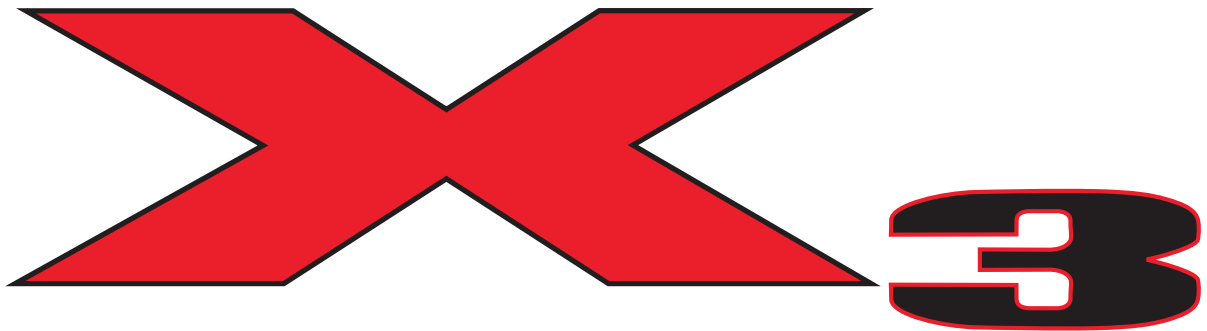


**145X3
HYDRAULIC EXCAVATOR
OPERATOR'S MANUAL**



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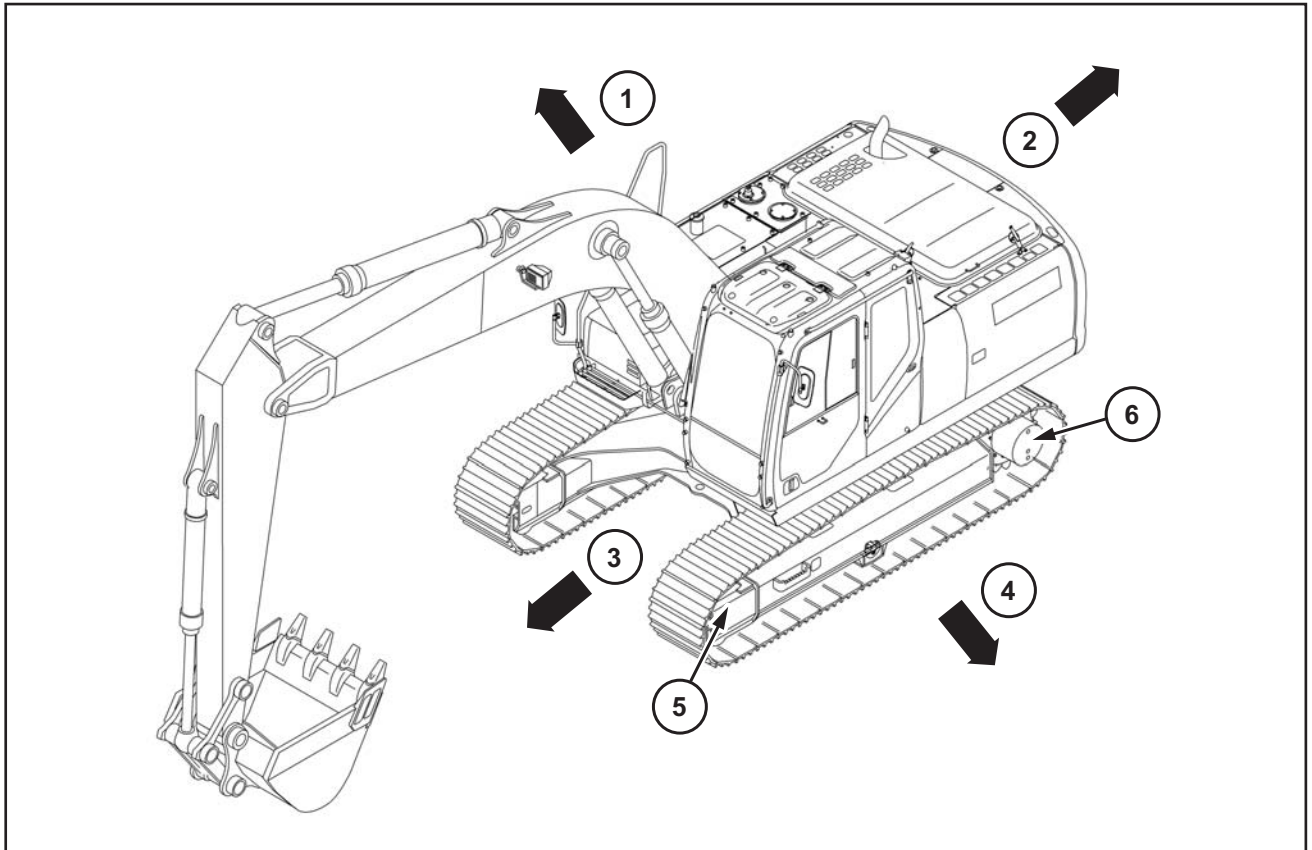
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RIGHT, LEFT, FRONT AND REAR OF THE EXCAVATOR



54F4224A

Figure 3

The terms Right-hand (1), Left-hand (4), Front (3), and Rear (2) are used in this manual to indicate the sides as they are seen from the operator's seat when the cab is over the idler wheels (5).

The illustration above shows the excavator in normal TRAVEL position. In normal TRAVEL position, the cab is over the idler wheels. The travel reduction gears (6) are at the rear of the upperstructure.

QUICK COUPLER PRECAUTIONS

- Always follow the safety procedures of the quick coupler manufacturer if you have one on your excavator. See Hydraulic Excavator Quick Coupler Operation for more details.

ENGINE PRECAUTIONS

- The fuel delivery system on the engine is under high pressure. DO NOT OPEN the high pressure fuel lines with the engine running.

SPECIFIC PRECAUTIONS TO THIS EXCAVATOR

- Keep the load or tool, such as bucket, breaker, hammer, ripper, or other device as low as possible while moving the excavator around the jobsite.
- Never smoke while refueling.

1. KHP18170

This decal warns the operator to stay off edge to prevent falling off the back of the excavator.



8D6C0ABE

Figure 28

2. KHP1534

This decal warns the operator to wait and relieve pressure before opening the radiator cap.

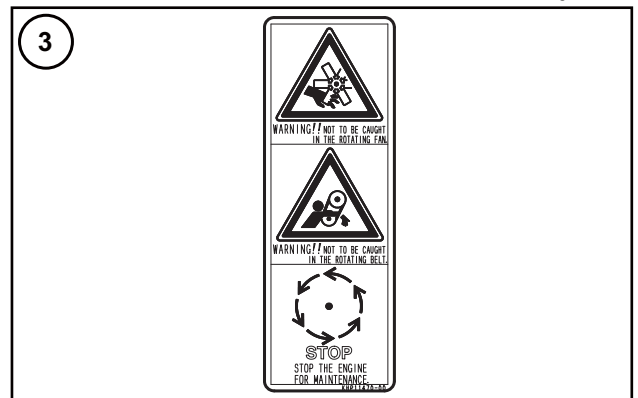


BC90F86F

Figure 29

3. KHP11470

This decal warns the operator of the rotating fan blades which could sever fingers and hands. Stop the engine before working on the fan or belt.

