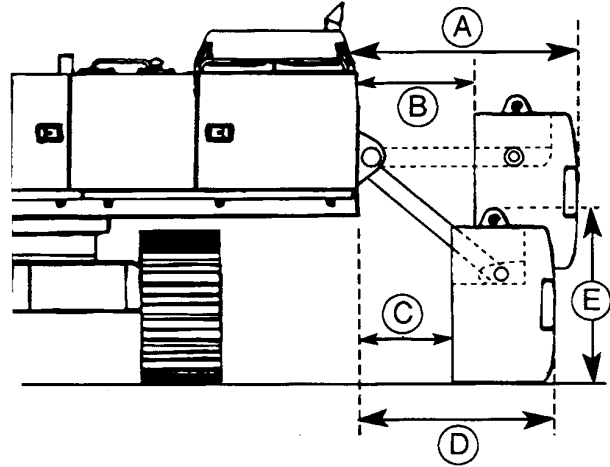
T8172AD —UN—20FEB04

Operation—Operating the Machine

Counterweight Removal/Installation Measurements

A—1435 mm (56.5 in.)
 B—700 mm (27.5 in.)
 C—584 mm (23.0 in.)

D—1321 mm (52.0 in.)
 E—1260 mm (49.5 in.)



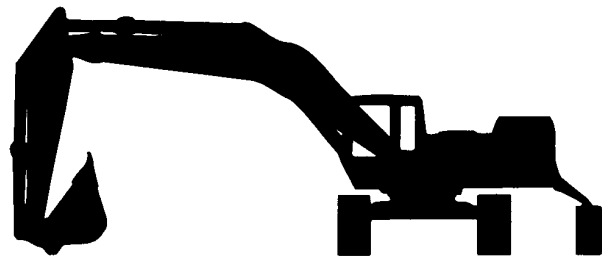
T8173BO (CV)

T8173BO—UN—20FEB94

DW90712,000017A -19-29JUN06-1/1

Counterweight Installation With Hydraulic Removal Option

1. Park machine on a level surface.
2. Lower bucket to ground.
3. Stop engine.
4. Remove both machine mainframe bottom access covers and counterweight top cover.



T8186AC (CV)

T8186AC—UN—07MAR94

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DW90712,000017B -19-29JUN06-1/6

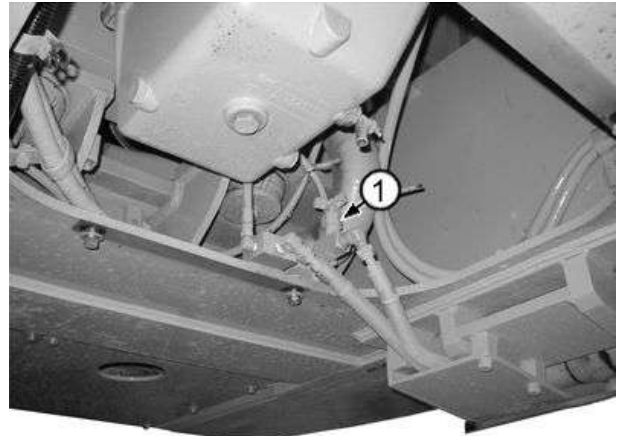
Operation—Operating the Machine

5. Open shut-off valve (1).
6. Start the engine.
7. Turn engine RPM dial to slow idle.
8. Push precision mode switch to ON.
9. Leave pilot shut-off lever in locked (UP) position.

CAUTION: To ensure good footing and visibility always stand on the machine service walk when operating counterweight pilot control valve.

10. Lower counterweight cylinder.

1— Shut-off Valve



Shut-off Valve

T139708B—UN—07MAR01

DW90712.000017B -19-29JUN06-2/6

11. Install counterweight lifting yoke link pins (E) to the counterweight pin brackets. Slide yoke (D) forward to the top position of the slot in the counterweight pin bracket.

IMPORTANT: To ensure full thread engagement of cap screw (B) in the yoke (D), length (A) must not exceed 120 mm (4-3/4 in.)

NOTE: In order to achieve proper alignment of cap screws and counterweight bosses to machine mainframe, the length (A) of each adjusting cap screw (B) may vary from side to side of the counterweight.

12. Adjust cap screw (B) on each yoke (D) to length (A). Tighten nut (C).

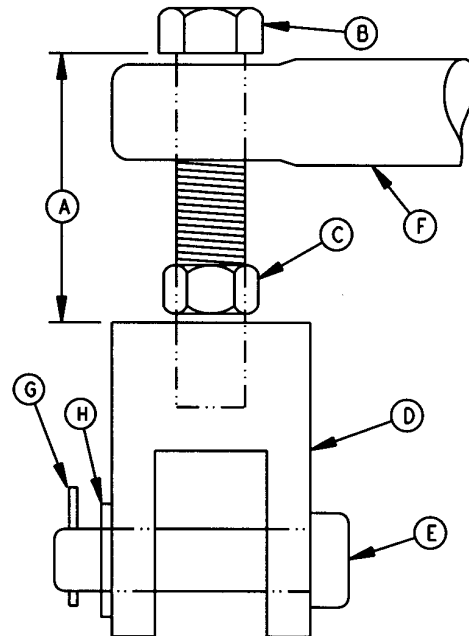
Counterweight—Specification

Head Of Cap Screw To
Yoke—Length..... 115 mm (4-1/2 in.) approximate

13. Slowly raise counterweight to full height.
14. Check counterweight boss and cap screw alignment.
15. As necessary, lower counterweight and adjust length (A). To raise counterweight, decrease length. To lower counterweight, increase length.

- | | |
|-------------------------------------|-----------------------------------------|
| A—115 mm (4-1/2 in.)
Approximate | E—Yoke-To-Counterweight Pin
(2 used) |
| B—Adjusting Cap Screw (2
used) | F—Washer (2 used) |
| C—Nut (2 used) | G—Lock Pin (2 used) |
| D—Yoke (2 used) | H—Flat Washer (2 used) |

T8174AL (CV)



T8174AL—UN—23SEP94

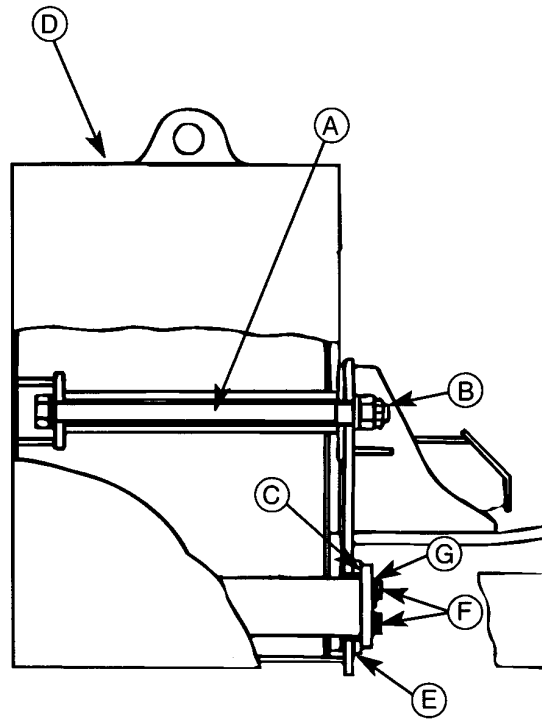
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DW90712.000017B -19-29JUN06-3/6

Operation—Operating the Machine

16. Install washers on cap screws (A). Install cap screws through counterweight and frame.
17. Install spacers and nuts (B). One flat of nut must be against tab. Turn cap screws (A) into nuts until end of cap screws are even with slotted end of nuts.

- | | |
|----------------------|-----------------------|
| A—Cap Screw (2 used) | E—Shim (as required) |
| B—Nut (2 used) | F—Cap Screws (4 used) |
| C—Boss Plate | G—Lock Strap (2 used) |
| D—Counterweight | |



T8172AD (CV)

T8172AD—UN—20FEB84

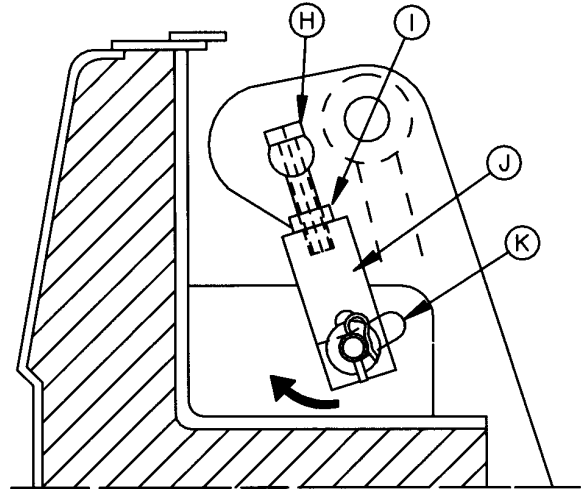
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DW90712,000017B -19-29JUN06-4/6

Operation—Operating the Machine

18. Lower counterweight cylinder slightly to slide yokes (J) to the back of slots (K). Lift arms must be below top surface of counterweight to prevent interference with counterweight top cover.

- H—Adjusting Cap Screw (2 used)
- I— Nut (2 used)
- J— Yoke
- K—Slot



T8 175AB (CV)

Counterweight Lift Cylinder Storage Position

Continued on next page

DW90712.000017B -19-29JUN06-5/6

T8175AB—UN—20FEB94

Operation—Operating the Machine

19. Install shims (E), plates (C), lock plates (G), and cap screws (F) to counterweight bosses.

20. Bend one top and one bottom corner of lock plates (G) against heads of cap screws (F).

NOTE: Replace lock plate if damaged.

21. Tighten counterweight-to-frame cap screws (A).

Counterweight—Specification

Counterweight-To-Frame

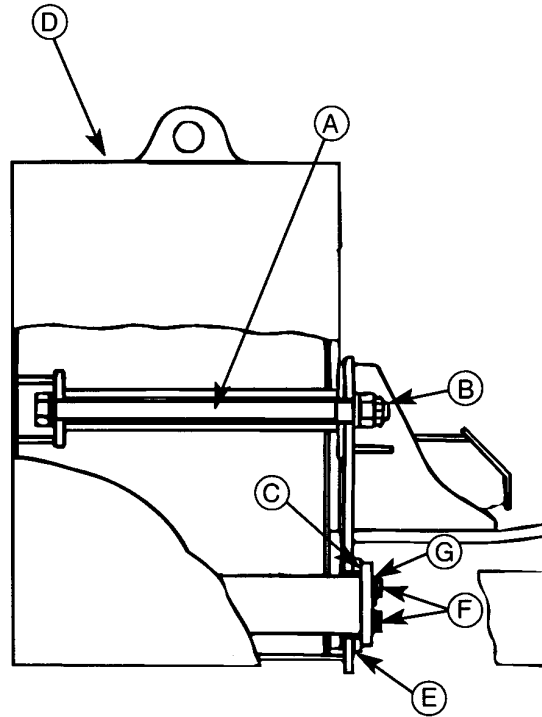
Cap Screw—Torque..... 2400 N·m (1740 lb ft)

22. Tighten or loosen cap screws (A) if necessary to install quick lock pins to nut (B).

23. Close shut off valve.

24. Install machine mainframe bottom access covers and counterweight top cover.

- | | |
|---------------------------------------|--------------|
| A—Counterweight-To-Frame
Cap Screw | E—Shim |
| B—Nut | F—Cap Screw |
| C—Plate | G—Lock Plate |
| D—Counterweight | |



T8172AD (CV)

Counterweight Hardware

DW90712,000017B -19-29JUN06-6/6

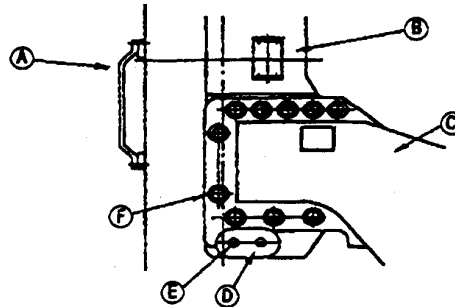
T8172AD —UN—20FEB84

Track Gauge Transport Position Adjustment

CAUTION: Do not loosen side frame STOP cap screws (E).

1. Remove 18 cap screws (nine cap screws from each of the track frame supports) of the side frame to be retracted.
2. Swing upper structure perpendicular to side frame.

- | | |
|-------------------|-------------------------|
| A—Side Frame Step | D—Stop |
| B—Side Frame | E—Stop Cap Screw |
| C—Track Frame | F—Track Frame Cap Screw |



T6912AW

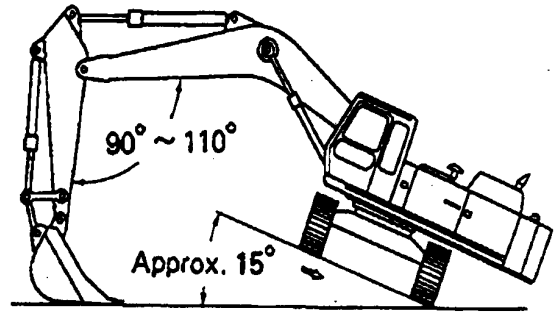
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DW90712,000017C -19-29JUN06-1/3

T6912AW —UN—07APR89

Operation—Operating the Machine

3. Raise side frame 15 degrees off the ground.
4. The side frame must slide against the inside stopper.
5. If side frame does not slide in this condition, vibrate side frame by slowly moving the track back and forth.
6. Lower machine to the ground.



T6912AX

T6912AX—19—07APR89

DW90712,000017C -19-29JUN06-2/3

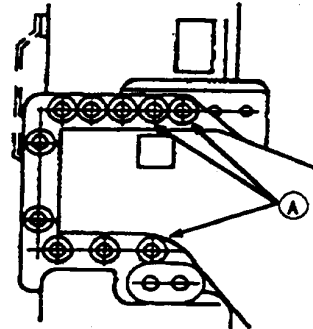
7. Fasten six cap screws (A) as shown (three cap screws at each of the two track frame supports). Tighten to 1720 N·m (1270 lb-ft).

Specification

Cap Screw—Torque..... 1720 N·m (1,270 lb-ft)

8. Repeat steps 1—7 to move opposite side frame into transport position.

A—Cap Screw



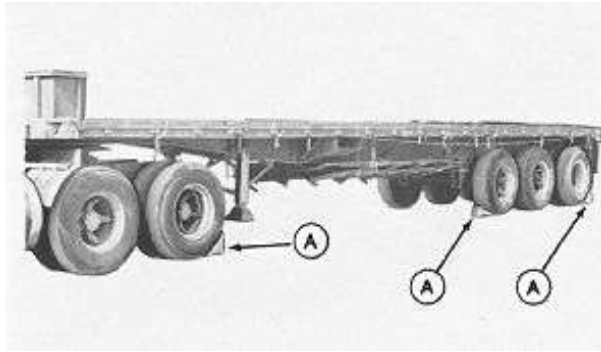
T6912AU

T6912AU—UN—07APR89

DW90712,000017C -19-29JUN06-3/3

Operation—Operating the Machine

Loading Machine On a Trailer



A—Chock Blocks

⚠ CAUTION: Prevent possible injury from unexpected machine movement. During loading operations with the track frames retracted, use care when swinging the upperstructure and travelling the machine. Avoid rapid movements, sharp turns, or counterrotating.

1. Keep the trailer bed clean.
2. Put chock blocks (A) against truck wheels.
3. Use ramp or loading dock. Ramps must be strong enough, have a low angle, and correct height.
4. Load and unload the machine on a level surface.
5. Turn auto-idle switch off.
6. Back the machine onto the ramp slowly.
7. The centerline of the machine should be over the centerline of the trailer.

8. Lower front-mounted equipment to the ground.
9. Stop engine. Remove key from switch.
10. Pull pilot control shut-off lever to locked position.
11. Cover exhaust opening to prevent entry of wind and water.

IMPORTANT: Fasten chains or cables to machine frame. Do not place chains or cables over or against hydraulic lines or hoses.

12. Fasten each corner of the machine to the trailer with a chain or cable with appropriate load binder
13. Place blocks in front of and behind tracks.

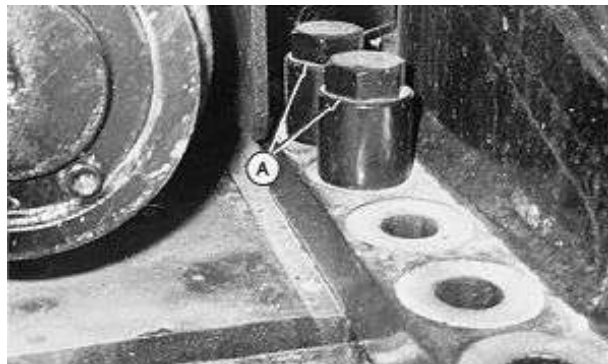
DW90712,000017D -19-29JUN06-1/1

T87155—UN—09NOV88

Track Gauge Work Position Adjustment

1. Remove the six cap screws (A) on the side frame to be extended (three cap screws each from the two track frame supports).
2. Swing upperstructure perpendicular to side frame.

A—Cap Screw



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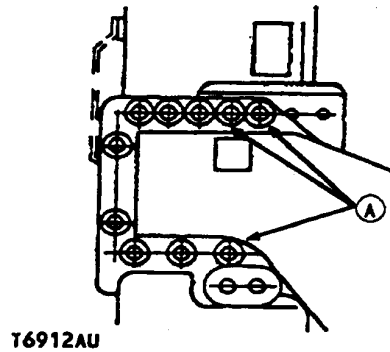
DW90712,000017E -19-29JUN06-1/4

T6929BE—UN—06DEC88

Operation—Operating the Machine

3. Attach a short chain or cable (A) around the center of the side frame forming a loop.
4. Attach a longer chain on cable from the arm and connect to loop.

A—Cable



T6912AU

DW90712,000017E -19-29JUN06-2/4

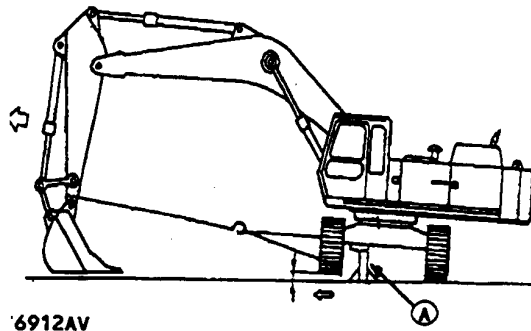
T6912AU—UN—07APR89

CAUTION: The approximate weight of machine without counterweight is 36,100 kg (79,500 lb).

5. Lift the side frame slightly off ground with service jack (A).

Specification
 Machine—Weight..... Without
 Counterweight: 36 100 kg (79,500 lb)

A—Service Jack



T6912AV

DW90712,000017E -19-29JUN06-3/4

T6912AV—UN—07APR89

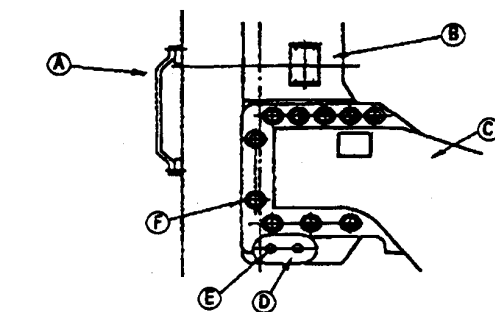
6. Extend arm slowly until side frame slides up against stop guide (D).
7. Lower machine to the ground and fasten 18 cap screws (F) (nine cap screws per section). Tighten cap screws to 1720 N·m (1270 lb-ft).

Specification
 Cap Screw—Torque..... 1720 N·m (1,270 lb-ft)

Repeat steps 1—7 to move opposite side frame to work position.

A—Side Frame Step
 B—Side Frame
 C—Track Frame

D—Stop Guide
 E—Stop Cap Screw
 F—Track Frame Cap Screw



T6912AW

DW90712,000017E -19-29JUN06-4/4

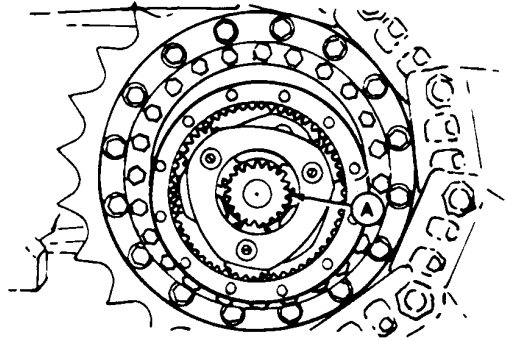
T6912AW—UN—07APR89

Operation—Operating the Machine

Towing Machine

CAUTION: Block both tracks when disconnecting travel drives. When travel drives are disconnected, machine has no brakes and can move. The machine will roll free on a slope or while being towed.

1. Block tracks.
2. Drain oil from each travel gearbox. (See Section 3-9.)
3. Remove cover from each gear case.
4. Remove sun gear (A) from each gearbox.
5. Install cover. Fill gearbox with oil.
6. Attach tow line to frame.



A—Sun Gear

T6879EG—JUN—06DEC88

DW90712,000017F -19-29JUN06-1/1

Lifting the Machine

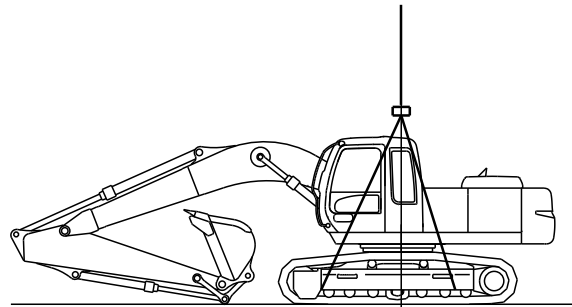
CAUTION: Check lifting capacity of crane before lifting the machine. Lift load only as high as necessary.

Keep all people clear of raised load.

Approximate operating weight of 450CLC is 47 174 kg (104,000 lb).

Specification

450CLC —Approximate
 Weight..... 47 174 kg (104,000 lb)



1—Center Of Gravity

T143156—JUN—21JUN01

DW90712,0000180 -19-29JUN06-1/1

Maintenance—Machine

Diesel Engine Oil

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

John Deere Plus-50™ II oil is preferred.

John Deere Plus-50™ is also recommended.

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

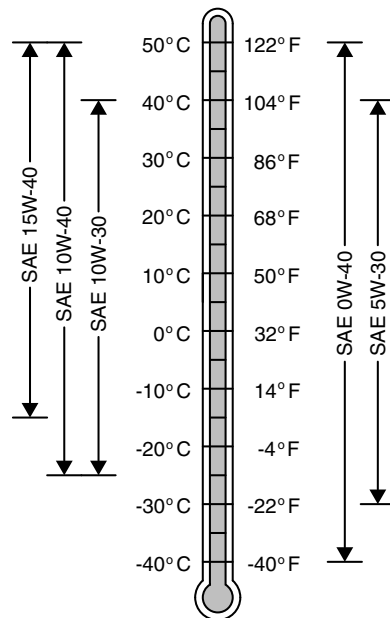
- John Deere Torq-Gard™
- API Service Category CJ-4
- API Service Category CI-4 PLUS
- API Service Category CI-4
- API Service Category CH-4
- ACEA Oil Sequence E9
- ACEA Oil Sequence E7
- ACEA Oil Sequence E6
- ACEA Oil Sequence E5
- ACEA Oil Sequence E4
- ACEA Oil Sequence E3

Multi-viscosity diesel engine oils are preferred.

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

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

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



Oil Viscosities for Air Temperature Ranges

TS1689—UN—18JUL07

DX,ENOil7 -19-11APR11-1/1

Diesel Engine Oil and Filter Service Intervals

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

Oil and filter service intervals are based on a combination of oil pan capacity, type of engine oil and filter used, and sulfur content of the diesel fuel.

Engine Oil and Filter Service Intervals		
	Standard Drain Oil Pan	Extended Drain Oil Pan
Fuel Sulfur	Less than 0.05% (500 mg/kg)	
Plus-50	375 hours	500 hours
Other Oils	250 hours	250 hours
Fuel Sulfur	0.05 - 0.50% (500 - 5000 mg/kg)	
Plus-50	275 hours	400 hours
Other Oils	150 hours	150 hours
Fuel Sulfur	0.50 - 1.00% (5000 - 10 000 mg/kg)	
Plus-50	187 hours	250 hours
Other Oils	125 hours	125 hours

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

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

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

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

- Use of diesel fuel with sulfur content 0.05% (500 mg/kg) to 0.50% (5000 mg/kg) may result in REDUCED oil and filter change intervals as shown in the table.
- BEFORE using diesel fuel with sulfur content greater than 0.50% (5000 mg/kg), contact your John Deere dealer.

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

Oil types in the table include:

- John Deere Plus-50™ II and John Deere Plus-50 oils.
- "Other Oils" include John Deere Torq-Gard Supreme™, API CJ-4, API CI-4 PLUS, API CI-4, API CH-4, ACEA E9, ACEA E7, ACEA E6, ACEA E5, ACEA E4, or ACEA E3 oils.

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

- Engine equipped with an extended drain interval oil pan
- Use of diesel fuel with sulfur content less than 0.05% (500 mg/kg)
- Use of John Deere Plus-50™ II or John Deere Plus-50 oil
- Use of an approved John Deere oil filter

DX.ENOIL12 -19-03AUG09-1/1

Light Duty Diesel Engine Coolant (for diesel engines without wet sleeve cylinder liners)

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

The following engine coolants are preferred:

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

Use John Deere COOL-GARD™ II PG Premix when a non-toxic coolant formulation is required.

Additional Recommended Coolants

The following engine coolant is also recommended:

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

Other Coolants

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

- ASTM D3306 prediluted (50%) coolant
- ASTM D3306 coolant concentrate in a 40—60% mixture of concentrate with quality water

If these coolants are unavailable, use an engine coolant concentrate or prediluted coolant with a minimum of the following chemical and physical properties:

- Is formulated with a quality nitrite-free additive package.

COOL-GARD is a trademark of Deere & Company

- Protects the cooling system metals (cast iron, aluminum alloys, and copper alloys such as brass) from corrosion.

The coolant concentrate or prediluted coolant shall be of a quality that is suitable for all-aluminum engines.

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 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 John Deere COOL-GARD II is used, the drain interval is six years or 6000 hours of operation.

When John Deere COOL-GARD II PG is used, the drain interval is five years or 5000 hours of operation.

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

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

Do not mix ethylene glycol and propylene glycol base coolants.

DX,COOL18 -19-20APR11-1/1

Drain Intervals for Diesel Engine Coolant

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

John Deere COOL-GARD™ II Premix, COOL-GARD II PG Premix and COOL-GARD II Concentrate are maintenance free coolants for up to six years or 6000 hours of operation, provided that the cooling system is topped off using only John Deere COOL-GARD II Premix or COOL-GARD II PG Premix.

Test the coolant condition annually with Coolant Test Strips designed for use with John Deere COOL-GARD II coolants. If the test strip chart indicates that additive is required, add John Deere COOL-GARD II Coolant Extender as directed.

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If John Deere COOL-GARD™ II Premix, COOL-GARD II PG Premix, or COOL-GARD II Concentrate is used, but the coolant is not tested OR additives are not replenished by adding John Deere COOL-GARD II Coolant Extender, the drain interval is four years or 4000 hours of operation. This drain interval only applies to COOL-GARD II coolants that have been maintained within a 40—60% mixture of concentrate with quality water.

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

DX,COOL11 -19-14APR11-1/1

John Deere COOL-GARD™ II Coolant Extender

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

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

John Deere COOL-GARD II Coolant Extender is a chemically matched additive system for use with all John Deere COOL-GARD II coolants. John Deere COOL-GARD II Coolant Extender is not intended for use with nitrite-containing coolants.

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

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

The use of non-recommended supplemental coolant additives may result in additive drop-out, gelation of the coolant, or corrosion of cooling system components.

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

DX,COOL16 -19-20APR11-1/1

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 glycol base engine coolants.

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

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

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

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

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

DX,COOL6 -19-03NOV08-1/1

Additional Information About Diesel Engine Coolants and John Deere COOL-GARD™ II Coolant Extender

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

Coolant Specifications

John Deere COOL-GARD™ II Premix either EG or PG, are fully formulated coolants that contain all three components in their correct concentrations. DO NOT add an initial charge of John Deere COOL-GARD II Coolant Extender to COOL-GARD II Premix. DO NOT add any other supplemental coolant additive or water to COOL-GARD II Premix.

John Deere COOL-GARD II Concentrate contains both ethylene glycol and inhibiting coolant additives. Mix this product with quality water, but DO NOT add an initial charge of John Deere COOL-GARD II Coolant Extender or any other supplemental coolant additive.

Replenish Coolant Additives

Some coolant additives will gradually deplete during engine operation. Periodic replenishment of inhibitors is required, even when John Deere COOL-GARD II Premix or COOL-GARD II Concentrate is used. Follow the recommendations in this manual for the use of John Deere COOL-GARD II Coolant Extender.

Why use John Deere COOL-GARD II Coolant Extender?

Operating without proper coolant additives will result in increased corrosion, cylinder liner erosion and pitting, and other damage to the engine and cooling system. A simple mixture of ethylene glycol or propylene glycol and water will not give adequate protection.

John Deere COOL-GARD II Coolant Extender is a chemically matched additive system designed to fortify the proprietary additives used in John Deere COOL-GARD II Premix and COOL-GARD II Concentrate and to provide optimum protection for up to six years or 6000 hours of operation.

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Avoid Automotive-type Coolants

Never use automotive-type coolants (such as those meeting ASTM D3306). These coolants do not contain the correct additives to protect heavy-duty diesel engines. Do not treat an automotive engine coolant with supplemental coolant additives because the high concentration of additives can result in additive fallout.

Water Quality

Water quality is important to the performance of the cooling system. Distilled, deionized, or demineralized water is recommended for mixing with ethylene glycol and propylene glycol base engine coolant concentrate. All water used in the cooling system should meet the following minimum specifications for quality:

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

Freeze Protection

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

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,COOL17 -19-20APR11-1/1

Testing Diesel Engine Coolant

Maintaining adequate concentrations of glycol and inhibiting additives in the coolant is critical to protect the engine and cooling system against freezing, corrosion, and cylinder liner erosion and pitting.

Test the coolant solution at intervals of 12 months or less and whenever excessive coolant is lost through leaks or overheating.

Coolant Test Strips

Coolant test strips are available from your John Deere dealer. These test strips provide a simple, effective method to check the freeze point and additive levels of your engine coolant.

When Using John Deere COOL-GARD II

John Deere COOL-GARD II Premix™, COOL-GARD II PG Premix and COOL-GARD II Concentrate are maintenance free coolants for up to six years or 6000 hours of operation, provided that the cooling system is topped off using only John Deere COOL-GARD II Premix or COOL-GARD II PG premix. Test the coolant condition annually with coolant test strips designed for use with John Deere COOL-GARD II coolants. If the test strip chart indicates that additive is required, add John Deere COOL-GARD II Coolant Extender as directed.

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Add only the recommended concentration of John Deere COOL-GARD II Coolant Extender. DO NOT add more than the recommended amount.

When Using Nitrite-Containing Coolants

Compare the test strip results to the supplemental coolant additive (SCA) chart to determine the amount of inhibiting additives in your coolant and whether more John Deere Liquid Coolant Conditioner should be added.

Add only the recommended concentration of John Deere Liquid Coolant Conditioner. DO NOT add more than the recommended amount.

Coolant Analysis

For a more thorough evaluation of your coolant, perform a coolant analysis. The coolant analysis can provide critical data such as freezing point, antifreeze level, pH, alkalinity, nitrite content (cavitation control additive), molybdate content (rust inhibitor additive), silicate content, corrosion metals, and visual assessment.

