MODEL - 460LX Tier III
SERIES LX Series
BOOK NO 1141
SERIAL NO. _____

This manual is for 460 LX excavator with a manufacturer's number of 460Q3 6001 and up. Due to EPA emission regulations the engine was changed in these machines. For machines with a 460Q3 1001-5999 please use the operator's manual book number 1034.

Litho in USA -01/07

IDENTIFICATION NUMBERS

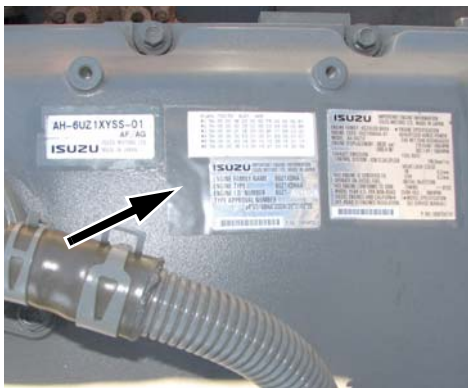
TYPE, SERIAL NUMBER AND YEAR OF MANUFACTURER

When ordering parts, obtaining information or assistance, always supply your authorized LBX Link-Belt dealer with the type and serial number of your machine or accessories.

Write the following in the spaces below: The model number, serial number and manufacturer number of your machine, accessories and the serial numbers of the various hydraulic and mechanical components.

Machine

Engine



Excavator Identification

Serial number.....
Manufacturer number.....

Engine Identification

Make and type.....
Serial number.....

Component serial numbers

Hydraulic pump .....
Swing motor .....
Travel motor.....
Main control valve .....
Swing gearcase.....
Travel gearcase .....

- To avoid spilling fuel maintain control of the fuel filler nozzle when filling the tank.
- Do not fill the fuel tank completely to the top. Allow room for expansion.
- Clean up spilled fuel immediately and dispose of contaminated material in an environmentally correct manner.
- Tighten the fuel tank cap securely. Should the fuel cap be lost, replace it only with the original manufacturers approved cap. Use of a non-approved cap without proper venting may result in pressurization of the tank.
- Never use fuel for cleaning purposes.
- Use the correct fuel grade for the operating season.

Burn Prevention

WARNING: *BATTERY ACID CAUSES SEVERE BURNS. Batteries contain sulfuric acid. Avoid contact with skin, eyes or clothing.*

Antidote: EXTERNAL - Flush with water.

Antidote: INTERNAL - Drink large quantities of water or milk.

***DO NOT** induce vomiting. Seek medical attention immediately.*

EYES - Flush with water for 15 minutes and seek medical attention immediately.

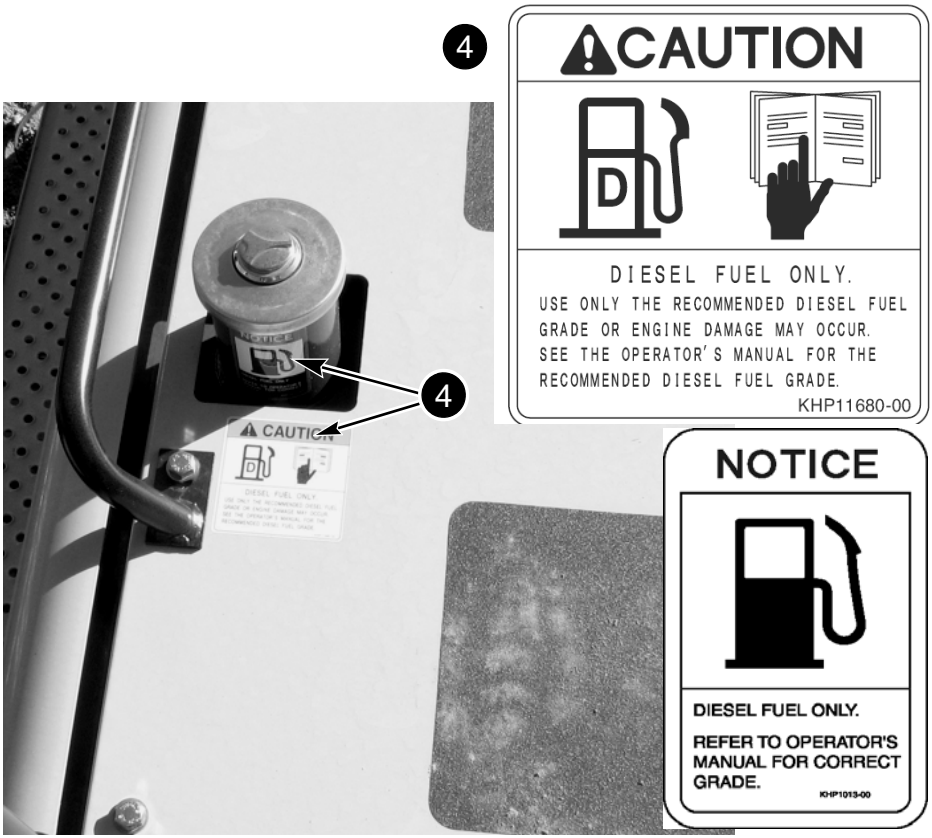
WARNING: *BATTERIES PRODUCE EXPLOSIVE GASES. Keep sparks, flame, cigars and cigarettes away. Ventilate when charging or using in enclosed area. Always wear eye protection when working near batteries. Wash hands after handling. KEEP OUT OF REACH OF CHILDREN.*