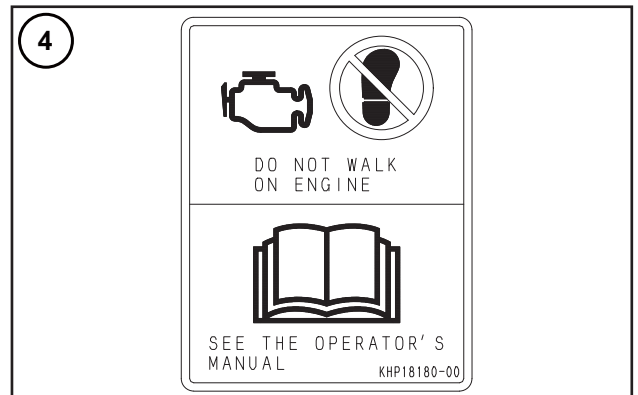


0A684AFE

Figure 30

4. KHP18180

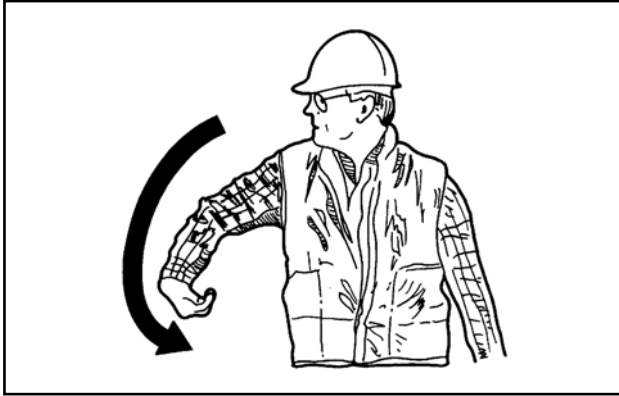
This decal warns the operator not to step on the engine. It indicates that engine maintenance must be performed correctly after reading the operator's manual.



29C791AF

Figure 31

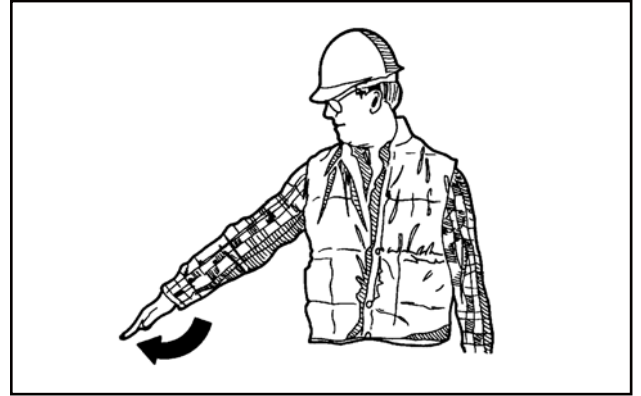
RETRACT ARM



E9E41709

Figure 74

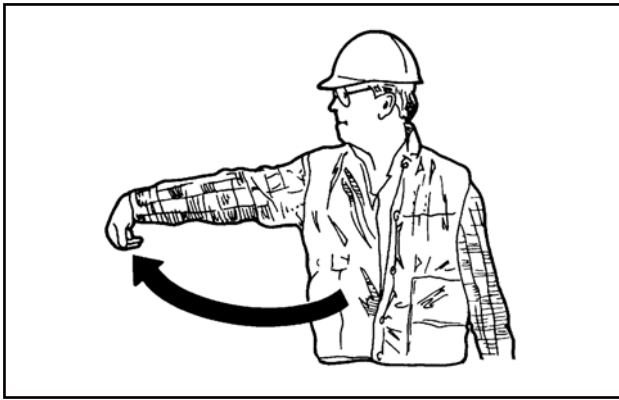
EMPTY TOOL



BD3C7BBF

Figure 77

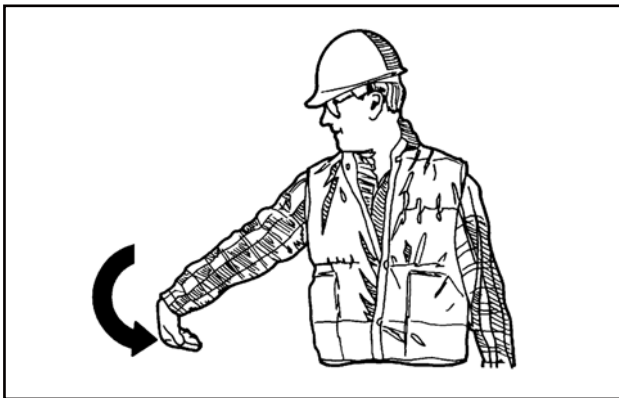
EXTEND ARM



4CC996B4

Figure 75

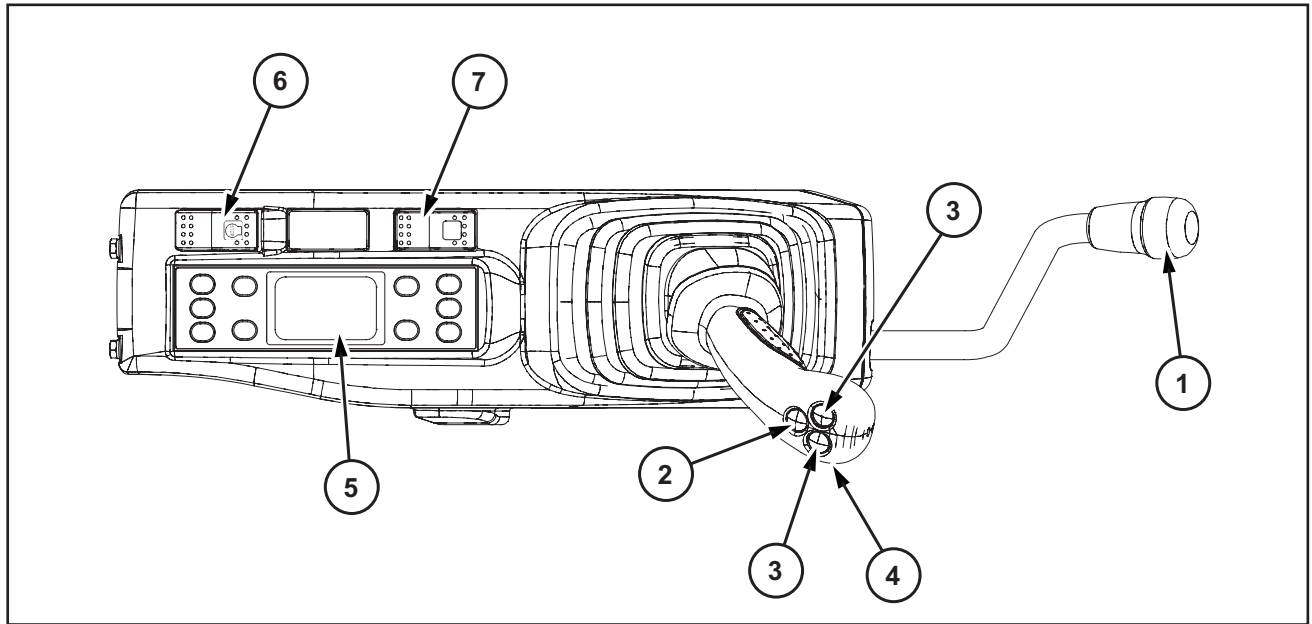
FILL TOOL



5CC0CCDC

Figure 76

LEFT-HAND CONTROL ARM



1617F057

Figure 11

1. Gate Lock Lever

The shape of the gate lock lever was designed to prevent the operator from leaving the cab without having raised the lever beforehand. See Gate Lock Lever (Page 4-23).

⚠ WARNING

To access or exit the cab, the gate lock lever must be in the raised position. Never try to avoid this basic requirement.

