PART NO. OMT390732X19

HITACHI

Reliable solutions

Operator's Manual

ZAXIS

310F-FE-6N

Forestry Excavator

LIMITATIONS AND RESPONSIBILITIES

These warranties are subject to the following:

ISUZU MOTORS AMERICA LLC. RESPONSIBILITIES
During the emission warranty period, if a defect in material or workmanship of a warranted part or component is found, Isuzu Motors America LLC. will provide:

- New, remanufactured, or repaired parts and/or components required to correct the defect. Note: Items replaced under this warranty become the property of Isuzu Motors America LLC.
- Labor, during normal working hours, required to make the warranty repair. This includes diagnosis and labor to remove and install the engine, if necessary.

OWNER RESPONSIBILITIES
During the emission warranty period, the owner is responsible for:

- The performance of all required maintenance. A warranty claim will not be denied because the scheduled maintenance was not performed. However, if the lack of required maintenance was the reason for the repair, then the claim will be denied.
- Premium of overtime costs.
- Costs to investigate complaints, which are not caused by a defect in Isuzu Motors America LLC. material or workmanship.
- Providing timely notice of a warrantable failure and promptly making the product available for repair.

LIMITATIONS
Isuzu Motors America LLC. is not responsible for resultant damages to an emission-related part or component resulting from:

- Any application or installation Isuzu Motors America LLC. deems improper as explained in the Instruction Manual.
- Attachments, accessory items, or parts not authorized for use by Isuzu Motors America LLC.
- Improper non-road diesel engine maintenance, repair, or abuse.
- Owner’s unreasonable delay in making the product available after being notified of a potential product problem. This warranty is in addition to Isuzu Motors America LLC. standard warranty, applicable to the non-road diesel engine product involved.

Remedies under this warranty are limited to the provision of material and services as specified herein. Isuzu Motors America LLC. is not responsible for incidental or consequential damages such as downtime or loss use of engine powered equipment.

TX,ECWS,ISUZU -19-24FEB20-2/2

Contents

Continued on next page

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

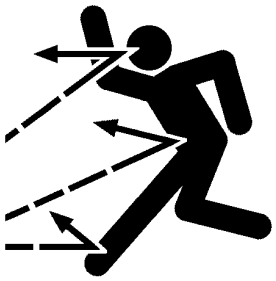
Prevent Parts From Flying

Grease in the track adjuster is under high pressure. Failure to follow the precautions below may result in serious injury, blindness, or death.

- Do not attempt to remove GREASE FITTING or VALVE ASSEMBLY.
- Do not attempt to remove grease fitting securing cover.
- As pieces may fly off, be sure to keep body and face away from valve.
- Never attempt to disassemble the track adjuster. Inadvertent disassembling of the track adjuster may cause the parts such as a spring to fly off, possibly resulting in severe personal injury or death.

Travel reduction gears are under pressure.

- As pieces may fly off, be sure to keep body and face away from AIR RELEASE PLUG to avoid injury.



TX1094270 —UN—28JUN13

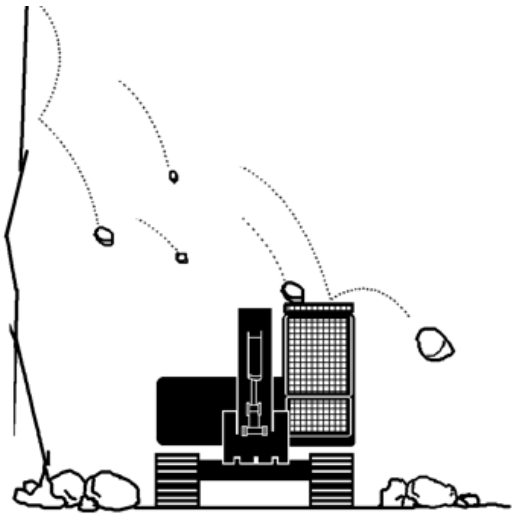
- GEAR OIL is hot. Wait for GEAR OIL to cool, then gradually loosen AIR RELEASE PLUG to release pressure.

MM16284,0001C55 -19-25AUG14-1/1

Install OPG Guard

In case the machine is operated in areas where the possibilities of falling stones or debris exist, equip Hitachi OPG guard. Consult your authorized dealer for installing the OPG guard. In order not to impair operator protective structure: Replace damaged OPG guard. Never attempt to repair or modify the guard.

OPG: Operator Protective Guard



TX1094219 —UN—27JUN13

TZ24494,00017C6 -19-14MAR16-1/1

Keep the Operator Protective Structure (OPS) in Place

The polycarbonate windows are part of the operator protection system. It is important to keep the operator protective structure (OPS) in place (doors, screens, windows, windshield, etc.) to minimize hazards from whipping or intruding objects.

To maintain OPS protection, replace damaged parts immediately. Replace if damaged, cloudy, or has visible micro-cracking or crazing. Replace only with Hitachi replacement parts to ensure the original operator protection level.

The protection offered by the OPS will be impaired if the OPS is subject to structural damage, is involved in an overturn incident, or is altered by welding, bending, drilling, or cutting. Damaged OPS components should be replaced, not reused.

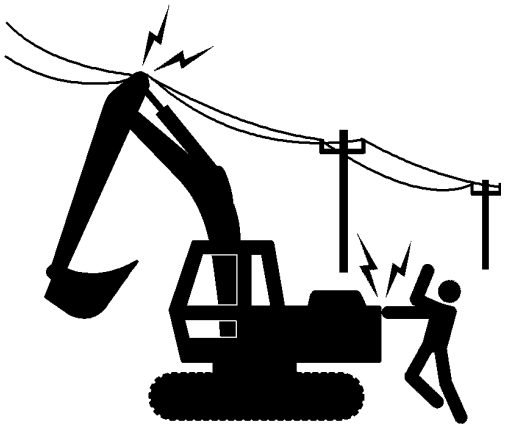
Keep all bolts and attaching hardware tight.

KR46761,00013BB -19-04OCT16-1/1

Avoid Power Lines

Serious injury or death can result if the machine or front attachments are not kept a safe distance from electric lines.

- When operating near an electric line, never move any part of the machine or load to within 3 m plus twice the line insulator length of overhead wires.
- Check and comply with any local regulations that may apply.
- Wet ground will expand the area that could cause any person on it to be affected by electric shock. Keep all bystanders or co-workers away from the site.



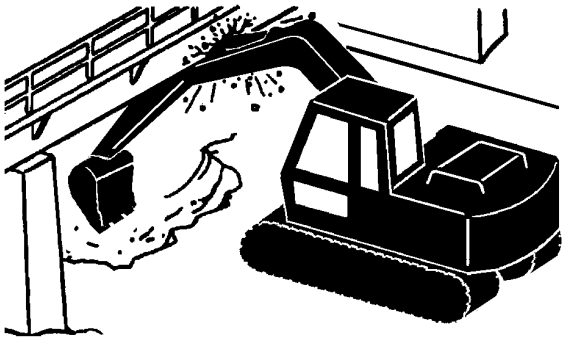
TX1094255 —UN—28JUN13

MM16284,0001951 -19-27OCT15-1/1

Operate with Caution

If the front attachment or any other part of the machine hits against an overhead obstacle, such as a bridge, both the machine and the overhead obstacle will be damaged, and personal injury may result as well.

- Take care to avoid hitting overhead obstacles with the boom or arm.



TX1094254 —UN—28JUN13

MM16284,0001C4F -19-26AUG14-1/1

Never Ride Attachment

Never allow anyone to ride attachments or load. This is an extremely dangerous practice.

MM16284,000196C -19-26JUL12-1/1

Operate Boom With Care

Always lower the boom so that the attachment is securely supported when operation is stopped.

When moving the machine, watch that enough clearance is available on both sides and above the boom. Extra clearance may be required, particularly where the ground is uneven.

Maintain a safe operating distance between the equipment and other personnel. Never swing boom, stick, attachment, or load elevated above the heads of bystanders.

Use only prearranged and approved signaling practices.

Operate Boom With Care

T147349 —UN—24OCT01

TX,OP,BOOM,CARE -19-08MAY20-1/1

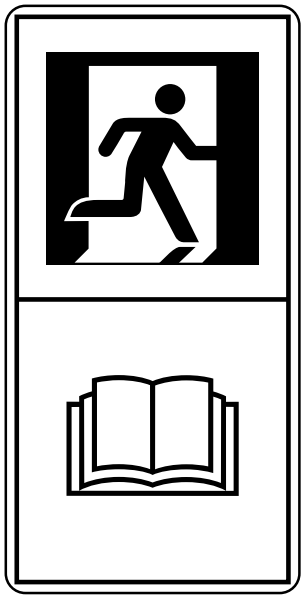
1— Alternative Exit (2 used)
2— IMPORTANT, Polycarbonate Windows
3— CAUTION, Attachment
4— IMPORTANT, Operator Protective Structure (OPS)
5— WARNING, Use Seat Belt
6— CAUTION, Control Pattern
7— WARNING, Avoid Serious Crushing Injury From Boom
8— CAUTION, Engine Fan
9— CAUTION, Cab Riser
10— DANGER, Electric Lines
11— CAUTION, Operate Machine Safely
12— Cab Tilting Procedure
13— CAUTION, Hydraulic Reservoir Cap
14— CAUTION, Prevent Machine Fires
15— WARNING, Maximum Load
16— Tiedown (4 used)
17— WARNING, Stay Clear (2 used)
18— WARNING, Rotating Fan Blade (2 used)
19— WARNING, Fan Belt
20— CAUTION, Pinch Point
21— WARNING, Cab Door
22— Fire Extinguisher Inside
23— Protective Structure Certification
24— Fire Extinguisher
25— First Aid
26— Retrieval Point (2 used)
27— WARNING, Avoid Machine Tipover
28— DANGER, Battery
29— WARNING, Falling Hazard (4 used)
30— WARNING, Track Adjuster (2 used)
31— CAUTION, Pinch Point
32— CAUTION, Do Not Touch
33— CAUTION, Sharp Objects (if equipped)

KR46761,0001366 -19-13JUN19-2/66

1. **Alternative Exits**

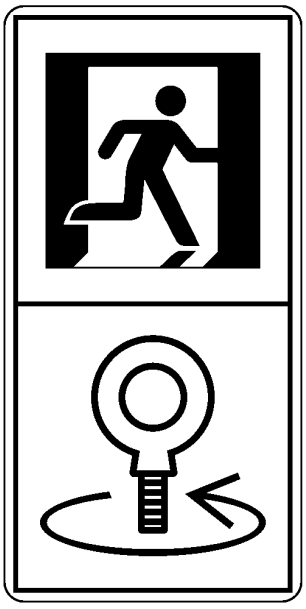
   Use alternative exit in an emergency situation.