M144B

- When the battery electrolyte is frozen, the battery can explode if, you try to charge the battery, or you try to jump start and run the engine. To prevent the battery electrolyte from freezing, try to keep the battery at full charge. If you do not follow these instructions, you or others in the area can be injured
- Hot coolant can spray out if the radiator cap is removed. To remove the radiator cap, let the cooling system cool, turn to the first notch, wait until the pressure is released, then remove the radiator cap.

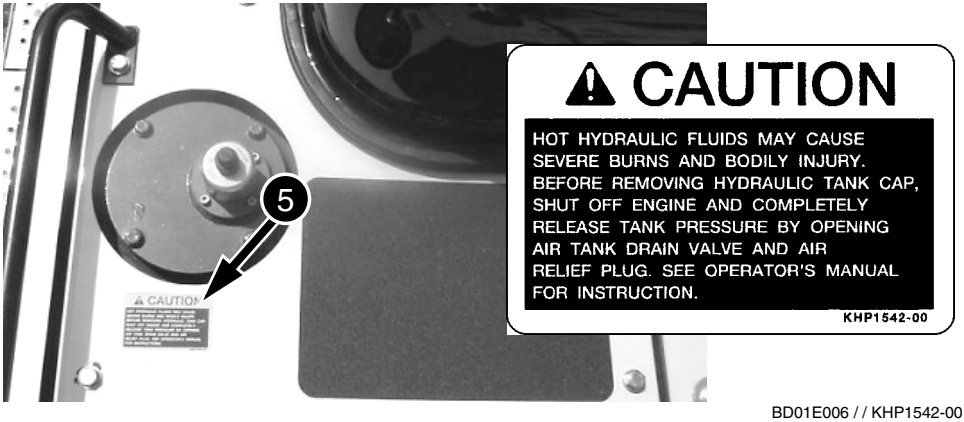
Hazardous Chemical Precautions

- If you are exposed to or come in contact with hazardous chemicals you can be seriously injured. The fluids, lubricants, paints, adhesives, coolants, etc., used with your machine can be hazardous.
- Material Safety Data Sheets (MSDS) provide information about the chemical substances within a product, safe handling procedures, first aid measures and procedures to be taken when the product is accidentally spilled or released. MSDS are available from your dealer.



BD02D098 / KHP1013-00

These decals instructs the operator to use diesel fuel only and to check the operator's manual for the recommended fuel grade.



BD01E006 / / KHP1542-00

This decal warns the operator to release hydraulic pressure correctly before removing the cap.

BI97D020

RAISE LOAD OR TOOL SLOWLY

BI97D026

LOWER LOAD OR TOOL SLOWLY

BI97D034

TURN MACHINE LEFT SWING LOAD LEFT

To stop movement, stop moving hand and make a fist.

BI97D033

TURN MACHINE RIGHT SWING LOAD RIGHT

To stop movement, stop moving hand and make a fist.

BP97D057

RAISE BOOM

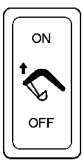
BI97D055

LOWER BOOM

1. CONTROL ARM TILT ADJUSTMENT AND FUNCTION CANCELLATION - This lever makes it possible for the operator to adjust the tilt angle of the control arm to suit his convenience. Raise the lever and hold it in this position. Tilt the control arm to the required position and then release the lever. This lever also makes it possible to raise the control arm completely, so as to cancel all machine functions.
2. GATE LOCK LEVER - This lever makes it possible for the operator to cancel the machine functions without having to raise the control arm. It is also used to operate gate lock.
3. GATE LOCK - The purpose of this bar is to prevent the operator leaving the operator's compartment without first raising the gate lock lever.
4. HORN - To operate the horn, press the button of the top of the left-hand control lever.

IMPORTANT: *Always sound the horn before operating the machine.*

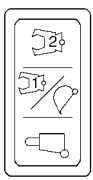
5. ASHTRAY - Pull the ashtray upwards to empty it.
6. BOOM RAISING PRIORITY - This is a two - position switch which can be used during loading operations to ensure faster boom raising when the upperstructure swing function is being used. In the "ON" position a message will be displayed see "Systems display and control panel" (item 10) and priority is given to boom raising. In "OFF" position boom raising and upperstructure swing function as normally



NOTE: *OFF" position is automatically selected each time the engine is started.*

7. FAN REVERSE SWITCH - This switch allows the fans to run in reverse so that the fine dust particles clogged in the radiator screen, radiator fin, and oil cooler fin can be removed. To start the reverse fan the key switch must be off. When the fan is reversed, a buzzer sounds and all controls are disabled. To return to normal rotation, turn the key back to off.