7. Free swing (optional)

When Free Swing is activated the icon on the switch will light up and the symbol will appear on the monitor. When Free Swing is on the mechanical swing break is turned off. Using free swing on uneven ground could cause the upper wing or drift. When the excavator is turned off free swing will default back to off.

2. Horn

To sound the horn, press at the end of the Left-hand control lever.

IMPORTANT: Always sound the horn before operating the excavator.

3. Option Control (if equipped)

4. Radio Mute Switch

This button on the bottom side of the control lever will mute the radio. To resume listening to the radio press the button again. The radio mute will appear on the computer monitor screen.

5. Heating, Ventilation And Air-conditioning Control

See Heating, Ventilation and Air-Conditioning Control for its use.

6. Engine Emergency Stop Switch

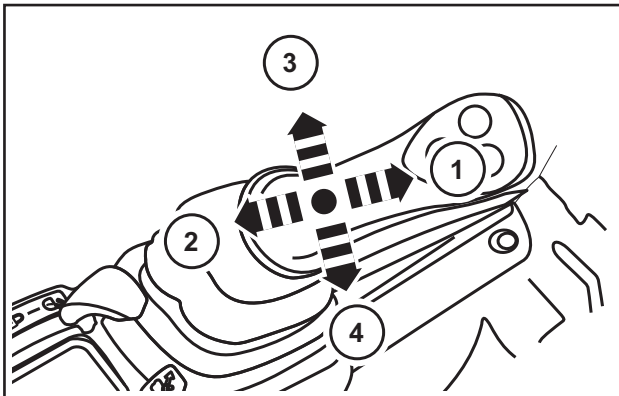
This switch kills the engine. The "ENGINE STOP" will appear in the display window and the excavator will not start until the switch is pushed again.

ARM AND UPPERSTRUCTURE SWING LEFT-HAND CONTROL LEVER IN PATTERN D

The speed of movement of the arm or the upperstructure swing depends on the control lever tilt angle. In the intermediate position both movements can be obtained simultaneously.

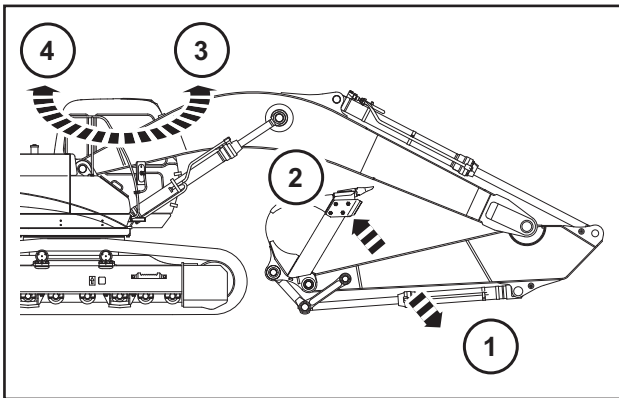
1. The arm extends.
2. The arm retracts.
3. The upperstructure swings towards the left.
4. The upperstructure swings towards the right.

NOTE: The movements of the excavator are shown in the Control functions decal. See Decals (Page 3-8).



77594B66

Figure 23



A05B24FE

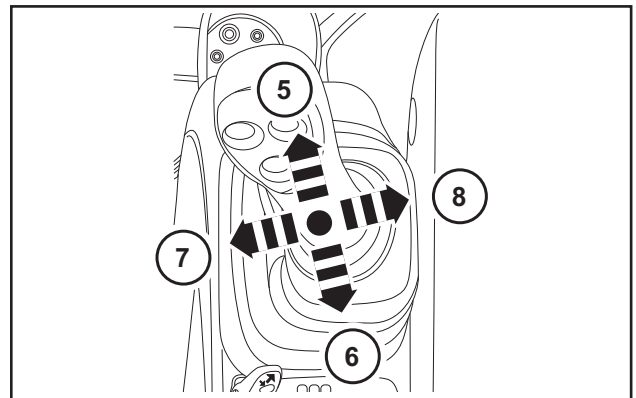
Figure 24

BOOM AND BUCKET RIGHT-HAND CONTROL LEVER IN PATTERN D

The speed of movement of the boom or the tool depends on the control lever tilt angle. In the intermediate position both movements can be obtained simultaneously.

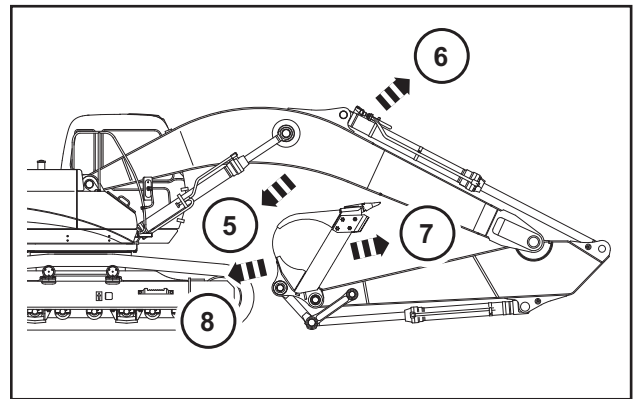
5. The boom lowers.
6. The boom raises.
7. The bucket retracts (filling).
8. The bucket extends (dumping).

NOTE: The movements of the excavator are shown in the Control functions decal. See Decals (Page 3-8).



84C27B86

Figure 25



FBEB3FE6

Figure 26

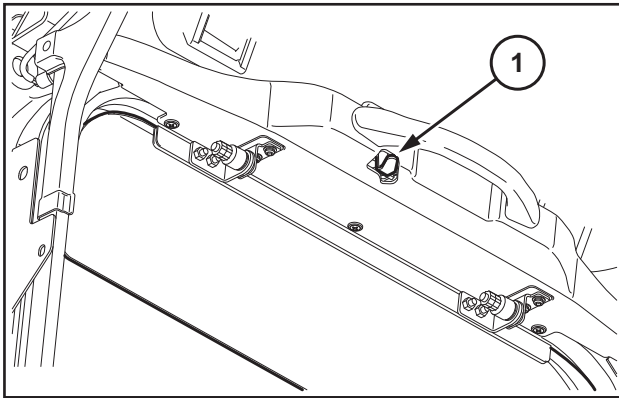
WINDSHIELD

⚠ WARNING

Make sure you follow the instructions below properly. If the windshield is not handled correctly it could slip and injure your fingers or hand.

OPENING

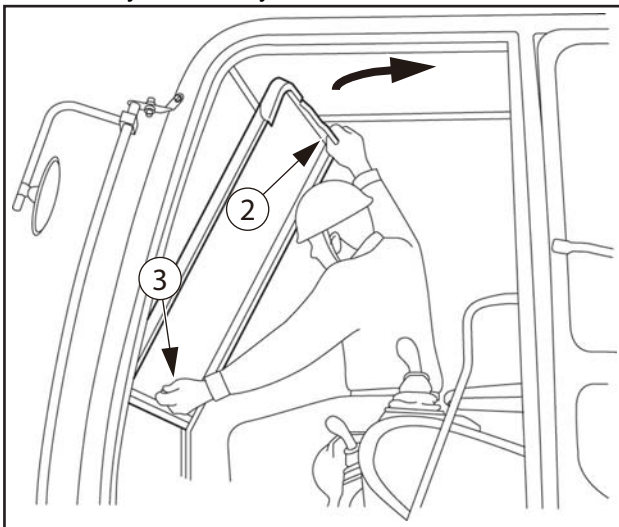
1. Bring the excavator to a complete stop on level ground if possible. Lock the gate lock lever in the off position to disable the controls.
2. Press the release lever (1) to the right to unlock the windshield. The windshield will release into the channel.