Contact your John Deere dealer for more information on coolant analysis.

DX,COOL9 -19-11APR11-1/1

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.

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

The temperature limits and service intervals shown in this manual apply to both conventional and synthetic oils.

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

If alternative hydraulic oils are required the hydraulic system needs to be completely flushed. This may require large amounts of oil to properly drain previous product.

NOTE: The following alternative oils could be used if factory fill has been completely flushed out.

Texaco Rando 46

Texaco Rando 32

Mobil DTE25-46

Mobil DTE25-32

Shell Tellus 46

Shell Tellus 32

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

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.

Consult your authorized dealer to obtain specific information and recommendations.

VD76477,00000DC -19-22JUN06-1/1

Engine Break-In Oil

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

New engines are filled at the factory with John Deere ENGINE BREAK-IN OIL. During the break-in period, add John Deere ENGINE BREAK-IN OIL as needed to maintain the specified oil level.

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

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

If John Deere ENGINE BREAK-IN OIL is not available, use a diesel engine oil with oil viscosity based on the expected air temperature range, and meeting one of the following, during the first 100 hours of operation:

- API Service Classification
- CCMC Specification D4

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

TX,15,DX649 -19-28JUN06-1/1

Hydraulic Oil

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.

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

The following oil is preferred:

4000 hour change interval:

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

2000 hour change interval:

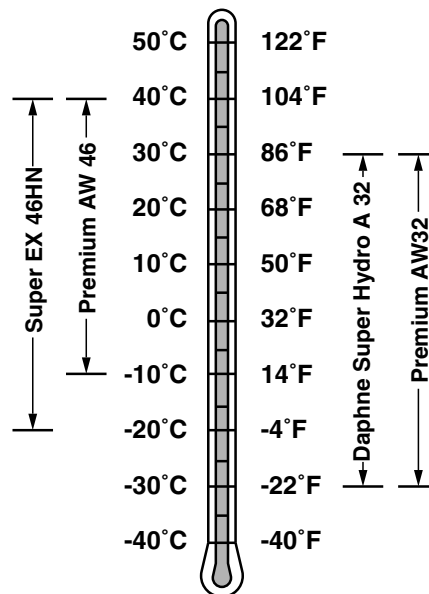
The following products can be used provided a complete hydraulic system flush has been performed. Contact your dealer for this procedure.

Other Premium AW oils may be used:

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

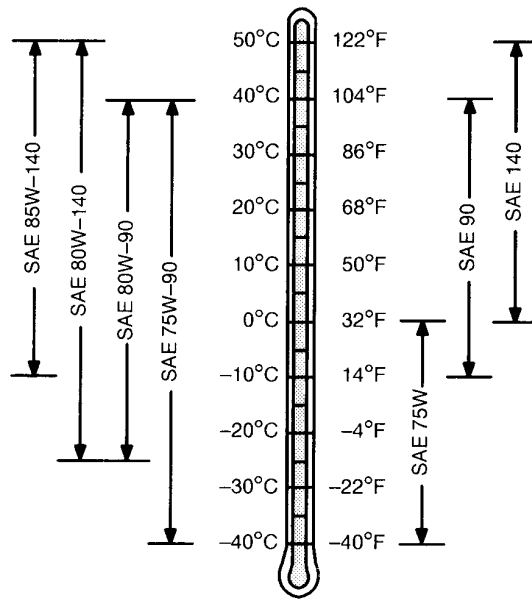
Swing Gearbox and Travel Gearbox Oils

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

The following oils are preferred:

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

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



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TX14740,0001CE5 -19-24JAN07-1/1

TS1653—UN—14MAR96

Track Adjuster, Working Tool Pivot, Swing Bearing, and Swing Bearing Gear Grease

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

The following greases are preferred:

- John Deere SD POLYUREA GREASE

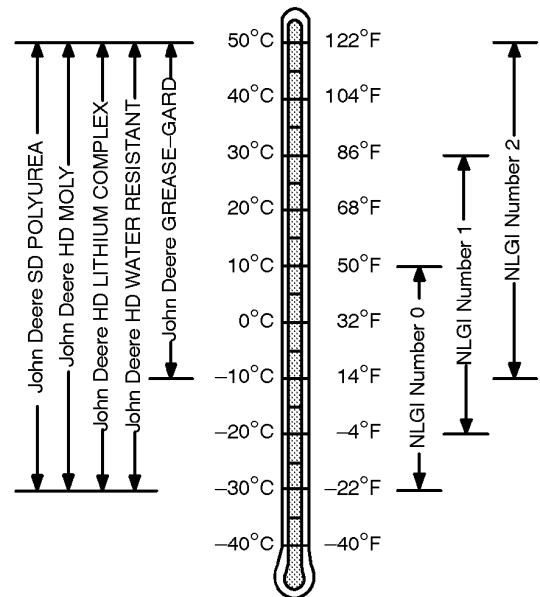
The following greases are also recommended:

- John Deere HD MOLY GREASE
- John Deere HD LITHIUM COMPLEX GREASE
- John Deere HD WATER RESISTANT GREASE
- John Deere GREASE-GARD

Other greases may be used if they meet the following:

- NLGI Performance Classification GC-LB

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



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TS1667—UN—30JUN99

Maintenance—Periodic Maintenance

Service Machine at Specified Intervals

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

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

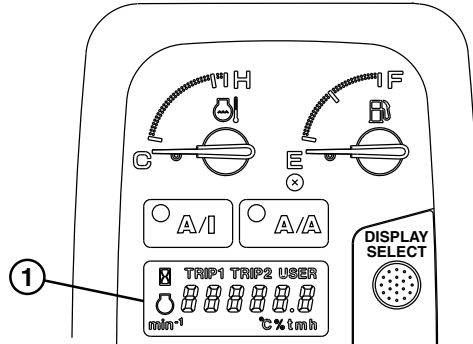
TX14740,0001C9F -19-17JUL07-1/1

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



T140186—UN—21MAR01

TX14740,0001CEE -19-29JUN06-1/1

Prepare Machine for Maintenance

1. Park machine on a level surface as shown.
2. Stop engine.



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TX14740,0001C3D -19-06MAY08-1/1

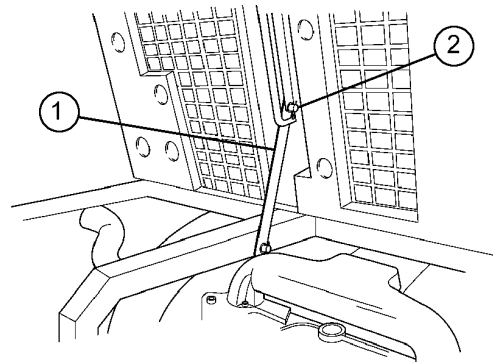
Open Engine Hood for Service

CAUTION: Prevent possible injury. Unlock latch. Pull open latches to unlock hood. Raise the hood until lock stay completely engages with lock groove inside the cover.

Raise hood using handle on hood until lock stay (1) completely engages lock groove (2) inside the cover.

1—Lock Stay

2—Lock Groove



T140175—UN—27MAR01

TX14740,0001CEF -19-29JUN06-1/1

Maintenance—Periodic Maintenance

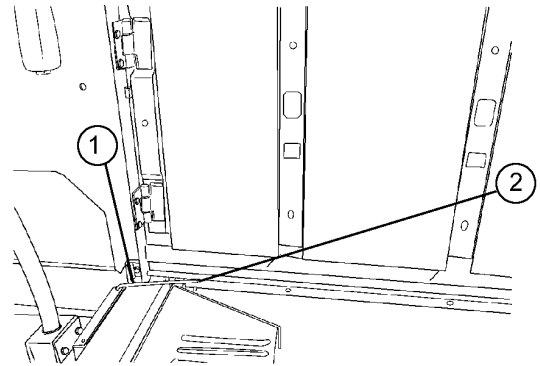
Open Access Doors for Service

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

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

1— Rod

2— Tab



T140176—UN—27MAR01

TX14740,0001CF0 -19-29JUN06-1/1

Fuel Tank

CAUTION: Handle fuel carefully. If the engine is hot or running, DO NOT fill the fuel tank. DO NOT smoke while you fill fuel tank or work on fuel system.

To avoid condensation, fill the fuel tank at the end of each day's operation. Capacity is 650 L (171 gal).

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

If fuel tank is empty, contact your authorized dealer.

Specification

Fuel Tank—Capacity..... 650 L (171 gal)

TX14740,0001CE0 -19-06MAR01-1/1

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.

the complete hydraulic system needs to be totally flushed by an authorized dealer.

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,

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

Percentage of Operating Time Breaker or Crusher Used	Hydraulic Return Filter Change Interval (hours)	Hydraulic Oil Change Interval (hours)
100	100	600
60	150	800
40	200	1000
20	300	1300

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Maintenance—Periodic Maintenance

Maintenance and Repair Record Keeping System

The checklist in this section summarizes scheduled maintenance, and parts and oil required at each maintenance interval.

Use the checklist to:

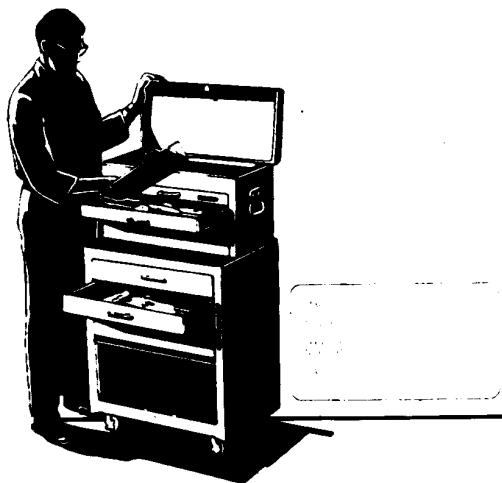
- Remind you to perform machine maintenance at specified intervals to minimize downtime.
- Calculate cost of machine operation and ownership allowing you to make better job estimates.
- Place yourself in a stronger position at trade-in time.
- Satisfy your SECURE contract requirements.

As maintenance is performed, check off each item on the list and record date and hour meter reading.

Do not tear out or mark on checklist in this section; keep it to make extra copies.



MAINTENANCE and REPAIR RECORD KEEPING SYSTEM FOR JOHN DEERE MACHINE OWNERS



T7511CO—UN—27JUN91

TX_50,FF2898 -19-27SEP07-1/1

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, usually prior to a filter and/or fluid change interval. Certain systems require more frequent sampling. Consult your authorized John Deere dealer on a maintenance program for your specific application. Your authorized John Deere dealer has the sampling products and expertise to assist you in lowering your overall operating costs through fluid sampling.



Fluid Analysis Kits

TX1003513A—UN—20FEB06

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Maintenance—Periodic Maintenance

Periodic Maintenance Record Keeping System

SERVICE INTERVALS

Service your machine at intervals shown on this chart. Also, perform service on items at multiples of the original requirement. For example, at 500 hours also service those items (if applicable) listed under 250 hours, 100 hours, 50 hours, and 10 hours or daily.

As Required

- Clean fuel tank inlet screen
- Drain fuel tank sump
- Drain fuel filter/water separator
- Clean radiator inlet screen
- Check coolant
- Check air cleaner unloader valve
- Check windshield washer fluid
- Check and adjust track sag
- Inspect belts, adjust tension

Every 10 Hours or Daily

- Check engine oil level
- Check coolant level at recovery tank
- Check hydraulic tank oil level

Every 50 Hours

- Lubricate working tool pivots

Initial Service - 250 Hours*

- Change engine break-in oil and replace filter

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

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.

Item	Part Number	Initial Service - 250 Hours	Every 250 Hours	Every 500 Hours	Every 1000 Hours	Every 2000 Hours	Every 4000 Hours	Every 4500 Hours
Engine Oil Filter	RE58935	1		1	1	1	1	1
Fuel Filter/Water Separator	RE507284		1	1	1	1	1	1
Hydraulic System Return Oil Filter	4333469		1	1	1	1	1	1
O-Ring for 4333469	A810220			1	1	1	1	1
Pump Drain Oil Filter	4363399			1	1	1	1	1
Pilot Control Oil Filter	AT186554				1	1	1	
Engine Torsional Damper	RE65565							1
Hydraulic Air Breather Element	4251384				1	1	1	
Air Filter Primary	AT308575				1	1	1	
Air Filter Secondary	4466268				1	1	1	
Dust Cup/Unloader Valve	4466272				1	1	1	
Engine Rocker Arm Cover Gasket (S.N. —014582)	R505677					1	1	
Engine Rocker Arm Cover Gasket (S.N. 014583—)	R502124					1	1	
Cab Fresh Air Filter	4S00640				As Needed			
Recirculating Air Filter	4484453				As Needed			
PLUS 50 ® Oil	TY6389*	42.0 L (45 qt)		42.0 L (45 qt)	42.0 L (45 qt)	42.0 L (45 qt)	42.0 L (45 qt)	42.0 L (45 qt)
API GL-5 Gear Oil	TY6296 *				13.0 L (14.0 qt)	31.0 L (33.0 qt)	31.0 L (33.0 qt)	
Coolant Extender	TY26575				As Needed			
COOL-GARD™ II Pre-Mix	TY26603					50.0 L (13.2 gal)	50.0 L (13.2 gal)	
Hitachi SUPER EX 46HN Hydraulic Oil	2908-050*						280.0 L (74.0 gal)	
Fluid Analysis Kits								
•Diesel Engine Oil	AT317904		1	1	1	1	1	1
•Hydraulic Oil	AT303189			1	1	1	1	1

Continued on next page

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Maintenance—Periodic Maintenance

Item	Part Number	Initial Service - 250 Hours	Every 250 Hours	Every 500 Hours	Every 1000 Hours	Every 2000 Hours	Every 4000 Hours	Every 4500 Hours
Swing Gearbox Oil	AT303189		1	1	1	1	1	1
Travel Gearbox Oil	AT303189		2	2	2	2	2	2
DIESELSCAN Kit	AT180344		1	1	1	1	1	1
COOL-GARD™ II Test Strips	TY26605		1	1	1	1	1	1
COOLSCAN PLUS Kit	AT183016		1	1	1	1	1	1

* For recommended oil viscosities based on operating temperatures, see Maintenance-Machine (Section 3-1).

Model: 450CLC Excavator Customer: _____
 PIN/Serial Number: _____ Delivery Date: _____ Hour Meter Reading: _____

OIL SAMPLING

Oil samples should be taken from each system prior to its recommended drain/change interval indicated on this form: 250, 500, 1000, 2000 hours. Maintenance recommendations supplied by OILSCAN will be provided based upon the oil analysis and operating information you supply. Regular oil sampling will extend the operational life of your machine's systems.

Every 250 Hours

- Check swing gearbox oil level
- Clean air cleaner elements
- Check travel gearbox oil level
- Take engine oil sample
- Check battery electrolyte level and terminals
- Check radiator coolant level
- Drain hydraulic tank sump

Every 500 Hours

- Lubricate swing bearing gear
- Check air intake hoses
- Change engine oil and replace filter
- Replace fuel filter/water separator
- Take diesel fuel sample
- Take swing gearbox oil sample
- Take hydraulic reservoir oil sample
- Replace pump drain oil filter
- Replace hydraulic oil filter
- Lubricate swing bearing
- Take engine coolant sample
- Take travel gearbox oil sample
- Clean cab fresh air and recirculating air filters (replace every 6 cleanings)

Every 1000 Hours

- Change swing gearbox oil
- Replace air cleaner elements and unloader valve
- Clean engine crankcase vent tube and hose
- Replace pilot control oil filter
- Replace hydraulic cap breather element
- Check coolant

Every 2000 Hours

- Change travel gearbox oil
- Check and adjust engine valve lash (clearance)
- Drain, flush and refill cooling system

Every 4000 Hours

- Change hydraulic oil, clean suction screen

Every 4500 Hours

- Replace engine torsional damper

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 COOL-GARD is a trademark of Deere & Company

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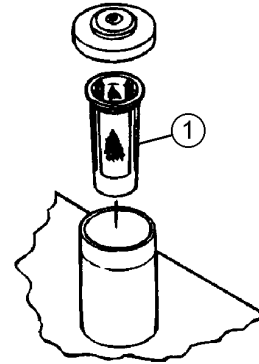
Maintenance—As Required

Clean Fuel Tank Inlet Screen

Clean screen (1) to remove any debris. Use solvent or diesel fuel.

Replace screen if damaged.

1— Fuel Tank Inlet Screen



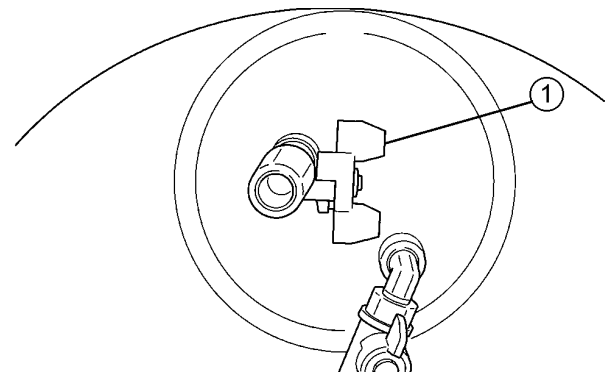
TX14740,0001C80 -19-03JAN07-1/1

T135186 —UN—06NOV00

Drain Fuel Tank Sump

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

1— Drain Valve



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T6811AJ —UN—18OCT88

T136406 —UN—18DEC00

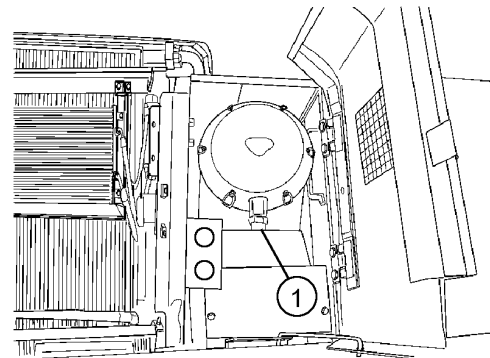
Clean Air Cleaner Dust Unloader Valve

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

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

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

1— Air Cleaner Dust Unloader Valve



TX14740,0001CF2 -19-20MAR01-1/1

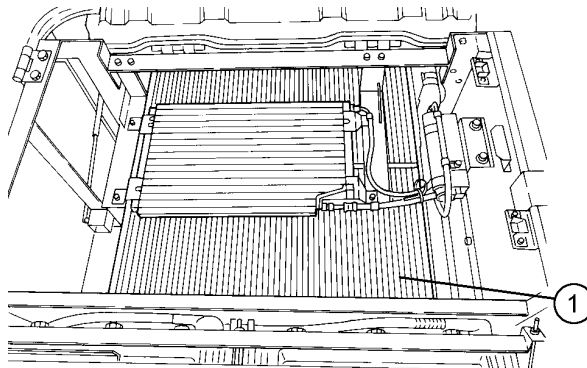
T140491 —UN—30JUL01

Maintenance—As Required

Clean Radiator Air Inlet Screen

Remove wing nuts and slide screen (1) up for cleaning.

1—Inlet Screen



T140228 —UN—21MAR01

TX14740,0001CF3 -19-20MAR01-1/1

Belt Tensioner Spring Check

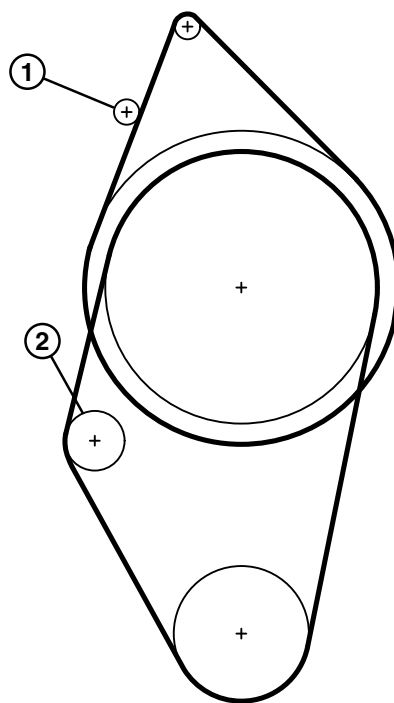
Belt drive systems equipped with automatic (spring) belt tensioners cannot be adjusted or repaired. The automatic belt tensioner is designed to maintain proper belt tension over the life of the belt.

A belt tension gauge will not give an accurate measure of the belt tension when automatic spring tensioner is used.

1. Start engine and run at fast idle.

Engine must not emit a loud squealing sound at slow idle, high rpm, or rapid acceleration. If belt drive produces a squealing under any of these conditions, shut off engine and proceed to step 4. If belt drive does not produce a squeal, proceed to next step.

2. Turn on air conditioner and headlights (high beam). If belt drive produces a squealing under any of these conditions, shut off engine and proceed to step 4. If belt drive does not produce a squeal, belt drive is OK.
3. Check belt regularly for wear. Replace if necessary.
4. If the belt does not show any signs of excessive wear, and the belt drive squealed loudly during the performance of steps 2 and 3, replace belt tensioner.
5. Using a breaker bar, slowly release tension from belt by rotating belt tensioner away from belt. Continue rotating belt tensioner until belt tensioner stop is contacted. Slowly return belt tensioner back to belt tensioned position. If the tensioner exhibited excessive "roughness" or hesitancy during rotation, replace belt tensioner.



1—Belt Tensioner

2—Belt Tensioner

T142947 —UN—08JUN01

TX14740,0001D20 -19-07JUN01-1/1

Maintenance—As Required

Inspect Serpentine Belts

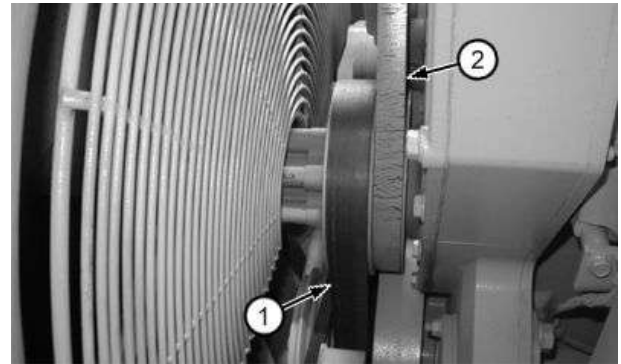
1. Check belts (1 and 2) regularly for wear, especially for cracks at the bottom of grooves and for frayed edges.

IMPORTANT: If either belt is stretched to the point that the belt tensioner is against its stop, belt must be replaced.

2. If necessary, replace belt.
3. Remove lower fan guard.

NOTE: Alternator belt requires a 1/2 inch square drive tool and fan belt requires a 3/4 inch square drive tool to release belt tension.

4. Hold tension adjuster assembly away from belt while removing old belt and installing new belt.
5. Install fan guard.



1— Belt

2— Belt

T141920B —UN—03MAY01

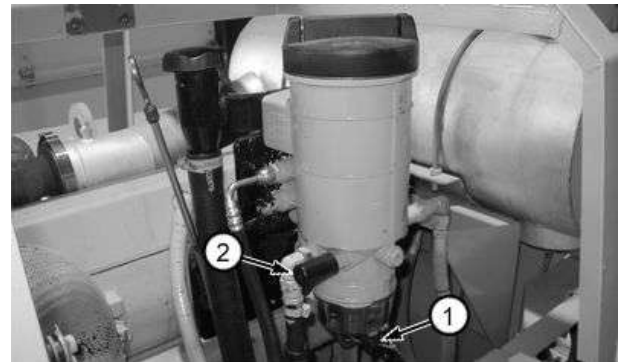
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Drain Primary Fuel Filter (Water Separator)

1. Open front engine door to access water separator.
2. Open drain valve (1) and pump primer (2) to extract water or debris from fuel system. Collect waste in a container and dispose of it properly.
3. Close drain valve.
4. Bleed fuel system. (See Bleed Fuel System in this Section.)

1— Drain Valve

2— Primer



T141910B —UN—02MAY01

TX14740,0001D15 -19-20APR01-1/1

Maintenance—As Required

Bleed Fuel System

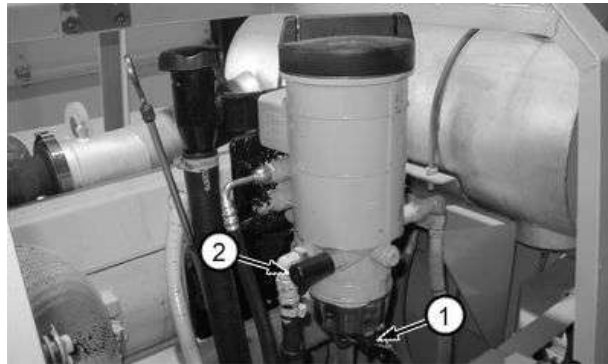
NOTE: Under normal conditions, fuel system bleeding is not required. Priming system with primer is normally sufficient. If necessary to bleed the system, use the following procedure:

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

1. Open drain valve (1) on water separator.
2. Pump primer (2) until bowl is clear of water or debris.
3. Close drain valve.
4. Remove filter cap and lift filter up until fuel level can be observed.
5. Pump primer until fuel is within 6 inches of filter canister top.
6. Install filter and filter cap.
7. Pump primer 20 strokes.
8. Start engine. Run engine at slow idle for 5 minutes.

1—Drain Valve

2—Primer



T141910B —UN—02MAY01



RG10304 —UN—02SEP99

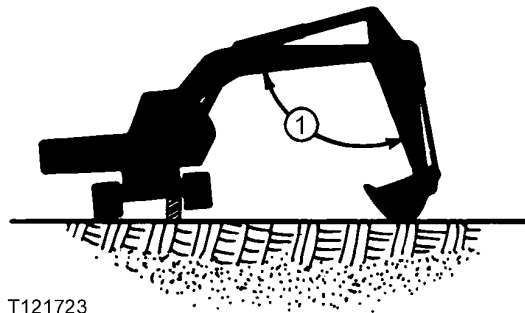
TX14740,0001D39 -19-10AUG05-1/1

Check and Adjust Track Sag

1. Swing upperstructure 90° and lower bucket to raise track off ground.
2. Keep the angle (1) between boom and arm 90—110° and position the bucket's round side on the ground.

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

3. Place blocks under machine frame to support machine.
4. Rotate track forward two full rotations and then in reverse two full rotations.



T121723

1—Boom-To-Arm Angle

T121723 —UN—10JUN99

Continued on next page

TX14740,0001CD9 -19-29JUN06-1/3

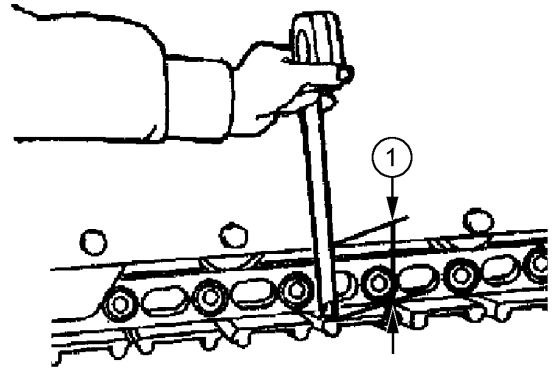
Maintenance—As Required

5. Measure distance (1) at middle track roller from bottom of track frame to top surface of track shoe.

Specification

Track—Sag..... 390—440 mm (15.3—17.3 in.)

1— Distance



T137528—UN—24JAN01

TX14740,0001CD9 -19-29JUN06-2/3

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

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

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

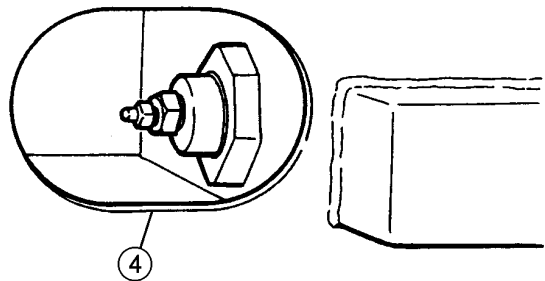
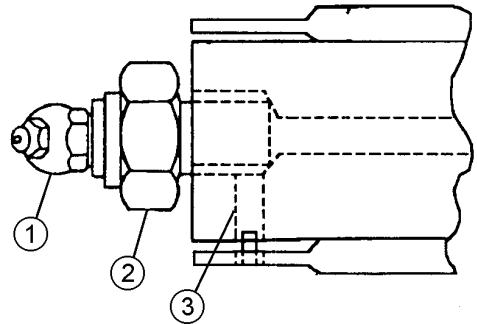
2. To loosen, slowly turn nut (2) counterclockwise; grease will escape through the bleed hole (3).
3. When amount of track sag is satisfactory, turn nut clockwise to tighten.

Specification

Nut—Torque..... 147 N·m (108 lb-ft)

1— Grease Fitting
2— Nut

3— Bleed Hole
4— Access Hole



T135187—UN—06NOV00

T135188—UN—06NOV00

TX14740,0001CD9 -19-29JUN06-3/3

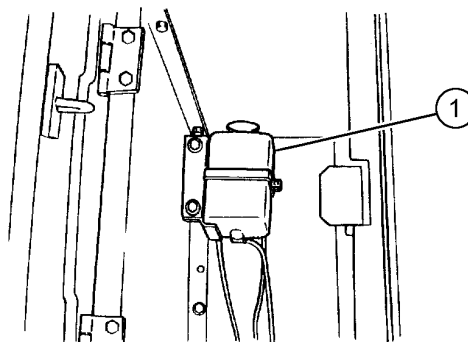
Maintenance—As Required

Check Windshield Washer Fluid Level

1. Check fluid in windshield washer tank (1). If necessary, remove rubber plug located under cover behind cab and remove fill cap to add fluid.
2. Install fill cap.
3. Install rubber plug.

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

1—Windshield Washer Tank



T140231—UN—21MAR01

TX14740,0001CF4 -19-20MAR01-1/1

Check Coolant

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

Remove surge tank cap only when engine is cold or when cool enough to touch with bare hands. Slowly loosen cap to relieve pressure before removing completely.

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

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

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

- **3-Way Heavy Duty Coolant Test Kit**
Coolant test strips provide an effective method to check freeze point and additive levels of engine coolant. See your authorized dealer for 3-Way Heavy Duty Coolant Test Kit and follow instructions on kit.
- **COOLSCAN PLUS™**

COOL-GARD is a trademark of Deere & Company
COOLSCAN PLUS is a trademark of Deere & Company



TS281—UN—15APR13

For a more thorough evaluation of coolant, perform COOLSCAN PLUS analysis, where available. See your authorized dealer for information about COOLSCAN PLUS.

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

Specification

Cooling System—Capacity.....	50.0 L
	13.2 gal

3. Install surge tank cap.

JH91824,0000516 -19-27FEB09-1/1

Maintenance—Every 10 Hours or Daily

Check Recovery Tank Coolant Level

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.

With the engine cold, coolant level must be at the FULL mark on the recovery tank (1).

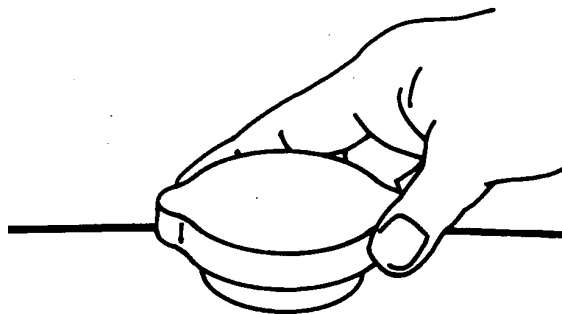
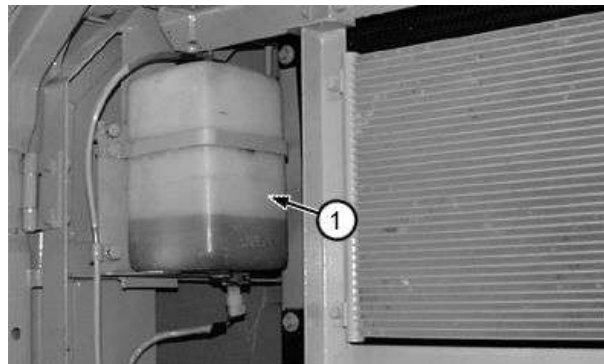
If coolant is below the FULL mark, add coolant to the recovery tank.