8. OPTION CONTROL (OPTIONAL)- This is a three position control for operating optional accessories such as hydraulic breakers, concrete crushers, shears, etc. Place the control in the position corresponding to accessory to be used. See "Auxiliary hydraulic circuits" in the "Operating Instructions" Section.



NOTE: *OFF" position is automatically selected each time the engine is started.*

9. TRAVEL ALARM SWITCH - There are two settings for the travel alarm. In CONT the alarm sounds constantly while the machine is in motion. In AUTO OFF the alarm sounds for 15 seconds then goes off. Each time you release the travel pedals and start again the alarm will sound for 15 seconds.

Using the anti-theft device

The anti-theft device has to be actuated when you are shutting down the engine.

To activate the device:

1. Turn the starter switch from “ON” to “OFF”, “ON” to “OFF” for about 2 seconds at a time until the audible alarm device sounds.

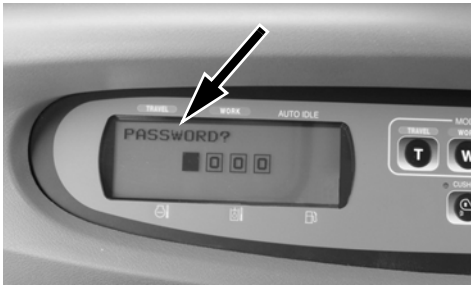
The anti-theft device is now operational and before being able to start the engine you will have to enter the access code.

You do not have to use the anti-theft device when shutting off the machine. If you so wish, when shutting down the engine, simply place the starter switch key in the “OFF” position and it will not be necessary to enter the access code to start the engine.

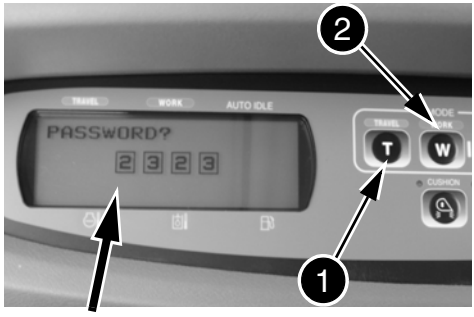
Entering the access code

If the anti-theft device was activated the last time the engine was shut down, then it will be necessary to enter the access code before being able start it again.

1. Place the starter switch key in the “ON” position.



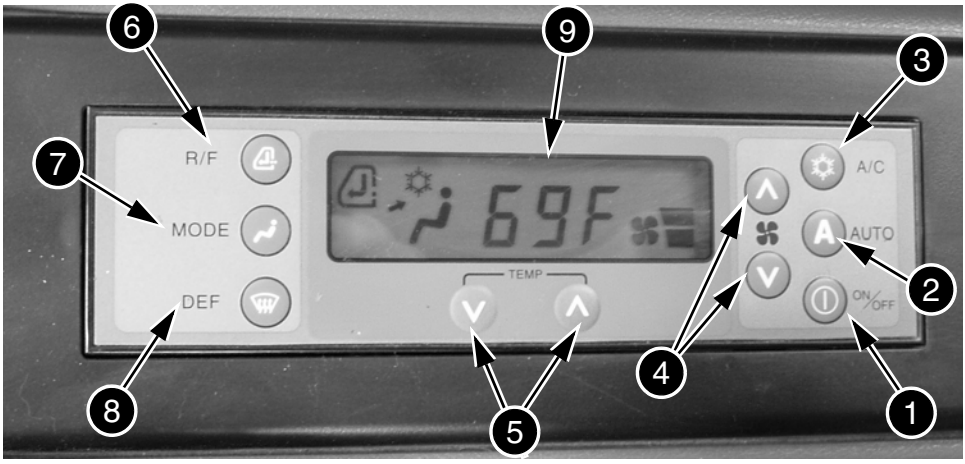
The message “Password” and four boxes will appear on the display screen.



2. To enter the code (e.g. 1234), press button (1) the same number of times as the digit selected (e.g once) then press button (2) to proceed to the second digit.
3. Press the button (1) same number of times as the second digit (e.g. twice) and then press button (2) to proceed to the third digit. Repeat the procedure for the third and fourth digits.