BBCAAE65

Figure 42

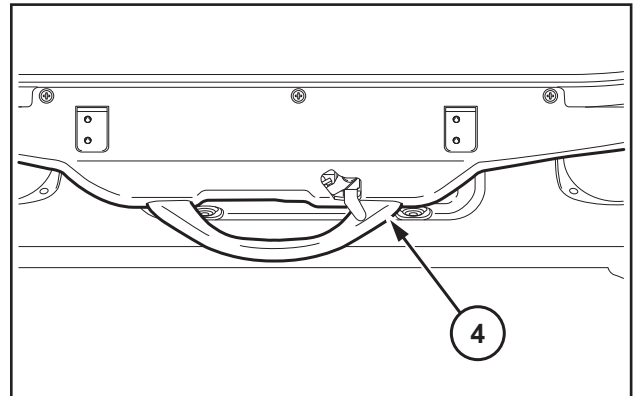
3. Grab the upper handle (2) and the lower handle (3) securely and slowly raise the window.



65B513D2

Figure 43

4. Raise the windshield and press it into the Auto-lock (4) to securely fasten the windshield. Keep your hands on the handles until it has been engaged into the Auto-lock. Push the windshield back and forth to make sure it is secure in the Auto-Lock.



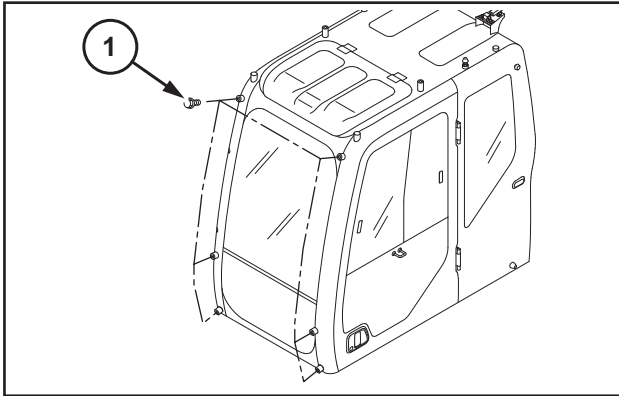
C6FEC6C6

Figure 44

ANTI-VANDAL COVER

TO INSTALL

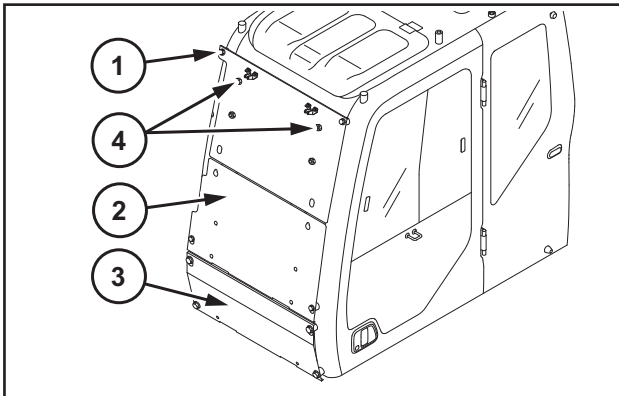
1. Remove the bolts (1) from the front of the cab.



1B724D64

Figure 66

2. Lower and secure the front window.
3. Install the anti-vandal covers (2) and (3).
4. Install the bolts (4) in the front of the cab.

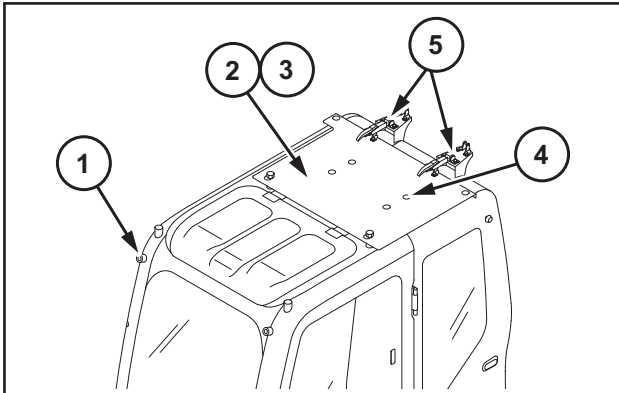


6A6F8586

Figure 67

TO REMOVE AND STORE

1. Remove the bolts (1) from the front of the cab.
2. Remove the anti-vandal covers (2) and (3), fold, and store on the roof of the cab.
3. Fasten with clamps (4) and (5).



FA91B89C

Figure 68

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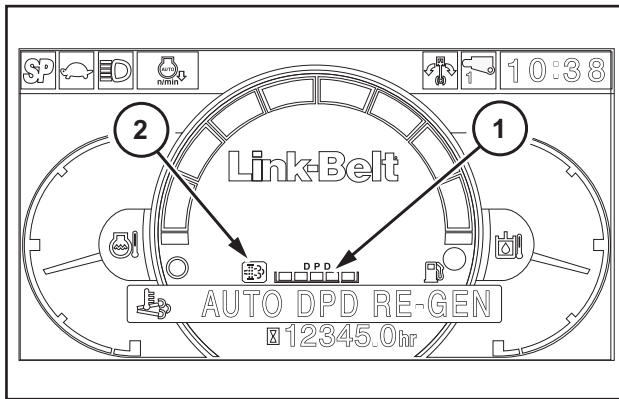
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AUTOMATIC RE-GEN

During Automatic Regeneration the excavator can and should be operated. Operating characteristics of the engine and hydraulic systems may change and sound different, and also white smoke may be seen from the tail pipe, but this is not an indication anything is wrong with your excavator - this is normal.

1. When all 5 bars on the DPD Gauge (1) become illuminated or 8 hours has passed since the last Re-gen occurred, An AUTO DPD RE-GEN will begin if the machine meets the following criteria:
 - The coolant temperature is above 160 °F.
 - The machine is not in an OVER HEAT mode.
2. During Automatic Regeneration, the DPD icon (2) will appear green and the audible alarm will sound for 2 seconds.



A5B5CE15

Figure 13

3. The following message will appear on the monitor during Automatic Regeneration: "AUTO DPD RE-GEN".
4. Minimum time for Automatic Regeneration is 8 minutes. The amount of time for Automatic Regeneration is depending on the outside temperature. Colder temperature will increase the amount of time to complete Automatic Regeneration. The illuminated bars on the DPD gauge will become dark as the machine is running the re-gen process.
5. When Automatic Regeneration is complete, the green icon will disappear and the gauge will be at zero bars.

Automatic Regeneration will discontinue if any of the following occur:

- Pressing the DPD switch will pause the regeneration process. By pressing the DPD switch again it will resume the process.
- Pressing and holding the DPD switch for 3 seconds will stop the Automatic Regeneration process and change it to Manual Regeneration.
- The coolant temperature drops below 160 °F. When the temperature is above the 160 °F it will resume the process.

- The coolant temperature rises above 212 °F. An OVERHEAT warning will appear in the monitor. Change the throttle to idol and check the coolant. If the temperature lowers the AUTO RE-GEN will continue.

If Automatic Regeneration is suspended or not completed in a certain amount of time, the DPD icon (2) will flash orange and Manual Regeneration may be required, but this is not an indication anything is wrong with your excavator - this is normal.