CAUTION: Prevent possible injury from hot spraying water. **DO NOT** remove radiator filler cap unless engine is cool. Then turn cap slowly to the stop. Release all pressure before you remove cap.

If recovery tank is empty, check for leaks. Repair as required. Add coolant to the radiator and the recovery tank.

NOTE: If recovery tank is full and radiator is low, check for leaks in radiator cap and hose connections between radiator and coolant recovery tank.

Coolant level must be at bottom of the filler neck.



1— Recovery Tank

VD76477,0000107 -19-22JUL05-1/1

T140548B —UN—26MAR01

T6274AQ —UN—18OCT88

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

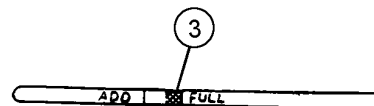
BEFORE THE ENGINE IS STARTED: The engine is full when oil level is in the cross-hatch area (3). It is acceptable to run the engine when the oil level is above the ADD mark.

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

3. If necessary, remove filler cap (2) to add oil. (See Section 3-1.)

1— Dipstick
2— Filler Cap

3— Cross-Hatch Area



TX14740,0001D02 -19-27MAR01-1/1

T141907B —UN—02MAY01

T144208 —UN—27JUL01

Check Hydraulic Oil Level

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

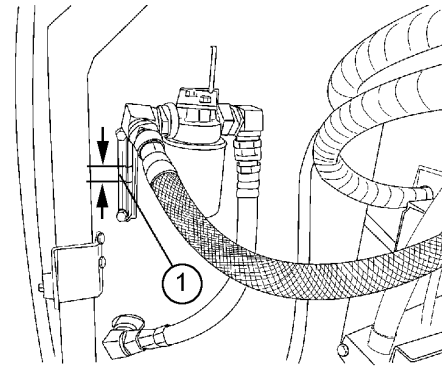
Avoid mixing different brands or types of oils. Oil manufacturers engineer their oils to meet certain specifications and performance requirements. Mixing different oil types can degrade lubricant and machine performance.

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 and position machine with arm cylinder fully retracted and bucket cylinder fully extended.
2. Stop engine.
3. Check hydraulic oil level gauge (1). Oil must be between marks on window.

If necessary, add oil.

To add oil:



1— Hydraulic Oil Level Window

Continued on next page

VD76477,0000108 -19-29JUN06-1/2

T6811A1—UN—18OCT88

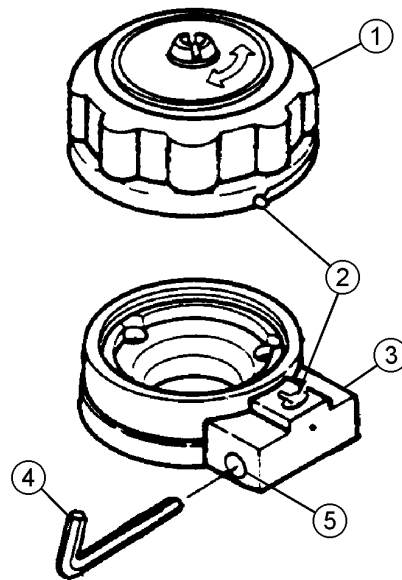
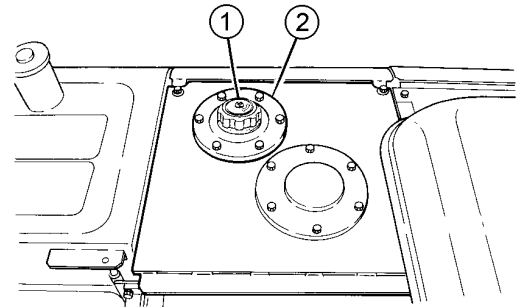
T140483—UN—27MAR01

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

4. Insert 4 mm hex wrench (4) into hole (5) and turn counterclockwise to release locking pin.
5. Slowly turn cap (1) counterclockwise a few degrees to relieve pressure. Remove cap.
6. Remove hydraulic oil tank cover.
7. Add oil. (See Section 3-1.)
8. Install hydraulic oil tank cover.
9. Install cap to case assembly (3) by aligning marks (2) and turning cap clockwise to lock position.
10. Tighten cap.

1— Cap
2— Aligning Marks
3— Case Assembly

4— Hex Wrench
5— Hole



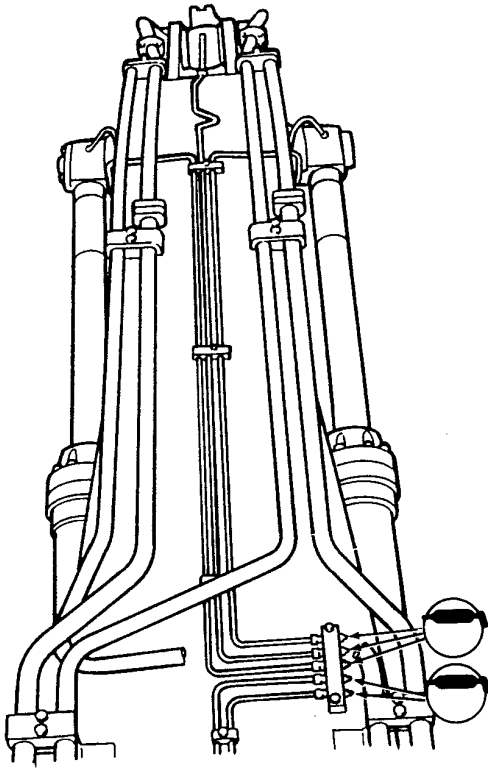
T135008—UN—01NOV01

T135189—UN—06NOV00

VD76477.0000108 -19-29JUN06-2/2

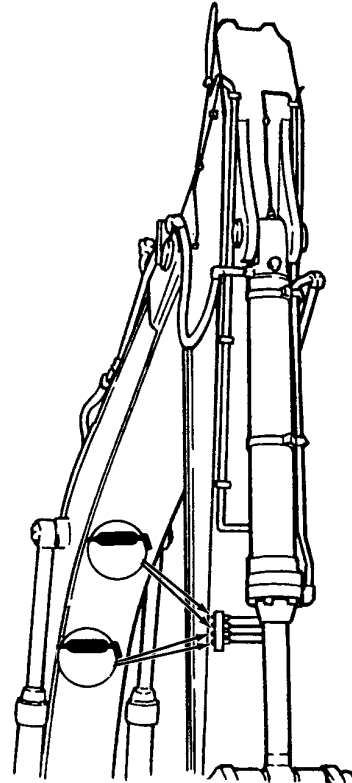
Maintenance—Every 50 Hours

Grease Working Tool Pivots



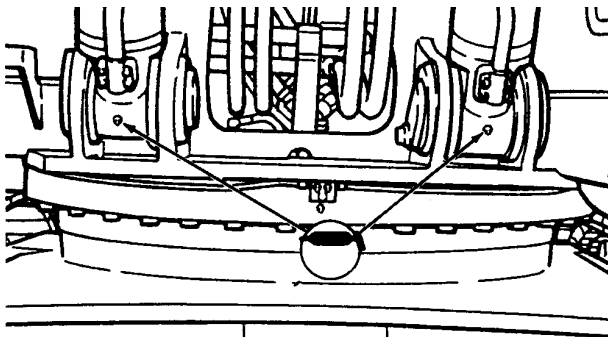
Five Points

T8163AK —UN—31JAN94



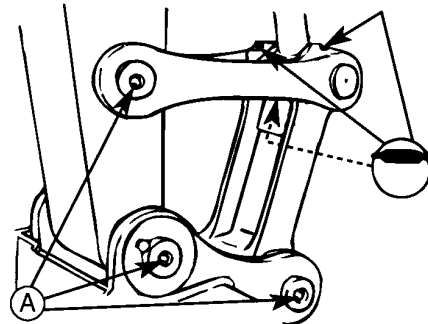
Four Points

T8163AE —UN—31JAN94



Two Points

T8171AQ —UN—06FEB94



Nine Points: A-Right Side Shown

T8175AA —UN—16FEB94

Grease these areas until grease escapes at joints. (See Section 3-1.)

Grease every four hours during the first 20 hours of operation.

Grease daily during the first 30—100 hours of operation and when working in mud and water.

TX,75,FF3833 -19-07MAY01-1/1

Maintenance—Initial Service - 250 Hours

Change Engine Break-In Oil and Replace Filter

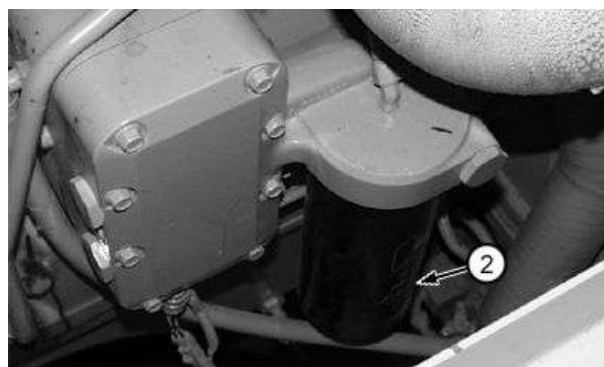
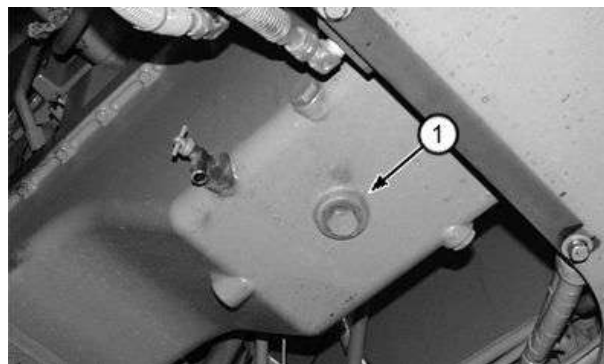
NOTE: Break-in oil should be changed after the first 250 hours of operation. See Engine Break-In Oil in section 3-1.

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

Specification

Engine—Oil Capacity
 With Filter Change..... 42.0 L (11.1 gal)

11. Fill engine with oil. (See Section 3-1.)
12. Install fill cap.
13. Start engine. Engine oil pressure indicator must go out within 15-20 seconds. If not, stop engine immediately and find the cause.



1— Drain Plug

2— Filter

14. Stop engine. Check oil level. Check for any leakage at filter. Tighten filter just enough to stop leakage.

TX14740.000013D -19-11JUL06-1/1

T140551B —UN—26MAR01

T141909B —UN—02MAY01

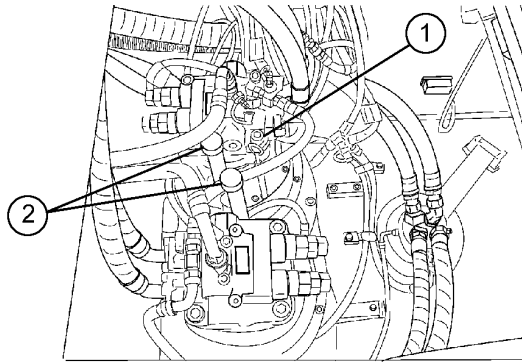
Maintenance—Every 250 Hours

Check Swing Gearbox Oil Level

1. Park machine on a level surface.
2. Remove dipstick (1). Oil must be between marks.
3. If oil is needed, remove filler cap (2) and add oil. (See Section 3-1.)
4. Check oil level.

1—Dipstick

2—Filler Cap



T140494 —UN—27MAR01

TX14740.0001CF5 -19-20MAR01-1/1

Check Travel Gearbox Oil Level

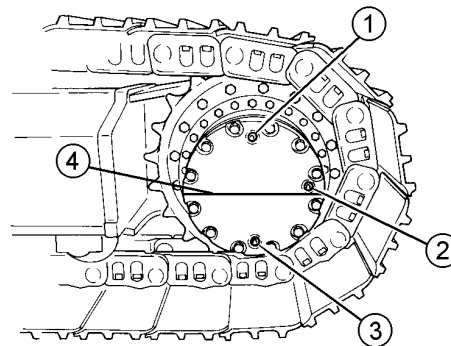
1. Park the machine on level ground rotating travel gearbox until bottom of the oil level check plug (2) is even with the horizontal centerline (4).
2. Stop engine.

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

3. After travel gearbox has cooled, slowly loosen check plug to release air to relieve pressure.
4. Remove check plug. Oil must be to bottom of hole.
5. If necessary, remove fill plug (1) and add oil until oil flows out of oil level check plug hole. (See Section 3-1.)
6. Wrap threads of plugs with sealing-type tape. Install plug. Tighten plugs to 70 N·m (51 lb-ft).

1—Fill Plug
2—Check Plug

3—Drain Plug
4—Horizontal Centerline



T134864 —UN—01NOV00

7. Check second travel gearbox oil level.

TX14740.0001CF6 -19-24JAN07-1/1

Clean or Replace Dusty Primary Element

1. Tap element (1) with the palm of your hand, NOT ON A HARD SURFACE.

CAUTION: Prevent possible injury from flying chips if compressed air is more than 210 kPa (2.1 bar) (30 psi). Reduce compressed air to less than 210 kPa (2.1 bar) (30 psi) when using for cleaning purposes. Clear area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

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

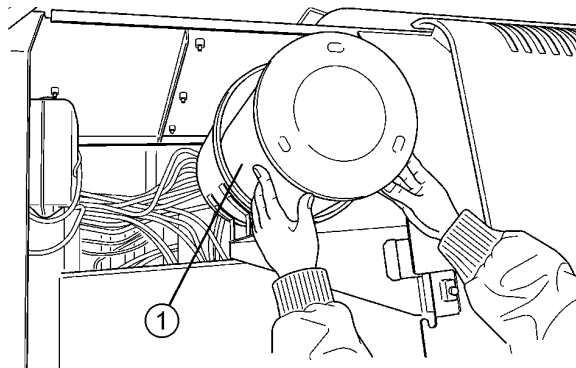
IMPORTANT: A damaged or dirty element may cause engine damage.

Install a new primary (outside) element:

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

Install a new secondary (inside) element:

1. If the primary element is damaged and needs to be replaced.
2. If the element is visibly dirty.



1— Air Cleaner Element

3. After 1000 hours service or annually.

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

1. Inspect element and gasket for damage.
2. Air restriction indicator will not signal correctly if an element has a break or is not correctly sealed in air cleaner housing. Throw away element that has the slightest damage. If gasket is broken or missing, install a new element.

T136457—UN—18DEC00

TX14740,0001CAD -19-29JUN06-1/1

Check Battery Electrolyte Level and Terminals

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

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

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

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

Avoid the hazard by:

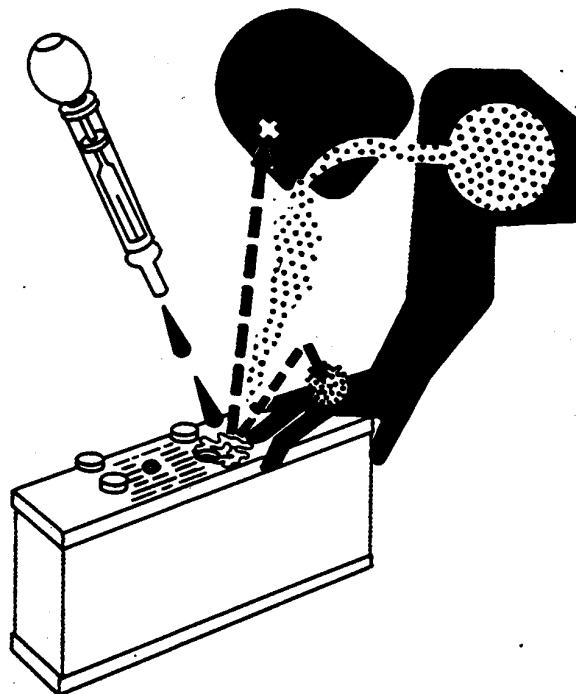
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

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

If acid is swallowed:

1. Do not induce vomiting.



2. Drink large amounts of water or milk, but do not exceed 1.9 L (2 quarts).
3. Get medical attention immediately.

1. Remove battery box cover.

Continued on next page

TX14740,0001CBE -19-29JUN06-1/3

TS203 —UN—23AUG88

Maintenance—Every 250 Hours

IMPORTANT: If water is added to batteries during freezing weather, batteries must be charged after water is added to prevent batteries from freezing. Charge battery using a battery charger or by running the engine.

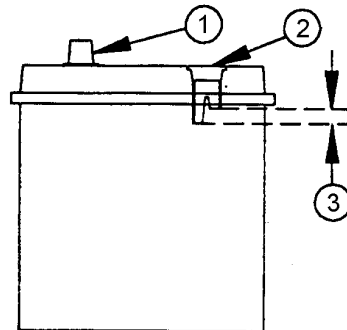
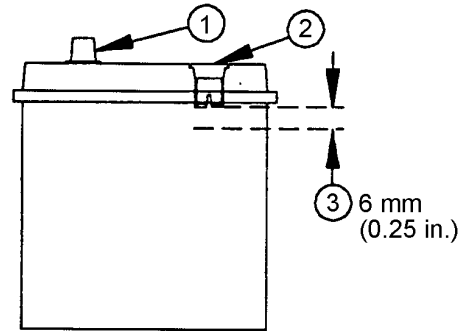
2. Fill each cell to within specified range with distilled water. DO NOT overfill.

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

3. Disconnect battery clamps, grounded clamp first.

1— Battery Post
2— Fill Tube

3— Electrolyte Level Range



T137535—UN—25JAN01

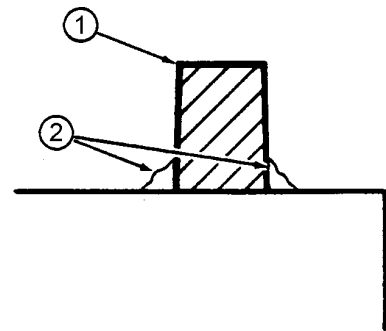
T137536—UN—25JAN01

TX14740,0001CBE -19-29JUN06-2/3

4. Clean battery terminals (1) and clamps with a stiff brush.
5. Apply lubricating grease (2) around battery terminal base only.
6. Install and tighten clamps, grounded clamp last.

1— Battery Terminal

2— Lubricating Grease



T137537—UN—25JAN01

TX14740,0001CBE -19-29JUN06-3/3

Maintenance—Every 250 Hours

Check Radiator Coolant Level

⚠ 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 air to relieve all pressure before you remove cap.

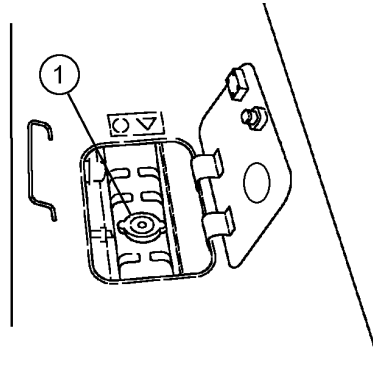
1. Slowly remove cap (1). Coolant level must be at bottom of the filler neck.

NOTE: If radiator coolant level is low, check for leaks on radiator cap, and hose connections between radiator and coolant recovery tank.

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.

2. Add coolant, if necessary.
3. Install filler cap.

1—Radiator Cap



T6642EK—UN—01NOV88

T140495—UN—08JUN01

VD76477,0000109 -19-22JUL05-1/1

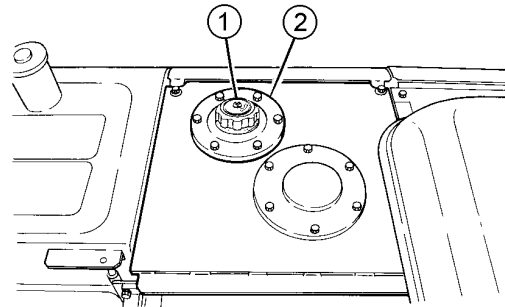
Drain Hydraulic Tank Sump

⚠ CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. **DO NOT** remove hydraulic cap. Relieve pressure by **SLOWLY** loosening cap.

1. **SLOWLY** loosen cap (1) to relieve pressure.

1—Hydraulic Cap

2—Hydraulic Oil Tank Cover



T135008—UN—01NOV01

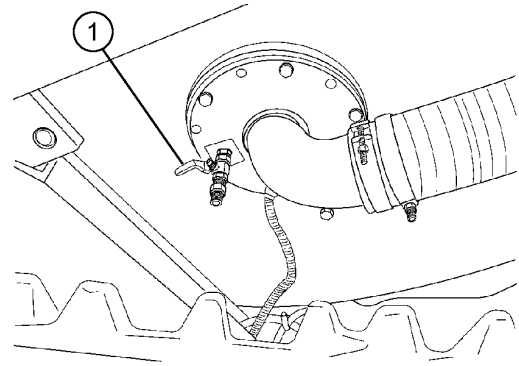
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VD76477,0000054 -19-29JUN06-1/2

Maintenance—Every 250 Hours

2. Remove drain plug and open drain valve (1) for several seconds to drain water and sediment into a container. Dispose of waste properly.
3. Close drain valve. Tighten drain plug and hydraulic cap.

1— Drain Valve



T140497—UN—27MAR01

VD76477,0000054 -19-29JUN06-2/2

Take Engine Oil Sample

See your authorized dealer.

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

Maintenance—Every 500 Hours

Grease Swing Bearing Gear

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

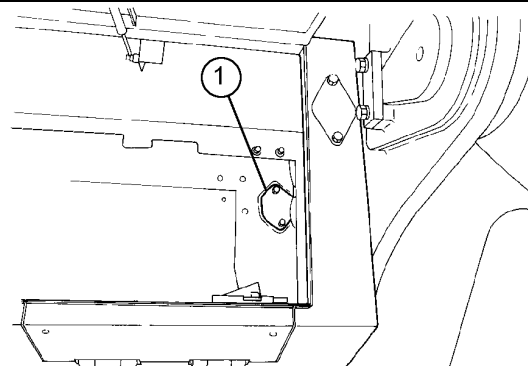
1. Remove swing bearing gear access cover (1).
2. Grease must be to bottom of the swing bearing gear teeth. The grease must also be free of contamination by dirt and water.

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

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

3. Add grease as required. (When completely dry or after running in mud or water swing bearing gear capacity is approximately 15.4 kg (34 lb). (See Section 3-1.)

IMPORTANT: Excessive grease can damage the swing gearbox seal.



Located In Tool Box

1— Access Cover

4. Remove any excess grease from over the top of the swing drive pinion.
5. Install access cover.

T140499—UN—27MAR01

TX14740,0001CF8 -19-20MAR01-1/1

Check Air Intake Hose

Check air intake hoses for cracks. Replace as necessary.

TX14740,0001C82 -19-04NOV00-1/1

Maintenance—Every 500 Hours

Change Engine Oil and Replace Filter

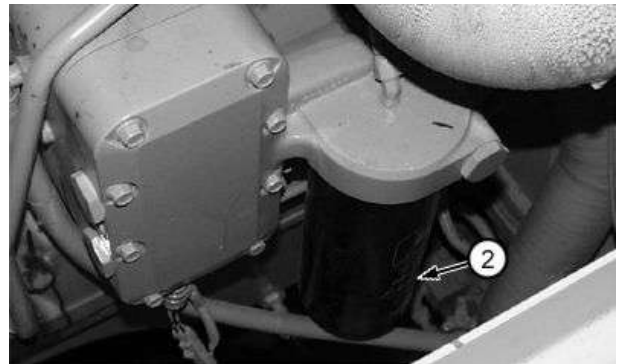
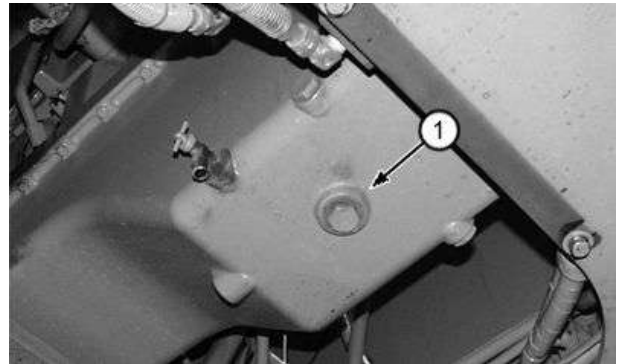
NOTE: Break-in oil should be changed after the first 100 hours of operation. See Engine Break-In Oil in section 3-1.

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

Specification

Engine—Oil Capacity
 With Filter Change..... 42.0 L (11.1 gal)

11. Fill engine with oil. (See Section 3-1.)
12. Install fill cap.
13. Start engine. Engine oil pressure indicator must go out within 15-20 seconds. If not, stop engine immediately and find the cause.



1— Drain Plug

2— Filter

14. Stop engine. Check oil level. Check for any leakage at filter. Tighten filter just enough to stop leakage.

TX14740,0001CE1 -19-29JUN06-1/1

T140551B —UN—26MAR01

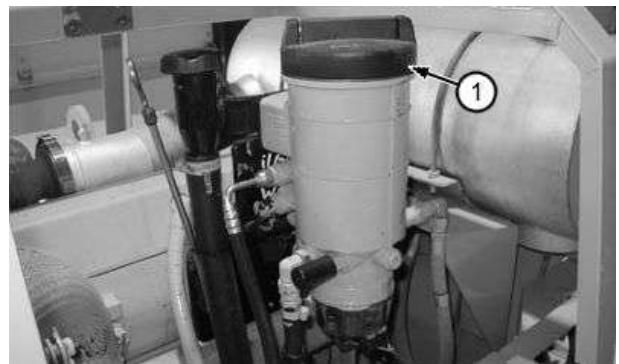
T141909B —UN—02MAY01

Replace Primary Fuel Filter (Water Separator)

CAUTION: If engine has been running, engine and fuel filter housing may be hot.

1. Clean entire top area of fuel filter assembly to keep debris from entering fuel system.

1— Cap



Continued on next page

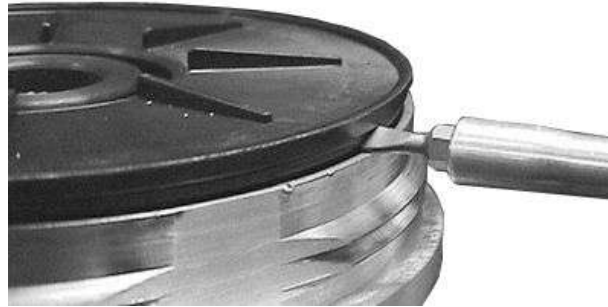
TX14740,0001D3A -19-03JUL01-1/4

T141910C —UN—03JUL01

Maintenance—Every 500 Hours

- Remove cap (1) from fuel filter housing.

NOTE: Relieve vacuum in filter housing by operating hand primer until fuel filter “pops up”. If filter does not “pop up” after about 30 strokes of primer, insert a small screwdriver as shown to carefully pry under filter flange to relieve vacuum in the housing.



RG10303 —UN—27MAY04

TX14740,0001D3A -19-03JUL01-2/4

- Remove filter element as shown. Hold filter suspended straight up in top of housing to drain fuel from filter.
- Dispose of used filter properly.
- Drain fuel from water separator bowl. (See Section 3-3.)

NOTE: If sediment in bowl cannot be flushed out by pumping primer, remove bowl to clean.

- Clean sediment from water separator bowl. (See Section 4-1.)

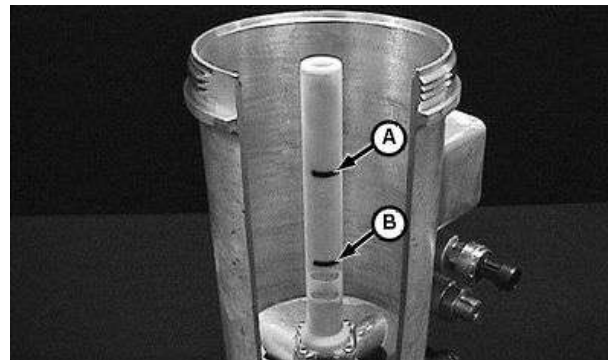


RG10304 —UN—02SEP99

TX14740,0001D3A -19-03JUL01-3/4

IMPORTANT: Fuel level below the MIN indication may result in trapped air in the filter causing the engine to stall and not restart without additional system purging. Fuel level above the MAX indication may cause fuel to overflow from the filter housing during insertion of filter element.

- Pump primer until fuel reaches the MAX (A) level.
- Insert **new** (dry) fuel filter into filter housing.
- Install fuel filter cap and hand tighten.
- Pump primer 20 strokes.
- Start engine. Run engine at slow idle for 5 minutes.



RG10305 —UN—02SEP99

A—Maximum Level 63 mm (2-1/2 in.) From Top of Housing (New Filter)

B—Minimum Level 127 mm (5 in.) From Top of Housing

TX14740,0001D3A -19-03JUL01-4/4

Maintenance—Every 500 Hours

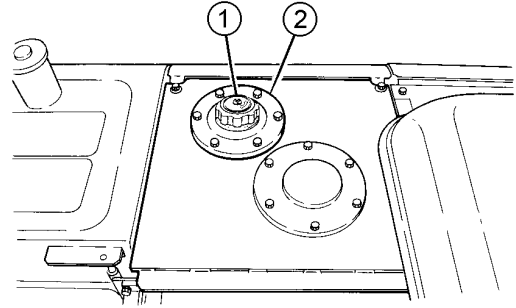
Replace Pump Case Drain Filter

CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. **DO NOT** remove hydraulic cap. Relieve pressure by **SLOWLY** loosening cap.

1. SLOWLY loosen cap (1) to relieve hydraulic pressure.

1— Hydraulic Cap

2— Hydraulic Oil Tank Cover

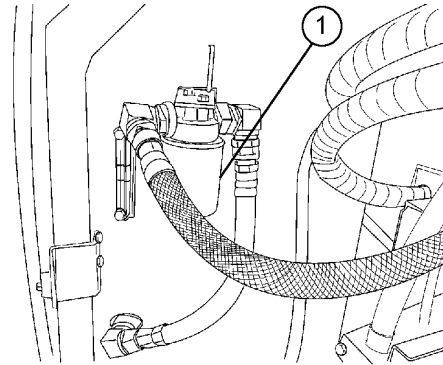


VD76477.0000055 -19-29JUN06-1/2

T135008—UN—01NOV01

2. Turn filter canister (1) counterclockwise with filter wrench to remove.
3. Clean filter gasket contact area.
4. Apply a thin film of clean oil to the gasket of new filter.
5. Install new filter. Turn filter canister clockwise by hand until gasket touches contact area.
6. Tighten filter cartridge 1/2 turn more using wrench.
7. Start engine. Check for any leakage.
8. Bleed air from hydraulic system.

1— Filter Cartridge



VD76477.0000055 -19-29JUN06-2/2

T140500—UN—27MAR01

Bleed Air From Hydraulic System

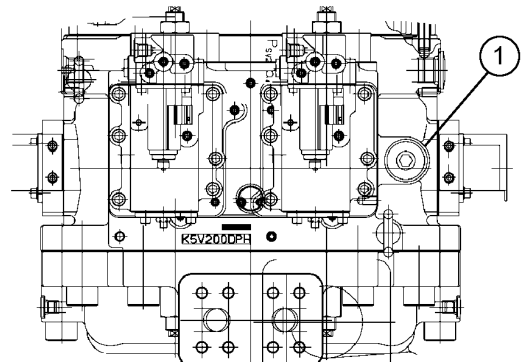
IMPORTANT: If the hydraulic pump is not filled with oil, it will be damaged when the engine is started.