   These safety labels are located inside the cab on the skylight window and outside the cab on the skylight window.



Alternative Exit

TX1233449 —UN—02FEB17



Alternative Exit

TX1234210 —UN—14FEB17

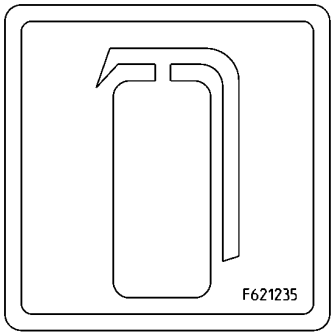
Continued on next page

KR46761,0001366 -19-13JUN19-3/66

24. **Fire Extinguisher**

Fire extinguisher mounting location.

This safety label is located inside the cab near the fire extinguisher.



Fire Extinguisher

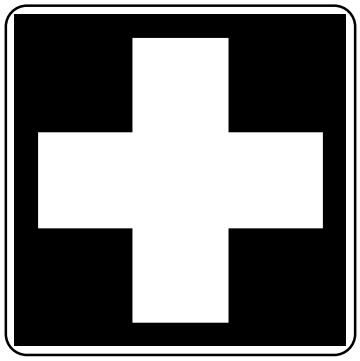
TX1174246 —UN—10OCT14

KR46761,0001366 -19-13JUN19-26/66

25. **First Aid**

Keep first aid kit handy.

This safety label is located inside the cab on the right side of the rear panel.



First Aid

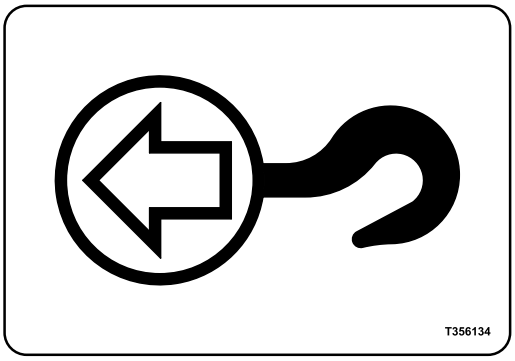
TX1170295 —UN—28AUG14

KR46761,0001366 -19-13JUN19-27/66

26. **Retrieval Points**

Route appropriate retrieval device through retrieval points.

This label is located at the front and rear of the machine's undercarriage.



Retrieval Point

TX1170297 —UN—28AUG14

Continued on next page

KR46761,0001366 -19-13JUN19-28/66

15. **WARNING, Stay Clear**

Operator may swing or reverse machine

STAY CLEAR

This safety label is located at the rear of the machine on each side of the counterweight.

TX1104370 —19—19DEC12

WARNING, Stay Clear

KR46761,0001366 -19-13JUN19-51/66

16. **WARNING, Rotating Fan Blade**

Be sure to stop the engine before servicing the machine. Personal injury or death may result if you become entangled with fan.

This safety label is located inside the engine compartment on top of the fan.

TX1222986 —19—15SEP16

WARNING, Rotating Fan Blade

KR46761,0001366 -19-13JUN19-52/66

17. **WARNING, Fan Belt**

Be sure to stop the engine before servicing the machine. Personal injury or death may result if you become entangled with fan belts.

This safety label is located inside the engine compartment on top of the fan.

TX1222982 —UN—15SEP16

WARNING, Fan Belt

Continued on next page

KR46761,0001366 -19-13JUN19-53/66

14. Key Switch—Switch has four positions:

- OFF
- ACC
- ON
- START

15. Keypad—Keypad has different applications:

- Use numbers 0—9 to enter password at machine start-up if equipped.
- Press keypad numbers 1—8 while radio is on to switch between programmed stations.
- When work light switch is on position 2, monitor changes to night mode (background lighting is dimmed). Press and hold number 0 on keypad to adjust monitor back to daytime mode display.

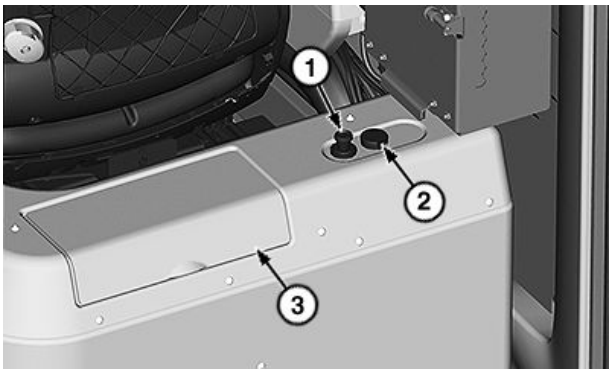
KR46761,0001154 -19-14DEC16-2/2

Rear Panel

Lighter (1): For operator convenience. Can also be used as an electrical port for 24-volt appliances only.

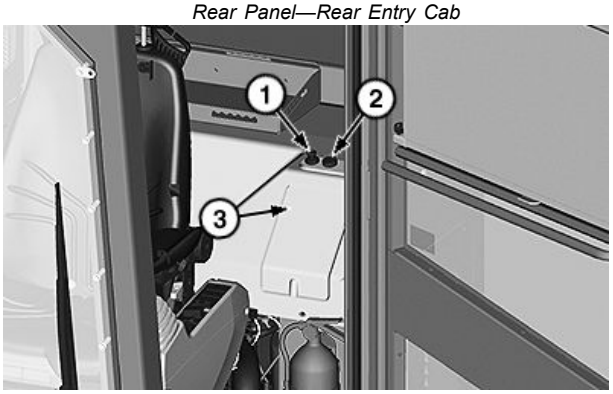
Accessory Power Port (2): 12-volt, 5-amp electrical port provided for service and maintenance.

Fuse Box Cover (3): Prevents damage to fuses. For more on fuses, see Replacing Fuses. (Section 4-1.)



TX1213195 —UN—22MAR16

Rear Panel—Rear Entry Cab



TX1213194 —UN—22MAR16

Rear Panel—Side Entry Cab

KR46761,00010FB -19-18NOV16-1/1

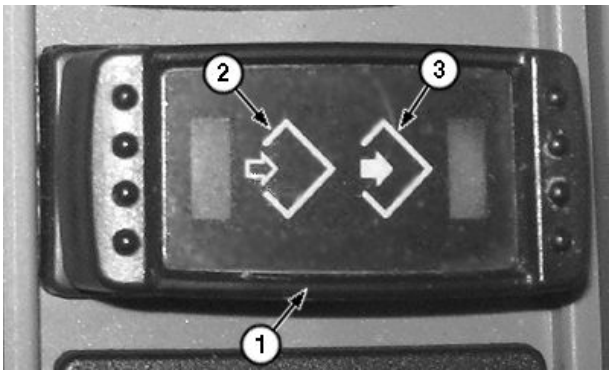
Service ADVISOR™ Remote (SAR) Switch

The Service ADVISOR™ Remote (SAR) switch (1) allows operator to accept or decline software updates available to the machine when prompted by an alarm on the monitor. LEDs on the SAR switch will illuminate when the alarm appears. The left LED will be red and the right LED will be green.

Press left side of SAR switch (red LED) to DECLINE installation (2) of software updates.

Press right side of SAR switch (green LED) to ACCEPT installation (3) of software updates.

For more information on SAR functionality, see Service ADVISOR™ Remote (SAR) Software Delivery Process and Service ADVISOR™ Remote (SAR) Operation. (Section 2-3.)



TX1086797A —UN—21JAN11

Service ADVISOR™ Remote Switch

1— Service ADVISOR™ Remote (SAR) Switch
2— DECLINE Installation
3— ACCEPT Installation

Service ADVISOR is a trademark of Deere & Company

OUT4001,0000748 -19-15MAY19-1/1

Fire Extinguisher Mounting Location

MOUNTING LOCATION:

On both the rear entry and side entry cabs, the designated fire extinguisher mounting location (1) is inside the cab door on the right side.