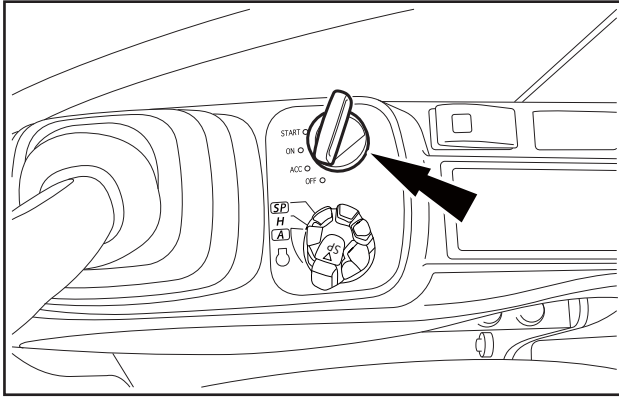
⚠ WARNING

Damage to the engine and the emissions system may occur if normal operation of the excavator occurs when the DPD icon is blinking orange. Move the excavator to a well ventilated area and activate Manual Regeneration as soon as possible.

LOWERING THE ATTACHMENT IN THE EVENT OF AN EXCAVATOR FAILURE

If the engine fails, use the following procedure to lower the attachment:

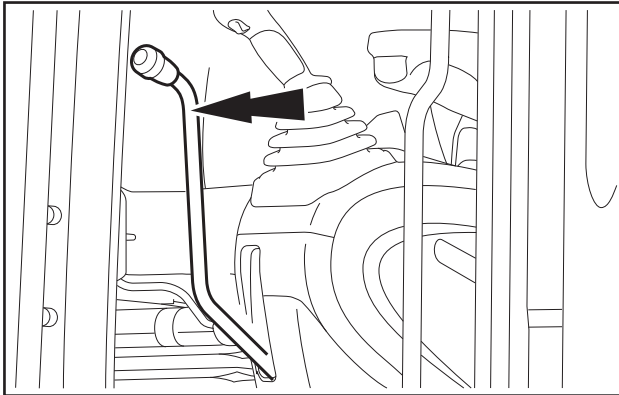
1. Turn the starter switch key to the ON position.



2FF3186D

Figure 31

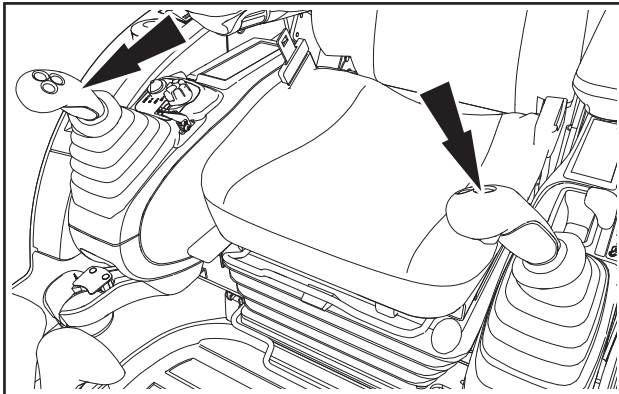
2. Lower the gate lock lever.



8C4DA88B

Figure 32

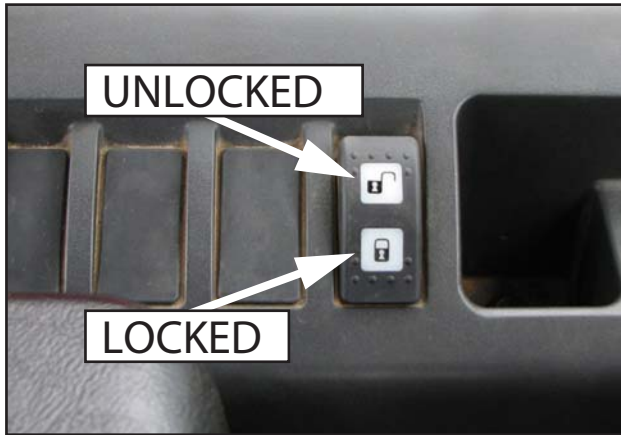
3. Place the control lever(s) in the position corresponding to the downward movement required.



5C150915

Figure 33

- Set the switch on the in-cab control panel to the "UNLOCKED" position, the switch will illuminate RED and activate an continuous audible buzzer in the cab.



0B19673A

Figure 71

NOTE: If no further action is taken within 5 seconds the unit will automatically LOCK OUT, the indicator light will go out and the buzzer will maintain a continuous tone. When or if this occurs, set the switch to LOCKED and repeat Step 2.

- Press and hold the activation switch within 5 seconds from switch on. The status indicator light will change from continuous to a flashing red signal and the buzzer will also change from a continuous tone to a pulsating tone.



548BFBF0

Figure 72

⚠ WARNING

If the locking latch has not retracted the release of the attachment IS NOT possible. In this case the full release/uncoupling procedure should be repeated.

- With the bucket rolled in, hold the bucket circuit over relief for 5 seconds. This procedure will open the cylinder locking jaws and the cylinder lock.

- Carefully roll the attachment outward and prepare to disengage from the bucket. Ensure that a suitable drop off location has been selected.



ABE9D296

Figure 73

- Continue to roll the attachment out away from the excavator to disengage the bucket or tool.



20800A5B

Figure 74

- Set the activation switch to the "LOCKED" position, the status indicator light will go out and the audible buzzer will stop sounding in the excavator cab. The quick coupler cylinder will extend and lock the latching jaws. This procedure will also activate the automatic latching system.

⚠ WARNING

Exercise caution when the coupler and bucket is employed on the excavator. The geometry of the curl in action has increased with the likelihood of striking the cab in the event of curling the bucket or attachment within close proximity to the cab.

CHAPTER 7 - LUBRICATION, FILTERS, AND FLUIDS

FLUIDS AND LUBRICANTS

Lubricants must have the correct properties for each application

The conditions of use for individual fluids and lubricants must be respected.

HYDRAULIC FLUID

The type of fluid to be used depends on the ambient temperature.

TEMPERATURE CLIMATES

-4°F (-20°C) to 104°F (40°C)

(MS 1230, ISO VG 46, DIN 51524 PART 2 HV)

HOT CLIMATES

32°F (0°C) to 122°F (50°C)

(MS 1216, ISO VG 68, DIN 51524 PART 3 CATEGORY HVLP)

COLD CLIMATES

-13°F (-25°C) to 68°F (20°C)

TRANSMISSION COMPONENT OIL

Extreme pressure oil used for enclosed transmission components.

GEAR 135H EP

(SAE 80W-90, API GL5, MIL-L-2105 D, MS 1316, ZF TE-ML 05A)

GREASE

MULTIPURPOSE GREASE 251H EP (NLGI 2)

Extreme pressure multipurpose grease with lithium soap and calcium.

ENGINE OIL

Only use the oil corresponding to one of the following categories:

API CJ-4.

FUEL

The fuel must conform to Tier 4 Exhaust Gas Control Regulations.

Use grade number 2-D (S15) fuel. Only use ultra low sulfur diesel.

Using other types of fuel may lead to stalled engine output or deterioration in fuel economy.

During cold weather (lower than 19.4° F (-7°C)) it is temporarily acceptable to use a mixture of No. 1-D (S15) and No. 2-D (S15). Contact your LBX Link-Belt Dealer or your fuel supplier.

If the temperature drops below the fuel cloud point output deficiency or engine start problems may occur due to wax crystals.

CONDITIONS APPLICABLE TO DIESEL FUEL

- No dust in the fuel
- Proper fuel viscosity
- High cetane rating
- Good flow properties in lower temperatures
- Low sulfur content
- Low carbon residue content

FUEL STANDARDS

Standard	Recommendation
ASTM	D 975
JIS	No. 2
DIN	DIN 51601
SAE - Based on SAE-J-313C	NO. 2-D (S15)
BS - Based on BS/2869-1970	Class A
EN 590	< 10 ppm sulfur

Using a non-recommended fuel may lead to damage of the fuel injection pump, injector, DPD and other fuel supply systems or to the engine.