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. Loosen bleed plug (1) from hydraulic pump.
2. Fill the pump with oil
3. Tighten plug.
4. Slowly loosen plug to release trapped air. Tighten plug when oil free from bubbles flows from hose.
5. Start engine. Run engine at slow idle and operate all control levers slowly and smoothly for 15 minutes to bleed the hydraulic system. Stop engine.
6. Check oil level in sight glass. Add oil, if necessary.

1— Bleed Plug



VD76477.000010A -19-29JUN06-1/1

T140512—UN—27MAR01

Maintenance—Every 500 Hours

Replace Hydraulic Tank Oil Filter

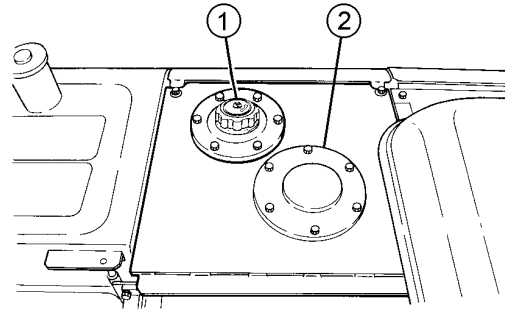
1. Park machine on a level surface with arm cylinder fully retracted and bucket cylinder fully extended.
2. Stop engine.

CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. **DO NOT** remove hydraulic cap. Relieve pressure by **SLOWLY** loosening cap.



3. SLOWLY loosen cap (1) to relieve pressure.
4. Hold down filter cover (2) against light spring load when removing the last two cap screws.

1—Hydraulic Cap 2—Hydraulic Oil Filter Cover



T6811A1—UN—18OCT88

T134987—UN—01NOV01

TX14740,0001CFA -19-29JUN06-1/2

5. Remove spring (3), valve (4), and filter element (5).
6. Discard filter element and O-ring (2).

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

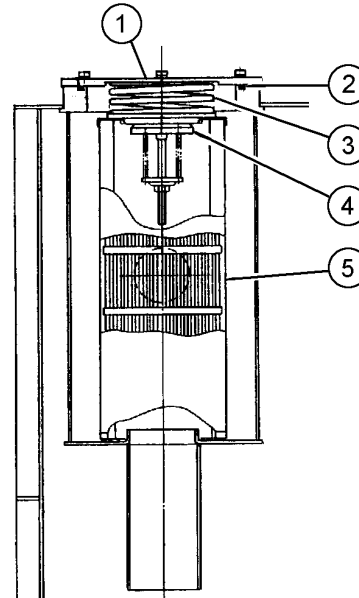
7. Install filter element, valve, and spring.
8. Install cover (1) and tighten cap screws.

Specification

Cap Screw—Torque..... 50 N·m (37 lb-ft)

9. Tighten cap.
10. Bleed air from hydraulic system. (See procedure in this section.)

1—Cover 4—Valve
 2—O-Ring 5—Filter Element
 3—Spring



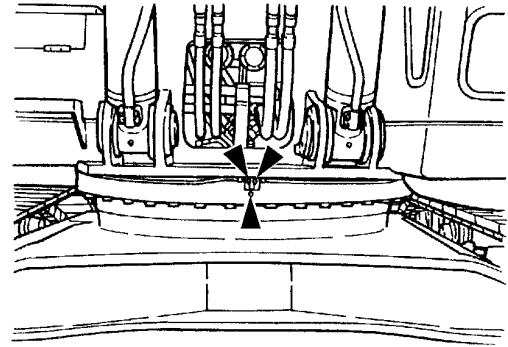
T140263—UN—21MAR01

TX14740,0001CFA -19-29JUN06-2/2

Grease Swing Bearing

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

1. Park machine on a level surface.
2. Stop engine.
3. Lubricate swing bearing with 6 shots of grease at each of three grease fittings.
4. Start engine. Raise bucket several inches off the ground and turn upperstructure 45 degrees.
5. Repeat steps 2—4 three times.



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

T140269—UN—21MAR01

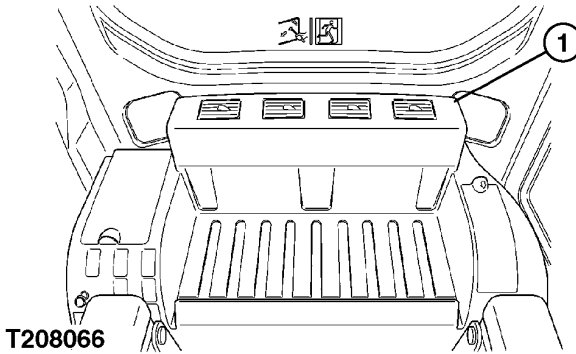
TX14740,0001CFB -19-20MAR01-1/1

Clean Cab Fresh Air and Recirculating Air Filters

IMPORTANT: Replace filters every 6th cleaning.

Removing Cab Fresh Air Filter:

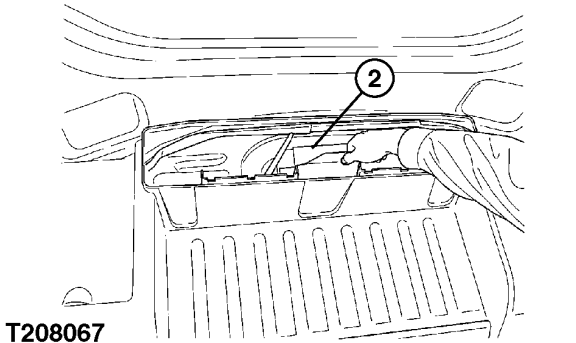
1. Tilt cab seat forward.
2. Push both sides of filter cover (1) and lift filter cover to remove.
3. Lift fresh air filter (2) straight up to remove.



Removing Cab Recirculating Air Filter:

NOTE: Recirculating air filter is located under rear deck.

1. Pull clips (4) and remove outer filter (3).
2. Remove inner filter behind outer filter.



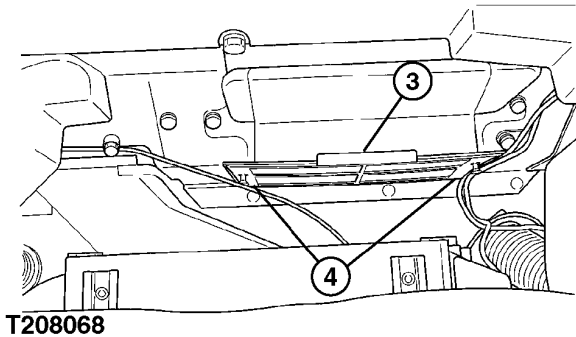
Cleaning and Installing Filters

1. Clean filters in one of 3 ways:
 - Tap filter on a flat surface with dirty side down.

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

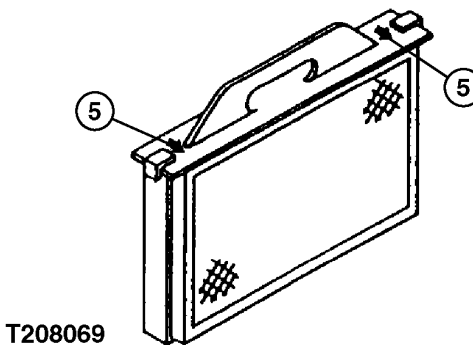
- Use compressed air opposite to the normal air flow.
- Wash filter in warm, soapy water. Flush filter. Allow filter to dry before using heater, defroster, or air conditioner.

NOTE: Install fresh air filter so the stamped arrows (5) are toward the air conditioner.



2. Install filter.
3. Install filter cover (1).
4. Install recirculating air filter with the clips (4) aligned with the duct mounting holes.

- | | |
|----------------------------|--------------------------|
| 1—Filter Cover | 4—Clip (2 used) |
| 2—Fresh Air Filter | 5—Stamped Arrow (2 used) |
| 3—Recirculating Air Filter | |



VD76477,000018E -19-24JAN07-1/1

Take Fluid Samples

See your authorized dealer for taking the following fluid samples:

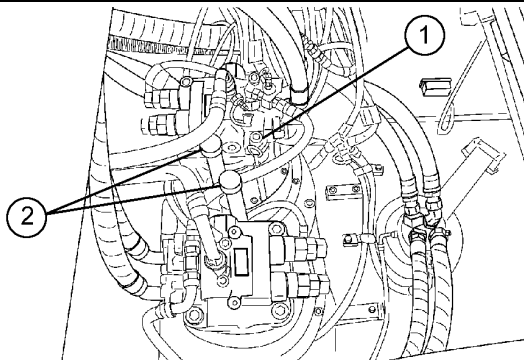
- Hydraulic Oil

JH91824,0000517 -19-27FEB09-1/1

Maintenance—Every 1000 Hours

Change Swing Gearbox Oil

1. Remove drain plugs (4) mounted at end of drain hoses.
2. Open drain valves (3) to drain oil. Allow oil to drain into a container. Dispose of waste oil properly.
3. Close drain valves.
4. Install drain plugs.
5. Remove filler caps (2) from fill tubes.
6. Add oil. until oil is between marks on dipstick (1). (See Section 3-1.)



T140494 —UN—27MAR01

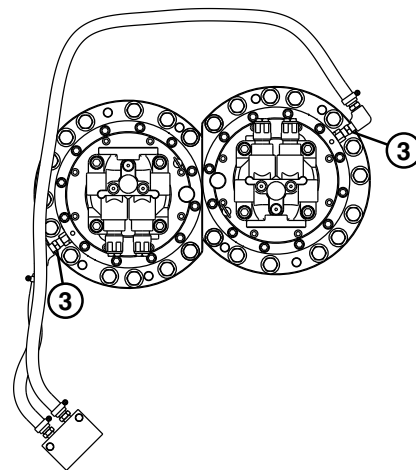
Specification

Swing gearbox—Oil
Capacity (each).....6.5 L (6.9 qt)

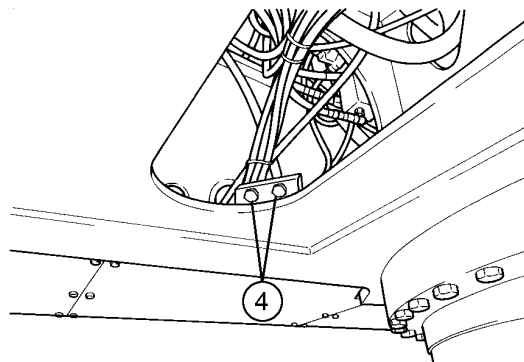
7. Install filler caps.

1— Dipstick
2— Filler Cap

3— Drain Valve
4— Drain Plug



T140503 —UN—28MAR01



T140504 —UN—28MAR01

TX14740,0001CE2 -19-06MAR01-1/1

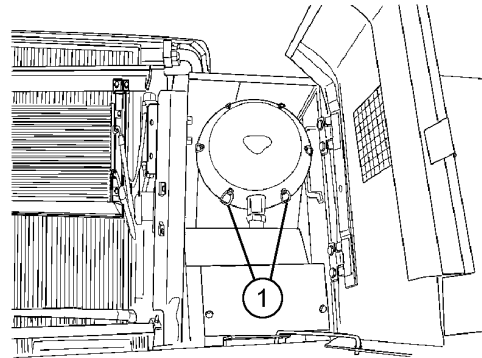
Maintenance—Every 1000 Hours

Replace Air Cleaner Elements

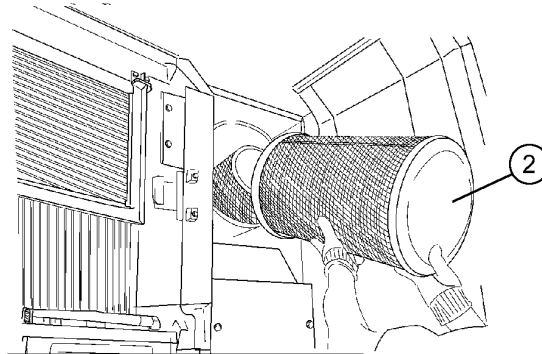
1. Loosen clamps (1) to remove cover.
2. Remove primary element (2).
3. Remove secondary element.
4. Clean the inside of filter canister.
5. Install elements, making sure the secondary element is centered in canister.
6. Install cover, tighten clamps.

1—Clamps

2—Primary Element



T140507—UN—30JUL01



T140508—UN—30JUL01

TX14740,0001CFF -19-23MAR01-1/1

Clean Engine Crankcase Ventilation Tube

1. Remove and clean the engine crankcase vent tube (1).
2. Install tube.

1—Engine Crankcase Ventilation Tube



T141611B—UN—02MAY01

TX14740,0001D18 -19-02MAY01-1/1

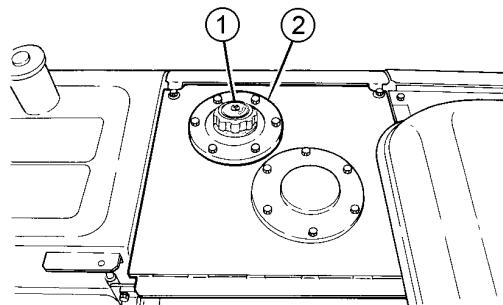
Replace Pilot System Oil Filter

CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. **DO NOT** remove hydraulic cap. Relieve pressure by **SLOWLY** loosening cap.

1. **SLOWLY** loosen cap (1) to relieve hydraulic pressure.

1—Hydraulic Cap

2—Hydraulic Oil Tank Cover



T135008—UN—01NOV01

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TX14740,0001CDB -19-29JUN06-1/2

Maintenance—Every 1000 Hours

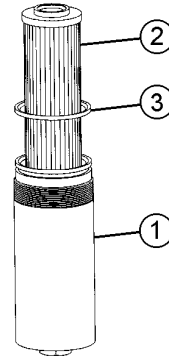
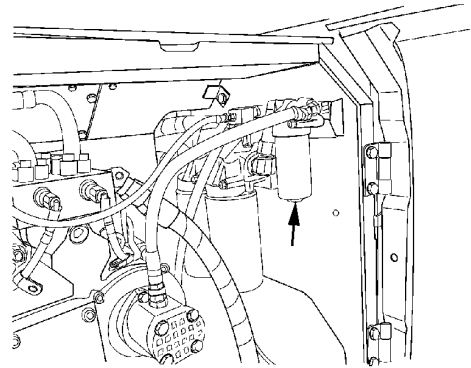
2. Remove filter canister (1).
3. Remove filter element (2).
4. Remove O-ring (3).
5. Install new O-ring and filter element.

Specification

Filter Canister—Torque.....20-30 N·m (15-22 lb·ft)

6. Install filter canister.
7. Tighten hydraulic cap.
8. Bleed air from hydraulic system. (See Section 3-7.)

- | | |
|--------------------|-----------|
| 1— Filter Canister | 3— O-Ring |
| 2— Filter Element | |



TX14740,0001CDB -19-29JUN06-2/2

T140509 —UN—27MAR01

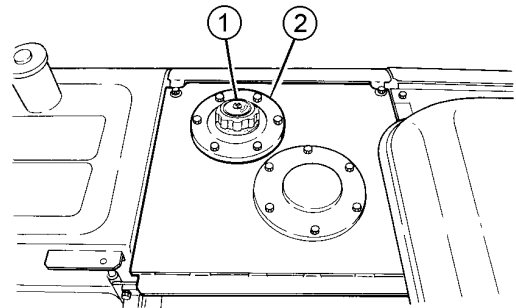
T136461 —UN—19DEC00

Replace Hydraulic Cap Breather Element

CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. **DO NOT** remove hydraulic cap. Release pressure by **SLOWLY** loosening cap.

1. **SLOWLY** loosen cap (1) to release hydraulic pressure.

- | | |
|------------------|-----------------------------|
| 1— Hydraulic Cap | 2— Hydraulic Oil Tank Cover |
|------------------|-----------------------------|



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VD76477,0000056 -19-29JUN06-1/2

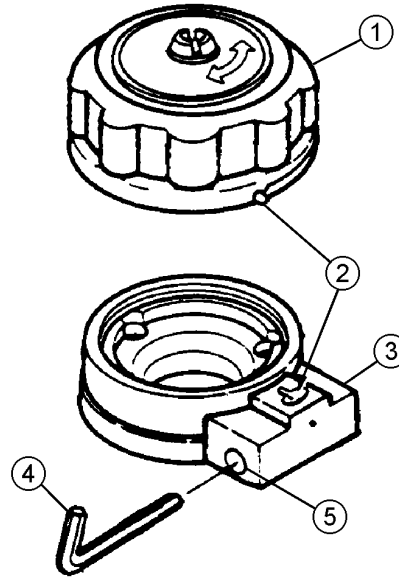
T135008 —UN—01NOV01

Maintenance—Every 1000 Hours

2. Insert 4 mm hex wrench (4) into hole (5) and turn counterclockwise.
3. Slowly turn cap (1) counterclockwise. Remove cap.
4. Remove screw from top of cap.
5. Remove and discard breather element.
6. Install new breather element.
7. Install screw.
8. Install cap to case assembly (3) by aligning marks (2) and turning cap clockwise to lock position.
9. Tighten cap.

1— Cap
2— Aligning Marks
3— Case Assembly

4— Hex Wrench
5— Hole



T135189—UN—06NOV00

VD76477,0000056 -19-29JUN06-2/2

Check Coolant

See Check Coolant in Maintenance—As Required.
(Section 3-3.)

JH91824,000050F -19-26FEB09-1/1

Maintenance—Every 2000 Hours

Change Travel Gearbox Oil

1. Park the machine on level ground rotating travel gearbox until bottom of the oil level check plug (2) is even with the horizontal centerline (4).
2. Stop engine.

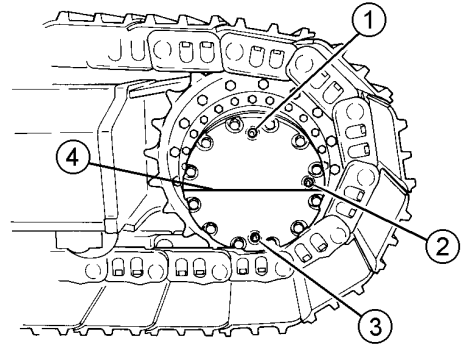
CAUTION: High pressure release of oils from pressurized system can cause serious burns. Wait for travel gearbox oil to cool. Keep body and face away from check plug. Gradually loosen check plug to release pressure.

3. After travel gearbox has cooled, slowly loosen check plug to release pressure.

Specification

Travel Gearbox—Oil
Capacity (each).....9.0 L (9.5 qt)

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 70 N·m (51 lb-ft).
6. Remove oil fill plug (1).
7. Add oil until oil flows out of oil level check plug hole. (See Section 3-1.)



1— Fill Plug
2— Check Plug

3— Drain Plug
4— Horizontal Centerline

8. Wrap threads of check plug and fill plug with sealing-type tape. Install plugs. Tighten plugs to 70 N·m (51 lb-ft).
9. Change oil of second travel gearbox.

T134964—UN—01NOV00

TX14740,0001CE4 -19-29JUN06-1/1

Drain Cooling System

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

Drain and flush cooling system using commercial products, replace radiator cap, and refill with new coolant.

1. Check coolant hoses for cracks and leaks. Replace if necessary.
2. Check radiator and oil cooler for dirt, grease, leaks, and loose or broken mountings. Clean radiator and oil cooler fins.

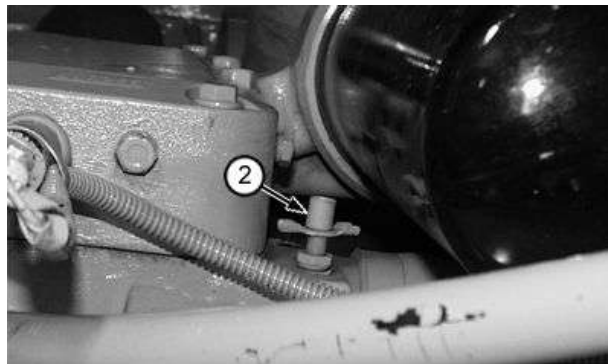
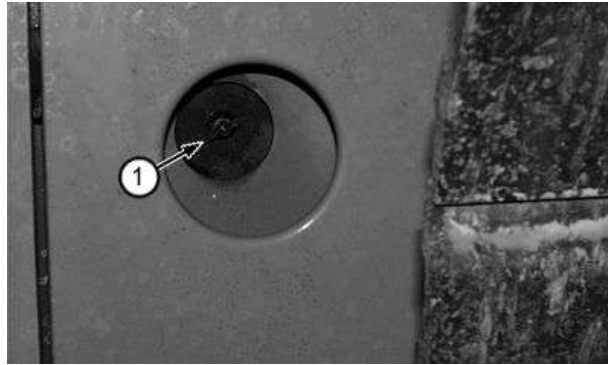
CAUTION: Prevent possible injury from hot spraying water. **DO NOT** remove radiator filler cap unless engine is cool. Then turn cap slowly to the stop.

3. Release air to relieve pressure. Remove filler cap.

Specification

Cooling System—Capacity..... 50 L (13.2 gal)

4. From under machine, turn radiator drain valve (1) counterclockwise to open valve. Allow coolant to drain into a container. Dispose of waste coolant properly. Close drain valve.
5. Turn engine block drain valve (2) counterclockwise to open valve. Drain coolant into a container. Dispose of waste properly. Close drain valve.



1—Radiator Drain Valve

2—Engine Block Drain Valve

T140550B —UN—26MAR01

T141318B —UN—11APR01

VD76477,000010B -19-22JUL05-1/1

Heavy Duty Diesel Engine Coolant

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

The following engine coolants are preferred:

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

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

Additional Recommended Coolants

The following engine coolant is also recommended:

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

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

Other Coolants

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

If these coolants are unavailable, use a coolant concentrate or prediluted coolant intended for use with heavy duty diesel engines and with a minimum of the following chemical and physical properties:

COOL-GARD is a trademark of Deere & Company

- Is formulated with a quality nitrite-free additive package.
- Provides cylinder liner cavitation protection according to either the John Deere Cavitation Test Method or a fleet study run at or above 60% load capacity
- Protects the cooling system metals (cast iron, aluminum alloys, and copper alloys such as brass) from corrosion

The additive package must be part of one of the following coolant mixtures:

- ethylene glycol or propylene glycol base prediluted (40–60%) heavy duty coolant
- ethylene glycol or propylene glycol base heavy duty coolant concentrate in a 40–60% mixture of concentrate with quality water

Water Quality

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

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

Do not mix ethylene glycol and propylene glycol base coolants.

Do not use coolants that contain nitrites.

Cooling System Fill and Deaeration Procedure

Specification

Cooling System—Capacity..... 50.0 L (13.2 gal)

IMPORTANT: Use only permanent-type low silicate ethylene glycol base antifreeze in coolant solution. Other types of antifreeze may damage cylinder seals.

FREEZING TEMPERATURES: Fill with permanent-type, low silicate, ethylene glycol antifreeze (without stop-leak additive) and clean distilled, deionized, or demineralized water.

Fill

Fill radiator to the bottom of the radiator fill neck.

Fill the recovery tank to FULL mark.

Deaeration

The cooling system requires several warm-up and cool down cycles to deaerate. It will NOT deaerate during

normal operation. Only during warm-up and cool down cycles will the system deaerate.

1. Start engine. Run engine until coolant reaches a warm temperature.
2. Stop engine. Allow coolant to cool.
3. Check coolant level at 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 FULL mark.

TX14740,0001CB8 -19-29JUN06-1/1

Adjust Engine Valve Clearance

See your authorized dealer for engine valve clearance adjustment.

NOTE: Perform this service at the first 500 hours of operation and then at 2000 hour intervals thereafter.

CED,OJO1032,2768 -19-08NOV05-1/1

Maintenance—Every 4000 Hours

Change Hydraulic Tank Oil, Clean Suction Screen

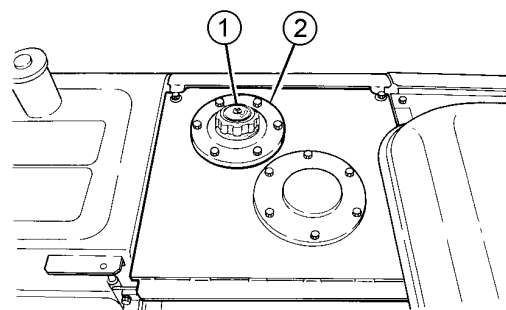
NOTE: Change original factory fill hydraulic oil after first 4000 hours. Change every 4000 hours thereafter if using Super EX 46HN, if using premium AW46 oils change every 2000 hours thereafter.

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 level surface with upperstructure rotated 90° for easier access.
2. Position machine with arm cylinder fully retracted and bucket cylinder fully extended.
3. Stop engine.



1— Hydraulic Oil Cap

2— Hydraulic Oil Tank Cover

VD76477,000010C -19-29JUN06-1/5

T6811AJ—UN—18OCT88

T135008—UN—01NOV01

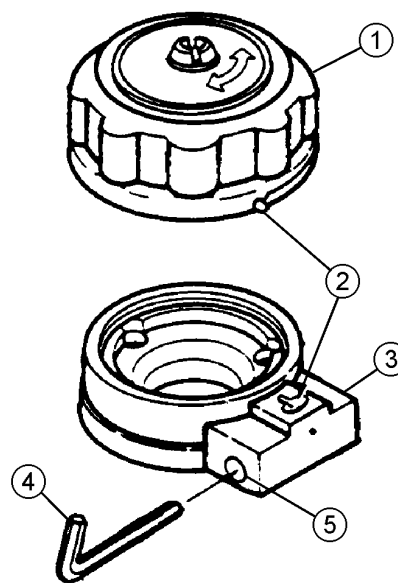
CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. **DO NOT** remove hydraulic cap. Relieve pressure by **SLOWLY** loosening cap.

4. Insert 4 mm hex wrench (4) into hole (5) and turn counterclockwise to release locking pin.
5. Slowly turn cap (1) counterclockwise a few degrees to relieve pressure. Remove cap.

Specification

Hydraulic Tank—Oil
Capacity..... 280.0 L (74.0 gal)

- | | |
|-------------------|---------------|
| 1— Cap | 4— Hex Wrench |
| 2— Aligning Marks | 5— Hole |
| 3— Case Assembly | |



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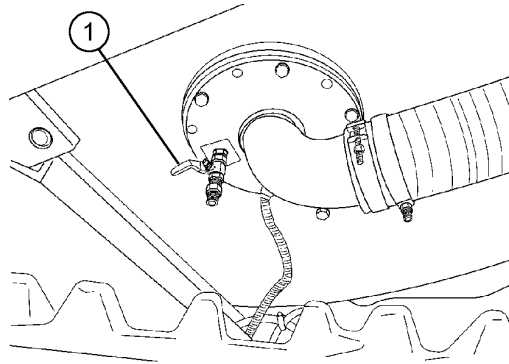
VD76477,000010C -19-29JUN06-2/5

T135189—UN—06NOV00

Maintenance—Every 4000 Hours

- Remove drain plug and open drain valve (1). Allow oil to drain into a container. Dispose of waste oil properly.

1—Drain Valve

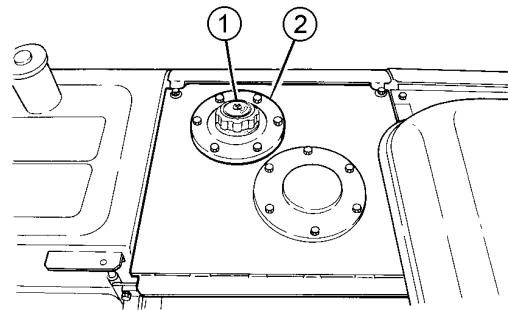


T140497—UN—27MAR01

VD76477,000010C -19-29JUN06-3/5

- Remove cover (2) with suction screen.
- Clean inside of tank and suction screen.
- Replace hydraulic oil filter. (See Section 3-7.)
- Replace pilot system oil filter.(See Section 3-8.)

1—Hydraulic Tank Cap 2—Hydraulic Oil Tank Cover



T135008—UN—01NOV01

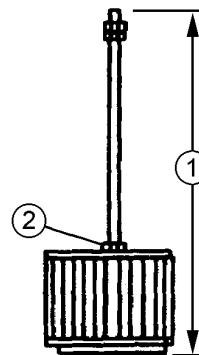
VD76477,000010C -19-29JUN06-4/5

- Install suction screen with cover. Suction screen must seal against outlet pipe in bottom of tank. If necessary, loosen nut (2) to adjust rod length.
- Install tank drain plug and close drain valve.
- Add oil until it is between marks on sight glass. (See Section 3-1.)

Specification

Suction Screen Rod	
(1)—Length.....	848 mm (33.0 in.)
Suction Screen Rod	
Nut—Torque.....	14.5—19.5 N·m (10.5—14.5 lb-ft)
Hydraulic Cover Cap	
Screw—Torque.....	50 N·m (37 lb-ft)

- Install tank cap.
- Bleed air from hydraulic system. (See Section 3-7.)



1—Suction Screen Rod 2—Suction Screen Rod Nut

T135193—UN—06NOV00

VD76477,000010C -19-29JUN06-5/5

Maintenance—Every 4500 Hours

Replace Engine Crankshaft Dampener

The crankshaft dampener assembly is not repairable and should be replaced every four years or 4000

hours, whichever occurs first, or whenever crankshaft is replaced. See your authorized John Deere dealer.

CED,TX03768,2668 -19-11NOV09-1/1

Miscellaneous—Machine

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.

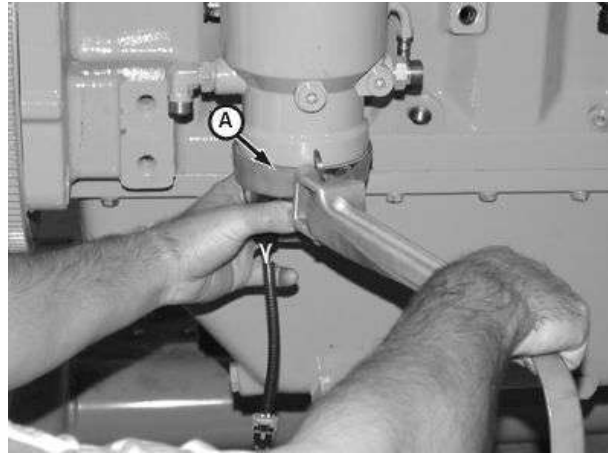
If these parts need service, see your authorized dealer.

TX,90,FF3114 -19-03JAN07-1/1

Clean Water Separator Bowl

IMPORTANT: Use the least amount of force necessary with strap wrench when removing and installing separator bowl to prevent plastic bowl from cracking.

1. Disconnect wiring connector from water-in-fuel sensor.
2. Drain fuel from separator bowl.
3. Position a strap wrench (A) as close as possible to top edge of separator bowl. While applying pressure with strap wrench, grip bowl and twist with other hand, as shown, to remove bowl.
4. Clean water separator bowl.
5. Install separator bowl and tighten by hand until seal makes contact.



RG10351—UN—13SEP99

A—Strap Wrench

Specification

Water Separator Bowl-To-Filter Housing—Torque.....	6 N·m (55 lb-in.)
----------------------------------------------------	-------------------

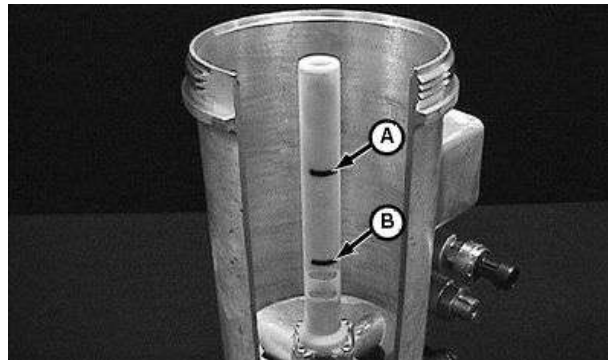
6. Connect wiring connector to water-in-fuel sensor.
7. Remove cap. Lift filter up until fuel level can be observed.