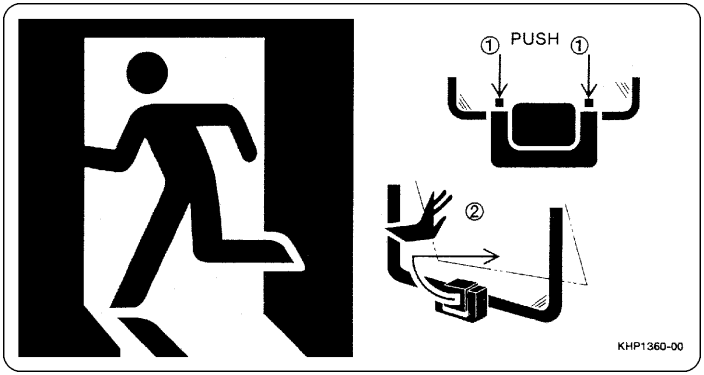
Heating and ventilation or air conditioning controls

These controls are located on the right-hand control arm.



1. On/Off
2. Automatic
3. Air conditioning
4. Fan Speed
5. Temperature
6. Recycle / Fresh Air
7. Air flow direction control
8. Windshield defroster
9. Display screen

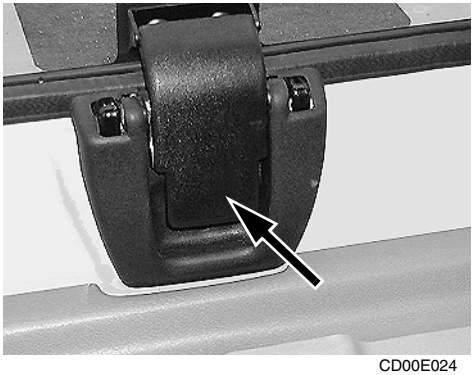
REAR WINDOW AND EMERGENCY EXIT



KHP1360-00

Opening

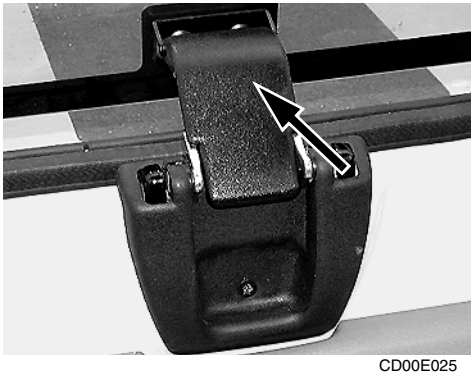
STEP 1



CD00E024

Pull the handle upwards.

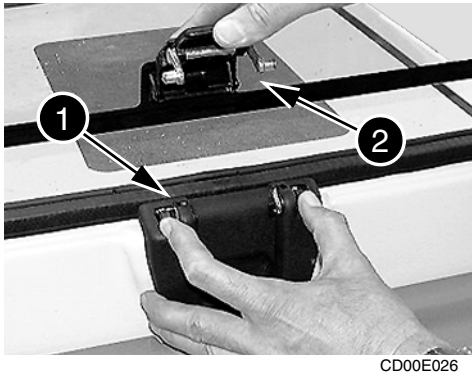
STEP 2



CD00E025

Push back the handle to open the window partially.

STEP 3



CD00E026

To open the window completely, release the pin (2) from the locking studs (1).

NOTE: The window can not be fastened in this position.

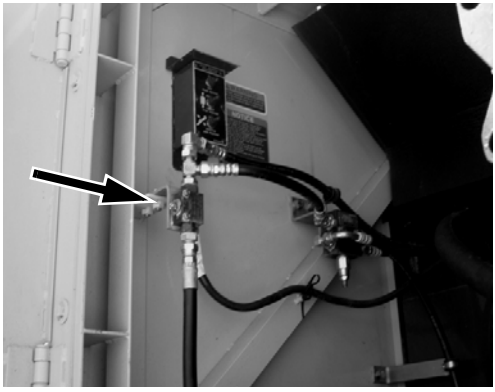
SELF-DETACHING COUNTERWEIGHT CONTROL BOX (optional)

CD01D035

1. ON/OFF
2. RAISE/LOWER
3. UP/DOWN

See “Self-detaching counterweight” in the “Operating Instructions” Section.

SELF-DETACHING COUNTERWEIGHT CIRCUIT SUPPLY VALVE (optional)



This valve is used to supply or shut off the flow of oil to the self-detaching counterweight circuit.

See “Self-detaching counterweight” in the “Operating Instructions” Section.

BRINGING THE MACHINE UP TO OPERATING TEMPERATURE

IMPORTANT: *Normal operating temperature of the hydraulic fluid is between 50° C and 80° C (122-176F), in the middle of the temperature indicator. If the machine is used with the hydraulic fluid at a temperature below 20° C (68F), then damage can be caused.*

After starting the engine and before using the machine, allow the hydraulic fluid to reach a temperature of 20° C(68F), as indicated by the appearance of the first bar segment on the hydraulic fluid temperature indicator. See item 8 under “Systems display and control panel” in the “Controls/Instruments/Accessories” Section.

Idle - Start

At start-up the engine speed defaults to low idle regardless of throttle position. This prevents over speeding a cold engine and extends its service life.