LBX Link-Belt Dealers and LBX Company LLC assume no responsibility for these damages. No warranty will not be applied for these damages.

It is recommended that the following safety information be considered in order to prevent damage to the engine fuel supply system.

Some fuel suppliers mix old engine oil and diesel fuel.

Do not use diesel fuel contaminated with engine oil, it could damage the engine and the emission components.

Before using the diesel fuel confirm with the supplier whether the fuel complies with the standards.

IMPORTANT: Contact your LBX Link-Belt Dealer regarding appropriate use of fuel additives.

IMPORTANT: In cold weather, fill the fuel tank at the end of the day's work, to prevent the formation of condensation.

FUEL STORAGE

Long storage can lead to the accumulation of impurities and condensation in the fuel. Engine trouble can often be traced to the presence of water in the fuel.

The storage tank must be placed outside and the temperature of the fuel should be kept as low as possible. Drain off water and impurities regularly.

COOLING SYSTEM

SERVICE SPECIFICATIONS

Expansion tank reservoir check	Every 10 hours or every day
Checking the tightening of clamps, of radiator hoses	Every 250 hours or every 6 months
Draining the system (long duration)	Every 1000 hours or every 2 years
Draining the system (with anti-freeze) (spring and autumn)	Twice a year
System capacity	4.0 gal (15.3 liters)

⚠ WARNING

Boiling coolant solution can spray out if the radiator cap is removed while the system is still hot. To remove the cap, allow the system to cool down, turn the cap to the first notch and wait until there is no more pressure. Then remove the cap.

⚠ WARNING

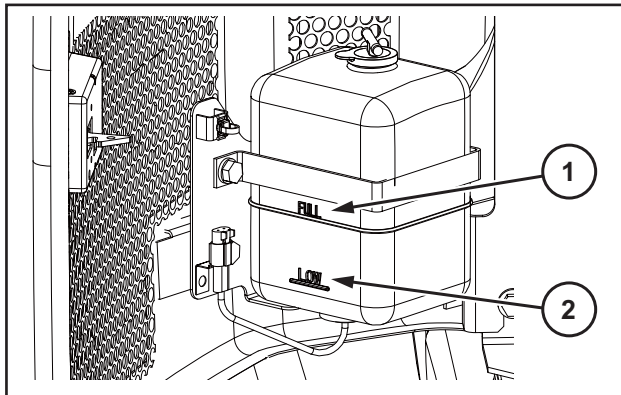
Check and service the cooling system according to the instructions given in this manual.

COOLANT SOLUTION

Put only ethylene-glycol coolant solution in the cooling system. Use good quality ethylene-glycol that has a high boiling point, with no additives to prevent leakage. Do not use non-approved anti-rust additives. Anti-rust additives and ethylene-glycol can mix and work against each other, thereby reducing anti-corrosion protection, forming deposits in the cooling system and causing damage to the cooling system and radiator.

LEVEL

The level of coolant solution should be checked when the engine is cold. On flat, level ground the level in the expansion reservoir should be between the Full (1) and Low (2) marks. If not, see Filling.



D05153D6

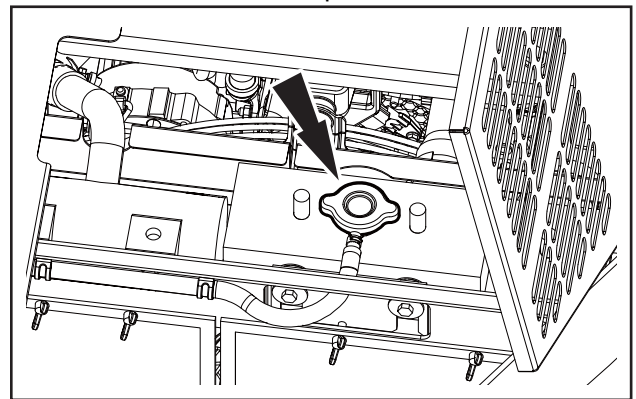
Figure 25

DRAINING

⚠ WARNING

Do not remove the radiator cap when the engine is hot. The system is still under pressure and you could be scalded.

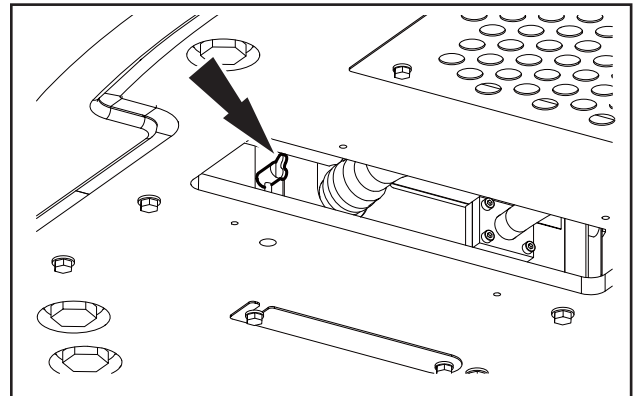
1. Remove the radiator cap.



E259EDFC

Figure 26

2. Remove the panel located under the upperstructure and open the radiator bleed plug.

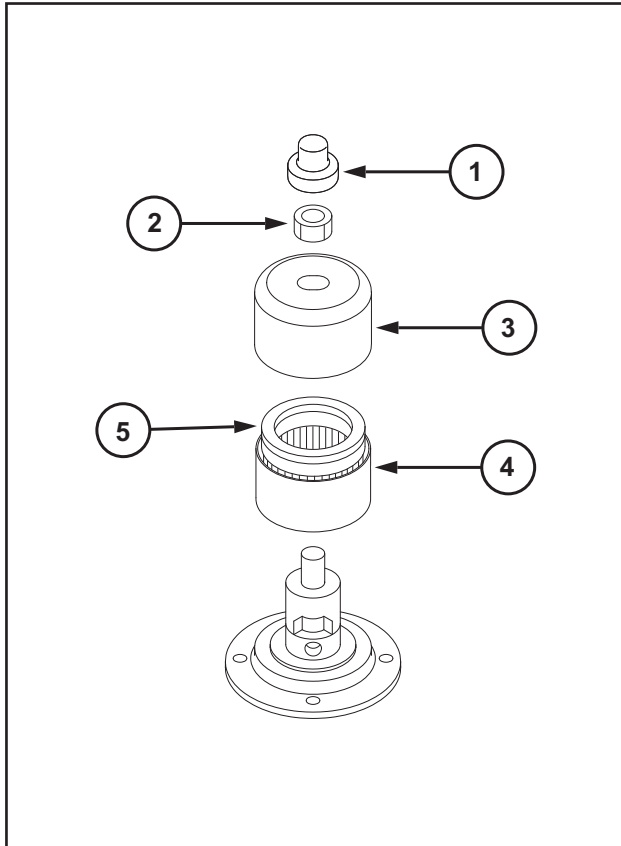


9A029181

Figure 27

REPLACING THE RESERVOIR BREATHER

1. Press the button (1) to release all pressure in the hydraulic reservoir.
2. Remove the nut (2) and the cover (3) from the breather.
3. Remove and discard the used filter (4).
4. Install a new element, making sure the seal (5) is facing upwards.
5. Install the cover (3) as well as the nut (2).

