CEAM031900

Operation & Maintenance Manual

930E-4

DUMP TRUCK
SOUND ATTENUATION PACKAGE

SERIAL NUMBERS 930E-4 A31879 and up

ENGINE 16V160

March 2017

KOMATSU®

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TABLE OF CONTENTS

FOREWORD 10-1
"Alerts" Page - a description of DANGER, WARNING, and CAUTION symbols. 10-2
TABLE OF CONTENTS. 10-3
Truck Model Illustration 10-7
ABOUT THIS MANUAL 10-8
STANDARD CHARTS AND TABLES 12-1
Index of Tables 12-1
Effect of Special Lubricants on Fasteners and Standard Torque Values 12-2
Standard Tightening Torques for Class 10.9 Cap Screws & Class 10 Nuts 12-2
Standard Tightening Torques for SAE Grade 5 & Grade 8 Cap Screws. 12-3
Standard Tightening Torques for SAE Hex Head and 12-point Grade 9 Cap Screws 12-4
GENERAL SAFETY 20-1
Safety Rules 20-1
Truck Safety Features 20-1
Clothing And Personal Items 20-1
Unauthorized Modification 20-1
Leaving The Operator's Seat 20-1
Mounting And Dismounting 20-2
Fire Extinguishers And First Aid Kits 20-2
Precautions For High Temperature Fluids 20-2
Asbestos Dust Hazard Prevention 20-2
Fire Prevention For Fuel And Oil 20-3
ROPS Precautions 20-3
Preventing Injury From Work Equipment 20-3
Precautions For Optional Attachments 20-3
Precautions When Starting The Machine 20-3
WORKING NEAR BATTERIES 20-4
Battery Hazard Prevention 20-4

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TABLE OF CONTENTS (cont.)

PRECAUTIONS FOR MAINTENANCE 20-5
BEFORE PERFORMING MAINTENANCE 20-5
Stopping The Engine Before Service 20-5
Electrical Systems Isolation 20-5
Warning Tag 20-7
Proper Tools 20-7
Use of Tie-Off Anchor During Maintenance 20-7
Securing The Dump Body 20-7
DURING MAINTENANCE 20-8
Personnel 20-8
Attachments 20-8
Working Under The Machine 20-8
Keeping The Machine Clean 20-8
Use Of Lighting 20-8
Precautions With The Battery 20-8
Handling High Pressure Hoses 20-9
Precautions With High Pressure Oil 20-9
Maintenance Near High Temperatures And High Pressures 20-9
Rotating Fan And Belts 20-9
Waste Materials 20-9
WHEN REPAIRS ARE NECESSARY 20-10
SPECIAL PRECAUTIONS FOR WORKING ON AN 930E-4 TRUCK 20-11
Preliminary Procedures before Welding or Performing Maintenance 20-11
Engine Shutdown Procedure before Welding or Performing Maintenance 20-11

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TABLE OF CONTENTS (cont.)

CAPACITOR DISCHARGE SYSTEM 20-13
Necessary Tools 20-13
Warnings And Cautions 20-14
MANUAL DC LINK CAPACITOR DISCHARGE PROCEDURE 20-15
Preparation 20-15
CAPACITOR CHARGE LIGHTS 20-17
FAILURE OF DISCHARGE SYSTEM 20-18
Measuring DC Voltage On Capacitors 20-18
MANUAL DISCHARGE OF CAPACITORS 20-19
SHORT ISOLATED CAPACITOR TERMINALS 20-22
CHASSIS SOUND ATTENUATION SYSTEM 30-1
OVERVIEW 30-1
Preparing For Operation 30-1
Safety Is Thinking Ahead 30-1
Components 30-1
General 30-1
Maintenance 30-1
Exhaust System 30-2
General 30-2
Maintenance 30-2
Approximate weights 30-2
Attenuators 30-3
General 30-3
Engine Side Panels 30-4
General 30-4
Maintenance 30-4
Approximate weights 30-4

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PRECAUTIONS FOR MAINTENANCE

BEFORE PERFORMING MAINTENANCE

Stopping The Engine Before Service

- Before performing inspections or maintenance, stop the machine on firm, flat ground. Lower the dump body, place the directional control lever to the PARK position (this will apply the parking brake), and turn the key switch to the OFF position and wait for the engine to stop.
- Wait two minutes after the engine has stopped, and if no warning lights illuminate, then turn the battery disconnect switches to the OFF position. Verify that the disconnects are functioning.
- Place wheel chocks around the wheels to prevent the truck from rolling.
- If the engine must be operated during maintenance, always move the directional control lever to the PARK position (this will apply the parking brake). Always perform this work with two people. One person must be in the operator's seat to stop the engine if necessary. Never move any controls not related to the task at hand during these situations. Apply the propel lockout lever (5, Figure 20-2) to prevent the truck from moving if the engine must operate during maintenance. When the propel lockout lever is in the OFF position and LED light (8) is illuminated, the drive system is locked out and the truck will not propel. When the propel lockout lever is in the ON position and LED light (7) is illuminated, the drive system is active and the truck can be driven.
- When servicing the machine, use care not to touch any moving parts. Never wear loose clothing.
- When performing service with the dump body raised, always place the dump lever in the HOLD position, and apply the lock (if equipped). Install the body-up safety cable securely.