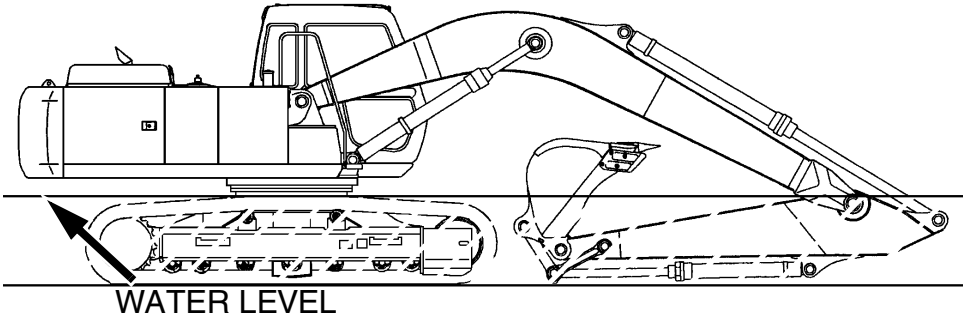
Auto engine warm-up

Once the engine has started, the warming-up process begins automatically. At first, engine speed is held at a pre-determined, low level. As the temperature increases, engine speed increases in proportion. It is possible to interrupt the warming-up process at any time, simply by manually changing engine speed or by operating one of the control levers. Warming-up takes approximately 5 to 10 minutes.

Engine manual warm-up

With the engine throttle button a quarter open, start the engine and allow it to run approximately for 5 to 10 minutes. When the coolant temperature increases, carry out the hydraulic fluid warm-up procedure.

OPERATING THE MACHINE IN WATER



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1. Make sure that the bottom of the stream, or stretch of water in which you will work, can support the weight of the machine.

2. Only the undercarriage must be below water level. The water may come up to the top of the tracks but no higher.

IMPORTANT: *Never work in water if the water level is higher than the tracks.*

3. Before working in water, grease the attachment linkage, turntable bearing and turntable bearing teeth generously.

IMPORTANT: *Do not operate in a fast flowing stream.*

OPERATING ON SLOPING GROUND

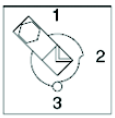
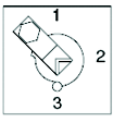
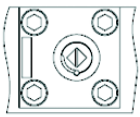
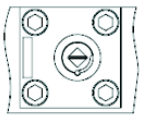
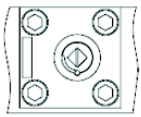
WARNING: *Hillside operations can be dangerous. Rain, snow, ice, loose gravel, soft ground, etc... modify terrain conditions. It is up to you to decide if the machine can be used in perfect safety.*

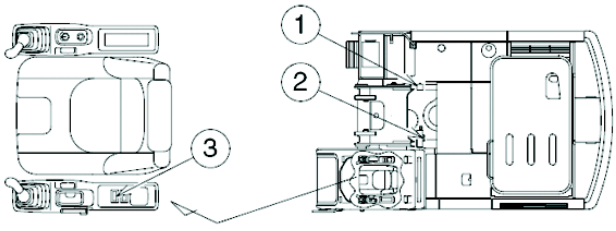
- During hillside operations, be extra careful.
- Make sure the upper structure swing is in locked position and that low travel speed is selected.
- When digging on a slope, avoid swinging the upper structure towards the bottom of the slope with the bucket full. Always keep the travel reduction gears pointing down towards the bottom of the slope.
- Always travel in the same direction as the slope, to prevent the machine from turning over.

AUXILIARY HYDRAULIC (OPTIONAL)

Your machine has two types of auxiliary hydraulic circuits. One circuit is for single flow equipment, such as hydraulic breakers. The second circuit is for single flow or double flow continuous flow equipment, or double flow equipment such as crushers. Consult your authorized LBX Link-Belt dealer for instructions on how to select the correct pressure for the optional tool.

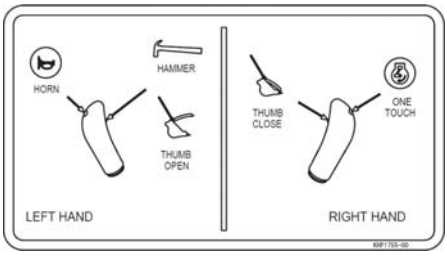
3 WAY VALVE & STOP VALVE & SWITCH SETTINGS

MODE	DIGGING	BREAKER	CRUSHER
① VALVE ; 3WAY	NO USE [EITHER POSITION]		
② VALVE ; STOP			
③ SWITCH (ON THE LEFT CONSOLE)	 ····· CRUSHER MODE (2 PUMP) ····· DIGGING & CRUSHER MODE (1 PUMP) ····· BREAKER MODE		



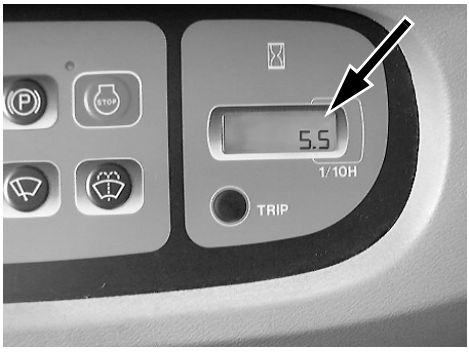
KSP0857

Be sure to follow the label above to ensure the proper positions of both of the valves.