USE:

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

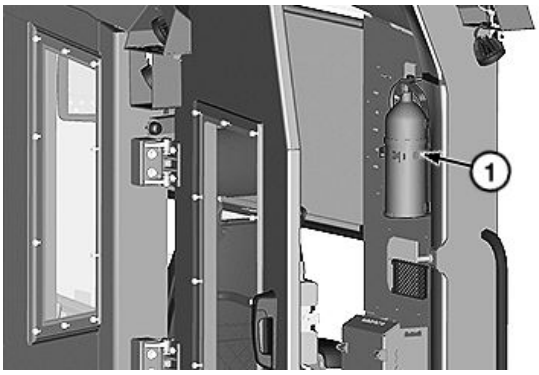
The portable fire extinguisher is used to aid in the extinguishing of small fires. Refer to individual manufacturer's instructions and proper fire fighting procedures before the need to use the fire extinguisher arises. See Prevent Fires. (Section 1-2.)

MAINTENANCE:

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

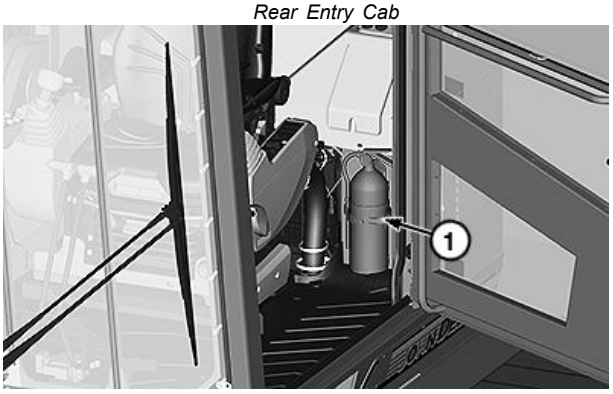
Inspect and maintain the fire extinguisher following the manufacturer's recommendations and all local, regional, and national regulations.

1— Fire Extinguisher Mounting Location



TX1212613 —UN—14MAR16

Rear Entry Cab



TX1212614 —UN—22MAR16

Side Entry Cab

KR46761,0001140 -19-14MAR16-1/1

Alternative Exit

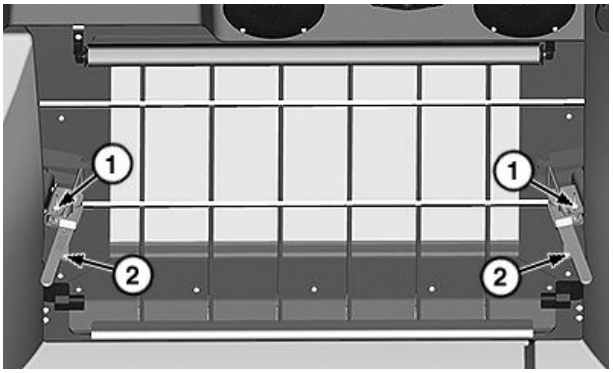
Rear Entry Cab—Lever Latch

The skylight provides an alternative exit path if the cab door is blocked in an emergency situation.

Remove pins (1), release latches (2), and push on skylight pane to remove and to open exit path.

1— Pin (2 used)

2— Latch (2 used)



TX1213130 —UN—21MAR16

Alternative Exit

Continued on next page

KR46761,0001112 -19-04AUG21-1/3

Aftertreatment Indicators Overview

The diesel exhaust fluid (DEF) indicator illuminates when the DEF is low. Fill DEF tank.

When the DEF indicator is combined with the warning indicator or stop engine indicator, engine performance is reduced by the engine control unit (ECU) because the DEF is below a measurable level. Fill DEF tank.

When engine emissions temperature indicator illuminates, aftertreatment device gas temperature is high, elevated idle is active, or aftertreatment device regeneration is in process. The machine can be operated as normal unless the operator determines the machine is not in a safe location for high aftertreatment temperatures and enables aftertreatment device regeneration inhibit.

When engine emissions temperature indicator is combined with the warning indicator or stop engine indicator, engine performance is reduced by the ECU because the aftertreatment gas temperature is higher than expected. Follow diagnostic trouble code (DTC) procedure or see an authorized Hitachi dealer.

When the aftertreatment device regeneration indicator illuminates, the aftertreatment device regeneration is in process, aftertreatment device system has a malfunction, or the aftertreatment device is in need of regeneration and the operator has enabled the aftertreatment device regeneration inhibit. If conditions are safe, the operator should disable the aftertreatment device regeneration inhibit setting or perform manual service regeneration or follow DTC procedure.

When the aftertreatment device regeneration indicator is combined with the warning indicator, engine performance is reduced by the ECU because there is an aftertreatment system malfunction or the soot level of the aftertreatment device is moderately high. If conditions are safe, the operator should disable the aftertreatment device regeneration inhibit function. If conditions are not safe, the operator should move the machine to a safe location and engage the aftertreatment device regeneration. Perform manual service regeneration or follow DTC procedure.

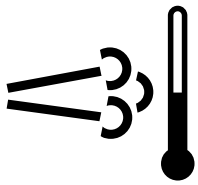
When the aftertreatment device regeneration is combined with the stop engine indicator, engine performance is further reduced by the ECU because there is an aftertreatment system malfunction or the soot level of the aftertreatment device is extremely high. If this combination is present, see an authorized Hitachi dealer.

The aftertreatment device regeneration inhibit indicator illuminates when the operator has engaged the request to enable the aftertreatment device regeneration inhibit function. This icon remains illuminated until the operator reengages aftertreatment device regeneration from the diagnostic gauge. Enabling inhibit mode is not recommended for any situation unless it is safety related or if the fuel tank lacks the required fuel to complete the regeneration process.

RG22487 —UN—21AUG13

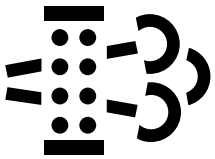
Diesel Exhaust Fluid Indicator

RG22488 —UN—21AUG13



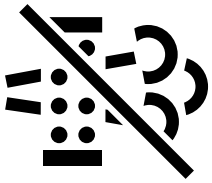
Engine Emissions Temperature Indicator

RG22489 —UN—21AUG13



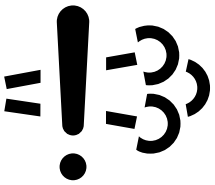
Aftertreatment Device Regeneration Indicator

RG22490 —UN—21AUG13



Aftertreatment Device Regeneration Inhibit Indicator

RG22491 —UN—21AUG13

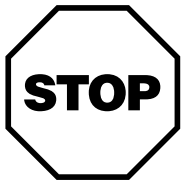


Aftertreatment Device Regeneration System Error Alarm

RG22492 —UN—21AUG13

Warning Indicator

RG22493 —UN—21AUG13



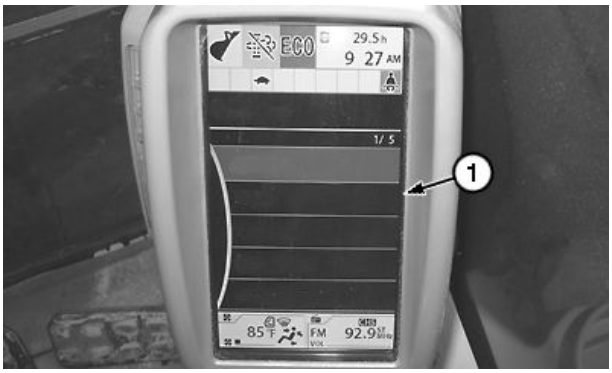
Stop Engine Indicator

The engine emissions system malfunction indicator illuminates when engine emissions are outside of normal operating range or engine emissions system malfunction. Follow DTC procedure or see an authorized Hitachi dealer.

When the engine emissions system malfunction indicator is combined with the warning indicator, engine performance is reduced by the ECU because the engine emissions are outside of normal operating range or engine emissions system malfunction. Follow DTC procedure or see an authorized Hitachi dealer.

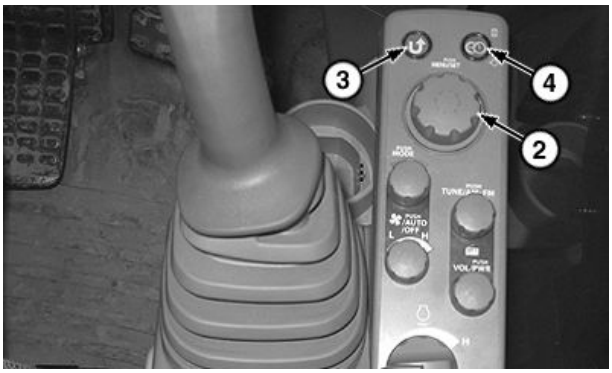
KR46761,0001386 -19-21SEP16-1/1

Main Menu—Air Conditioner



TX1086306A —UN—28DEC10

Main Menu Screen



TX1183787A —UN—29JAN15

Switch Panel

The **Air Conditioner** menu allows operator to turn the air conditioner ON or OFF and set the circulation air mode to recirculating cab air or fresh air.

The submenus under Main Menu that appear on monitor include:

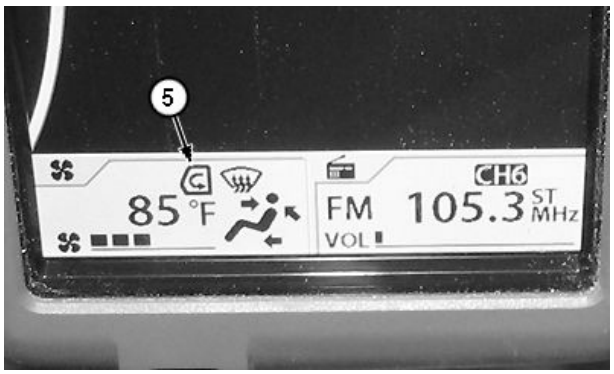
NOTE: Alarm List ONLY appears as a submenu if there is an actual alarm.