Electrical Systems Isolation

- Isolation box (6, Figure 20-2) contains master disconnect switch (3), starter disconnect switch (4) and propel lockout lever (5). The isolation box is located on top of the front bumper, on the left hand side. Move both disconnect switches and the propel lockout lever to the OFF position to disable the 24VDC electrical system, starters and the AC electric drive system. When the switches and propel lockout lever are in the OFF position, LED lights (8) will be illuminated. The battery disconnect switches and propel lockout lever can be padlocked in the OFF position to prevent unauthorized truck operation. When the switches and the propel lockout lever are in the ON position, LED lights (7) will be illuminated. Refer to the following table to ensure the correct disconnect is used to isolate a desired circuit or system.

NOTE: This is the recommended usage of the battery disconnect and propel lockout switches. Local regulations may be different.

Action	Recommended Isolation
24V Electrical Troubleshooting	Starter Lockout
24V Electrical Maintenance/Repair	Master Lockout
High Voltage/Propulsion Troubleshooting	None
High Voltage Maintenance/Repair	Master Lockout
Hydraulic Troubleshooting	Propel Lockout
Hydraulic Maintenance/Repair	Starter Lockout
Engine Troubleshooting	Propel Lockout
Engine Repair	Master Lockout
Mechanical Repair	Starter Lockout
Weld Repair	Master Lockout & Alternator Isolation
Fueling	Starter Lockout
Lube/General Maintenance	Starter Lockout
Shift Change Walk Around	Starter Lockout
Oil Sample Collection	Propel Lockout

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SPECIAL PRECAUTIONS FOR WORKING ON AN 830E/930E TRUCK

Preliminary Procedures before Welding or Performing Maintenance

Prior to welding and/or repairing an 830E/930E dump truck, maintenance personnel must attempt to notify a Komatsu service representative. Only qualified personnel, specifically trained for servicing the AC drive system, must perform this service.

If it is necessary to perform welding or repair to the truck without the field engineer present, the following procedures must be followed to ensure that the truck is safe for maintenance personnel to work on and to reduce the chance for damage to equipment.

⚠DANGER

Anytime the engine is operating:

- ***DO NOT open any of the cabinet doors or remove any covers.***
- ***DO NOT use any of the power cables for hand holds or foot steps.***
- ***DO NOT touch the retarding grid elements.***

⚠WARNING

Before opening any cabinets or touching a grid element or a power cable, the engine must be shutdown and the red drive system warning lights must not be illuminated.

Engine Shutdown Procedure before Welding or Performing Maintenance

Normal operation of the drive system at shutdown will leave the system safe to maintain. However, in the event of a system failure, performing the following procedure prior to any maintenance activities will ensure that no hazardous voltages are present in the AC drive system.

1. Before shutting down the engine, verify the status of all the drive system warning lights on the overhead display panel. Use the lamp test switch to verify that all lamps are functioning properly.

   If any of the red drive system warning lights remain on, DO NOT attempt to open any cabinets, disconnect any cables, or reach inside the retarder grid cabinet without a trained drive system technician present - even if engine is off.

   Only qualified personnel, specifically trained for servicing the A-C drive system, must perform this service.
2. If all red drive system warning lights are off, follow all of the instructions for "Parking The Machine."
3. After the engine has been off for at least five minutes, inspect the link voltage lights on the exterior of the main control cabinet and rear of the center console. If all lights are off, the retard grids, wheel motors, alternator, and related power cables are safe to work on.
4. Locate the GF cut-out switch in the front access panel on the left side of the main control cabinet. Place the switch in the CUTOUT position. This will prevent the alternator from re-energizing and creating system voltage until the switch is returned to the previous position.
5. Ensure both battery disconnect switches are in the OFF position. Verify that the battery disconnects are functioning.
6. Before doing any welding on the truck, always disconnect the battery charging alternator lead wire.

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MANUAL DISCHARGE OF CAPACITORS

If the voltage is greater than 1V on any of the capacitors, the capacitor must be manually discharged. With a suitable capacitor discharge device, such as ground stick pair (PC3299), discharge the capacitors where needed per the following instructions:

1. With the control cabinet high voltage compartment doors closed, connect the ground stick pair ground lead to ground. The most convenient location is the middle top bolt that attaches the door center post to the control cabinet frame.
2. Verify the ground connection and ground stick resistance levels. Measure the resistance between each individual ground stick tip to either the GND1 or GND2 ground block in the low voltage compartment of the control cabinet using a multimeter (Figure 20-11). Ensure that the resistance is within the manufacturer's specifications for the ground sticks.