KHP1755

HOURMETER



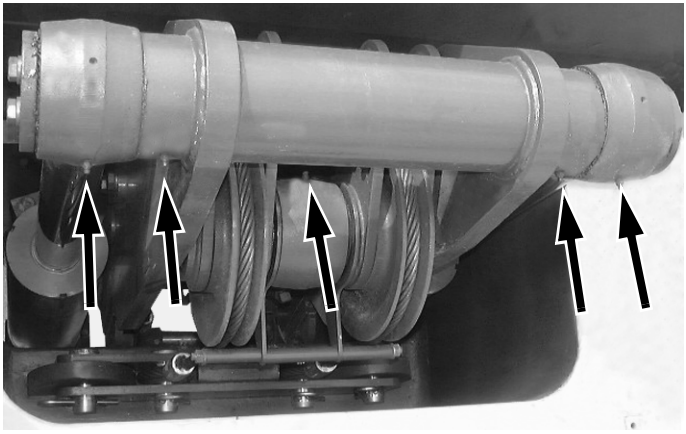
The hourmeter enables service operations to be scheduled. It displays the total time that the engine has been operated, in hours and tenths of an hour.

Servicing intervals are carefully calculated to guarantee safe and efficient machine operation.

Be sure to carry out all the servicing operations properly as defined in this manual.

GREASING THE SELF-DETACHING COUNTERWEIGHT SYSTEM (OPTIONAL)

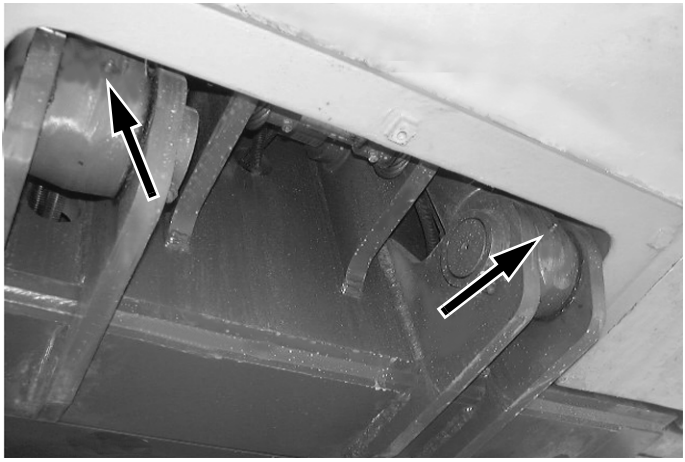
Every 1000 hours



CD01D038

Cylinder top pins ..... (3)

Every 1000 hours



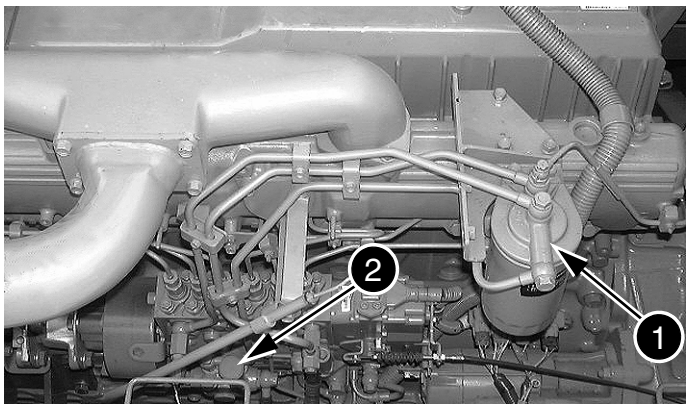
CD01D039

Cylinder bottom pins ..... (3)

BLEEDING THE SYSTEM

It is necessary to bleed the fuel system when :

- The tank has been completely emptied.
- The fuel filter has been replaced.
- Parts of the fuel system have been removed for servicing or repair work.
- The machine has been in storage for a fairly long period.



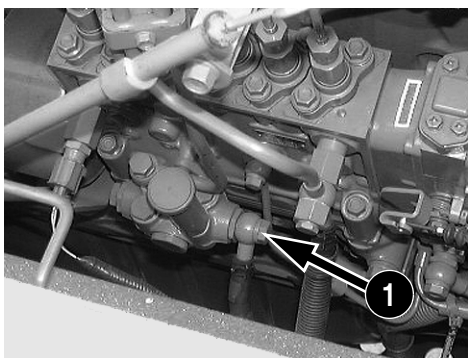
CD01C176

To Bleed the System:

1. Loosen the knob of the priming pump (2). Loosen the air bleed screw (1). Move the handle of the priming pump (2) up and down until no bubbles come out of the air bleed screw (1).
2. When bubbles no longer come out, tighten the air bleed screw (1) and tighten the knob of the priming pump (2). Completely wipe off any spilled fuel. Start the engine and check for fuel leakage.