- **Alarm List**
- **Air Conditioner**
- **Radio**
- **Setting Menu**
- **Information Menu**

At Main Menu screen (1), rotate monitor dial (2) to highlight Air Conditioner. Press monitor dial to display Air Conditioner menu.

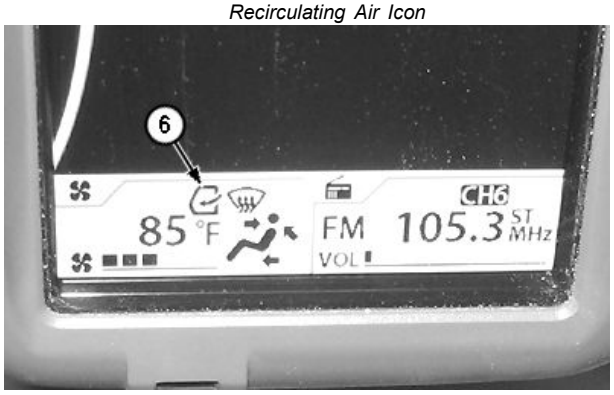
Air Conditioner menu items include:

□ **(Cab recirculating air mode symbol is displayed.)** Rotate monitor dial to highlight the cab recirculating air mode symbol. Press monitor dial to turn ON the cab recirculating air mode. The color of the preceding square will turn green and a recirculating air icon (5) will appear in the air conditioner display in the lower left corner of the monitor. Press monitor dial again to turn OFF the recirculating air mode and switch to fresh air mode. The color of the preceding square will be gray and a fresh air icon (6) will appear in the air conditioner display in the lower left corner of the monitor.



TX1086310A —UN—28DEC10

Recirculating Air Icon



TX1086311A —UN—28DEC10

Fresh Air Icon

1— Main Menu Screen
2— Monitor Dial
3— Back Button
4— Home Button
5— Recirculating Air Icon
6— Fresh Air Icon

Continued on next page

KR46761,0001407 -19-02FEB17-1/2

Main Menu—Setting Menu—Unit Selection

The **Unit Selection** menu allows operator to change the unit system that appears on the monitor to either US or Metric and change temperature display reading on the monitor between degrees Celcius (°C) or degrees Fahrenheit (°F).

At Setting Menu, rotate monitor dial (2) to highlight Unit Selection. Press monitor dial to display Unit Selection menu.

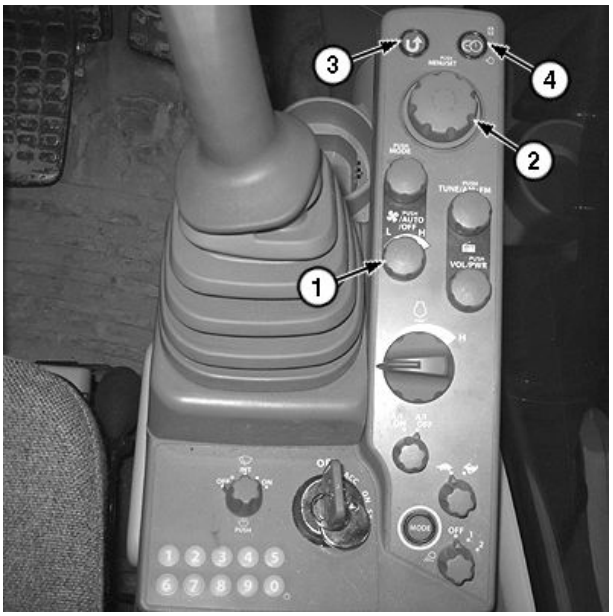
Unit Selection menu items include:

- **Unit**
  Rotate monitor dial to highlight Unit and press monitor dial. Press monitor dial to change setting between US or Metric.
- **°C/°F**
  (Blower Must Be ON)

  NOTE: Before changing °C or °F, turn the blower fan ON by pressing the blower speed switch (1) on the switch panel.

  Rotate monitor dial to highlight °C/°F and press monitor dial. After displaying Wait message, temperature reading is changed from previous setting in lower left corner of the screen on the air conditioner display. Press monitor dial again to change temperature reading back to opposite setting.

Press back button (3) to return to previous screen.



TX1086278A —UN—27DEC10

Switch Panel

1— Blower Speed Switch
2— Monitor Dial
3— Back Button
4— Home Button

Press home button (4) to return to default screen.

OUT4001,000072E -19-31AUG15-1/1

Main Menu—Setting Menu—Main Menu Sequence Change

The **Main Menu Sequence Change** menu provides the capability to change the sequence order of some of the submenus under the Main Menu according to how frequently they are used.

At Setting Menu, rotate monitor dial to highlight Main Menu Sequence Change. Press monitor dial to display Main Menu Sequence Change menu.

Main Menu Sequence Change menu items include:

- **Air Conditioner**
- **Radio**

Rotate monitor dial to highlight the submenu that is preferred to be shown first. Press monitor dial to change the submenu sequence.

Press back button to return to previous screen.

Press home button to return to default screen.

KR46761,00014AB -19-30JAN17-1/1

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.

IMPORTANT: Prevent possible damage to the engine. The diesel fired coolant heater is required for temperatures -20°C (-4°F) and below. See an authorized Hitachi dealer.

IMPORTANT: Prevent possible damage to engine. Temperatures below -20°C (-4°F) require a diesel fired coolant heater warm-up period. At -20°C (-4°F) the engine requires 1-hour warm-up period. Temperatures below -20°C (-4°F) require additional warm-up period. See table below.

Diesel Fired Coolant Heater Warm-Up Period	
Temperature	**Required Warm-Up Period Before Operation**
-20°C (-4°F)	1 Hour
-21°C (-5°F)	1 Hour
-22°C (-7°F)	2 Hours
-23°C (-9°F)	2 Hours
-24°C (-11°F)	2 Hours
-25°C (-13°F)	2 Hours
-26°C (-14°F)	2 Hours
-27°C (-16°F)	2 Hours
-28°C (-18°F)	2 Hours
-29°C (-20°F)	3 Hours
-30°C (-22°F)	4 Hours
-31°C (-23°F)	5 Hours
-32°C (-25°F)	6 Hours
-33°C (-27°F)	7 Hours
-34°C (-29°F)	8 Hours
-35°C (-31°F)	9 Hours
-36°C (-32°F)	10 Hours
-37°C (-34°F)	11 Hours
-38°C (-36°F)	12 Hours
-39°C (-38°F)	13 Hours
-40°C (-40°F)	14 Hours

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

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

1. If temperature is below 0°C (32°F), engine will start at 800 rpm and ramp to 1200 rpm after 30 seconds. Engine maintains 1200 rpm until hydraulic temperature reaches 2°C (35.6°F) or 15 minutes, whichever comes first.
2. Run engine at 1/2 speed for 5 minutes. Do not run at fast or slow idle.

CAUTION: Prevent possible injury from unexpected machine movement. Clear the area of all bystanders before running 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 causes machine functions to respond slowly.

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

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

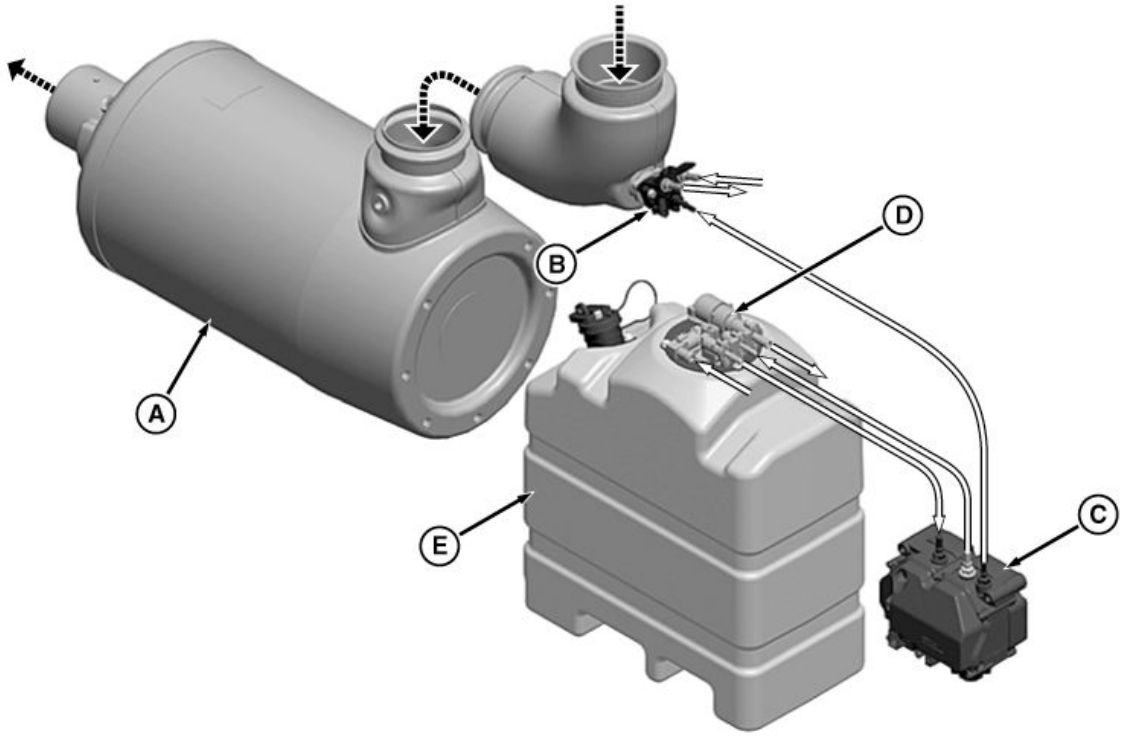
7. Keeping the angle between boom and arm 90—110°, fully actuate bucket close function (cylinder extend) and lower bucket to raise track off ground.