   For PC3299 grounding sticks, the valid range is 80 to 125 ohms per stick.

⚠WARNING

Hazardous voltages are present in this equipment. Avoid touching any energized equipment when the door to the low voltage area is open. Failure to do so may result in personal injury and equipment damage.

3. Discharge the relevant capacitors. Open the door(s) and place one grounding stick on one of the positive (+) capacitor terminals and the other on the diagonally located negative (-) terminal. Refer to Figure 20-10 and Figure 20-12. Attempt to minimize the time between application of the positive stick and the negative stick so that the current flow will be positive to negative rather than either to ground. Leave sticks in place until capacitors are discharged. Refer to Figure 20-12.

NOTE: On the capacitors located behind the door post, it is difficult to access diagonal terminals on the same capacitor. If using adjacent terminals, use care to keep the tips separated while discharging or else use a positive terminal on one capacitor and negative terminal of the adjacent capacitor on the same bus bar.

For PC3299 grounding sticks, the discharge times from 2000 volts are:

- 15 seconds (maximum) for 2 capacitors
- 75 seconds (maximum) for 10 capacitors

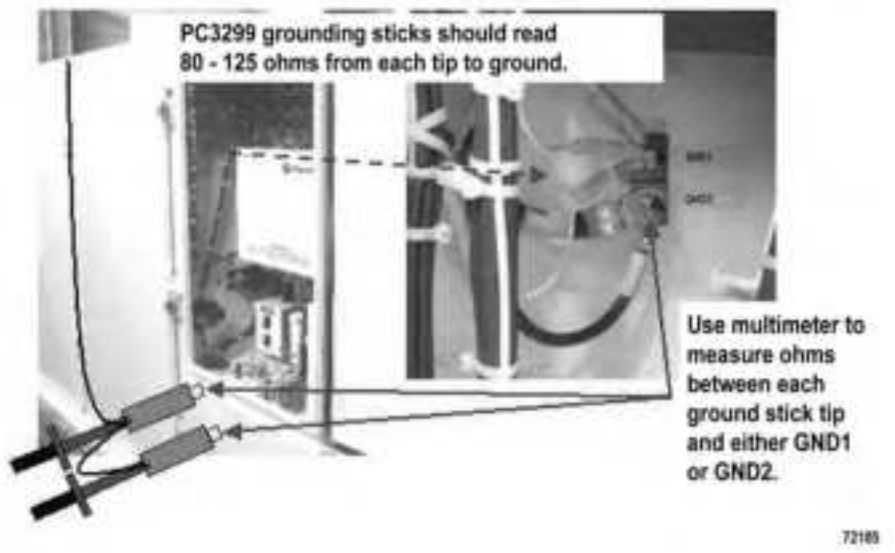


FIGURE 20-11. GROUNDING STICK LEAD CONNECTION AND CHECK

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FAILURE OF DISCHARGE SYSTEM

If the capacitor charge lights remain illuminated, a failure of the normal (fast) capacitor discharge system (RP discharge path) has likely occurred. The slow discharge resistors that are hard wired across the DC link should then discharge the capacitors. The slow discharge resistors will discharge the DC link to less than 1 VDC in under 7.5 minutes. If after 7.5 minutes, the capacitor charge lights are still illuminated, it must be assumed that the automatic discharge system is not working and that high voltage is present in the high voltage area.

Measuring Dc Voltage On Capacitors

1. Open the high voltage area doors.
2. With a suitable high voltage meter rated for at least 2000 VDC, such as PC3186 or equivalent, plus suitable protective equipment, measure the voltage across each of the DC link capacitors. Place one meter lead on the positive (+) capacitor terminal, and the other meter lead on the negative (-) capacitor terminal, and observe the voltage. See Figure 20-9 and Figure 20-10. If the voltage is less than 1.0 V the capacitor is sufficiently discharged. Repeat on all DC Link capacitors. If the voltage of any capacitor is above 1.0 V, manually discharge the capacitor as described in "MANUAL DISCHARGE OF CAPACITORS" on page 21.



FIGURE 20-9. DC METER ON CAPACITOR



FIGURE 20-10. CAPACITOR TERMINAL POLARITY

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Attenuators

General

Attenuators are fitted in various places around the engine compartment to muffle the noise. A typical attenuator is made of up numerous perforated splitters (2, Figure 30-2). Each splitter is filled with a special insulation pillow (3, Figure 30-3).