TX14740,0001D3B -19-03JUL01-1/2

8. Pump primer until fuel is within 6 inches of filter cannister top.
9. Press filter to seal.
10. Install filter cap.
11. Pump primer 20 strokes.
12. Start engine. Run engine at slow idle for 5 minutes.

A—Maximum Level 63 mm (2-1/2 in.) From Top Of Housing (new filter)

B—Minimum Level 152 mm (6 in.) From Top Of Housing (re-used filter)



RG10305—UN—02SEP99

TX14740,0001D3B -19-03JUL01-2/2

Precautions for Alternator and Regulator

When batteries are connected, follow these rules:

1. Disconnect negative (-) battery cable when you work on or near alternator or regulator.
2. Be sure alternator wires are correctly connected BEFORE you connect batteries.
3. Do not ground alternator output terminal.
4. Do not disconnect or connect any alternator or regulator wires while batteries are connected or while alternator is operating.
5. Connect batteries or a booster battery in the correct polarity (positive [+] to positive [+] and negative [-] to negative [-]).
6. Do not disconnect the batteries when engine is running and alternator is charging.
7. Disconnect battery cables before you connect battery charger to the batteries.

T82,EXMA,I -19-03JAN07-1/1

Diagnostic Display Unit (DDU) Operation

The Diagnostic Display Unit (located in battery compartment) will show only codes produced by sensors on the engine and connected to the engine control unit (ECU).

Service codes are displayed according to J1939 Standard as a two part code.

The first part of the code is a two—four digit Suspect Parameter Number (SPN), indicating the system or component having a failure; for example SPN 110 indicates a failure in the engine coolant temperature circuit.

The second part of the code is a two digit Failure Mode Identifier (FMI), indicating the type of failure that has occurred; for example FMI 3 indicates value above or below normal.

Code SPN 110 FMI 3 indicates engine coolant temperature too high.

The diagnostic display unit will show active codes and stored codes, and can clear codes from memory after a repair has been made.

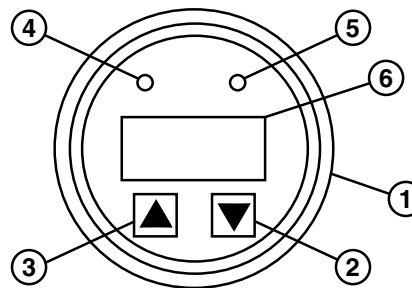
Active codes are occurring at the present time, and will be indicated by “SrvcCode” with dashes above it flashing on the display every 5 seconds or “Error” will appear in the display with the circuit causing the service code. The service code must be repaired and cleared to stop “SrvcCode” and “Error” from appearing in the display. If the service code is cleared without being repaired, it will reappear.

Stored codes have occurred in the past. An intermittent short or open will cause a code to be stored. SPN and FMI code numbers will identify the circuit generating the code. A stored code can be cleared, but will reappear if the problem returns.

The diagnostic display unit will display real time temperatures, pressures and other items useful in diagnosing problems or monitoring operation of engine related items.

Items displayed are listed below.

- SrvcCode (active service codes)
- StorCode (stored service codes)
- Units (choose English or Metric)
- EngConf
- Throttle % (measurement of voltage from engine speed dial)
- Load@RPM
- Eng RPM (engine speed)
- EngHrs (total engine hours)
- CoolTmp (coolant temperature)
- FuelRate (fuel consumption in gallons per hour)
- ManiTmp (intake manifold air temperature)
- BatVolt (battery system voltage)



T139865

- | | |
|----------------------------|---------------------------|
| 1— Diagnostic Display Unit | 4— Yellow Indicator Light |
| 2— Down Arrow | 5— Red Indicator Light |
| 3— Up Arrow | 6— Display Window |

T139865—UN—20MAR01

Continued on next page

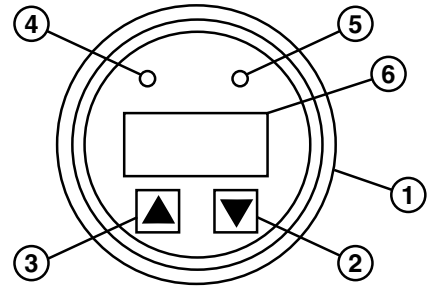
TX14740,0001D21 -19-21MAY07-1/15

Miscellaneous—Machine

Accessing Menu

1. Key switch ON.
2. Push down arrow (2) or up arrow (3) to scroll through menu.
3. Menu items will appear in the display window (6).

- | | |
|----------------------------|-------------------|
| 1— Diagnostic Display Unit | 4— Yellow Light |
| 2— Down Arrow | 5— Red Light |
| 3— Up Arrow | 6— Display Window |

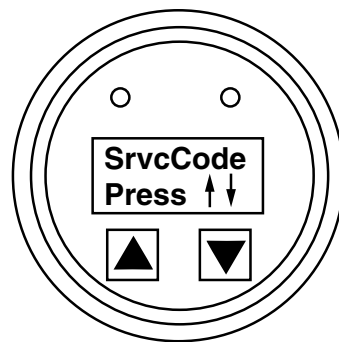


T139865

T139865—UN—20MAR01

TX14740,0001D21 -19-21MAY07-2/15

4. If a menu item has a sub menu or contains data where a choice can be made between multiple items, up and down arrows will appear beside the item name in the display window.



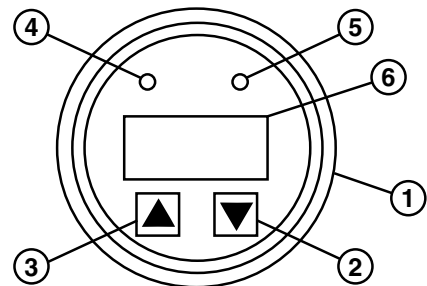
T139868

T139868—UN—20MAR01

TX14740,0001D21 -19-21MAY07-3/15

5. Push down (2) and up (3) arrows at the same time to display stored data.

- | | |
|----------------------------|---------------------------|
| 1— Diagnostic Display Unit | 4— Yellow Indicator Light |
| 2— Down Arrow | 5— Red Indicator Light |
| 3— Up Arrow | 6— Display Window |



T139865

T139865—UN—20MAR01

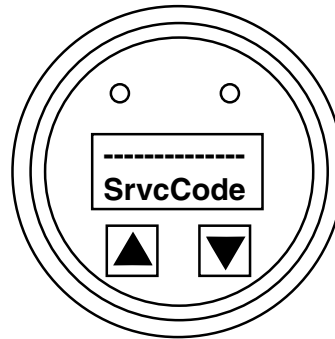
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TX14740,0001D21 -19-21MAY07-4/15

Miscellaneous—Machine

Viewing Active Service Codes

1. If a service code is active, the yellow light will be ON. If " SrvcCode" with dashes above it appears in the display window and flashes every 5 seconds, Fuel Pressure Low (SPN 94 FMI 1) or Water In Fuel (SPN 97 FMI 31) is indicated. View active service codes by following steps below.
2. Key switch ON.

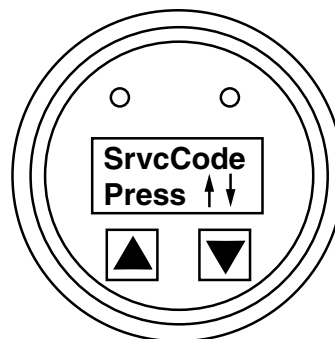


T140002

T140002 —UN—20MAR01

TX14740,0001D21 -19-21MAY07-5/15

3. Scroll through menu items until "SrvcCode" with up and down arrows appears in the display window.

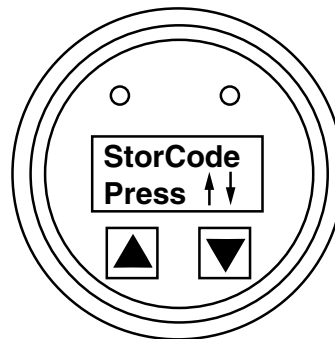


T139868

T139868 —UN—20MAR01

TX14740,0001D21 -19-21MAY07-6/15

4. Press up and down arrows at the same time.



T139914

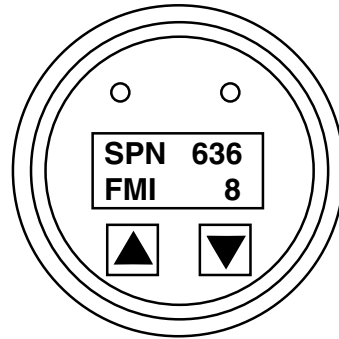
T139914 —UN—20MAR01

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TX14740,0001D21 -19-21MAY07-7/15

Miscellaneous—Machine

5. If service codes are active they will appear in the display window.

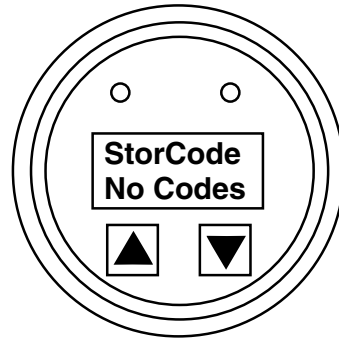


T139923

TX14740,0001D21 -19-21MAY07-8/15

T139923 —UN—20MAR01

6. If there are no service codes “No Codes” with up and down arrows appears on the display window.



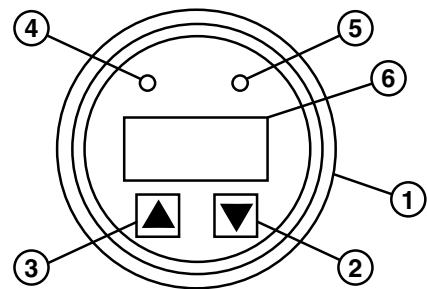
T139949

TX14740,0001D21 -19-21MAY07-9/15

T139949 —UN—20MAR01

7. To exit active service code, and return to the menu, press down (2) and up (3) arrows at the same time.

- | | |
|----------------------------|-------------------|
| 1— Diagnostic Display Unit | 4— Yellow Light |
| 2— Down Arrow | 5— Red Light |
| 3— Up Arrow | 6— Display Window |



T139865

Continued on next page

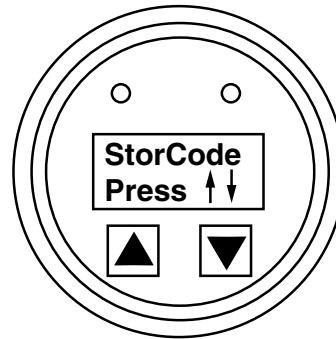
TX14740,0001D21 -19-21MAY07-10/15

T139865 —UN—20MAR01

Miscellaneous—Machine

Access Stored Codes

1. Key switch ON.
2. Scroll through menu items until "StorCode" with up and down arrows appears in the display window.



T139914

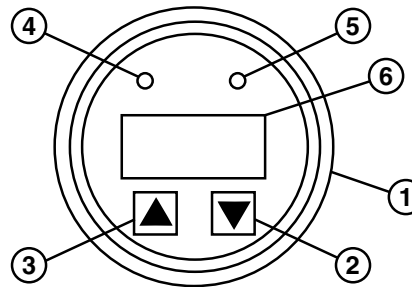
T139914 —UN—20MAR01

TX14740,0001D21 -19-21MAY07-11/15

3. Push down (2) and up (3) arrows at the same time.

- 1— Diagnostic Display Unit
- 2— Down Arrow
- 3— Up Arrow

- 4— Yellow Light
- 5— Red Light
- 6— Display Window

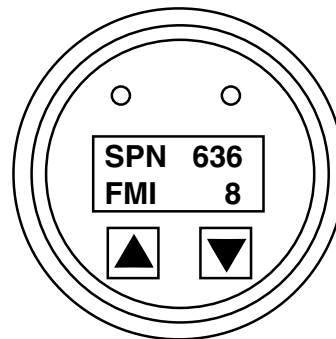


T139865

T139865 —UN—20MAR01

TX14740,0001D21 -19-21MAY07-12/15

4. Stored codes will appear in the display window.



T139923

T139923 —UN—20MAR01

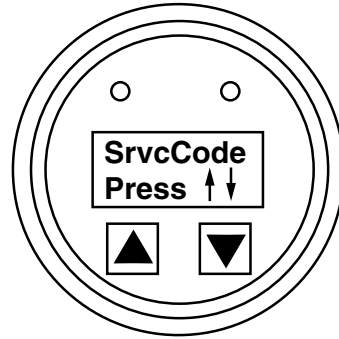
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TX14740,0001D21 -19-21MAY07-13/15

Miscellaneous—Machine

Clearing Active Or Stored Service Codes From Diagnostic Display Unit Memory

1. Key switch ON.
2. Scroll through menu items until "SrvcCode" with up and down arrows appears on the display window.
3. Push both up and down arrows to display code.



T139868

T139868 —UN—20MAR01

TX14740,0001D21 -19-21MAY07-14/15

4. Push and hold both up and down arrows for more than 8 seconds. Two rows of stars will appear on the display window, and the yellow or red indicator light will go out. Release the up arrow (2) switch and continue to hold the down arrow (1) until "Send DM3" appears, indicating the code has been cleared. If the problem has not been repaired, the service code will reappear.

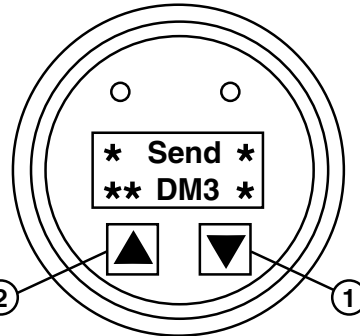
1— Down Arrow

2— Up Arrow



T140051

T140051 —UN—20MAR01



T140129

T140129 —UN—20MAR01

TX14740,0001D21 -19-21MAY07-15/15

Miscellaneous—Machine

Engine Service Codes

SPN	FMI	Code Description
28	3	Throttle Reference Voltage High
28	4	Throttle Reference Voltage Low
29	3	Throttle Ground Voltage High
29	4	Throttle Ground Voltage Low
91	3	Throttle Input Voltage High
91	4	Throttle Input Voltage Low
94	18	Fuel Pressure Low-Moderate Level
94	1	Fuel Pressure Low-High Level
94	16	Fuel Pressure High-Moderate Level
94	3	Fuel Supply Pressure Input Voltage High
94	4	Fuel Supply Pressure Input Voltage Low
97	31	Water in Fuel
97	3	Water-in-Fuel Signal Voltage High
97	4	Water-in-Fuel Signal Voltage Low
102	3	Manifold Air Pressure (MAP) Input Voltage High
102	4	Manifold Air Pressure (MAP) Input Voltage Low
105	16	Inlet Air Temp High-Moderate Level
105	3	Manifold Air Temperature Input Voltage High
105	4	Manifold Air Temperature Input Voltage Low
110	15	Coolant Temp High - Low Level (>110C)
110	16	Coolant Temp High - Moderate Level (>113C)
110	0	Coolant Temp High - High Level (>115C)
110	3	Engine Coolant Temperature (ETC) Input Voltage High
110	4	Engine Coolant Temperature (ETC) Input Voltage Low
158	17	Controller Cannot Power Down
174	3	Fuel Temperature Input Voltage High
174	4	Fuel Temperature Input Voltage Low
611	3	Injector Wiring Shorted To Power Source
611	4	Injector Wiring Shorted To Ground
620	3	Sensor Supply Voltage High
620	4	Sensor Supply Voltage High
627	1	ECU Supply Voltage High Or Open
629	13	Reprogram Controller
636	2	Cam Position Input Noise
636	8	Cam Position Input Missing
636	10	Cam Position Input Pattern Error
637	2	Crank Position Input Noise
637	7	Crank Position Cam Position Out Of Sync
637	8	Crank Position Input Missing
637	10	Crank Position Input Pattern Error
651	5	Cylinder #1 EUI Circuit Open
651	6	Cylinder #1 EUI Circuit Shorted
652	5	Cylinder #2 EUI Circuit Open
652	6	Cylinder #2 EUI Circuit Shorted
653	5	Cylinder #3 EUI Circuit Open
653	6	Cylinder #3 EUI Circuit Shorted
654	5	Cylinder #4 EUI Circuit Open
654	6	Cylinder #4 EUI Circuit Shorted
655	5	Cylinder #5 EUI Circuit Open
655	6	Cylinder #5 EUI Circuit Shorted

Continued on next page

TX14740,0001D22 -19-08JUN01-1/2

Miscellaneous—Machine

SPN	FMI	Code Description
656	5	Cylinder #6 EUI Circuit Open
656	6	Cylinder #6 EUI Circuit Shorted
1569	31	Fuel Derate Active

TX14740,0001D22 -19-08JUN01-2/2

Handling, Checking, and Servicing Batteries Carefully

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

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

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

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

Avoid the hazard by:

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

If you spill acid on yourself:

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

If acid is swallowed:

1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 1.9 L (2 qts.).
3. Get medical attention immediately.

WARNING: Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. **Wash hands after handling.**

If electrolyte spills on the floor, use one of the following mixtures to neutralize the acid: 0.5 kg (1 lb.) baking soda in 4 L (1 gal.) water, or 0.47 L (1 pt.) household ammonia in 4 L (1 gal.) water.

IMPORTANT: Do not overfill the battery cells.

Check the specific gravity of electrolyte in each battery cell.

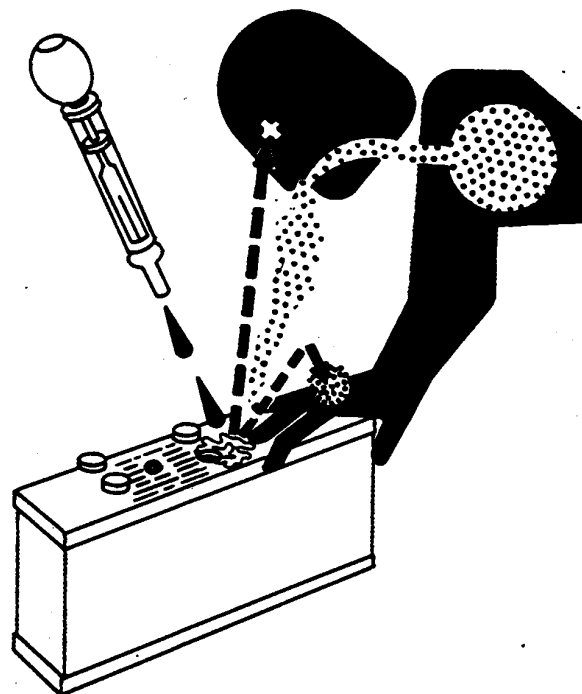
See your authorized dealer for JT05460 SERVICEGARD™ battery and coolant tester. Follow directions included with the tester.

A fully charged battery will have a corrected specific gravity reading of 1.260. If the reading is below 1.200, charge the battery.

SERVICEGARD is a trademark of Deere & Company



Exploding Battery Gas



Battery Electrolyte



Battery and Coolant Tester

TS204—UN—15APR13

TS203—UN—23AUG88

T85402—UN—10NOV88

TX03679,0001788 -19-05MAR13-1/1

Miscellaneous—Machine

Using Battery Charger

CAUTION: Disconnect battery ground before you charge batteries in the machine to prevent damage to electrical components.

A battery may explode if charged when it is frozen. Warm battery to 16°C (60°F) before charging.

A battery charger may be used as a booster to start engine.

IMPORTANT: DO NOT use battery charger as a booster if a battery has a 1.150 specific gravity reading or lower. Turn off charger before connecting or disconnecting it.



TS204—UN—15APR13

T82.EXMA,G -19-03JAN07-1/1

Replacing Batteries

Your machine has two 12-volt batteries with negative (-) ground. Batteries must meet one of the specifications below.

	Specification
Battery—Cold Cranking	
Amps At -18°C (0°F).....	800
Battery—Minutes	
Reserve Capacity At 25	
Amps.....	180

If one battery in a 24-volt system has failed but the other is still good, replace the failed battery with one of the same type. For example, replace a failed maintenance-free battery with a new maintenance-free battery. Different types of batteries may have different rates of charge. This difference could overload one of the batteries and cause it to fail.

TX,90,DH5153 -19-03JAN07-1/1

Welding On Machine

IMPORTANT: Disconnect battery ground strap or turn battery disconnect switch to "OFF" to prevent voltage spikes through alternator or monitor.

Disable electrical power before welding. Turn off main battery switch or disconnect positive

battery cable. Separate harness connectors to engine and vehicle microprocessors.

Connect welder ground clamp close to each weld area so electrical current does not arc inside any bearings.

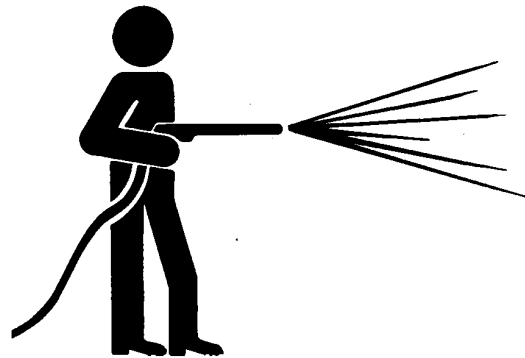
TX,90,DH5140 -19-03JAN07-1/1

Clean the Machine Regularly

Remove any grease, oil, fuel, or debris build-up to avoid possible injury or machine damage.

IMPORTANT: Directing pressurized water at electronic/electrical components or connectors, bearings and hydraulic seals, fuel injection pumps or other sensitive parts and components may cause product malfunctions. Reduce pressure and spray at a 45 to 90 degree angle.

High pressure washing (greater than 1379 kPa (13.8 bar) (20 psi) can damage freshly painted finishes. Paint should be allowed to air dry for 30 days minimum after receipt of machine before cleaning with high pressure. Use low pressure wash operations until 30 days have elapsed.



Do not spray oil cooler fins at an angle. Fins may bend.

T6642EJ—UN—18OCT88

TX03679,00017E0 -19-28JUN06-1/1

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, 8-amp outlet.

When possible, use 24-volt accessories. If 12-volt accessories are added, use a 24-volt to 12-volt converter. Converters are available from your John Deere dealer.

Converter capacity requirements depend on the load of the accessories installed. Follow electronic dealer

and manufacturer's recommendations to determine the capacity of the converter required and its installation requirements. If standard equipment, verify if amperage is adequate for application.

IMPORTANT: DO NOT connect an accessory to one battery. Connecting a 12-volt accessory to one battery will cause one battery to overcharge, and the other battery to undercharge, causing battery failure.

TX,90,DH3734 -19-17JUL07-1/1

Replacing Fuses

The fuse box is located behind the seat.

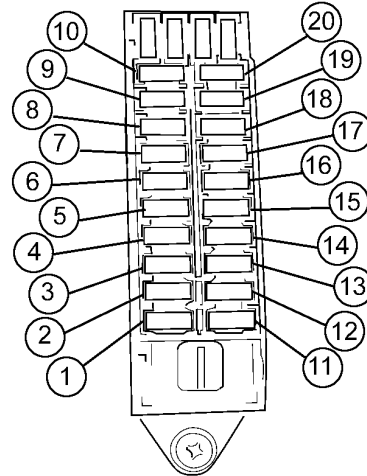
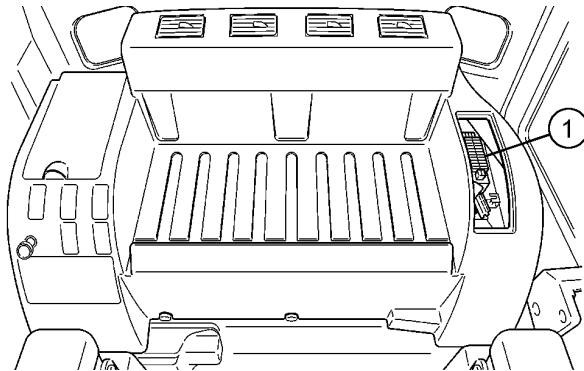
Remove cover.

IMPORTANT: Install fuse with correct amperage rating to prevent electrical system damage from overload.

Fuse (Blade-Type) Color Codes

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— 5 Amp—Radio And Monitor Controller Backup | 11— 20 Amp—Work And Drive Lights |
| 2— 5 Amp—Pump And Valve Controller | 12— 10 Amp—Wiper |
| 3— 20 Amp—Starter Relay | 13— 20 Amp—Air Con And Heater |
| 4— 10 Amp—Solenoid | 14— 5 Amp—Air Con And Heater |
| 5— 5 Amp—Travel Alarm | 15— 10 Amp—Horn |
| 6— 5 Amp—Pump And Valve Controller | 16— 5 Amp—Radio |
| 7— 5 Amp—Monitor Controller Power | 17— 10 Amp—Lighter |
| 8— 15 Amp—Diagnostic Connector | 18— 5 Amp—Dome Light |
| 9— 10 Amp—Optional | 19— 10 Amp—Aux |
| 10— 10 Amp—Engine Control Unit | 20— 20 Amp—Start Aid (optional) |



T140322 —UN—22MAR01

T140464 —UN—28MAR01

TX14740,0001CFD -19-23MAR01-1/1

Miscellaneous—Machine

Replacing Bucket Teeth

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

IMPORTANT: Angle the drift toward the bucket to avoid damaging the rubber pin lock.

1. Use a hammer and drift to drive out locking pin.

NOTE: Alternate buckets may use different tooth assemblies.

2. Remove tooth.



Bucket Teeth

T95784—UN—10NOV88

04T,90,M16 -19-28MAR11-1/3

3. Inspect rubber pin lock (A) for damage. Replace if necessary.
4. If rubber pin lock has moved, reposition in slot in adapter tooth shank.

A—Rubber Pin Lock



Rubber Pin Lock

T95785—UN—10NOV88

04T,90,M16 -19-28MAR11-2/3

5. Position the new tooth over the tooth shank.
6. Drive the locking pin into the hole fully.

NOTE: Check bucket teeth periodically so that wear does not extend to the bucket tooth shank.



Tooth Shank

T95786—UN—10NOV88

04T,90,M16 -19-28MAR11-3/3

Miscellaneous—Machine

Replacing Bucket Tooth Tip—Heavy-Duty Bucket

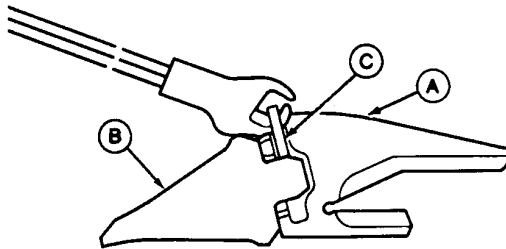
1. Clean tooth (A) and tooth tip (B).
2. Insert lock removal tool under U-shaped pin (C).

CAUTION: Avoid possible injury. Pin may fly after it is released from tooth tip. Keep a firm grip on pin to prevent injury.

3. Remove pin.
4. Turn tooth tip counterclockwise and pull it towards you to remove.
5. Clean tooth shank.
6. Replace U-shaped pin at same time you replace tooth tip.
7. Insert tooth tip on shank turning tip clockwise.
8. Install U-shaped pin. Side of pin marked "FRONT" (D) must face tooth tip. Make sure pin is firmly engaged over tooth tip.

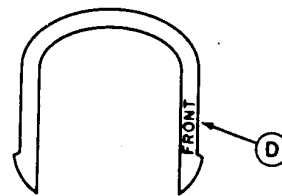
A—Tooth
B—Tooth Tip

C—Pin
D—"Front" Mark



T6879EE

Bucket Tooth Tip—Heavy-Duty Bucket



U-Shaped Pin—Heavy-Duty Bucket

04T,90,K273 -19-23AUG12-1/1

T6879EE—UN—06DEC08

T7627DO—UN—27JUN91

Adjust Bucket to Arm Joint

Your machine has a bucket adjustment system to take up play. When play increases, remove shims as follows:

1. Slide O-ring out of way.



Continued on next page

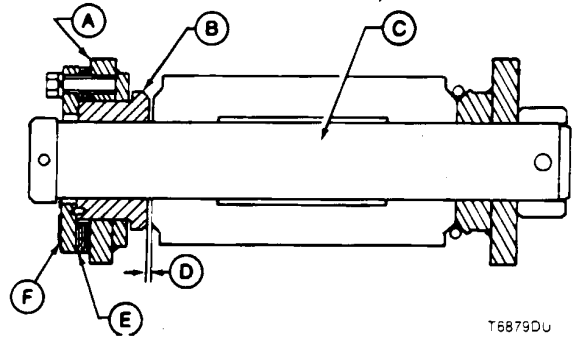
04T,90,M210 -19-29JUN06-1/3

T95775—UN—10NOV88

Miscellaneous—Machine

2. Measure distance (D) between the bushing (B) and the arm. This distance should not be adjusted below 0.5 mm (0.020 in.).
3. Remove plate (F).

A—Bucket
 B—Bushing
 C—Pin
 D—Clearance
 E—Shim
 F—Plate

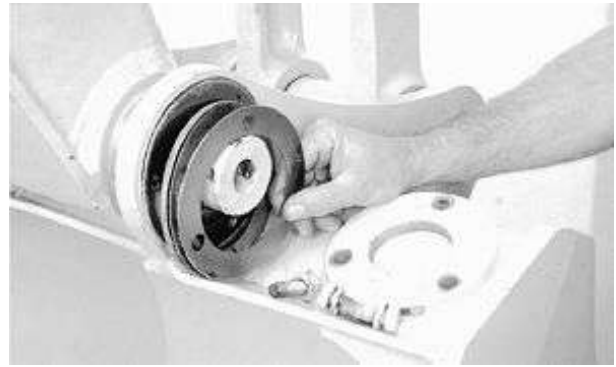


04T,90,M210 -19-29JUN06-2/3

T6879DU —UN—06DEC88

NOTE: Alternate buckets may have different adjustment procedures.

4. Remove shim(s) according to distance measured. This will allow the bushing to move to the right and take up the excessive play.
5. Install plate and tighten cap screws.
6. Slide O-ring back into position.



04T,90,M210 -19-29JUN06-3/3

T95788 —UN—10NOV88

Removing the Bucket

1. Lower bucket to the ground.
2. Remove snap rings and locking pins.
3. Slide O-ring seals out of way. Remove bucket pins.
4. Install and adjust bucket. See Adjust Bucket To Arm Joint in this section.

04T,90,M35 -19-29JUN06-1/1

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 -19-11MAY06-1/1

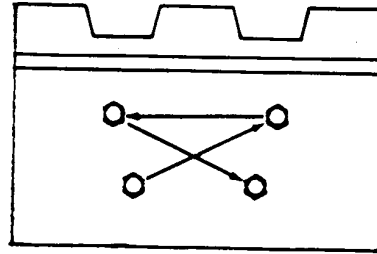
Check Track Shoe Hardware

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

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.



Cap Screw Tightening Sequence

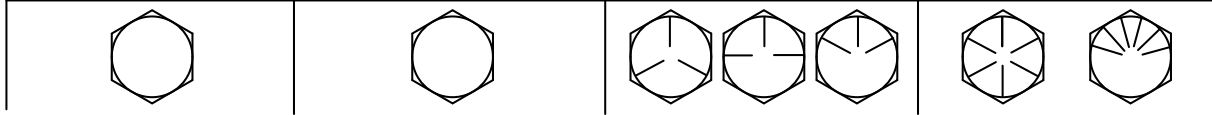
T6352AH—UN—23FEB89

TX14740,0001CFC -19-03JAN12-1/1

Miscellaneous—Machine

Unified Inch Bolt and Screw Torque Values

TS1671 —UN—01MAY03



Bolt or Screw Size	SAE Grade 1				SAE Grade 2 ^a				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c	
	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.