> ⚠ **WARNING:** *Completely wipe off any spilled fuel after replacing a filter element or bleeding the system.*

Cleaning the Priming Pump Screen



CD01D047

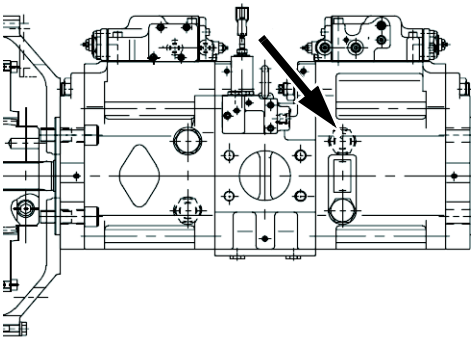
The screen is located inside the jackscrew (1).

1. Remove the screen, clean it with compressed air and then rinse it in clean fuel.

BLEEDING AIR FROM THE HYDRAULIC COMPONENTS

IMPORTANT: *After bleeding air from the components, stop the engine for five minutes and check there are no bubbles at the surface of the hydraulic fluid in the reservoir.*

Hydraulic pump



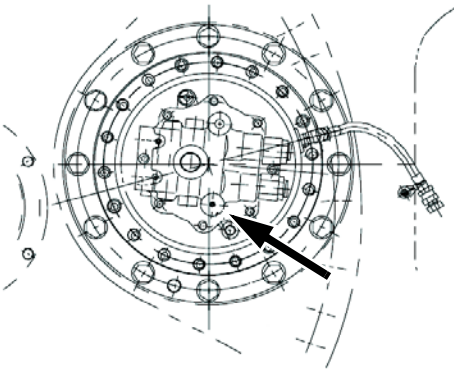
CD01D053

1. Clean the top of the pump and the air bleed plug with solvent and remove the air bleed plug.
2. Fill the pump with new clean hydraulic fluid. Install and tighten the air bleed plug.
3. Start the engine and run at idle speed.
4. Loosen the air bleed plug on the pump. Tighten the plug when air free fluid comes out of the bleed plug hole. Clean the area completely.

Attachment cylinders

Start and run the engine at low idle speed. Extend and retract the attachment cylinder rods four or five times without bringing them to end of stroke. Then repeat the operation three or four times, this time bringing the cylinder rods to end of stroke.

Hydraulic swing motor



CD01D175

1. Loosen the fitting on the top of the swing reduction gear to release any air.
2. Tighten the fittings when air free oil comes out of the plug hole.
3. After the warm up procedure is completed, move each control slowly several times to remove any air in the system.
4. Swing the upperstructure evenly left to right two turns or more.
5. Stop the engine and wait five minutes.
6. Check the oil level in the hydraulic reservoir and add oil as required and check that there are no air bubbles in the hydraulic reservoir.

ADJUSTMENT/MAINTENANCE

TRACKS

Service specifications

Clean ..... Periodically and when the machine has been working in mud
Check tension ..... Periodically
Check track shoe bolt torques ..... Every 250 hours
(after the first 50 hours during the run-in period)

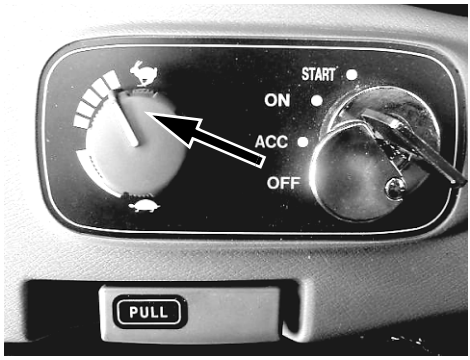
IMPORTANT: *If tracks are too tight, they wear quickly. If tracks are not tight enough, they wear quickly and the links can catch on the sprocket wheel or slide off the idler wheel or the sprocket wheel. Clean the tracks after work.*

Cleaning

When the machine has been working in mud, a drop in temperature can cause the mud to harden.

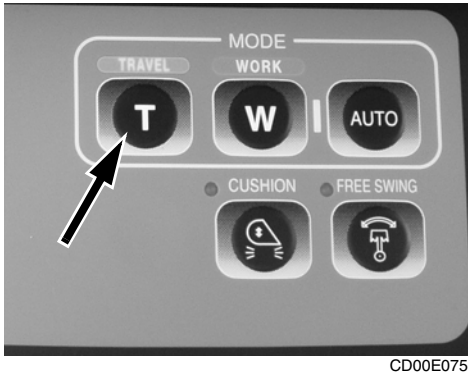
700LX469

1. Place upperstructure at right angles to the undercarriage. Use the attachment to press on ground and lower the boom until the track is raised off the ground.