Periodically, the attenuators need to be inspected and disassembled for maintenance. Refer to Sound Attenuation System Service for inspection and maintenance intervals.

The insulation pillow should have a protective cloth between the insulation and the perforated cover. The insulation should be clean, soft, and free from debris. The insulation should be of consistent density, and fill the cavity completely, not slumping to the bottom. Remove any debris, oil, or grease present in the system as required. Never use a pressure washer to clean an attenuator, as damage to the protective cloth and the insulation may result.

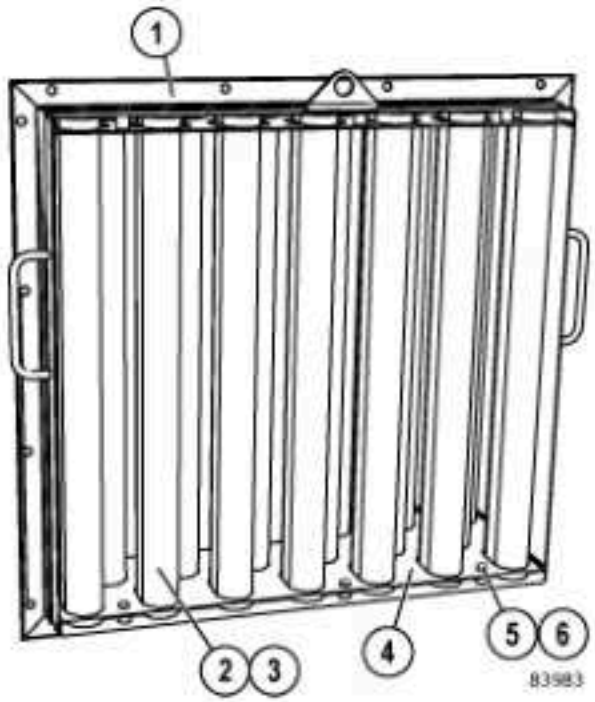


FIGURE 30-2. TYPICAL ATTENUATOR ASSEMBLY

1. Housing
2. Splitter (Perforated)
3. Insulation
4. Baffle
5. Spacer
6. Cap Screw

⚠WARNING

Do not pressure wash the sound attenuation surfaces. Malfunction and damage may occur, reducing the effectiveness of the attenuators.

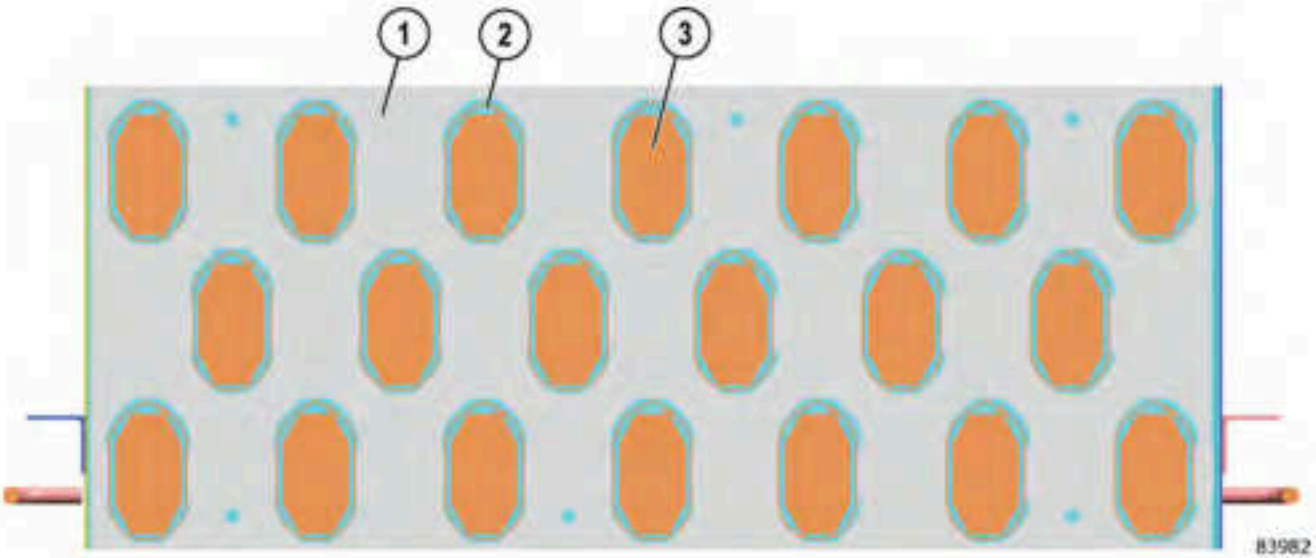


FIGURE 30-3. ATTENUATOR CROSS SECTION VIEW

1. Housing
2. Splitter (Perforated)
3. Insulation Pillow

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