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

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

KR46761,000137E -19-15SEP16-1/1

Selective Catalytic Reduction (SCR) System Overview



RG22427 —UN—14FEB13

SCR System

A—SCR Catalyst
B—DEF Dosing Injector
C—DEF Dosing Unit
D—DEF Tank Header Assembly
E—DEF Tank

IMPORTANT: Do not remove battery leads for at least 5 minutes after engine stops. The SCR system automatically purges itself of diesel exhaust fluid (DEF) immediately after the engine is stopped. If adequate time is not allowed for lines to be purged, residual DEF can freeze and possibly damage components of the SCR system during cold-weather exposure.

In order to comply with national and local emission requirements, this engine series contains a selective catalytic reduction (SCR) system. The main components of the SCR system include the SCR catalyst (A), DEF dosing injector (B), DEF dosing unit (C), DEF tank header assembly (D), and DEF tank (E). The SCR system is effective at reducing the nitrogen oxides (NOx) emissions. NOx is a major component of smog and acid rain.

During combustion, NOx molecules are formed in the exhaust. DEF is injected into the exhaust stream before the SCR catalyst. Through a chemical reaction in the SCR, NOx is converted into nitrogen and water.

Water vapor is a normal by-product of combustion. During cold-weather operation at low exhaust temperatures, this water vapor can condense and resemble white smoke from the exhaust. This will dissipate as operating temperature increases and the water is further vaporized. This situation is considered normal.

A DEF solution begins to crystallize and freeze at -11°C (12°F). With climate temperatures that can range much colder than this, DEF is expected to freeze in the DEF tank. For this reason, the DEF tank contains a heating element that provides rapid thawing of DEF upon start-up. The heating element cycles to maintain fluidity during operation as needed. DEF is not dosed upon initial start-up; therefore, it is not necessary to have liquid DEF at cold start-up.

If DEF quality deteriorates and it is no longer within specifications, the engine can derate. DEF should be crystal clear with a light ammonia smell. If DEF appears cloudy, has a colored tint, or has a profound ammonia smell, it is likely not within specification. A diagnostic trouble code (DTC) is displayed, informing the operator to replace the DEF. Upon replacement of DEF and operation of the engine under load for a period of time or an aftertreatment device regeneration, the code automatically goes away with no required input from the operator.

TX,SCR,OVERVIEW,2 -19-13JUL20-1/1

Lifting the Machine

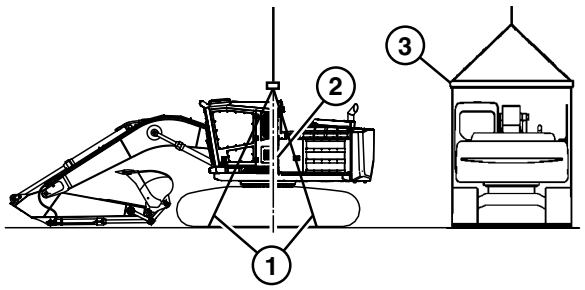
CAUTION: Prevent possible injury from unexpected machine movement when lifting the machine. Check lifting capacity of crane before lifting the machine. Lift load only as high as necessary.

Keep all people clear of raised load.

NOTE: The center of gravity (2) will vary depending on the kind of attachment.

Refer to decals on machine for correct lifting points (1). There are two lifting points on each side of the undercarriage.

1. Fully extend arm and bucket (if equipped) cylinders.
2. Position the upperstructure parallel with tracks.
3. Lower boom until attachment comes in contact with ground.
4. Turn key switch to the OFF position. Remove key from switch.
5. Pull pilot shutoff lever to locked (UP) position.
6. Close and lock all doors and covers.



TX1229755 —UN—02DEC16

Lifting the Machine (side entry cab shown)

1— Lifting Point (4 used)
2— Center of Gravity
3— Support Bar

7. Route appropriate lifting device through lifting points and under both sides of the track frame as illustrated.
8. Attach appropriate lifting device to crane.
9. Slowly lift machine. For machine weights, see Miscellaneous—Specifications. (Section 4-6.)

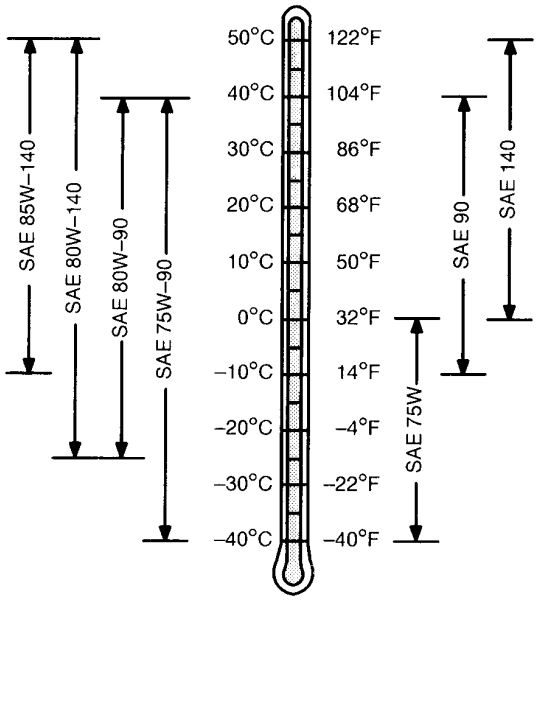
TD48962,00001B8 -19-02JUL19-1/1

Swing Gear Case and Travel Gear Case Oils

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

The following oils are preferred:

- API Service Category GL-5



Swing Gear Case and Travel Gear Case Oils

KR46761,00013FF -19-27OCT16-1/1

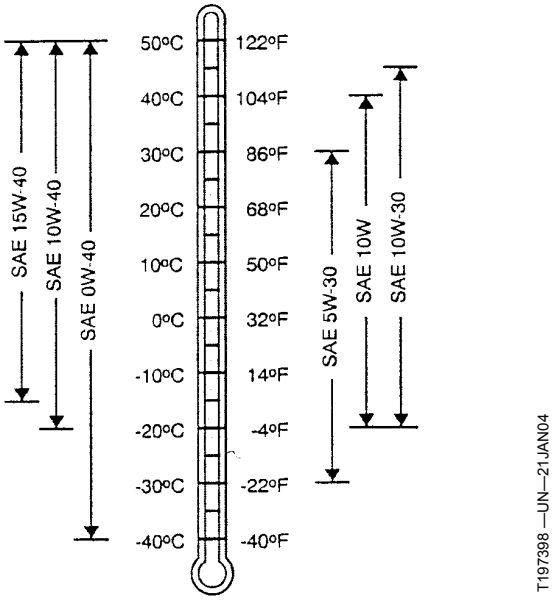
Pump Drive Gear Case Oil

IMPORTANT: This machine can use 15W/40 engine oil or 80/90 gear oil in the pump drive gear case.

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

The following oil is preferred:

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



Pump Gear Case Oil

KR46761,0001400 -19-27OCT16-1/1

Enclosure Door Manual Operation

Rear Entry Cab

CAUTION: Prevent possible injury. The maximum load on the open enclosure door is not to exceed 250 kg (550 lb).

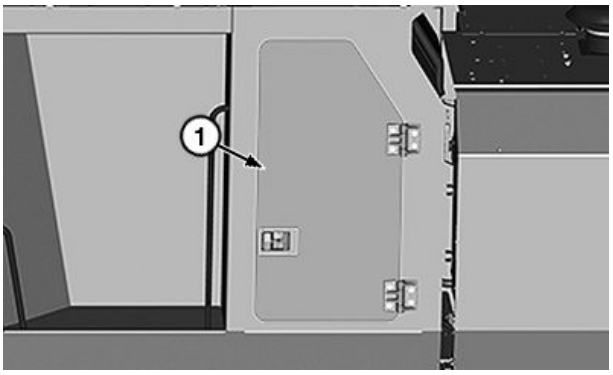
Prevent possible injury from door closing. Ensure door is secured in the open position.

Opening Enclosure Door

1. Open cab service door (1) to access the enclosure door and cab tilt hydraulic pump.
2. Fully turn enclosure door open solenoid valve (2) clockwise.
3. Place handle (4) into hand pump (5).
4. Operate hand pump to open the enclosure door.
5. Fully turn enclosure door open solenoid valve counterclockwise.
6. Close cab service door.

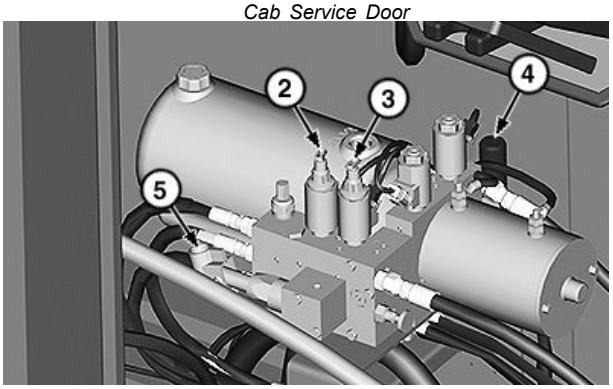
Closing Enclosure Door

1. Open cab service door to access the enclosure door and cab tilt hydraulic pump.
2. Fully turn enclosure door close solenoid valve (3) clockwise.
3. Place handle into hand pump.
4. Operate hand pump to close the enclosure door.
5. Fully turn enclosure door close solenoid valve counterclockwise.
6. Close cab service door.