^aGrade 2 applies for hex cap screws (not hex bolts) up to 6 in. (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

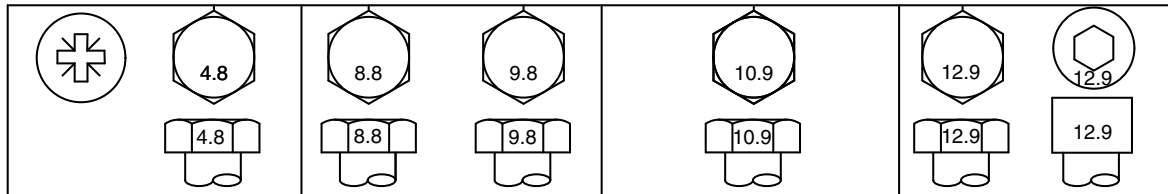
^b"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

^c"Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B, F13E or F13H zinc flake coating.

Miscellaneous—Machine

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 ^a		Dry ^b		Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b	
	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	32	23.5	40	29.5	37	27.5	47	35
			N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.								
M10	23	204	29	21	43	32	55	40	63	46	80	59	75	55	95	70
	N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.	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.

^a"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.

^b"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—Machine Assembly

Install Boom, Arm, Bucket and Counterweight

Inspect shipping assemblies.

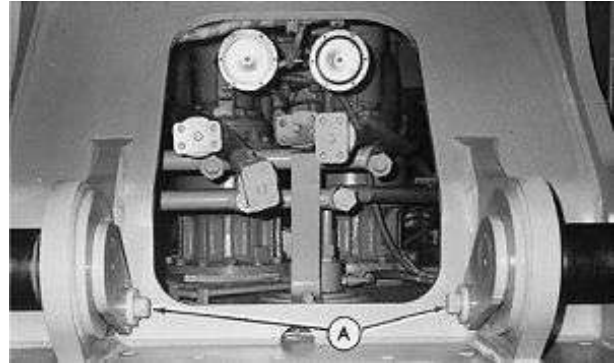
CAUTION: The approximate weight of boom cylinder head pin is 22.7 kg (50 lb).

Specification

Boom Cylinder Head
Pin—Weight..... 22.7 kg (50 lb)

1. Loosen cap screws (A) to remove pins.

A—Cap Screw



T6912AA —UN—28OCT88

TX,111,DY2446 -19-31MAY01-1/19

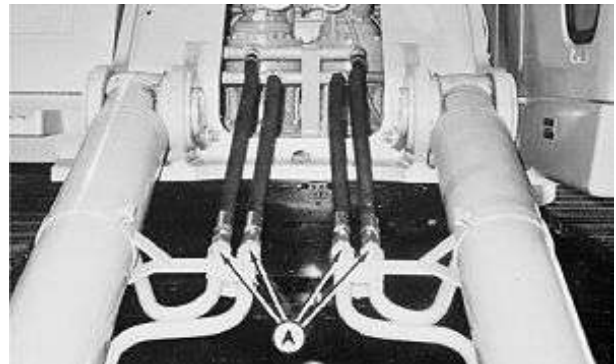
CAUTION: The approximate weight of boom cylinder is 421 kg (928 lb).

Specification

Boom Cylinder—Weight..... 421 kg (928 lb)

2. Install cylinders, left cylinder first. Position tubes under cylinder with connectors (A) of each cylinder facing toward each other.

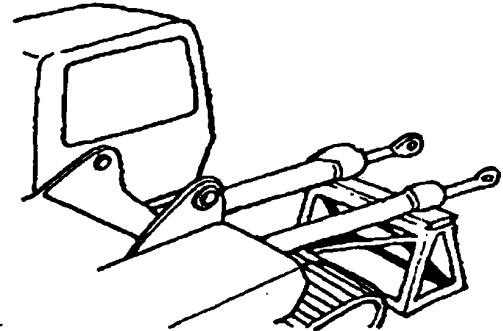
A—Connector



T6912AD2 —UN—09JAN89

TX,111,DY2446 -19-31MAY01-2/19

3. Put shop stands under rod end for support.



T6912AL

T6912AL —UN—07APR89

Continued on next page

TX,111,DY2446 -19-31MAY01-3/19

Miscellaneous—Machine Assembly

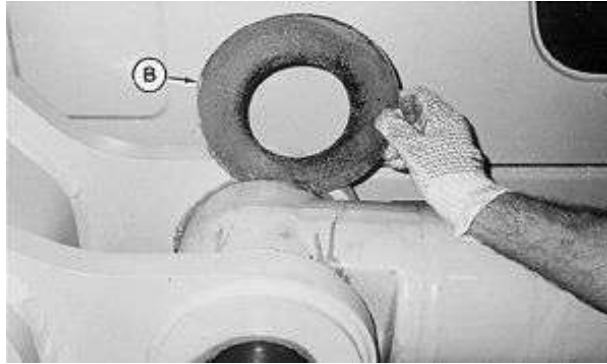
4. Install the thick shim on the inside of each cylinder head end. Install shims (B), as required. Do not shim gap tighter than 0.5 mm (0.019 in.).

Specification

Shim—Gap..... 0.5 mm (0.019 in.)

5. Install pins and cap screws. Tighten cap screws.

B—Shim

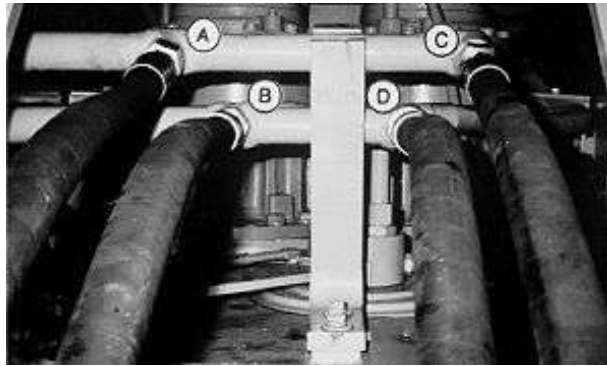


T6912AB—UN—28OCT88

TX,111,DY2446 -19-31MAY01-4/19

6. Slowly remove hydraulic tube caps and connect hoses (A—D).

A—Right Boom Cylinder Head End	C—Left Boom Cylinder Head End
B—Right Boom Cylinder Rod End	D—Left Boom Cylinder Rod End



T6912AC—UN—28OCT88

TX,111,DY2446 -19-31MAY01-5/19

- CAUTION:** The approximate weight of boom pivot pin is 116 kg (257 lb).

Specification

Boom Pivot Pin—Weight.....116 kg (257 lb)

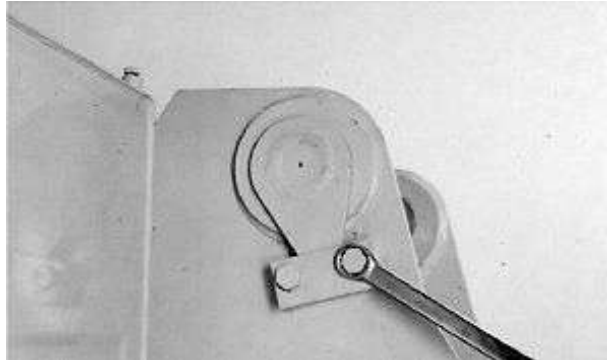
7. Remove retainer to slide pin out.

- CAUTION:** The approximate weight of boom and arm cylinder is 3370 kg (7,430 lb).

Specification

Boom And Arm Cylinder—Weight..... 3370 kg (7,430 lb)

8. Lift boom into position, install pin. Install shims, as required, on each side of boom.



T5856AS—UN—27OCT88

Continued on next page

TX,111,DY2446 -19-31MAY01-6/19

Miscellaneous—Machine Assembly

9. Install retainer and cap screws. Tighten cap screws.



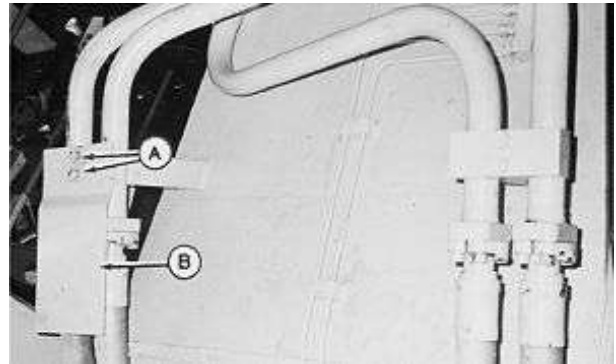
T5856AT —UN—27OCT88

TX,111,DY2446 -19-31MAY01-7/19

10. Remove cap screws (A) to remove guard (B).

A—Cap Screw

B—Guard

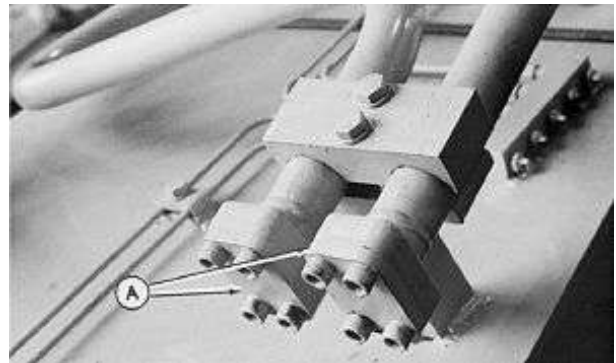


T6912AJ —UN—28OCT88

TX,111,DY2446 -19-31MAY01-8/19

11. Remove tube and hose caps (A) and discard.

A—Hose Cap



T6912AE —UN—28OCT88

Continued on next page

TX,111,DY2446 -19-31MAY01-9/19

Miscellaneous—Machine Assembly

12. Connect hoses (A and B) to the tubes on boom as follows:

- Outside hose (A) to outside left boom tube
- Inside hose (A) to inside left boom tube
- Outside hose (B) to outside right boom tube.
- Inside hose (B) to inside right boom tube

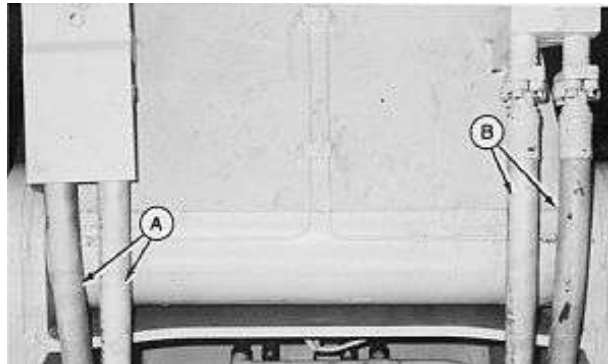
13. Attach guard.

14. Start engine.

IMPORTANT: Cylinder rod seal friction burn damage may result if cylinder is cycled too rapidly when removing air from circuit.

15. Run engine at slow idle. Operate hand controller slowly to extend and retract boom cylinders completely.

16. Cycle each cylinder slowly a minimum of six times to remove air from circuit.



A—Hose

B—Hose

17. Repeat last step to remove air from cylinder circuit.

TX,111,DY2446 -19-31MAY01-10/19

T6912AK—UN—28OCT88

CAUTION: The approximate weight of boom cylinder rod end pin is 94 kg (206 lb).

Specification

Boom Cylinder Rod End
Pin—Weight..... 94 kg (206 lb)

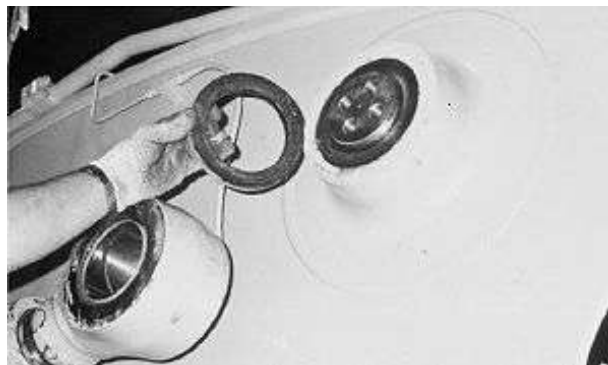
18. Remove four cylinder rod end-to-boom cap screws and retaining ring from one side of boom pin.

19. Drive pin in until flush with exterior boss.

20. Attach hoist to cylinder.

21. Raise cylinder into position. Operate hand controller to align rod end with pin.

22. Insert pin. Install retainer and cap screws.



T6912AF—UN—28OCT88

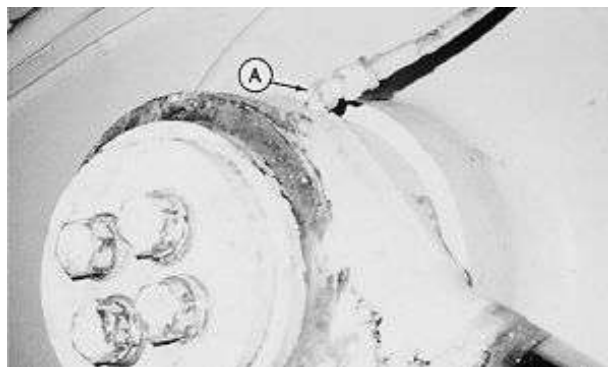
TX,111,DY2446 -19-31MAY01-11/19

23. Attach lubrication hose (A).

24. Repeat procedure for opposite cylinder.

25. Install light on bracket located on left side of boom.

A—Lubrication Hose



T6912AG—UN—28OCT88

Continued on next page

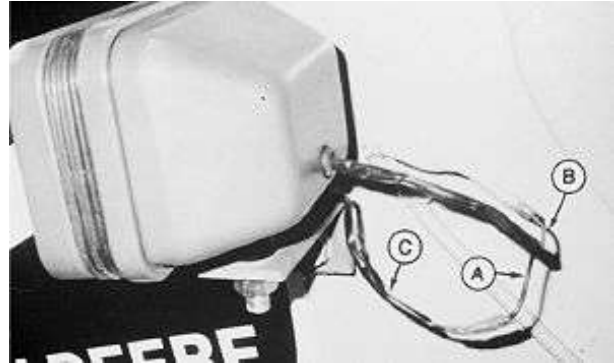
TX,111,DY2446 -19-31MAY01-12/19

Miscellaneous—Machine Assembly

26. Connect black (ground) wire (A) from light to black (ground) wire (C) attached to the bracket. Connect the red (HOT) wire (B) into the harness on boom.

A—Black Ground Wire
B—Red (HOT) Wire

C—Black Ground Wire

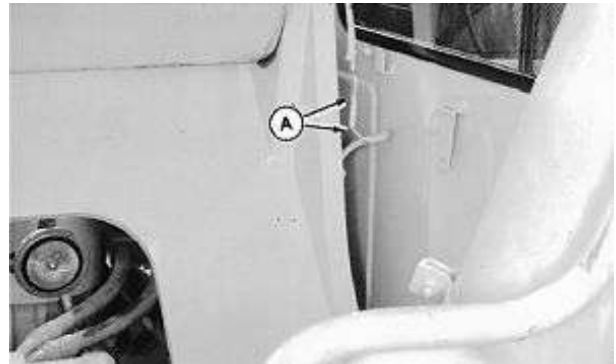


T6912AH—UN—28OCT88

TX,111,DY2446 -19-31MAY01-13/19

27. Connect boom work light wiring harness (A).

A—Boom Work Light Wiring Harness



T6907AA—UN—27OCT88

TX,111,DY2446 -19-31MAY01-14/19

CAUTION: The approximate weight of arm with bucket cylinder is 2540 kg (5,600 lb).

Specification

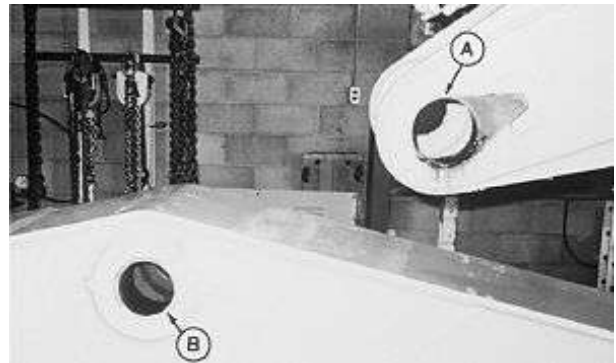
Arm With Bucket
Cylinder—Weight..... 2540 kg (5,600 lb)

28. Lift arm assembly into position. Align arm pin hole (B) with boom pin hole (A).

CAUTION: The approximate weight of arm-to-boom pivot pin is 61 kg (135 lb).

Specification

Arm-To-Boom Pivot Pin
—Weight..... 61 kg (135 lb)



A—Boom Pin Hole

B—Arm Pin Hole

T6912AM—UN—28OCT88

29. Insert pin. Add shims as required, add pin retainer, tighten cap screws.

Continued on next page

TX,111,DY2446 -19-31MAY01-15/19

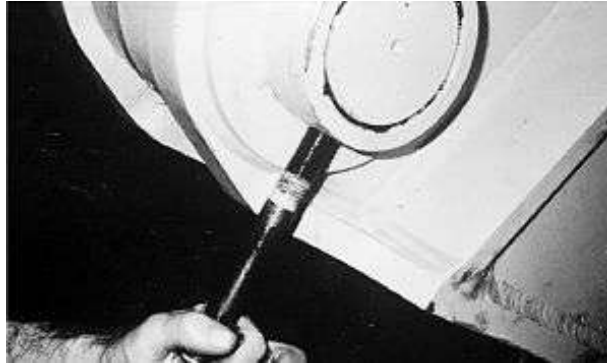
Miscellaneous—Machine Assembly

CAUTION: The approximate weight of arm cylinder rod end pin is 25 kg (54 lb).

Specification

Arm Cylinder Rod End
Pin—Weight..... 25 kg (54 lb)

30. With rod end lubrication fitting pointing up, lift and extend arm cylinder rod end into position, attach pin and cross bolts.

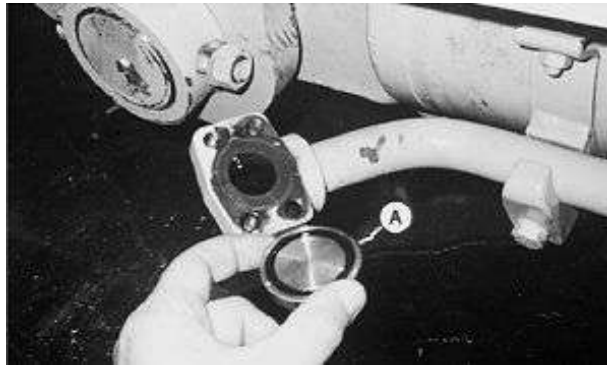


T6912AN—UN—28OCT88

TX,111,DY2446 -19-31MAY01-16/19

31. Slowly remove hydraulic tube caps (A) from bucket cylinder tubes.

A—Tube Cap



T6912AO—UN—28OCT88

Continued on next page

TX,111,DY2446 -19-31MAY01-17/19

Miscellaneous—Machine Assembly

32. Attach bucket cylinder-to-boom end hoses as shown.



T6912AP—UN—28OCT88

TX,111,DY2446 -19-31MAY01-18/19

33. Slide four dust seals (O-rings) over inside of bosses.

CAUTION: The approximate weight of bucket is 1624 kg (3,578 lb).

	Specification	
Bucket—Weight.....		1624 kg (3,578 lb)

- 34. Lift bucket into position.
- 35. Operate hand controller to extend arm into position.
- 36. Install pin and cross bolt.



T96159—UN—10NOV88

TX,111,DY2446 -19-31MAY01-19/19

Adjust Bucket to Arm Joint

Adjust bucket to arm joint. (See Section 4-1.)

TX14740,0001D17 -19-29JUN06-1/1

Moving Track Gauge to Work Position

Move track gauge to work position.

See Track Gauge Work Position Adjustment. (See Section 2-2.).

TX,111,FF3898 -19-29JUN06-1/1

Miscellaneous—Machine Assembly

Check Hydraulic Oil Level

(See Section 3-4.)

TX,111,FF3900 -19-29JUN06-1/1

Grease Working Tool Pivots

(See Section 3-5.)

Grease working tool pivots.

TX,111,FF3901 -19-07MAY01-1/1

Install Counterweight (With Hydraulic Removal Option)

(See Section 2-2.)

TX,111,FF3902 -19-27MAR00-1/1

Install Counterweight (Without Hydraulic Removal Option)

IMPORTANT: DO NOT attempt to remove or install counterweight with the track gauge in the narrow transport position. Before removing or installing the counterweight, the track gauge must be widened to the work position. See Track Gauge Transport Position Adjustment. (See Section 2-2.)

NOTE: Counterweight installation procedure must be performed with the machine located on a level surface.

1. Park machine on a level surface.
2. Rotate upperstructure 90°. lower front attachment to the ground.
3. Stop engine.

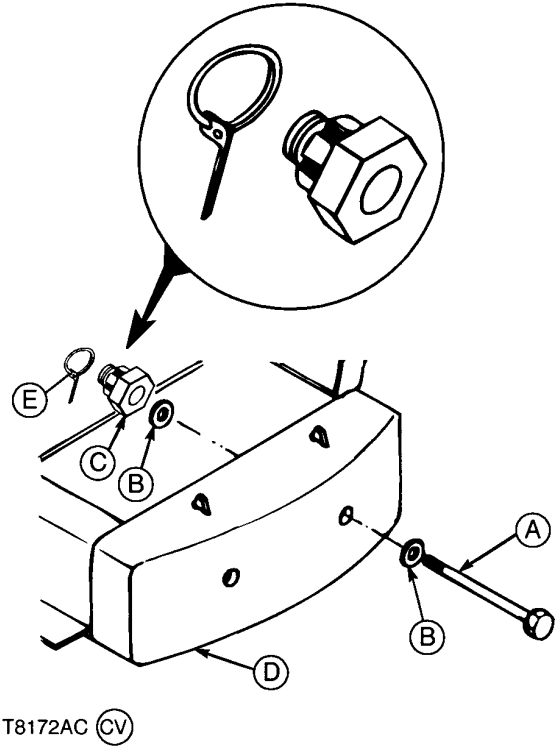
CAUTION: Prevent possible injury from unexpected counterweight movement. DO NOT go directly under machine counterweight. To remove or install counterweight hardware, go under machine entering from the area on either SIDE of the counterweight. Clear everyone from the area before removing or installing the counterweight.

4. Remove the rear bottom covers from each side of the machine.
5. Open engine hood.

CAUTION: The approximate weight of the counterweight is 8210 kg (18,100 lb). Use an adequate lifting device when lifting the counterweight.

Specification	
Counterweight—Weight.....	8210 kg (18,100 lb)

6. Lift counterweight into position.
7. Install parts (A—C) to attach counterweight to the machine.



- | | |
|---------------------|-----------------|
| A—Tie Bolt (2 used) | D—Counterweight |
| B—Washer (4 used) | E—Lock Pin |
| C—Slotted Nut | |

8. Tighten each tie bolt (A) to 2400 N·m (1,770 lb-ft).

Specification	
Bolt—Torque.....	2400 N·m (1,770 lb-ft)

NOTE: Tighten or loosen tie bolts (from torque) to align lock pins.)

9. Install lock pins (E).

Continued on next page

T1559,VV757 -19-22MAR00-1/2

T8172AC—UN—20FEB94

Miscellaneous—Machine Assembly

10. Add shims (E) as required

NOTE: It may be necessary to replace the lock strap if damaged.

11. Install boss plate (C), lock strap (G) and cap screws (F).

12. Tighten cap screws (F) 686 N·m (500 lb-ft).

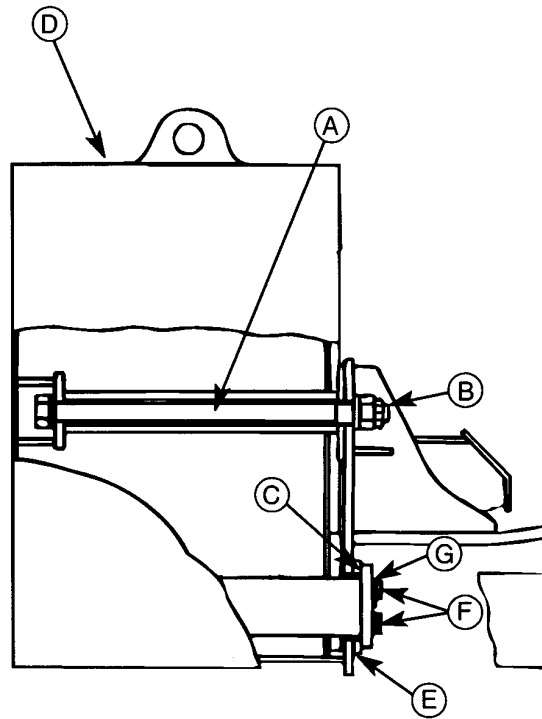
Specification

Cap Screw—Torque..... 686 N·m (500 lb-ft)

13. Bend one top and one bottom corner of the lock strap against the head of each cap screw (F).

14. Install bottom covers.

- | | |
|------------------------|-----------------------|
| A—Tie Bolt (2 used) | E—Shim (as required) |
| B—Slotted Nut (2 used) | F—Cap Screws (2 used) |
| C—Boss Plate (2 used) | G—Lock Strap (2 used) |
| D—Counterweight | |



T8172AD (CV)

T8172AD—UN—20FEB84

T1559.VV757 -19-22MAR00-2/2

Miscellaneous—Operational Checkout

Operational Checkout

Use this procedure to check all systems and functions on the machine. It is designed so you can make a quick check of machine operation while doing a walk around inspection and performing specific checks from the operator's seat.

Should you experience a problem with your machine, you will find helpful diagnostic information in this checkout that will pinpoint the cause. This information may allow you to perform a simple adjustment yourself which will reduce the down time of your machine. Use the table of contents to help find adjustment procedures.

The information you provide after completing the operational checkout will allow you or your authorized dealer to pinpoint a specific test or repair needed to restore the machine to design specifications.

A location will be required which is level and has adequate space to complete the checks. No tools or equipment are needed to perform the checkout.

Complete the necessary visual checks (oil levels, oil condition, external leaks, loose hardware, linkage, wiring, etc.) prior to doing the checkout. The machine must be at operating temperature for many of the checks.

Start at the top of the left column and read completely down column before performing check. Follow this sequence from left to right. In the far right column, if no problem is found, you will be instructed to go to next check. If a problem is indicated, you will be referred to either a section in this manual or to your authorized dealer for repair.

VD76477,0000057 -19-12SEP12-1/27

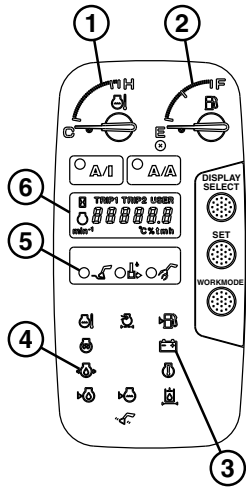
Operator Station Checks—Key Switch On, Engine Off

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VD76477,0000057 -19-12SEP12-2/27

Miscellaneous—Operational Checkout

Gauges, Monitor, And Relay Checks



T141361 —UN—04MAY01

- 1— Engine Coolant Temperature Gauge
- 2— Fuel Gauge
- 3— Alternator Voltage Indicator
- 4— Engine Oil Pressure Indicator
- 5— Dig Mode Indicator
- 6— Monitor Display

NOTE: Monitor buzzer is not checked during this procedure.

NOTE: If engine coolant temperature is below 30°C (86°F) engine coolant temperature gauge needle may not move to the right. Run engine a few minutes to warm coolant before check.

Engine OFF.

Key switch ON.

Does battery relay click?

Do engine coolant temperature gauge (1) and fuel gauge (2) needles move to the right?

Do all monitor indicators light and after 2—3 seconds only the alternator voltage indicator (3), engine oil pressure indicator (4), and dig mode indicator (5) remain lit?

Does monitor display (6) show 888888.8 for 2—3 seconds, then indicate machine hours?

YES: Go to next check.

NO: Check monitor fuses 1 and 7 in the fuse box.

NO: Check and replace bulb if any bulb fails to light. Go to your authorized dealer.

VD76477.0000057 -19-12SEP12-3/27

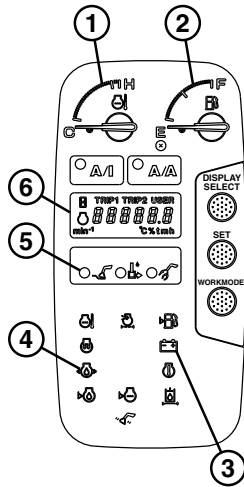
Operator Station Checks—Engine On

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VD76477.0000057 -19-12SEP12-4/27

Miscellaneous—Operational Checkout

Monitor Circuit, Gauge Checks



T141361 —UN—04MAY01

- 1— Engine Coolant Temperature Gauge
- 2— Fuel Gauge
- 3— Alternator Voltage Indicator
- 4— Engine Oil Pressure Indicator
- 5— Dig Mode Indicator
- 6— Monitor Display

Start engine.

Are all monitor indicator lights OFF after engine starts except for the dig mode indicator (5)?

Is coolant temperature gauge needle (1) in normal operating zone after a few minutes?

Does fuel gauge (2) indicate fuel level?

Does monitor display (6) indicate machine hours?

YES: Go to next check.

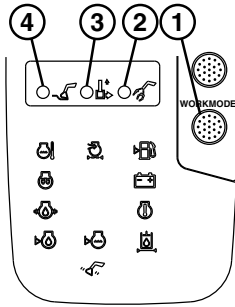
NO: Check alternator belt if alternator voltage indicator lights after engine starts. Go to your authorized dealer.

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VD76477,0000057 -19-12SEP12-5/27

Miscellaneous—Operational Checkout

Work Mode Circuit Checks



T141362 —UN—20APR01

- 1— Mode Selection Switch
- 2— Attachment Mode
- 3— Dig Mode 11
- 4— Dig Mode

Auto-idle switch OFF.

Pilot shut-off lever in LOCKED position.

Push work mode select switch (1) to select desired work mode.

Do corresponding indicators (2—4) light as switch is pushed?

YES: Go to next check.

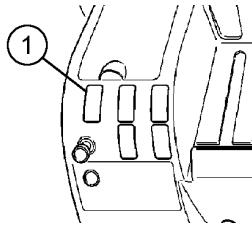
NO: Check fuse 6 in fuse box. Go to your authorized dealer.

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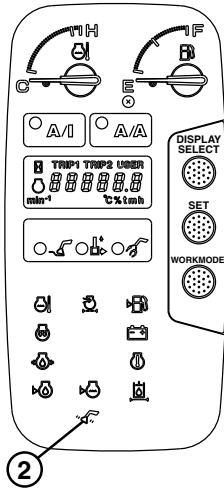
VD76477.0000057 -19-12SEP12-6/27

Miscellaneous—Operational Checkout

Precision Mode Circuit Check



T141363 —UN—27JUN01



T141365 —UN—20APR01

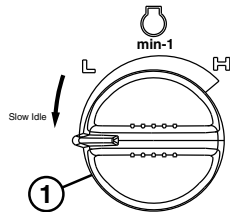
- 1— Precision Mode Switch
- 2— Precision Mode Indicator

Push precision mode switch (1) to ON.
Does precision mode indicator (2) light?

YES: Go to next check.
NO: Check fuses 2, 4, and 6 in fuse box. Go to your authorized dealer.

VD76477,0000057 -19-12SEP12-7/27

Engine RPM Dial Checks



T137611 —UN—05FEB01

- 1— Engine RPM Dial

Auto-idle/auto-acceleration switch OFF.
Move engine RPM dial (1) clockwise.
Does engine speed increase?
Move engine RPM dial counterclockwise.
Does engine speed decrease?