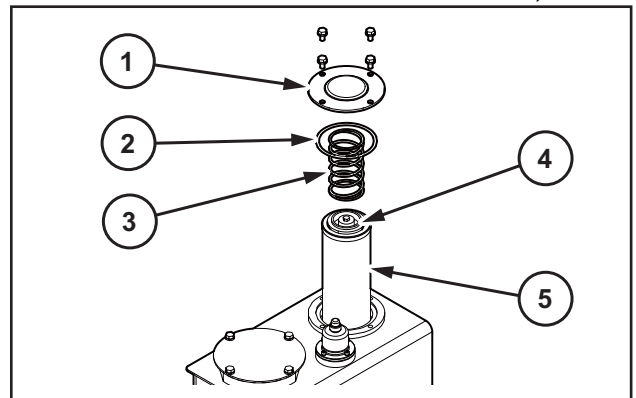


9296A8F4

Figure 55

RETURN FILTER REPLACEMENT

1. Release all pressure in the hydraulic reservoir. See Releasing Pressure in the Hydraulic System (Page 7-18).
2. Clean the top of the hydraulic reservoir and clean the return filter cover.
3. Remove the cover (1) and O-ring (2).
4. Take out the spring (3), valve (4), and return filter (5) from the tank.
5. Install a new filter (5). Clean the spring (3) and valve (4) and install them.
6. Check the O-ring (2) and replace it if worn or damaged.
7. Install the cover (1).
8. Check the level of the hydraulic fluid and add more if necessary. See Filling the Reservoir (Page FILLING THE HYDRAULIC RESERVOIR).



4F22C6F5

Figure 56

CHAPTER 8 - MAINTENANCE AND ADJUSTMENTS

TRACKS

MAINTENANCE SPECIFICATIONS

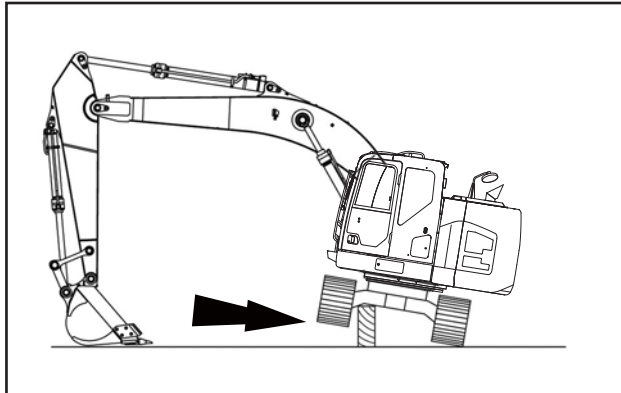
Clean	Every 50 hours or every week
Check tension	Every 50 hours or every week
Check Shoe Bolt torques	Every 250 hours (after the first 50 hours during the run-in period)

IMPORTANT: If the 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 excavator has been working in mud, a reduction in temperature can cause the mud to solidify.

1. Place the upperstructure at right angles to the undercarriage. Use the attachment to press on the ground and lower the boom until the track is raised off the ground.
2. Place a block under the undercarriage to keep the excavator from drifting down.



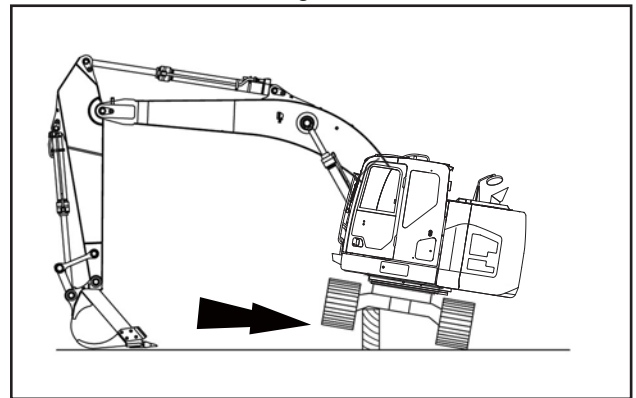
E8CE5681

Figure 1

3. Put the engine throttle button in the SP mode and select the High speed travel.
4. Operate the travel control lever for the raised track forwards and then in reverse, to remove the mud.
5. Repeat Step 1 to 4 for the other track.

CHECKING THE TENSION

1. Park the excavator on flat, horizontal ground.
2. Clean the tracks.
3. Place the upperstructure at right angles to the under carriage. Use the attachment to press on the ground and lower the boom until the track is raised off the ground.
4. Place a block under the undercarriage to keep the excavator from drifting down.

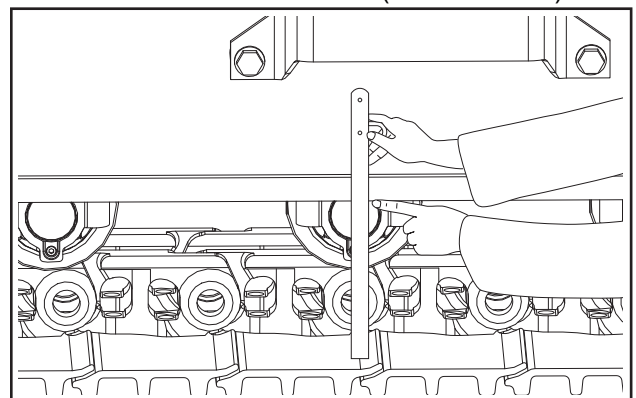


E8CE5681

Figure 2

5. Use the travel control lever to operate the raised track in reverse for a few moments.
6. Stop the engine and remove the starter switch key.
7. Measure the slack between the base of the undercarriage and the upper part of the track tread.

Track Tension Value
Track Tension: 11.8 - 12.99 (300 - 330 mm)



A34C3839

Figure 3

8. Adjust the tension if necessary and then lower the raised track to the ground.

**AIR CONDITIONING
MAINTENANCE SPECIFICATIONS**

Clean the intake filter	Every 50 hours
Clean the air recycling filter	Every 50 hours
Have checked by a specialist	Every 6 months
Replace the filters	Every 2000 hours

The components of the air conditioning system need servicing at regular intervals. Make sure these intervals are respected, in order to ensure the air conditioning functions correctly and with maximum effectiveness. The air conditioning system contains gas which is subject to strict legislation. Any defect in the system must be fixed rapidly.

Operate the air conditioning system at least once a week, if only for a short time.

INSPECTION

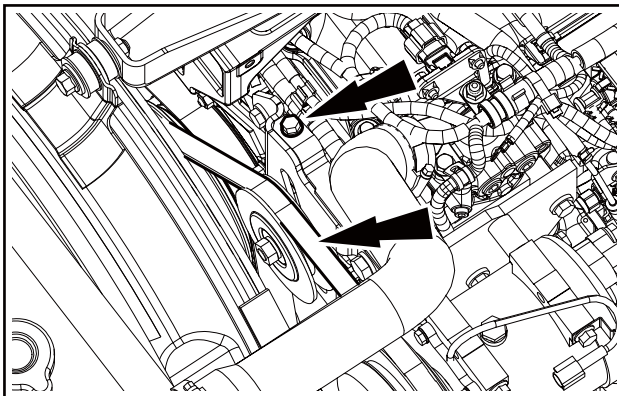
In order to ensure the air conditioning functions correctly, inspect the air conditioner using the procedure outlined below before starting work.

CLEANLINESS OF THE CONDENSER

If the condenser is dirty it will not dissipate heat properly. Clean the condenser with water.

Never use water under pressure to clean the condenser.

CHECKING THE BELT TENSION



DDBAC63F Figure 16

Use your finger to exert pressure of around 22.046 lbs (10 kg) on the center of the drive belt. The tension slack should be between about 0.236" (6 mm) to 0.315"(8 mm). If necessary, adjust the belt tension.