Cab Service Door

TX1213788 —UN—26APR16



Enclosure Door and Cab Tilt Hydraulic Pump

TX1213806 —UN—26APR16

1— Cab Service Door
2— Enclosure Door Open Solenoid Valve
3— Enclosure Door Close Solenoid Valve
4— Handle
5— Hand Pump

Continued on next page

KR46761,000116A -19-31MAY16-1/2

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

Clean filters using one of the following methods:

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

Installing Cab Fresh Air Filter—Early Production

1. Install filter.
2. Install cover and cap screws. Tighten wing nuts.

Installing Cab Fresh Air Filter—Late Production

1. Install filter.
2. Install cover. Tighten wing nuts.

Installing Cab Recirculating Air Filter

1. Install filter.
2. Install cover and cap screws and secure latch.
3. Close cab service door.

Continued on next page

KR46761,00010C5 -19-14SEP20-3/4

b. Insert 4 mm hex wrench (5) into hole (6) and turn counterclockwise to release locking pin.

CAUTION: Avoid personal injury from high-pressure fluid. High-pressure release of oil from pressurized system can cause serious burns or penetrating injury. Relieve pressure by slowly turning hydraulic tank cap counterclockwise a few degrees.

To prevent possible burn injury from hot hydraulic oil, wait for hydraulic oil to cool before starting work.

c. Slowly turn hydraulic tank cap (4) counterclockwise a few degrees to relieve pressure. Remove cap.

d. Add oil until it is between marks on sight glass. See Hydraulic Oil. (Section 3-1.)

e. Install hydraulic tank cap to case assembly (7) using aligning marks (8) and turning cap clockwise to lock position.

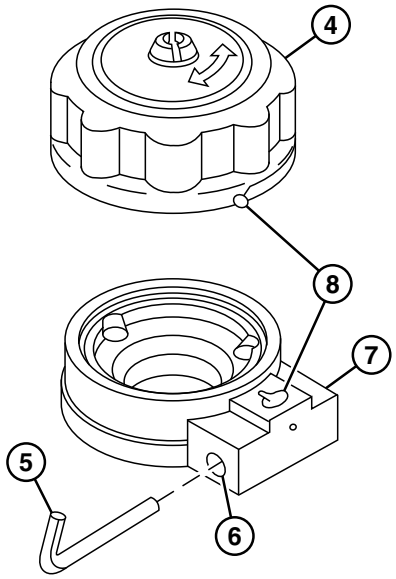
f. Close access door.

6. Close enclosure door.

4— Hydraulic Tank Cap
5— Hex Wrench
6— Hole
7— Case Assembly
8— Aligning Mark (2 used)

TS281 —UN—15APR13

Pressurized Fluids



TX1210978 —UN—17FEB16

Hydraulic Tank Cap

Continued on next page

KR46761,000138D -19-14DEC16-2/3

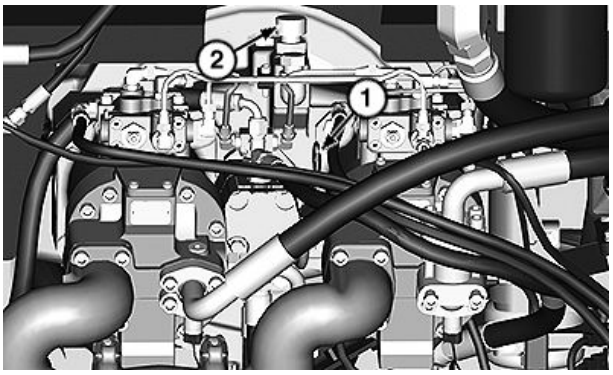
Check Pump Drive Gear Case Oil Level

1. Park machine on a level surface.

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

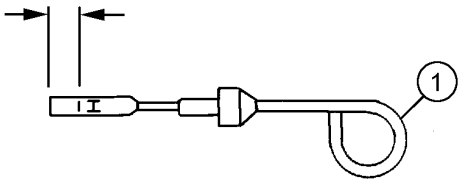
2. Run engine at slow idle speed without load for 5 minutes.
3. Stop engine.
4. Open enclosure door to access pump drive gear case. See Open Access Doors for Service. (Section 3-2.)
5. Remove dipstick (1). Wipe dipstick clean and insert completely into tube.
6. Remove dipstick. Oil level must be approximately halfway below the H mark. Insert dipstick.
7. If necessary, remove fill plug (2) and add oil. See Pump Drive Gear Case Oil. (Section 3-1.)
8. Install fill plug.
9. Check oil level on dipstick.
10. Close enclosure door.

1— Dipstick **2— Fill Plug**



Pump Drive Gear Case

TX1211199 —UN—18FEB16



Dipstick

T145092 —UN—31AUG01

KR46761,0001109 -19-11APR16-1/1

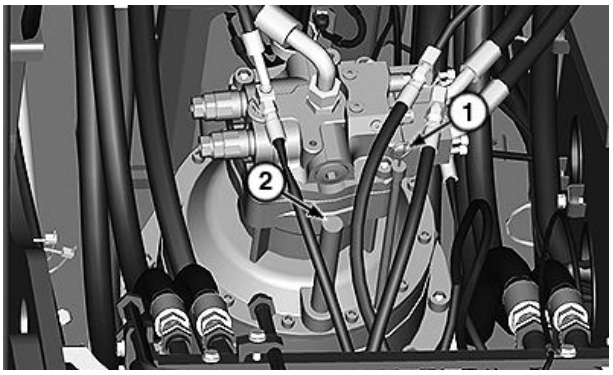
Drain and Refill Swing Gear Case Oil

1. Park machine on a level surface.

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

2. Run engine at slow idle speed without load for 5 minutes.
3. Stop engine.
4. Remove plug mounted on end of drain pipe to drain oil into a container. Dispose of waste oil properly.
5. Install plug.
6. Remove filler cap (2) and add oil. See Swing Gear Case and Travel Gear Case Oils. (Section 3-1.)

Specification	
Swing Gear Case Oil—Capacity	11.7 L 3.1 gal



TX1211019 —UN—17FEB16

Swing Gear Case

1— Dipstick **2— Filler Cap**

7. Install filler cap.
8. Check oil level on dipstick (1).

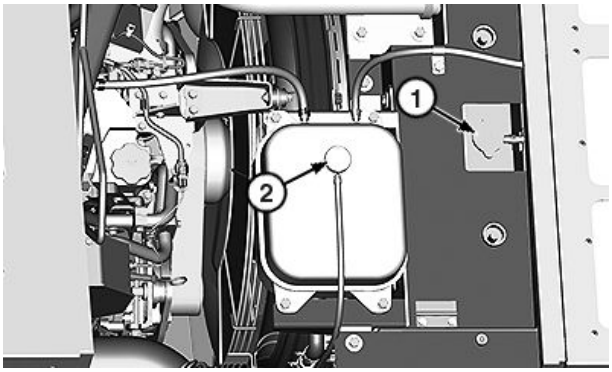
KR46761,000110F -19-24MAR16-1/1

Drain, Flush, and Refill Engine Cooling System

Drain Cooling System

TS281 —UN—15APR13

Pressurized Fluids



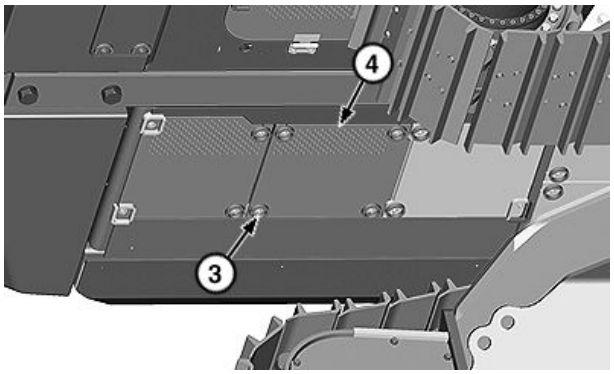
TX1226297 —UN—17OCT16

Surge Tank Cap and Radiator Cap

1. Open both engine covers.
2. Check coolant hoses for cracks and leaks. Replace if necessary.
3. Check radiator, charge air, and oil cooler for dirt, grease, leaks, and loose or broken mountings. Clean radiator, charge air, and oil cooler fins. See Clean Radiator, Oil Cooler, Charge Air Cooler, and Fuel Cooler. (Section 3-9.)

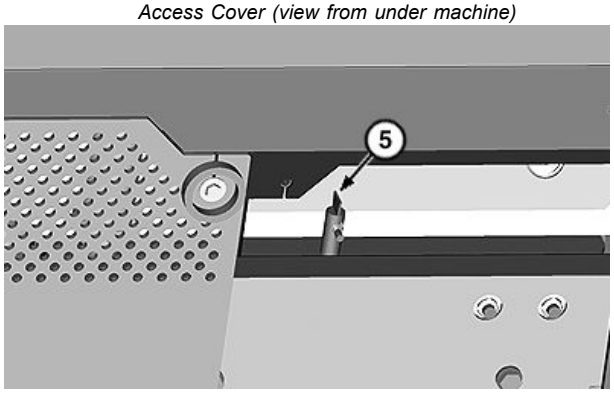
CAUTION: Prevent possible injury from hot, spraying fluids. Shut off engine. Remove radiator cap (1) only when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

4. Remove radiator cap (1) to relieve pressure and remove surge tank cap (2).
5. Underneath left side of machine, remove cap screws (3) and access cover (4).
6. Turn drain valve (5) counterclockwise to open. Allow coolant to drain into a container. Dispose of waste coolant properly.
7. Close drain valve.