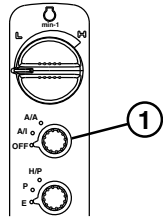
YES: Go to next check.
NO: Go to your authorized dealer.

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VD76477,0000057 -19-12SEP12-8/27

Miscellaneous—Operational Checkout

Auto-Idle/Auto-Acceleration Circuit Check



T137676 —UN—02FEB01

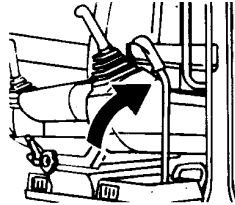
1— Auto-Idle/Auto-Acceleration Switch

- Run engine at fast idle.
- Power mode switch in H/P mode.
- Auto-idle/auto-acceleration switch OFF.
- Pilot shut-off lever in UNLOCKED position.
- Move auto-idle/auto-acceleration switch (1) to A/I.
- Does auto-idle indicator light?
- Does engine speed decrease after 4 seconds?
- Slowly actuate any dig function control lever.
- Does engine speed return to fast idle?
- Move auto-idle/auto-acceleration switch to A/A.
- Do auto-idle and auto-acceleration indicators light?
- Does engine speed decrease after 4 seconds?
- Slowly actuate any dig function control lever.
- Does engine speed return to fast idle?

YES: Go to next check.
NO: Check fuse 7 in fuse box. Go to your authorized dealer.

VD76477,0000057 -19-12SEP12-9/27

Pilot Shut-Off Valve Checks



T7351CC —UN—22AUG90

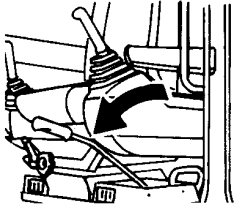
- Run engine at slow idle.
- Pilot shut-off lever in LOCKED (rearward) position.
- Actuate all dig and travel function controls.
- Do any dig or travel functions operate?

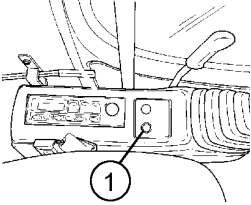
YES: Go to your authorized dealer.
NO: Continue check.

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VD76477,0000057 -19-12SEP12-10/27

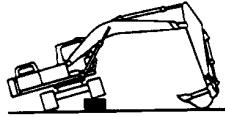
Miscellaneous—Operational Checkout


<p>Pilot Shut-Off Valve Checks (Continued)</p>	 <p>T7351CB —UN—22AUG90 Move pilot shut-off lever to UNLOCKED (forward) position. Operate all dig and travel functions. Do all functions operate?</p>	<p>YES: Go to next check. NO: Go to your authorized dealer.</p> <p>VD76477,0000057 -19-12SEP12-11/27</p>
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<p>Travel Alarm And Travel Alarm Cancel Switch Checks</p>	 <p>T141257 —UN—12APR01 1— Travel Alarm Cancel Switch Pilot shut-off lever in UNLOCKED position (forward). Push travel pedals or levers forward or pull travel pedals or levers rearward. Does travel alarm sound? Push travel pedals or levers and allow travel alarm to operate for a minimum of 15 seconds. While continuing travel, push travel alarm cancel switch (1). Does travel alarm stop sounding?</p>	<p>YES: Go to next check. NO: Check fuse 5 in fuse box. Go to your authorized dealer.</p> <p>VD76477,0000057 -19-12SEP12-12/27</p>
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<p>Pilot Controller Pattern Check</p>	<p>Engine at slow idle. Operate machine in clear area. Move pilot shut-off lever to UNLOCKED position. Slowly move hydraulic levers to all positions on decals. Do bucket, boom, arm, and swing move as decals show? (See Section 2-2 for more detailed information.)</p>	<p>YES: Go to next test. NO: Install decals for pattern (operator preference). Go to your authorized dealer.</p> <p>Continued on next page</p> <p>VD76477,0000057 -19-12SEP12-13/27</p>
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Miscellaneous—Operational Checkout

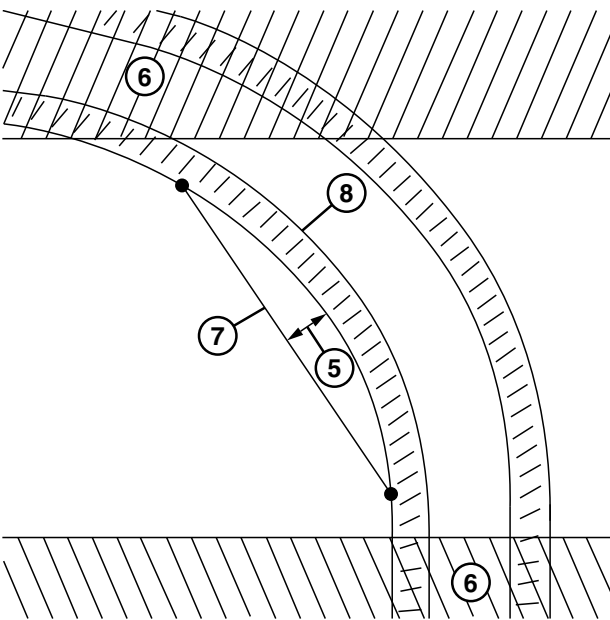
<p>Swing Circuit Leakage Check</p>	 <p>T6479AZ —UN—19OCT88 Engine at slow idle. Position machine on a side hill or raise one side of machine 300 mm (1 ft) with the boom and ease block under track. Raise bucket 300 mm (1 ft) off the ground at maximum reach. Bottom bucket cylinder and hold lever in the actuated position. <i>NOTE: Actuating the bucket function releases the mechanical swing brake.</i> Does upperstructure move only slightly?</p>	<p>YES: Go to next check. NO: Go to your authorized dealer.</p> <p>VD76477,0000057 -19-12SEP12-14/27</p>
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<p>Dig Function Drift Check</p>	 <p>T6290AF —UN—19OCT88 Engine at slow idle. Fill bucket with dirt and position bucket at maximum reach with bucket 2 in. (50 mm) above ground. Observe bucket for 1 minute. Does bucket drift down to ground within 1 minute?</p>	<p>YES: Go to your authorized dealer. NO: Go to next check.</p> <p>VD76477,0000057 -19-12SEP12-15/27</p>
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<p>Control Valve Lift Check Test</p>	 <p>T6292AZ —UN—19OCT88 Engine at slow idle. Position machine as illustrated. Slowly actuate pilot controller to lower boom, extend arm (retract cylinder), and dump bucket (retract cylinder). Do functions move in opposite direction as control levers are moved, then change direction as levers are moved further?</p>	<p>YES: If functions move in opposite direction first, a leak within the cylinder or lift check valve is indicated. Go to your authorized dealer. NO: Go to next check.</p> <p>VD76477,0000057 -19-12SEP12-16/27</p>
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Miscellaneous—Operational Checkout

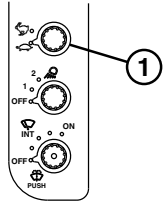
<p>Travel System Tracking Checks (Travel Only)</p>	<p>Engine at fast idle.</p> <p>Travel speed switch in fast position.</p>  <p>TX1120481 —UN—17AUG12</p> <p style="text-align: center;"><i>Tracking Check</i></p> <p>5— Distance of Mistrack 6— Acceleration and Deceleration Zone (approximately): 3—5 m (10—16 ft.) 7— Test Line (distance): 20 m (66 ft.) 8— Track Print</p> <p>Operate machine at full travel forward speed on a flat and level surface approximately 30 m (99 ft.).</p> <p><i>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.</i></p> <p>Observe direction of mistrack.</p> <p>Create a straight test line 20 m (66 ft.) (7) long between two points on track print (8).</p> <p>Measure and record greatest distance of mistrack (5) between inside edge of track print and test line.</p> <p>Repeat procedure in reverse travel.</p> <p><i>LOOK: Do both tracks move and machine does not mistrack excessively in forward or reverse?</i></p>	<p>YES: Go to next check.</p> <p>NO: Note which track does not move, or if machine mistracks note the mistrack pattern. Go to your authorized dealer.</p> <p style="text-align: right;">VD76477,0000057 -19-12SEP12-17/27</p>
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<p>Travel System Tracking Checks (While Operating A Digging Function)</p>	<p>Engine at fast idle.</p> <p>Travel speed switch in fast position.</p> <p>Travel machine at full speed forward on a flat and level area.</p> <p>After machine is moving, slowly move the arm control lever from neutral to full actuation to extend the arm.</p> <p>Does machine mistrack excessively when the arm is extended?</p> <p><i>NOTE: Machine will slow down during this test.</i></p>	<p>YES: Go to your authorized dealer.</p> <p>NO: Go to next check.</p> <p style="text-align: right;">VD76477,0000057 -19-12SEP12-18/27</p>
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Miscellaneous—Operational Checkout

Travel Speed Selection Check



T137725 —UN—02FEB01

1— Travel Speed Switch

Engine at fast idle.
 Travel speed switch in fast position.
 Park machine on a level area.
 Move travel speed switch (1) to slow speed position.
 Does travel speed decrease?

YES: Go to next check.
NO: Go to your authorized dealer.

VD76477,0000057 -19-12SEP12-19/27

Cycle Times Check

Engine at fast idle.
 Auto-idle switch OFF.
 Travel speed switch in fast position
 Record cycle time for each function.

Specification

Boom Raise (cylinder extend)—Cycle Time (seconds).....	3.4 ± 0.3
Boom Lower (cylinder retract)—Cycle Time (seconds).....	2.5 ± 0.3
Arm In (cylinder extend)—Cycle Time (seconds).....	4.4 ± 0.3
Arm Out (cylinder retract)—Cycle Time (seconds).....	3.2 ± 0.3
Bucket Load (cylinder extend)—Cycle Time (seconds).....	4.0 ± 0.3
Bucket Dump (cylinder retract)—Cycle Time (seconds).....	2.8 ± 0.3
Swing Left Or Right-3 Revolutions From A Running Start—Cycle Time (seconds).....	19.3 ± 1.5
Travel 20 m (65 ft) From A Running Start. Check In Forward And Reverse With Travel Speed Switch In FAST Position.—Cycle Time (seconds).....	23.0 ± 2.0
Travel 20 m (65 ft) From A Running Start. Check In Forward And Reverse With Travel Speed Switch In SLOW Position.—Cycle Time (seconds).....	34.0 ± 2.0

Does machine perform within specifications?

YES: Go to next check.

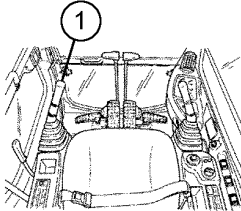
NO: Go to your authorized dealer.

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VD76477,0000057 -19-12SEP12-20/27

Miscellaneous—Operational Checkout

<p>Track Sag Roller And Idler Leakage Checks</p>	<p>Swing upperstructure to side and raise track off ground.</p> <p>Operate track in reverse.</p> <p>Stop engine.</p> <p>Measure distance between top of track shoe to center of lower surface of track frame.</p> <p>Is track sag to specifications?</p> <p><i>NOTE: If track sag is less than specified, track chain wear will be accelerated. If it is less than specified on one side only, the machine may mistrack.</i></p> <p>Check rollers and idlers for oil leaks.</p> <p>Is oil leaking from rollers or idlers?</p> <p>Raise other side of machine and repeat checks.</p> <p>(See Section 3-3 for more detailed information.)</p>	<p>YES: Go to your authorized dealer for repair if oil leakage is noted from idlers or rollers.</p> <p>NO: Go to next check.</p> <p>VD76477,0000057 -19-12SEP12-21/27</p>
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<p>Horn Circuit Check</p>	 <p>T137734 —UN—01FEB01</p> <p>1—Horn Button</p> <p>Key switch ON.</p> <p>Press horn button (1) on top of left control lever.</p> <p>Does horn sound?</p>	<p>YES: Go to next check.</p> <p>NO: Check fuse 15 in fuse box. Go to your authorized dealer.</p> <p>VD76477,0000057 -19-12SEP12-22/27</p>
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<p>Air Conditioner</p>	<p>Engine at fast idle.</p> <p>Turn air conditioner switch to ON position.</p> <p>Turn blower switch to high speed.</p> <p>Wait for any warm air in duct system to dissipate.</p> <p>Is air from ducts cool?</p> <p>(See Section 2-1 for more detailed information.)</p>	<p>YES: Check complete.</p> <p>NO: Go to your authorized dealer</p> <p>VD76477,0000057 -19-12SEP12-23/27</p>
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<p>Miscellaneous Checks</p>	<p>Continued on next page</p>	<p>VD76477,0000057 -19-12SEP12-24/27</p>
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Miscellaneous—Operational Checkout

<p>Seat Control Checks</p>	<p>Does seat raise and lower easily? Does seat angle change easily? Does lever unlock easily and then lock to hold seat and consoles in position? Does lever move easily to unlock seat support? Does seat move forward and rearward easily? Does lever lock seat support in position when released? Does seat back tilt forward and rearward easily? Does lever unlock and lock easily to hold seat back in position? (See Section 2-1 for more detailed information.)</p>	<p>YES: Go to next check. NO: Inspect linkage and repair. Go to your authorized dealer.</p> <p>VD76477,0000057 -19-12SEP12-25/27</p>
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<p>Window Checks</p>	<p>Pull window up and back until it catches in latch for convenient storage overhead. Does pin move smoothly to lock and unlock window? Does latch operate freely? Does pin engage rear hole and lock window securely in full open position? Do side window panes slide freely to left and right? Does roof exit cover open and close freely? Does cylinder hold roof exit cover in the open position? (See Section 2-1 for more detailed information.)</p>	<p>YES: Go to next check. NO: Inspect. Repair.</p> <p>VD76477,0000057 -19-12SEP12-26/27</p>
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<p>Miscellaneous Machine Components Checks</p>	<p>Verify the following are working properly and all mounting brackets and hardware are tight.</p> <ul style="list-style-type: none"> • All latches and locks. • Hood and access doors. • Hoses and clamps. • Fan shroud and fan guard. • Fan direction. 	<p>YES: Check complete. NO: Repair or replace if necessary.</p> <p>VD76477,0000057 -19-12SEP12-27/27</p>
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Miscellaneous—Troubleshooting

Using Troubleshooting Charts

NOTE: Troubleshooting charts are arranged from the simplest to verify, to least likely, more difficult to verify. When diagnosing a problem, use all possible means to isolate the problem to a single component or system. Use the following steps to diagnose problems:

- Step 1. Operational Checkout Procedure.
- Step 2. Troubleshooting charts.
- Step 3. Adjustments.
- Step 4. See your authorized dealer.

TX14740,0001D40 -19-24JUL01-1/1

Miscellaneous—Troubleshooting

Engine

Symptom	Problem	Solution
Engine Cranks But Will Not Start Or Hard To Start	Wrong fuel	Use correct fuel.
	Water separator clogged or not primed	Check water separator.
	Water in separator bowl	Check and drain.
	Leaks in fuel system	Check fuel system connections.
	Contaminated fuel	Drain tank. Add clean fuel. Check water separator.
	Air in fuel system	Bleed air.
	Low battery power	Charge or install new batteries.
	Slow cranking speed (poor electrical connection)	Clean and tighten battery and starter connections.
	Wrong engine oil	Use correct oil.
	Air filter clogged	Clean or replace elements.
Engine Knocks, Runs Irregularly, Or Stops	Starter	Replace starter.
	Air filter clogged	Clean or replace elements. Clean system.
	Water separator clogged or air in water separator	Check water separator. Bleed.
	Air in water separator	Bleed air from fuel system.
	Engine oil level low	Add oil.
	Contaminated fuel	Drain tank. Add clean fuel. Replace water separator.
	Coolant temperature low	Thermostat not working correctly or too "cool."
	Injection pump	Go to your authorized dealer.
Engine Starts But Will Not Continue To Run	Power-on (POW.ON) fuse	Replace fuse.
Engine Not Developing Full Power	Air filters clogged	Clean or replace filter elements.
	Water in separator bowl	Change. Bleed air.
	Contaminated fuel	Drain fuel tank. Change water separator, bleed air. Add clean fuel.

Continued on next page

TX14740,0001D0A -19-04APR01-1/3

Miscellaneous—Troubleshooting

Symptom	Problem	Solution
	Wrong fuel	Use correct fuel.
	Fuel line restricted	Repair or replace fuel line. Bleed air.
	Clogged vent in fuel tank cap	Clean or install new cap.
	Exhaust restriction	Install new muffler.
	Wrong valve clearance	Check and adjust valves.
	Wrong oil	Use correct oil.
Engine Overheats	Coolant level low	Add coolant to recovery tank. Remove cap when cool. Check coolant level in radiator.
	Radiator screen clogged	Remove and clean screen.
	Radiator core or oil cooler core clogged	Clean radiator and oil cooler.
	Air filter clogged	Clean or replace elements. Check inlet screen.
	Air cleaner inlet clogged	Clean air inlet screen.
	Radiator cap	Go to your authorized dealer.
	Fan on backwards	Install fan correctly.
	Cooling system passages clogged	Flush cooling system.
Low Engine Oil Pressure	Oil level low	Add oil.
	Oil filter clogged	Install new oil filter.
	Wrong oil	Use correct oil.
	Oil leaks	Go to your authorized dealer.
	Engine temperature too high	Check cooling system.
Engine Uses Too Much Oil	Wrong oil	Use correct oil.
	Oil leaks	Check engine oil drain plug.
	Engine temperature too high	Check cooling system.
	Air cleaner clogged	Clean element or install new element.
	Inlet screen clogged or missing	Clean or replace.

Continued on next page

TX14740,0001D0A -19-04APR01-2/3

Miscellaneous—Troubleshooting

Symptom	Problem	Solution
Engine Uses Too Much Fuel	Clogged or dirty air intake system	Clean air intake system.
	Wrong fuel	Use correct fuel.
Excessive Black Or Gray Exhaust Smoke	Wrong fuel	Use correct fuel.
	Clogged or dirty air intake or exhaust system	Clean air intake and exhaust system.
Exhaust Smoke Is White	Wrong fuel	Use correct fuel.
	Cold engine	Run engine until warm.
Turbocharger Excessively Noisy Or Vibrates	Air leak in engine, intake, or exhaust manifold	Inspect, repair.
Oil Dripping From Turbocharger Adapter	Excessive crankcase pressure	Check vent tube to ensure tube is not clogged. Clean.
	Turbocharger oil return line carbon buildup where line passes exhaust manifold	Remove line. Inspect, clean.

TX14740,0001D0A -19-04APR01-3/3

Miscellaneous—Troubleshooting

Electrical System

Symptom	Problem	Solution
Nothing Works	Battery	Recharge or replace.
Batteries Undercharged	Loose or corroded connections	Clean and tighten or replace batteries.
Batteries Will Not Take A Charge	Loose or corroded connections	Clean and tighten.
	Low battery power	Replace both batteries.
Battery Uses Too Much Water	Cracked battery case	Replace batteries.
	High ambient temperature	Refill with water.
Cracked Battery Case	No battery hold down clamp	Replace both batteries, and install hold down clamp.
	Loose battery hold down clamp	Replace both batteries, and install hold down clamp.
	Frozen battery	Replace both batteries. Keep batteries fully charged in cold weather.
Low Battery Output	Low water level	Add water.
	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 both batteries.
Starter Will Not Turn	Battery undercharged or dead	Recharge or replace both batteries.
	Battery cables making poor connections	Clean connections.
	Starter	Repair or replace starter.
	Starter pinion jammed in flywheel gear	Repair or replace starter, or ring gear.
Starter Turns But Will Not Crank Engine	Starter	Repair or replace starter.
Engine Cranks Slowly	Battery cables damaged or broken internally	Inspect and replace cables.
	Battery or starter cable connections loose or corroded	Clean and tighten connections.
	Battery discharged or will not hold a charge	Recharge or replace both batteries.
	Starter	Repair or replace starter.
	Low battery voltage	Recharge or replace both batteries.

Continued on next page

TX14740.0001D0B -19-24JAN07-1/2

Miscellaneous—Troubleshooting

Symptom	Problem	Solution
Starter Continues To Run After Engine Starts	Starter	Repair or replace starter.
	Key switch malfunction	Disconnect battery ground.
Charging Indicator Light On, Engine Running	Loose or glazed alternator belt	Check belt. Replace if glazed.
	Excessive electrical load from added accessories	Remove accessories or install higher output alternator.
	Loose or corroded electrical connections on battery, ground strap, starter, or alternator	Inspect, clean, or tighten electrical connections.
	Battery voltage low	Charge or replace both batteries.
Noisy Alternator	Worn drive belt	Replace belt.
	Worn pulleys	Replace pulleys and belt.
	Pulley misaligned	Adjuster alternator mount.
	Alternator bearing	Loosen alternator belts. Turn pulley by hand. If any roughness is felt, repair alternator.
No Monitor Panel Indicators Or Gauges Work	Fuse	Replace fuse.
Individual Indicators Not Working In Monitor Panel	Bulb	Replace bulb.
	Fuse	Replace fuse.
No Switch Panel Switches Or Speed Dial Work	Fuse	Replace fuse.

TX14740,0001D0B -19-24JAN07-2/2

Miscellaneous—Troubleshooting

Hydraulic System

Symptom	Problem	Solution
No Hydraulic Functions	Lack of hydraulic oil	Add oil.
	Pump and valve controller (PVC) fuse	Replace fuse.
	Clogged suction filter	Clean.
Hydraulic Functions Are Slow or Have Little or no Power	Low oil level	Fill reservoir to full mark.
	Cold oil	Push hydraulic warm-up switch.
	Wrong oil	Use correct oil.
	Suction screen clogged	Inspect and clean.
	Hydraulic tank cap	Replace cap.
Power Boost Does Not Work	Fuse	Check fuse.
Hydraulic Oil Overheats	Wrong oil	Use correct oil.
	Clogged radiator or oil cooler	Clean and straighten fins.
	Radiator screen clogged	Remove and clean.
	Low oil level	Fill tank to full mark.
Oil Foams	High or low oil level	Correct level.
	Wrong oil	Use correct oil.
	Water in oil	Change oil.
	Kinks or dents in oil lines	Check lines.
No Swing Function	Pilot control hoses pinched or kinked	Inspect and correct.
Swing Function Is "Jerky"	Lack of grease	Fill with grease
Slow Travel Speed only	Fuse	Replace fuse.
	Pilot controller hoses pinched or kinked	Inspect and correct.
Travel Is "Jerky"	Track sag adjustment	Adjust tension.
	Rocks or mud jammed in track frame	Remove and repair.
	Water separator clogged	Drain. Change element.
Engine Stops When Travel Or Control Lever Moved	Water separator clogged	Drain. Change element.

Continued on next page

TX14740,0001DOC -19-29JUN06-1/2

Miscellaneous—Troubleshooting

NOTE: If any other problems are encountered which require special tools or machine knowledge to correct, see your authorized dealer.

TX14740,0001D0C -19-29JUN06-2/2

Miscellaneous—Storage

Prepare Machine for Storage

1. Before storage, operate engine on at least one complete tank of petroleum diesel fuel to purge the fuel system. Ensure that the fuel tank is full during storage to prevent water build up due to condensation..

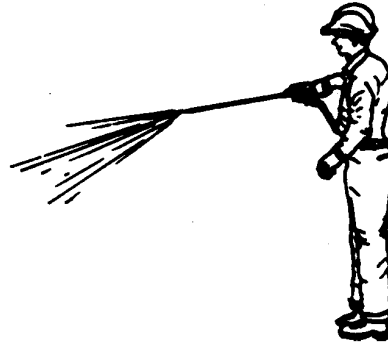
NOTE: For up to and including B20, it is recommended that biodiesel be used within 3 months of its manufacture. For blends greater than B20, it is recommended that the biodiesel be used within 45 days. The poor oxidation stability characteristic of biodiesel can result in long-term storage problems. John Deere does not recommend using biodiesel in engines powering standby applications or vehicles operating on a seasonal basis. Consult your John Deere dealer or fuel supplier for additives to improve fuel storage and performance of biodiesel fuels. These additives must be added to the biodiesel close to its time of production for them to be effective.

2. Clean primary air cleaner.

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.

3. 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.
4. Fill fuel tank to prevent condensation.
5. Check tire pressure to ensure tires are properly inflated
6. Apply waste oil to track chains. Run machine back and forth several times. Park machine on a hard surface to prevent tracks from freezing to ground.
7. Store machine in a dry, protected place. If stored outside, cover with a waterproof material.

LPS is a trademark of the Holt Lloyd Corporation.



IMPORTANT: LPS 3 Rust Inhibitor can destroy painted finish. DO NOT spray LPS 3 Rust Inhibitor on painted areas.

8. Retract all hydraulic cylinders, if possible. If not, coat exposed cylinder rods with LPS® 3 Rust Inhibitor.
9. Place a "DO NOT OPERATE" tag on the right control lever.
10. Lubricate all grease points.
11. Remove batteries.
12. Remove seat cushion and other perishable items.
13. Remove keys and lock all covers and doors.

T47764—UN—09NOV88

T5813AM—UN—09FEB89

TX,105,FF2313 -19-17AUG11-1/1

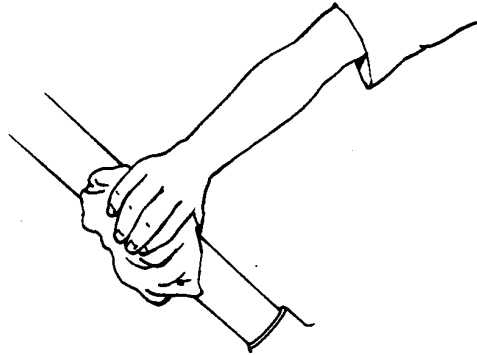
Miscellaneous—Storage

Monthly Storage Procedure

⚠ CAUTION: Prevent possible injury or death from asphyxiation. Engine exhaust fumes can cause sickness or death. Start engine **ONLY** in a well-ventilated area.

1. Drain water and sediment from fuel tank when air temperature is above freezing.
2. Remove LPS 3® Rust Inhibitor from cylinder rods with a cleaning solvent.

LPS 3 Rust Inhibitor is a trademark of Illinois Tool Works.



T6191AA—UN—18OCT88

VD76477,00016A3 -19-13JUN11-1/2

IMPORTANT: Prevent possible engine damage. During cold temperatures, check fluidity of engine oil on dipstick. If the oil appears waxy and/or jelly-like rather than liquid, **DO NOT** attempt to start engine. Use external heat source to warm the crankcase until oil appears fluid.

3. Check all fluid levels. If low, check for leaks and add oil as required.
4. Check belts.
5. Check condition of all hoses and connections.
6. Check battery electrolyte level. Charge and install battery.
7. For machines with **tires**, check condition of tires and tire pressure.

For machines with **tracks**, check condition of tracks and track sag.

On crawler machines with non sealed-and-lubricated track chains, apply oil to the pin-to-bushing joints. Run machine back and forth several times.

8. Park machine on a hard surface to prevent tracks from freezing to ground.
9. Fill fuel tank.
10. Pre-lubricate turbocharger bearings, if equipped:
 - a. Disconnect fuel shutoff fuse.
 - b. Crank engine for 10 seconds.
 - c. Connect fuel shutoff fuse.
11. Inspect engine compartment, and remove any foreign material that may have accumulated. Start engine and



T6181AU—UN—18OCT88

run until it reaches operating temperature. Run at 1/2 speed for five minutes. Do not run at fast or slow idle.

- If engine fails to start or runs poorly after starting, change fuel filter(s). Bleed fuel system.

12. Operate all controls, levers, seat adjustments, etc.

⚠ CAUTION: Prevent possible injury from unexpected machine movement. Clear the area of all persons before running machine through the operation procedure.

13. Make sure the area is clear to allow for movement. Cycle all hydraulic functions several times. Check condition of all hoses and connections.
14. Park the machine with cylinder rods retracted, if possible. Turn key switch to OFF.
15. Apply LPS 3 Rust Inhibitor to exposed cylinder rod areas.

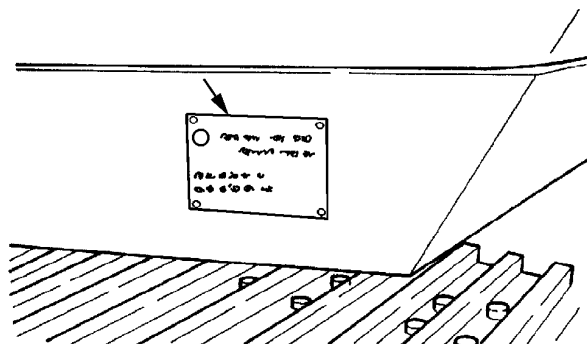
VD76477,00016A3 -19-13JUN11-2/2

Miscellaneous—Machine Numbers

Record Product Identification Number (PIN)

Purchase Date

NOTE: Record all 13 characters of the Product Identification Number.



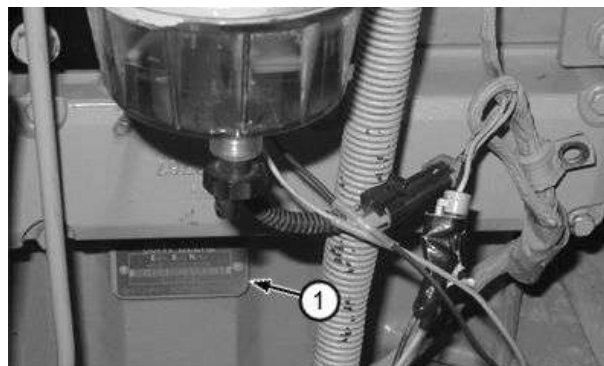
T140690 —UN—11APR01

TX14740,0001D05 -19-01DEC05-1/1

Record Engine Serial Number

Engine Serial Number (1)

1— Engine Serial Number



T141750B —UN—20APR01

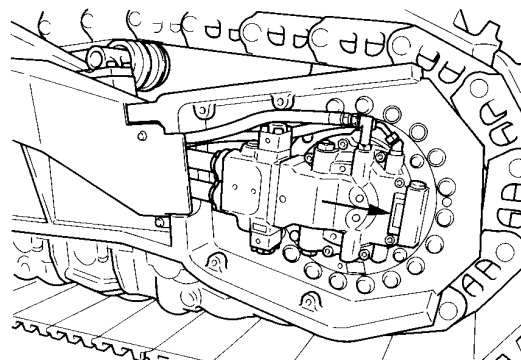
TX14740,0001D16 -19-20APR01-1/1

Record Travel Motor Serial Numbers

Travel Motor Serial Number

Travel Motor Serial Number

(Cover removed for clarity of photograph)



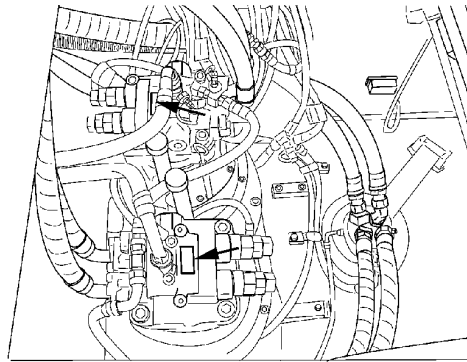
T140691 —UN—28MAR01

TX14740,0001D06 -19-24JAN07-1/1

Miscellaneous—Machine Numbers

Record Swing Motor Serial Numbers

Swing Motor Serial Number
Swing Motor Serial Number



T140692—UN—28MAR01

TX14740,0001D07 -19-28MAR01-1/1

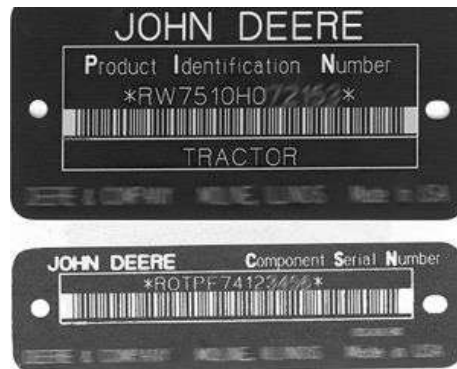
Record Hydraulic Pump Serial Number

Hydraulic Pump Serial Number

TX,120,FF2201 -19-06DEC90-1/1

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

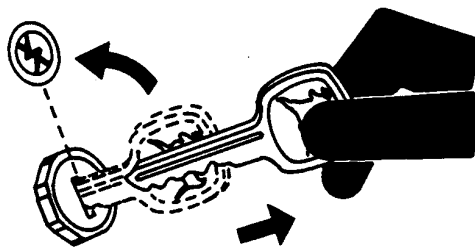


TS1680—UN—09DEC03

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.