Tension Adjustment

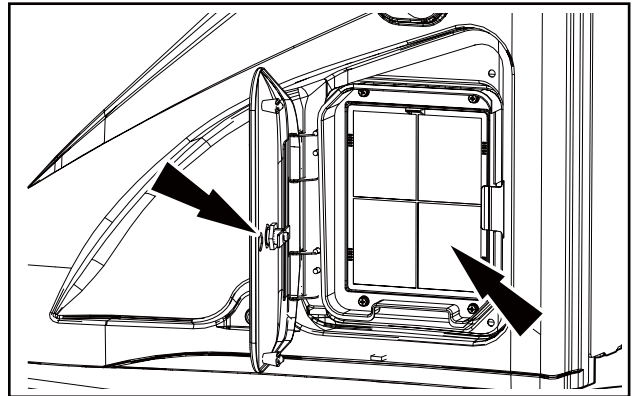
1. Loosen the pulley mounting bolt.
2. Use the adjustment screw to move the pulley outward until belt tension is correct and tighten pulley mounting bolt.

CHECKING THE LINES

Make a visual check of the lines and make sure there are no accumulations of dust, grease, etc.

CLEANING THE FRESH AIR INTAKE FILTER

1. To clean the fresh air intake filter open the filter cover door on the left side of the cab with the key.



BF15534E Figure 17

2. Remove the filter and use compressed air to clean the filter. If it is damaged, replace it.

IMPORTANT: Always protect your face before using compressed air.

3. Place the filter back in the housing and close the cover door. Lock the cover door.

CHECKING A BATTERY

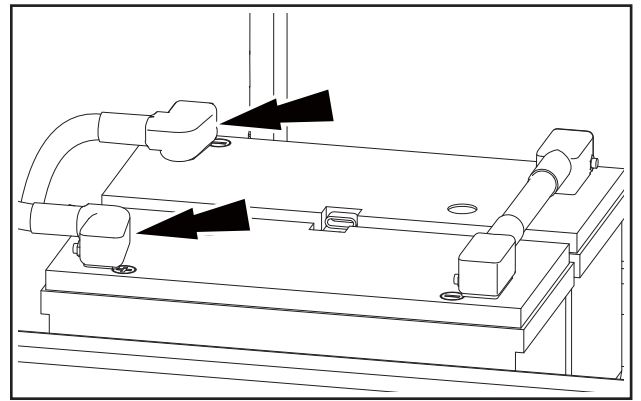
Make sure the battery terminals are clean and coated with grease and the cables are properly tightened.

Checking the charging state and the electrolyte level is carried out using the indicator:

- Green: Normal
- Black: Recharge the battery.
- White: Change the battery.

REPLACING A BATTERY

IMPORTANT: When you change a battery replace both batteries at the same time. If you only change one it will shorten the life of the new battery.

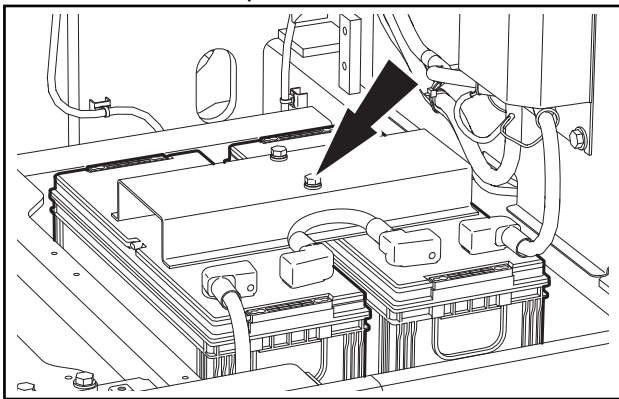


52DDC6CE

Figure 9

REMOVAL

1. Remove the skid plate.



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Figure 8

2. Remove the terminal sleeves, disconnect the cable (negative terminals) then the cable (positive terminals).
3. Remove the batteries.
4. Clean the battery compartment, remove all foreign bodies, and clean any spilled electrolyte.

INSTALLATION

1. Install a new battery. Clean the cables and battery terminals and coat them with grease.
2. Set the batteries in the excavator.
3. Connect the cable (positive terminals), then the cable (negative terminal) and install the terminal sleeves.

⚠ WARNING

Do not invert battery terminals. Connect positive (+) cable ends to positive (+) terminals and (negative) cable ends to negative terminals (-).

⚠ WARNING

Always store batteries in a safe place, out of the reach of children.

LIFTING THE EXCAVATOR

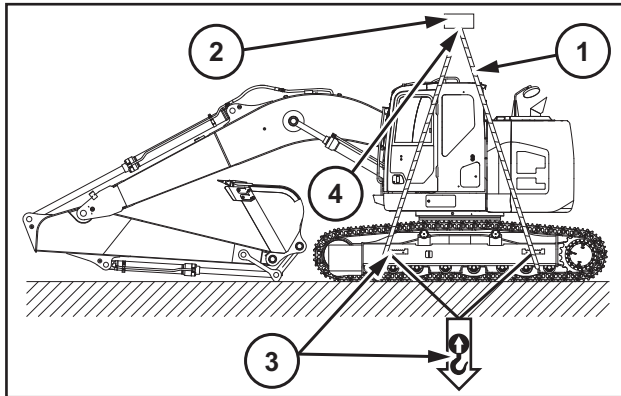
Before lifting the excavator always contact your LBX Link-Belt Dealer for any special circumstances with your excavator.

IMPORTANT: Before handling the excavator, make sure the slings are in perfect condition and they are capable of supporting the weight of the excavator.

⚠ WARNING

Do not allow anyone near or under the excavator when lifting.

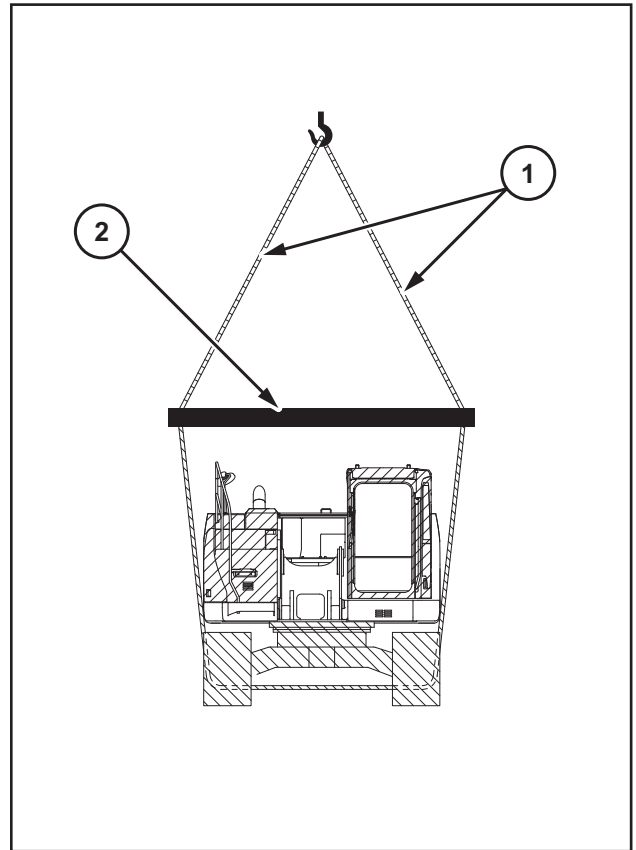
1. Fully extend the bucket and the arm cylinder. Lower the boom slowly. Turn off the engine.



037CFA9C

Figure 19

2. Use a wire rope with a sufficient strength for lifting, and route the wire through the lifting points (3). Use a supporting bar (2) that will keep the rope away from the excavator. Make sure the lifting angle (4) is between 30° and 40°.



8FE20079

Figure 20

Slowly lift the excavator off the ground, make sure the wire is not rubbing on the excavator and check the condition of the hook.

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