TX1226302 —UN—17OCT16

Access Cover (view from under machine)



TX1226303 —UN—17OCT16

Drain Valve (view from under machine)

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

Continued on next page

KR46761,00013DD -19-21DEC16-1/4

Drain and Refill Enclosure Door and Cab Tilt Oil

Rear Entry Cab

CAUTION: Prevent possible injury. The maximum load on the open enclosure door is not to exceed 250 kg (550 lb).

Prevent possible injury from door closing. Ensure door is secured in the open position.

1. Park machine on a level surface.

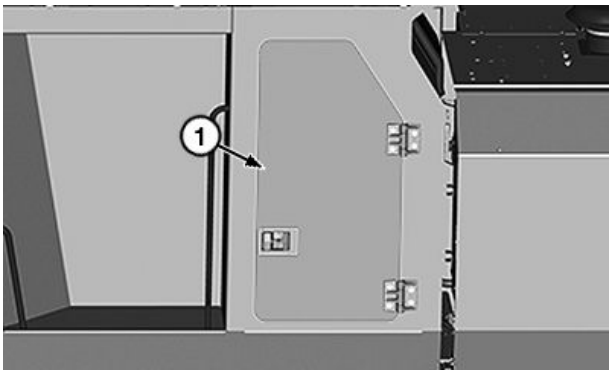
CAUTION: Turbocharger can be damaged if procedure to shut down engine is not done properly.

2. Run engine at slow idle speed without load for 5 minutes.
3. Stop engine.
4. Open cab service door (1) to access the enclosure door and cab tilt hydraulic pump.
5. Open fill cap (3).
6. Remove drain plug (4) and allow oil to drain into a container. Dispose of waste oil properly.
7. Install drain plug.
8. Remove fill cap and add oil. See Enclosure Door and Cab Tilt Oil. (Section 3-1.)

Specification

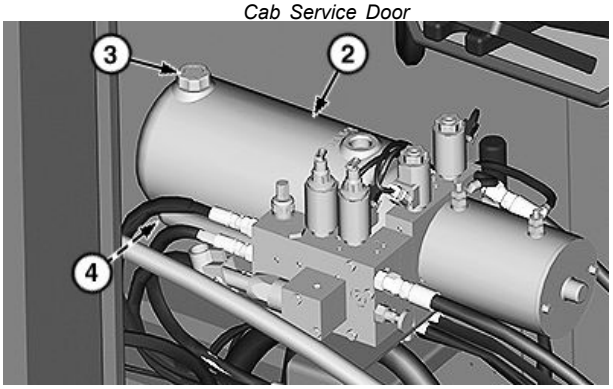
Enclosure Door and Cab Tilt Tank Oil—Capacity	3.3 L 3.4 qt

9. Install fill cap.



Cab Service Door

TX1213788 —UN—26APR16



Enclosure Door and Cab Tilt Hydraulic Pump

TX1214917 —UN—18MAY16

1— Cab Service Door
2— Enclosure Door and Cab Tilt Oil Tank
3— Fill Cap
4— Drain Plug

10. Check oil level on enclosure door and cab tilt oil tank. Oil level must be at FILL line.
11. Close cab service door.

Continued on next page

KR46761,000116D -19-31MAY16-1/2

JDLink™ Machine Monitoring System (MMS)—If Equipped

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

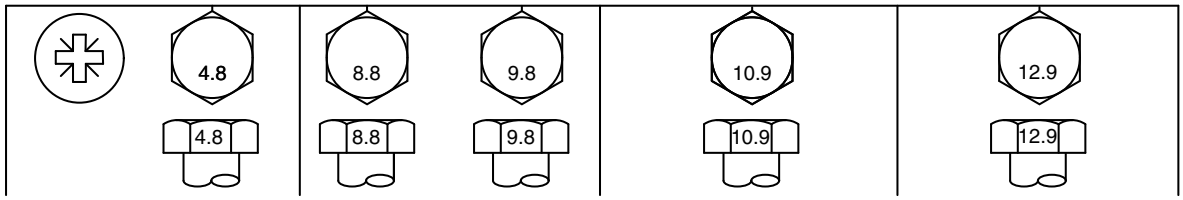
For more information, see an authorized Hitachi dealer or visit www.deere.com (browse to Construction, Services and Support, JDLink™).

JDLink is a trademark of Deere & Company

KR46761,0001411 -19-03NOV16-1/1

Metric Bolt and Screw Torque Values

TS1742 —UN—31MAY18



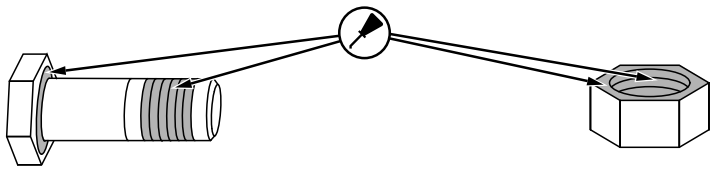
Bolt or Screw Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]	
	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in
M6	3.6	31.9	3.9	34.5	6.7	59.3	7.3	64.6	9.8	86.7	10.8	95.6	11.5	102	12.6	112
									N·m	lb·ft	N·m	lb·ft	N·m	lb·ft	N·m	lb·ft
M8	8.6	76.1	9.4	83.2	16.2	143	17.6	156	23.8	17.6	25.9	19.1	27.8	20.5	30.3	22.3
			N·m	lb·ft	N·m	lb·ft	N·m	lb·ft								
M10	16.9	150	18.4	13.6	31.9	23.5	34.7	25.6	46.8	34.5	51	37.6	55	40.6	60	44.3
	N·m	lb·ft														
M12	—	—	—	—	55	40.6	61	45	81	59.7	89	65.6	95	70.1	105	77.4
M14	—	—	—	—	87	64.2	96	70.8	128	94.4	141	104	150	111	165	122
M16	—	—	—	—	135	99.6	149	110	198	146	219	162	232	171	257	190
M18	—	—	—	—	193	142	214	158	275	203	304	224	322	245	356	263
M20	—	—	—	—	272	201	301	222	387	285	428	316	453	334	501	370
M22	—	—	—	—	365	263	405	299	520	384	576	425	608	448	674	497
M24	—	—	—	—	468	345	518	382	666	491	738	544	780	575	864	637
M27	—	—	—	—	683	504	758	559	973	718	1080	797	1139	840	1263	932
M30	—	—	—	—	932	687	1029	759	1327	979	1466	1081	1553	1145	1715	1265
M33	—	—	—	—	1258	928	1398	1031	1788	1319	1986	1465	2092	1543	2324	1714
M36	—	—	—	—	1617	1193	1789	1319	2303	1699	2548	1879	2695	1988	2982	2199

The nominal torque values listed are for general use only with the assumed wrenching accuracy of 20%, such as a manual torque wrench.
DO NOT use these values if a different torque value or tightening procedure is given for a specific application.
For lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application.

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 that fastener threads are clean.
- Apply a thin coat of Hy-Gard™ or equivalent oil under the head and on the threads of the fastener, as shown in the following image.
- Be conservative with the amount of oil to reduce the potential for hydraulic lockup in blind holes due to excessive oil.
- Properly start thread engagement.

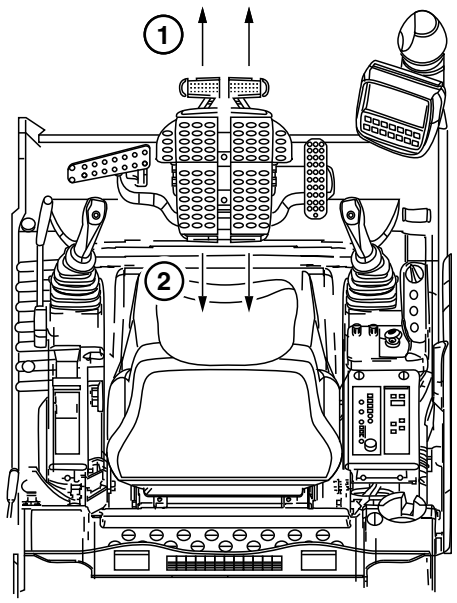
TS1741 —UN—22MAY18



[a]Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.
[b]Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.

DX,TORQ2 -19-30MAY18-1/1

Travel Lever and Pedal Neutral Checks



TX1093760 —UN—31AUG11

Travel Lever and Pedal

1— Forward
2— Rearward

Push both travel levers and pedals forward (1), then release.

Pull both travel levers and pedals rearward (2), then release.

FEEL: Do levers and pedals require equal effort to operate in forward and reverse?

LOOK: Do levers and pedals return to neutral at the same time when released?

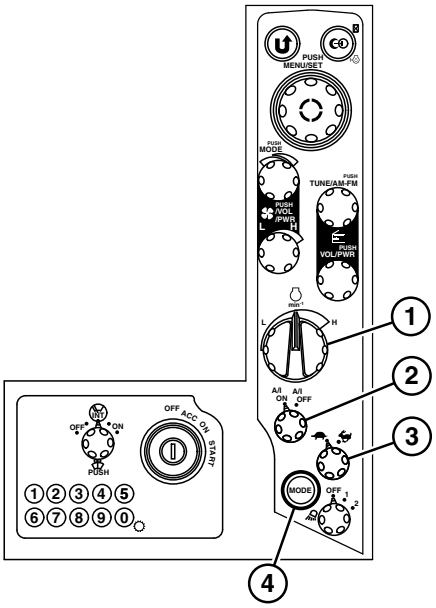
YES: Go to next check.