BD01E057

2. Turn the engine throttle button to maximum speed position.



CD00E075

3. Use the travel speed selector to select high speed.

REPLACING A BUCKET

Removal

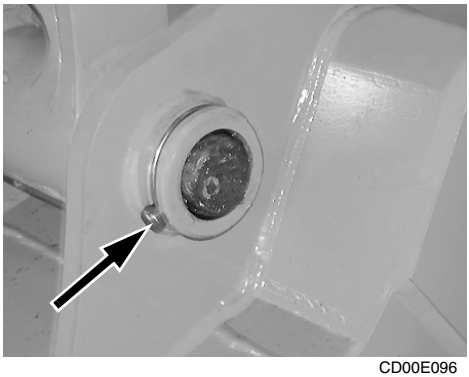
STEP 1

Place the bucket flat on flat, horizontal ground. Operate the attachment controls so that the arm/bucket linkage pin is not gripped by the weight of the dipper.

STEP 2

Stop the engine and remove the starter switch key.

STEP 3



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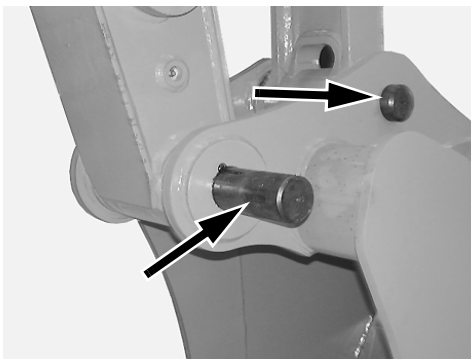
Remove the retaining rings and pins.

STEP 4



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Remove the bucket pins.

STEP 5

Start the engine, disengage the attachment from the bucket and retain the linkage seals for re-use.

Installation

STEP 1

Make sure the bucket is in a stable position.

STEP 2

Install the linkage seals on the arm bushing shoulders. Change them if necessary.

TORQUE AND SPECIFICATIONS PER COMPONENT

Component	Bolt Size	Torque (Ft.Lbs)	Torque (Nm)
Travel reduction gear (*)	M24	665-776	901-1052
Drive sprocket (*)	M24	665-776	901-1052
Upper roller (*)	M30	1314-1533	1781-2078
Lower roller (*)	M30	1314-1533	1781-2078
Chain guide (*)	M30	1230-1447	1668-1962
Track shoe	M27	1302-1591	1765-2157
Counterweight	M42	1663-1881	2256-2550
Turntable bearing	M30	1077-1254	1460-1700
Undercarriage side members	M36	1881-2169	2550-2942
Swing reduction gear (*)	M24	663-774	900-1050
Engine mounts (*)	M24	665-773	902-1049
Radiator	M20	289-361	392-490
Hydraulic pump (*)	M12	80-93	109-127
Hydraulic reservoir (*)	M20	347-418	471-568
Fuel tank (*)	M20	347-418	471-568
Control valve (*)	M20	252-289	343-392
Cab	M16	57-59	78-80

NOTE: *Use Loctite 262, or the equivalent, on bolts marked (*).*

MACHINE STORAGE

PREPARATION FOR STORAGE

The following procedure applies when the machine is to be stored for a month or more. Store the machine on flat, level ground, inside a building or, if not possible, outside and covered with a tarpaulin. Before storing the machine, carry out the following operations :

1. Clean the machine.
2. Retract the arm cylinder rod as for as possible and lower the boom until the attachment is resting on the ground.
3. Grease the machine thoroughly. The exposed surfaces of the cylinder rods should be greased or covered with a protective film. See your authorized LBX Link-Belt dealer.

NOTE: *When the machine resumes service, the film will disappear automatically.*

4. Run the reverse fan to clean the oil cooler fin and radiator fins.
5. Drain the fuel tank and fill with a mixture of 90% diesel fuel and 10% anti-corrosive oil. Run the engine at idle speed for five minutes to allow the anti-corrosive oil to reach the lines, filters, pump and injectors.
6. While the engine is still warm, drain the oil sump, fill with anti-corrosive oil and replace the engine oil filter.
7. When the engine is cold, clean the outer parts of the engine with diesel fuel.
8. Clean or replace the air filter element.
9. Drain the cooling system, leave the drain valves open and do not tighten the radiator cap.
10. Remove the batteries, clean the battery housings and make sure not to leave any traces of acid. Store the batteries in a cool, dry place, where temperature is always above freezing.
11. Paint any areas where the paintwork is not good.
12. Plug the air filter inlet and the exhaust pipe.
13. Remove the starter switch key and place a “Do not operate” label on the right-hand control arm and then raise the function cancellation lever (safety bar in inward position).
14. Lock the hoods and the cab door.