TS230—UN—24MAY89

DX,SECURE2 -19-18NOV03-1/1

Miscellaneous—Specifications

Engine Specifications

Item	Measurement	Specification
John Deere 6125HT	Type	4-Stroke Cycle, Turbocharged
	Cylinders	6
	Displacement	12.5 L (763 cu in.)
	Net Torque @ 1300 RPM	1844 N·m (1360 lb-ft)
	Power At 1800 RPM	236 kW (315 hp) Net SAE
	Cooling Fan	Suction
	Electrical System	24 Volt
	Batteries (2) 12-volt	180 Minutes Reserve Capacity:

TX14740,0001D04 -19-27MAR01-1/1

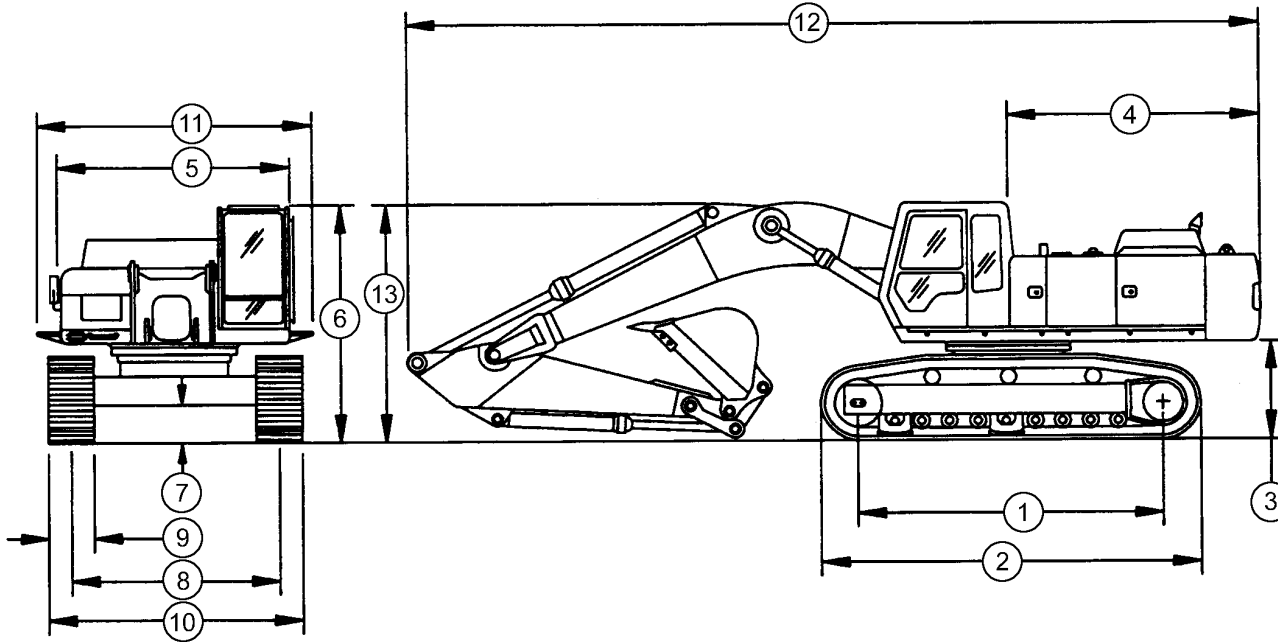
Drain and Refill Capacities

Item	Measurement	Specification
Fuel Tank	Capacity	650.0 L (171.0 gal)
Cooling System	Capacity	50.0 L (13.2 gal)
Engine	Oil Capacity, Including Filter Change	42.0 L (11.1 gal)
Hydraulic Tank	Oil Capacity	280.0 L (74.0 gal)
Hydraulic System	Oil Capacity	510.0 L (135.0 gal)
Swing Gearbox (each)	Oil Capacity	6.5 L (6.9 qt)
Travel Gearbox (each)	Oil Capacity	9.0 L (9.5 qt)

TX14740,0001CDF -19-29JUN06-1/1

Miscellaneous—Specifications

450CLC



T140727—UN—30JUL01

- 1— Sprocket Center To Idler Center
- 2— Undercarriage Length
- 3— Counterweight Clearance
- 4— Rear End Swing Radius
- 5— Overall Width (excluding back mirrors)
- 6— Cab Height
- 7— Minimum Ground Clearance
- 8— Center Of Sprocket To Center Of Sprocket
- 9— Track Shoe Width
- 10— Undercarriage Width
- 11— Overall Width
- 12— Overall Length
- 13— Transport Height

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 unit equipped with 900 mm (36 in.) shoes, 3.9 m (12 ft 10 in.) arm, 2.34 m³ (3.06 yd³) bucket, full fuel tank, 79 kg (175 lb) operator and standard equipment.

Item	Measurement	Specification
1—Sprocket Center To Idler Center	Distance	4470 mm (14 ft 8 in.)
2—Undercarriage	Length	5470 mm (17 ft 11 in.)
3—Counterweight Clearance	Distance	1350 mm (4 ft 5 in.)
4—Rear End Swing Radius	Distance	3480 mm (11 ft 5 in.)
5—Overall Width (excluding back mirrors)	Distance	3240 mm (10 ft 8 in.)
6—Cab	Height	3280 mm (10 ft 9 in.)
7—Minimum Ground Clearance	Distance	735 mm (2 ft 5 in.)
8—Center Of Sprocket To Center Of Sprocket	Distance	Operational—2890 mm (9 ft 6 in.) Transport—2390 mm ((7 ft 10 in.)
9—Track Shoe	Width	750 mm (30 in.) or 900 mm (36 in.)
10—Undercarriage	Width	With 750 mm (30 in.) Shoe: 3640 mm (11 ft 11 in.)

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TX14740,0001CD6 -19-22FEB01-1/2

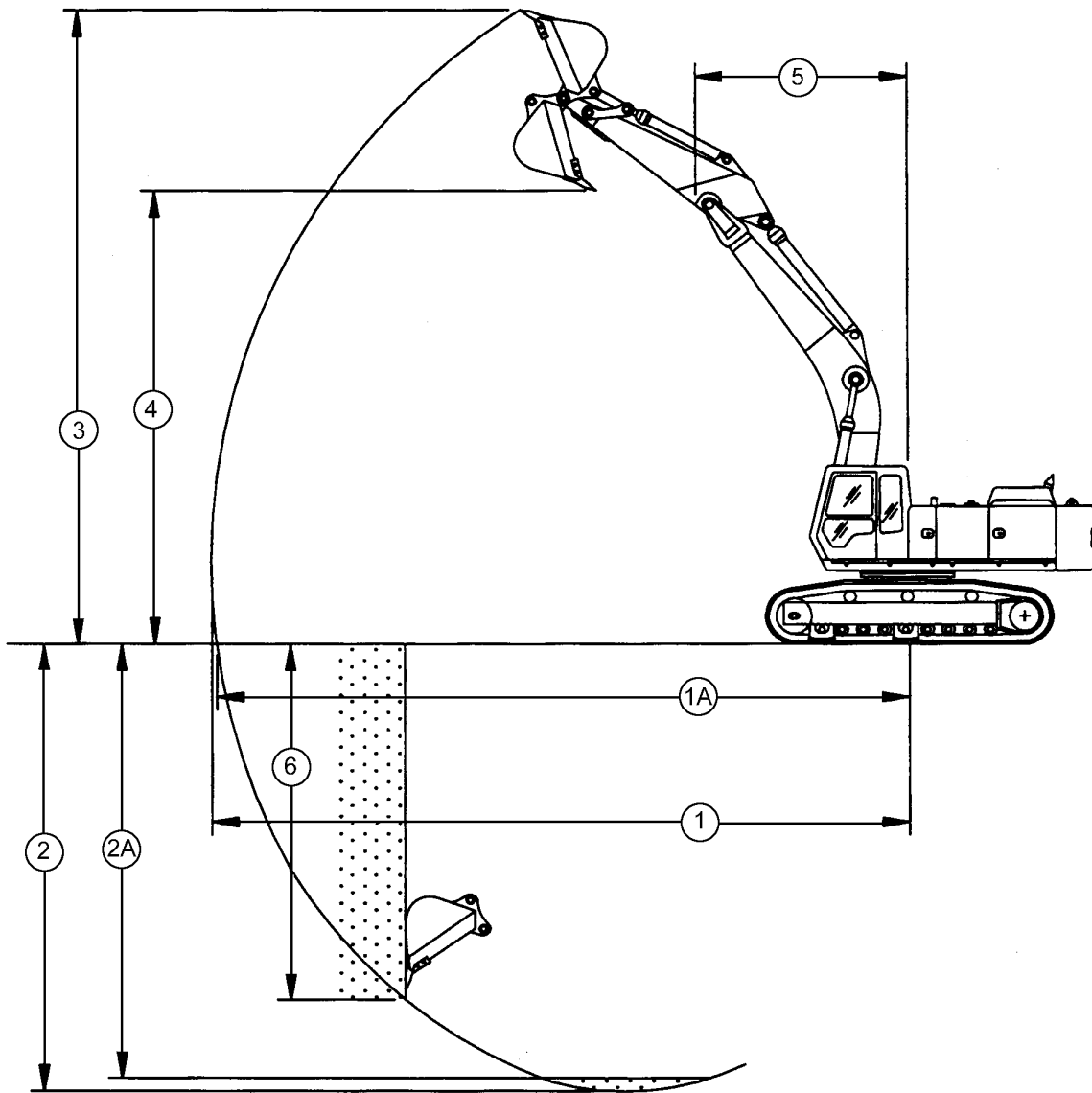
Miscellaneous—Specifications

Item	Measurement	Specification
	Width	With 900 mm (36 in.) Shoe: 3790 mm (12 ft 5 in.)
11—Machine	Overall Width	3940 mm (12 ft 11 in.)
12—Machine	Overall Length	With 2900 mm (9 ft 6 in.) Arm: 1188 mm (39 ft 0 in.)
	Overall Length	With 3400 mm (11 ft 2 in.) Arm: 1179 mm (38 ft 8 in.)
	Overall Length	With 3900 mm (12 ft 10 in.) Arm: 1179 mm (38 ft 8 in.)
	Overall Length	With 4900 mm (16 ft 1 in.) Arm: 1170 mm (38 ft 5 in.)
13—Machine	Transport Height	With 2900 mm (9 ft 6 in.) Arm: 3600 mm (11 ft 10 in.)
	Transport Height	With 3400 mm (11 ft 2 in.) Arm: 3480 mm (11 ft 5 in.)
	Transport Height	With 3900 mm (12 ft 10 in.) Arm: 3480 mm (11 ft 5 in.)
	Transport Height	With 4900 mm (16 ft 1 in.) Arm: 4660 mm (15 ft 3 in.)
Machine	Operating Weight	47 174 kg (104,000 lb)

TX14740,0001CD6 -19-22FEB01-2/2

Miscellaneous—Specifications

Working Ranges



T140728 —UN—28MAR01

- 1— Maximum Digging Reach 2— Maximum Digging Depth 3— Maximum Cutting Height 6— Maximum Vertical Wall
- 1A— Maximum Digging Reach At 2A— Maximum Digging Depth At 4— Maximum Dumping Height
- Ground Level 2440 mm (8 ft level) 5— Minimum Swing Radius

Item	Measurement	Specification
1—Maximum Digging Reach	Distance	With 2900 mm (9 ft 6 in.) Arm: 11390 mm (37 ft 4 in.)
	Distance	With 3400 mm (11 ft 2 in.) Arm: 12050 mm (39 ft 6 in.)
	Distance	With 3900 mm (12 ft 10 in.) Arm: 12480 mm (40 ft 11 in.)
	Distance	With 4900 mm (16 ft 1 in.) Arm: 13380 mm (43 ft 11 in.)

Continued on next page

TX,115,DY2391 -19-19APR01-1/3

Miscellaneous—Specifications

Item	Measurement	Specification
1A—Maximum Digging Reach At Ground Level	Distance	With 2900 mm (9 ft 6 in.) Arm: 11140 mm (36 ft 7 in.)
	Distance	With 3400 mm (11 ft 2 in.) Arm: 11810 mm (38 ft 9 in.)
	Distance	With 3900 mm (12 ft 10 in.) Arm: 12270 mm (40 ft 3 in.)
	Distance	With 4900 mm (16 ft 1 in.) Arm: 13180 mm (43 ft 3 in.)
2—Maximum Digging Depth	Depth	With 2900 mm (9 ft 6 in.) Arm: 7260 mm (23 ft 10 in.)
	Depth	With 3400 mm (11 ft 2 in.) Arm: 7760 mm (25 ft 6 in.)
	Depth	With 3900 mm (12 ft 10 in.) Arm: 8260 mm (27 ft 1 in.)
	Depth	With 4900 mm (16 ft 1 in.) Arm: 9110 mm (29 ft 11 in.)
2A—Maximum Digging Depth At 2440 mm (8 ft level)	Depth	With 2900 mm (9 ft 6 in.) Arm: 7060 mm (23 ft 2 in.)
	Depth	With 3400 mm (11 ft 2 in.) Arm: 7620 mm (25 ft 0 in.)
	Depth	With 3900 mm (12 ft 10 in.) Arm: 8130 mm (26 ft 8 in.)
	Depth	With 4900 mm (16 ft 1 in.) Arm: 9000 mm (29 ft 6 in.)
3—Maximum Cutting Height	Height	With 2900 mm (9 ft 6 in.) Arm: 10270 mm (33 ft 8 in.)
	Height	With 3400 mm (11 ft 2 in.) Arm: 11080 mm (36 ft 4 in.)
	Height	With 3900 mm (12 ft 10 in.) Arm: 11180 mm (36 ft 8 in.)
	Height	With 4900 mm (16 ft 1 in.) Arm: 11850 mm (38 ft 8 in.)
4—Maximum Dumping Height	Height	With 2900 mm (9 ft 6 in.) Arm: 7040 mm (23 ft 1 in.)
	Height	With 3400 mm (11 ft 2 in.) Arm: 7660 mm (25 ft 2 in.)
	Height	With 3900 mm (12 ft 10 in.) Arm: 7780 mm (25 ft 6 in.)
	Height	With 4900 mm (16 ft 1 in.) Arm: 8770 mm (28 ft 9 in.)
5—Minimum Swing Radius	Radius	With 2900 mm (9 ft 6 in.) Arm: 4920 mm (16 ft 2 in.)
	Radius	With 3400 mm (11 ft 2 in.) Arm: 4840 mm (15 ft 11 in.)
	Radius	With 3900 mm (12 ft 10 in.) Arm: 4810 mm (15 ft 9 in.)
	Radius	With 4900 mm (16 ft 1 in.) Arm: 4820 mm (15 ft 10 in.)
6—Maximum Vertical Wall	Depth	With 2900 mm (9 ft 6 in.) Arm: 5340 mm (17 ft 6 in.)

Continued on next page

TX,115,DY2391 -19-19APR01-2/3

Miscellaneous—Specifications

Item	Measurement	Specification
	Depth	With 3400 mm (11 ft 2 in.) Arm: 6660 mm (21 ft 10 in.)
	Depth	With 3900 mm (12 ft 10 in.) Arm: 7090 mm (23 ft 1 in.)
	Depth	With 4900 mm (16 ft 1 in.) Arm: 8450 mm (27 ft 9 in.)

TX,115,DY2391 -19-19APR01-3/3

Miscellaneous—Specifications

Lift Capacity—KG (LB)

NOTE: Ratings are at bucket lift hook, using standard counterweight, situated on firm, level, uniform supporting surface. Figures do not exceed 87 percent of hydraulic capacity or 75 percent of weight

needed to tip machine. Figures marked with an () are hydraulically-limited capacities. Remaining figures are stability-limited capacities.*

LIFTING OVER FRONT—Power Boost ON							
Arm: 2.9 m (9 ft 6 in.)		Bucket: 1905 kg (4200 lb) with mass excavating boom				Shoe: 900 mm (36 in.)	
Load Point Height	Horizontal Distance from Centerline of Rotation						
m (ft)	1.52 (5)	3.05 (10)	4.57 (15)	6.10 (20)	7.62 (25)	9.15 (30)	10.67 (35)
7.62 (25)							
6.10 (20)				10433 (23000) ^a	9662 (23000) ^a		
4.57 (15)			14923 (32900) ^a	11839 (26100) ^a	10206 (22500) ^a		
3.05 (10)				13789 (30400) ^a	11113 (24500) ^a	7983 (17600) ^a	
1.52 (5)				15468 (34100) ^a	11975 (26400) ^a	9843 (21700) ^a	
Ground Line				22544 (49700) ^a	16284 (35900) ^a	12474 (27500) ^a	9072 (20000) ^a
-1.52 (-5)				21183 (46700) ^a	15966 (35200) ^a	12247 (27000) ^a	
-3.05 (-10)				18552 (40900) ^a	14379 (31700) ^a	10841 (23900) ^a	
-4.57 (-15)				14107 (31100) ^a	10886 (24000) ^a		

LIFTING OVER SIDE—Power Boost ON							
m (ft)	1.52 (5)	3.05 (10)	4.57 (15)	6.10 (20)	7.62 (25)	9.15 (30)	10.67 (35)
7.62 (25)							
6.10 (20)				10433 (23000) ^a	9163 (20200)		
4.57 (15)			14923 (32900) ^a	11839 (26100) ^a	8890 (19600)		
3.05 (10)				12292(27100)	8482 (18700)	6033 (13300)	
1.52 (5)				11476 (25300)	8029 (17700)	5851 (12900)	
Ground Line			17282 (38100)	10977 (24200)	7711 (17000)	5670 (12500)	
-1.52 (-5)			17237 (38000)	10750 (23700)	7575 (16700)		
-3.05 (-10)			17463 (38500)	10841 (23900)	7620 (16800)		
-4.57 (-15)			14107 (31100) ^a	10886 (24000) ^a			

^aHydraulically-limited capacity

NOTE: Ratings are at bucket lift hook, using standard counterweight, situated on firm, level, uniform supporting surface. Figures do not exceed 87 percent of hydraulic capacity or 75 percent of weight

needed to tip machine. Figures marked with an () are hydraulically-limited capacities. Remaining figures are stability-limited capacities.*

LIFTING OVER FRONT—Power Boost ON							
Arm: 2.9 m (9 ft 6 in.)		Bucket: 1778 kg (3920 lb), 2.28 m ³ (2.98 yd ³)				Shoe: 750 mm (30 in.) or 900 mm (36 in.)	
Load Point Height	Horizontal Distance from Centerline of Rotation						
m (ft)	1.52 (5)	3.05 (10)	4.57 (15)	6.10 (20)	7.62 (25)	9.15 (30)	10.67 (35)
7.62 (25)					9026 (19900) ^a		
6.10 (20)					9253 (20400) ^a		
4.57 (15)			16465 (36300) ^a	12156 (26800) ^a	10115 (22300) ^a	8936 (19700) ^a	
3.05 (10)				14288 (31500) ^a	11158 (24600) ^a	9435 (20800) ^a	
1.52 (5)				15876 (35000) ^a	12111 (26700) ^a	9888 (21800) ^a	
Ground Line				16420 (36200) ^a	12610 (27800) ^a	9888 (21800)	
-1.52 (-5)			20276 (44700) ^a	16012 (35300) ^a	12474 (27500) ^a	9798 (21600)	

Miscellaneous—Specifications

LIFTING OVER FRONT—Power Boost ON							
Arm: 2.9 m (9 ft 6 in.)		Bucket: 1778 kg (3920 lb), 2.28 m ³ (2.98 yd ³)			Shoe: 750 mm (30 in.) or 900 mm (36 in.)		
Load Point Height	Horizontal Distance from Centerline of Rotation						
m (ft)	1.52 (5)	3.05 (10)	4.57 (15)	6.10 (20)	7.62 (25)	9.15 (30)	10.67 (35)
-3.05 (-10)		21047 (46400) ^a	18189 (40100) ^a	14696 (32400) ^a	11521 (25400) ^a		
-4.57 (-15)			14878 (32800) ^a	12202 (26900) ^a	9163 (20200) ^a		
LIFTING OVER SIDE—Power Boost ON							
m (ft)	1.52 (5)	3.05 (10)	4.57 (15)	6.10 (20)	7.62 (25)	9.15 (30)	10.67 (35)
7.62 (25)					9026 (19900) ^a		
6.10 (20)					9163 (20200)		
4.57 (15)			16465 (36300) ^a	12156 (26800)	8800 (19400)	6305 (13900)	
3.05 (10)				11839 (26100)	8301 (18300)	6078 (13400)	
1.52 (5)				11068 (24400)	7893 (17400)	5806 (12800)	
Ground Line				10659 (23500)	7575 (16700)	5625 (12400)	
-1.52 (-5)			17055 (37600)	10569 (23300)	7439 (16400)	5579 (12300)	
-3.05 (-10)		21047 (46400) ^a	17282 (38100)	10659 (23500)	7484 (16500)		
-4.57 (-15)			14878 (32800) ^a	10886 (24000)	7711 (17000)		

^aHydraulically-limited capacity

NOTE: Ratings are at bucket lift hook, using standard counterweight, situated on firm, level, uniform supporting surface. Figures do not exceed 87 percent of hydraulic capacity or 75 percent of weight

needed to tip machine. Figures marked with an (*) are hydraulically-limited capacities. Remaining figures are stability-limited capacities.

LIFTING OVER FRONT—Power Boost ON							
Arm: 3.4 m (11 ft 2 in.)		Bucket: 1633 kg (3600 lb), 2.07 m ³ (2.71 yd ³)			Shoe: 750 mm (30 in.) or 900 mm (36 in.)		
Load Point Height	Horizontal Distance from Centerline of Rotation						
m (ft)	1.52 (5)	3.05 (10)	4.57 (15)	6.10 (20)	7.62 (25)	9.15 (30)	10.67 (35)
6.10 (20)					8845 (19500) ^a	8346 (18400) ^a	
4.57 (15)				11521 (25400) ^a	9707 (21400) ^a	8708 (19200) ^a	
3.05 (10)				13744 (30300) ^a	10886 (24000) ^a	9253 (20400) ^a	
1.52 (5)				15604 (34400) ^a	11929 (26300) ^a	9843 (21700) ^a	
Ground Line			11521 (25400) ^a	16556 (36500) ^a	12655 (27900) ^a	10024 (22100)	
-1.52 (-5)			19550 (43100) ^a	16465 (36300) ^a	12746 (28100) ^a	9888 (21800)	
-3.05 (-10)		17554 (38700) ^a	19822 (43700) ^a	15468 (34100) ^a	12111 (26700) ^a	9389 (20703) ^a	
-4.57 (-15)		20185 (44500) ^a	16828 (37100) ^a	13426 (29600) ^a	10387 (22900) ^a		
-6.10 (-20)			12020 (26500) ^a	9480 (20900) ^a			
LIFTING OVER SIDE—Power Boost ON							
m (ft)	1.52 (5)	3.05 (10)	4.57 (15)	6.10 (20)	7.62 (25)	9.15 (30)	10.67 (35)
6.10 (20)					8845 (19500) ^a	6668 (14700)	
4.57 (15)				11521 (25400) ^a	9072 (20000)	6532 (14400)	
3.05 (10)				12292 (27100)	8573 (18900)	6260 (13800)	
1.52 (5)				11476 (25300)	8119 (17900)	6033 (13300)	
Ground Line			11521 (25400) ^a	10932 (24100)	7802 (17200)	5805 (12800)	
-1.52 (-5)			17146 (37800)	10751 (23700)	7620 (16800)	5670 (12500)	
-3.05 (-10)		17554 (38700) ^a	17327 (38200)	10750 (23700)	7575 (16700)	5715 (12600)	
-4.57 (-15)		20185 (44500) ^a	16828 (37100) ^a	10932 (24100)	7711 (17000)		
-6.10 (-20)			12020 (26500) ^a	9480 (20900) ^a			

^aHydraulically-limited capacity

NOTE: Ratings are at bucket lift hook, using standard counterweight, situated on firm, level, uniform supporting surface. Figures do not exceed 87 percent of hydraulic capacity or 75 percent of weight

needed to tip machine. Figures marked with an (*) are hydraulically-limited capacities. Remaining figures are stability-limited capacities.

Miscellaneous—Specifications

LIFTING OVER FRONT—Power Boost ON							
Arm: 3.9 m (12 ft 10 in.)		Bucket: 1569 kg (3460 lb), 1.89 m ³ (2.47 yd ³)			Shoe: 750 mm (30 in.) or 900 mm (36 in.)		
Load Point Height	Horizontal Distance from Centerline of Rotation						
m (ft)	1.52 (5)	3.05 (10)	4.57 (15)	6.10 (20)	7.62 (25)	9.15 (30)	10.67 (35)
7.62 (25)						5080 (11200) ^a	
6.10 (20)						7802 (17200) ^a	
4.57 (15)					9117 (20100) ^a	8210 (18100) ^a	4581 (10100) ^a
3.05 (10)			18234 (40200) ^a	12882 (28400) ^a	10342 (22800) ^a	8890 (19600) ^a	6940 (15300) ^a
1.52 (5)			16012 (35300) ^a	14969 (33000) ^a	11521 (25400) ^a	9525 (21000) ^a	7938 (17500)
Ground Line			14787 (32600) ^a	16239 (35800) ^a	12383 (27300) ^a	10024 (22100) ^a	7756 (17100)
-1.52 (-5)		8845 (19500) ^a	19958 (44000) ^a	16511 (36400) ^a	12701 (28000) ^a	9888 (21800)	
-3.05 (-10)		16692 (36800) ^a	20820 (45900) ^a	15830 (34900) ^a	12338 (27200) ^a	9707 (21400) ^a	
-4.57 (-15)		23224 (51200) ^a	18189 (40100) ^a	14197 (31300) ^a	11022 (24300) ^a		
-6.10 (-20)			13971 (30800) ^a	11022 (24300) ^a	7847 (17300) ^a		
LIFTING OVER SIDE—Power Boost ON							
m (ft)	1.52 (5)	3.05 (10)	4.57 (15)	6.10 (20)	7.62 (25)	9.15 (30)	10.67 (35)
7.62 (25)						5080 (11200) ^a	
6.10 (20)						6804 (15000)	
4.57 (15)					9117 (20100) ^a	6622 (14600)	4581 (10100) ^a
3.05 (10)			18234 (40200) ^a	12519 (27600)	8709 (19200)	6350 (14000)	4717 (10400)
1.52 (5)			16012 (35300) ^a	11612 (25600)	8210 (18100)	6033 (13300)	4536 (10000)
Ground Line			14787 (32600) ^a	11022 (24300)	7802 (17200)	5806 (12800)	4445 (9800)
-1.52 (-5)		8845 (19500) ^a	17010 (37500)	10705 (23600)	7575 (16700)	5625 (12400)	
-3.05 (-10)		16692 (36800) ^a	17100 (37700)	10659 (23500)	7484 (16500)	5625 (12400)	
-4.57 (-15)		23224 (51200) ^a	17373 (38300)	10750 (23700)	7575 (16700)		
-6.10 (-20)			13971 (30800) ^a	11022 (24300)	7847 (17300)		

^aHydraulically-limited capacity

NOTE: Ratings are at bucket lift hook, using standard counterweight, situated on firm, level, uniform supporting surface. Figures do not exceed 87 percent of hydraulic capacity or 75 percent of weight

needed to tip machine. Figures marked with an (*) are hydraulically-limited capacities. Remaining figures are stability-limited capacities.

LIFTING OVER FRONT—Power Boost ON							
Arm: 4.9 m (16 ft 1 in.)		Bucket: 1170 kg (2580 lb), 1.36 m ³ (1.78 yd ³)			Shoe: 750 mm (30 in.) or 900 mm (36 in.)		
Load Point Height	Horizontal Distance from Centerline of Rotation						
m (ft)	1.52 (5)	3.05 (10)	4.57 (15)	6.10 (20)	7.62 (25)	9.15 (30)	10.67 (35)
6.10 (20)						7257 (16000) ^a	6123 (13500) ^a
4.57 (15)						7847 (17300) ^a	7348 (16200) ^a
3.05 (10)					9798 (21600) ^a	8618 (19000) ^a	7847 (17300) ^a
1.52 (5)			20003 (44100) ^a	14107 (31100) ^a	11158 (24600) ^a	9434 (20800) ^a	8301 (18300) ^a
Ground Line			19867 (43800) ^a	15921 (35100) ^a	12337 (27200) ^a	10160 (22400) ^a	8301 (18300)
-1.52 (-5)		8981 (19800) ^a	20140 (44400) ^a	16874 (37200) ^a	13018 (28700) ^a	10342 (22800)	8165 (18000)
-3.05 (-10)		13880 (30600) ^a	22816 (50300) ^a	16874 (37200) ^a	13109 (28900) ^a	10206 (22500)	8074 (17800)
-4.57 (-15)		20003 (44100) ^a	21047 (46400) ^a	15921 (35100) ^a	12474 (27500) ^a	9888 (21800) ^a	
-6.10 (-20)		24086 (53100) ^a	17917 (39500) ^a	13835 (30500) ^a	10705 (23600) ^a		
-7.62 (-25)			12746 (28100) ^a	9798 (21600) ^a			
LIFTING OVER SIDE—Power Boost ON							
m (ft)	1.52 (5)	3.05 (10)	4.57 (15)	6.10 (20)	7.62 (25)	9.15 (30)	10.67 (35)
6.10 (20)						7257 (16000) ^a	5579 (123003)
4.57 (15)						7303 (16100)	5488 (12100)
3.05 (10)					9480 (20900)	6985 (15400)	5307 (11700)
1.52 (5)			19459 (42900)	12560 (27700)	8936 (19700)	6668 (14700)	5126 (11300)

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Miscellaneous—Specifications

LIFTING OVER SIDE—Power Boost ON

m (ft)	1.52 (5)	3.05 (10)	4.57 (15)	6.10 (20)	7.62 (25)	9.15 (30)	10.67 (35)
Ground Line			18098 (39900)	11748 (25900)	8437 (18600)	6350 (14000)	4944 (10900)
-1.52 (-5)		8981 (19800) ^a	17509 (38600)	11294 (24900)	8074 (17800)	6123 (13500)	4808 (10600)
-3.05 (-10)		13880 (30600) ^a	17327 (38200)	11068 (24400)	7893 (17400)	6033 (13300)	4763 (10500)
-4.57 (-15)		20003 (44100) ^a	17463 (38500)	11022 (24300)	7893 (17400)	6033 (13300)	
-6.10 (-20)		24086 (53100) ^a	17781 (39200)	11204 (24700)	8029 (17700)		
-7.62 (-25)			12746 (28100) ^a	9798 (21600) ^a			

^aHydraulically-limited capacity

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