NO: See an authorized Hitachi dealer.

Continued on next page

KR46761,000141E -19-15JUL19-14/48

Auto-Idle Circuit Check



TX1086753 —UN—11JAN11

Switch Panel

1— Engine Speed Dial
2— Auto-Idle Switch
3— Travel Mode Switch
4— Power Mode Button

Turn engine speed dial (1) to H (fast idle) position.

Press power mode button (4) until H/P (high power) mode is displayed on monitor.

Turn auto-idle switch (2) to A/I OFF.

Place pilot shutoff lever to unlocked (DOWN) position.

Turn auto-idle switch to A/I ON.

LOOK/LISTEN: Does engine speed decrease after 4—6 seconds?

YES: Go to next check.

Slowly actuate dig function.

NO: Check solenoid 20 A fuse (marked SOLENOID) (F4). See Replacing Fuses. (Section 4-1.)

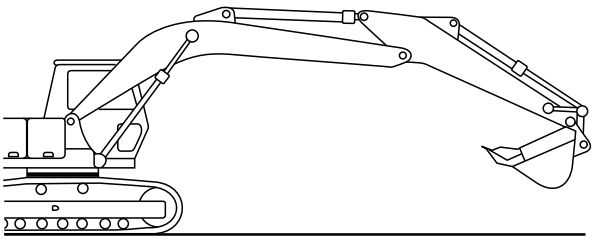
LOOK/LISTEN: Does engine speed return to fast idle?

IF OK: See an authorized Hitachi dealer.

Continued on next page

KR46761,000141E -19-15JUL19-25/48

Dig Function Drift Check



TX1095487 —UN—28JUN13

Machine Position

Fill the bucket with dirt to specification, if applicable.

Specification

Loaded Bucket—Weight (approximate)..... 2100 kg
4630 lb

Position attachment at maximum reach with attachment pivot pin at same height as boom pivot pin.

Retract arm cylinder, then extend approximately 50 mm (2 in).

Extend attachment cylinder, then retract approximately 50 mm (2 in).

Stop engine.

Measure amount cylinders extend or retract in 5 minutes.

Measure distance from bottom of attachment to ground.

Compare measurements to specifications.

Dig Function Drift—Specification

Boom Cylinder—Drift..... 20 mm
0.79 in

Arm Cylinder—Drift..... 30 mm
1.18 in

Attachment Cylinder (if applicable)—Drift..... 20 mm
0.79 in

Bottom of Attachment-to-Ground—Drift..... 150 mm
5.91 in

LOOK: Is cylinder drift within specification?

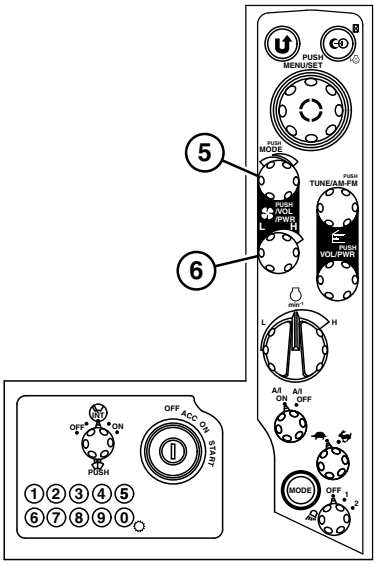
YES: Go to next check.

NO: See an authorized Hitachi dealer.

Continued on next page

KR46761,000141E -19-15JUL19-35/48

Heater and Air Conditioner Circuit Check



TX1086866 —UN—13JAN11

Switch Panel

5— Temperature Control/Mode Switch
6— Blower Speed Switch

Start engine and warm to normal operating temperature.

Turn temperature control/mode switch (5) clockwise to maximum heat position.

FEEL: Does warm air come from the vents?

Turn temperature control/mode switch counterclockwise to maximum cold position.

YES: Checks complete.

LISTEN: Does air conditioner compressor clutch solenoid "click"?

NO: Heater does not operate. Check air conditioner and heater 20 A fuse (marked HEATER) (F3). See Replacing Fuses. (Section 4-1.)

FEEL: Does cool air come from the vents?

IF OK: See an authorized Hitachi dealer.

Continued on next page

KR46761,000141E -19-15JUL19-46/48

Symptom	Problem	Solution
	Water in oil	Drain hydraulic tank and refill with oil.
	Air leak in oil line from reservoir	Repair leak.
	Kinks or dents in oil lines	Inspect and correct.
No Swing Function	Pilot shutoff lever	Place pilot shutoff lever in unlocked (DOWN) position.
	Pilot control valve hoses pinched or kinked	Inspect and correct.
Swing Function is Jerky	Lack of grease in swing bearing	Fill with grease.
	Rocks or mud jammed in track frame	Remove and repair.
Slow Travel Speed Only	Pilot control valve hoses pinched or kinked	Inspect and correct.
	Cold oil	Perform hydraulic warm-up procedure.
Travel is Jerky	Engine speed too slow	Increase engine speed.
	Track sag adjustment	Adjust track sag.
	Rocks or mud jammed in track frame	Remove and repair.
Engine Stops When Travel or Control Lever Actuated	Air filters restricted or dirty	Replace air filter elements.
	Fuel filters restricted	Replace filters. Bleed air. Clean fuel tank inlet screen.
	Air in fuel system	Bleed air. See Bleed Fuel System. (Section 4-1.)

KR46761,0000C45 -19-19MAY16-2/2

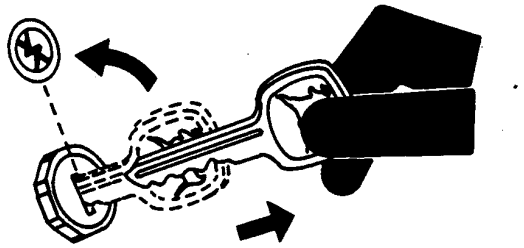
Front Attachments Electrical Controls

Symptom	Problem	Solution
Function Does Not Work	Controller switch	See an authorized Hitachi dealer.
	Relay	See an authorized Hitachi dealer.
	Solenoid	See an authorized Hitachi dealer.
	Connector	See an authorized Hitachi dealer.

KR46761,00013A3 -19-22SEP16-1/1

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 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 an authorized Hitachi dealer of any losses.



TS230 —UN—24MAY89

Key Lock

KR46761,00013B9 -19-21OCT16-1/1

Lift Capacity—Undercarriage: 2690 mm (8 ft 10 in)

Ratings are measured with machine 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 asterisk (*) are hydraulically limited capacities. Remaining figures are stability-limited capacities.

NOTE: Lift capacities are listed in kg (lb).

Arm: 3.1 m (10 ft 2 in)	**Bucket: 1034 kg (2280 lb)**			**Shoe: 710 mm (28 in)**
Power Boost: On				
LIFTING OVER FRONT				
Load Point Height	**Horizontal Distance From Center Line of Rotation**			
m (ft)	**3.0 (10)**	**4.5 (15)**	**6.0 (20)**	**7.5 (25)**	**9.0 (30)**
7.5 (25)			6900* (15 300*)		
6.0 (20)		8300* (18 200*)	7300* (16 200*)	6800* (15 100*)	
4.5 (15)	15 500* (34 200*)	10 300* (22 700*)	8300* (18 200*)	7200* (15 900*)	
3.0 (10)		12 800* (28 100*)	9400* (20 700*)	7800* (17 100*)	6900* (15 100*)
1.5 (5)		14 400* (31 800*)	10 400* (22 800*)	8300* (18 200*)	7000* (15 400*)
Ground Line	21 100* (46 600*)	14 800* (32 600*)	10 800* (23 800*)	8500* (18 800*)	
-1.5 (-5)	19 700* (43 400*)	14 200* (31 300*)	10 600* (23 400*)	8300* (18 200*)	
-3.0 (-10)	17 000* (37 400*)	12 600* (27 800*)	9600* (21 100*)		
LIFTING OVER SIDE					
Load Point Height	**Horizontal Distance From Center Line of Rotation**				
m (ft)	**3.0 (10)**	**4.5 (15)**	**6.0 (20)**	**7.5 (25)**	**9.0 (30)**
7.5 (25)			6900* (15 300*)		
6.0 (20)		8300* (18 200*)	7300* (16 200*)	6800* (15 100*)	
4.5 (15)	15 500* (34 200*)	10 300* (22 700*)	8300* (18 200*)	7200* (15 900*)	
3.0 (10)		12 800* (28 100*)	9400* (20 700*)	7800* (17 100*)	6000 (13 200)
1.5 (5)		14 400* (31 800*)	10 300* (22 600*)	7600* (16 700*)	5900 (13 000)
Ground Line	21 100* (46 600*)	14 800* (32 600*)	10 000* (22 000*)	7400* (16 300*)	
-1.5 (-5)	19 700* (43 400*)	14 200* (31 300*)	9900* (21 800*)	7400* (16 200*)	
-3.0 (-10)	17 000* (37 400*)	12 600* (27 800*)	9600* (21 100*)		

* Hydraulically Limited Capacities

KR46761,00010F4 -19-16DEC16-1/1