Operation & Maintenance Manual

Dump Truck

930E-4

Serial Numbers A31832 — A31869
A31881
A31891

WARNING

Unsafe use of this machine may cause serious injury or death. Operators and maintenance personnel must read this manual before operating or maintaining this machine. This manual should be kept near the machine for reference and periodically reviewed by all personnel who will come into contact with it.

NOTICE

Komatsu has Operation & Maintenance Manuals written in some other languages. If a foreign language manual is necessary, contact your local distributor for availability.

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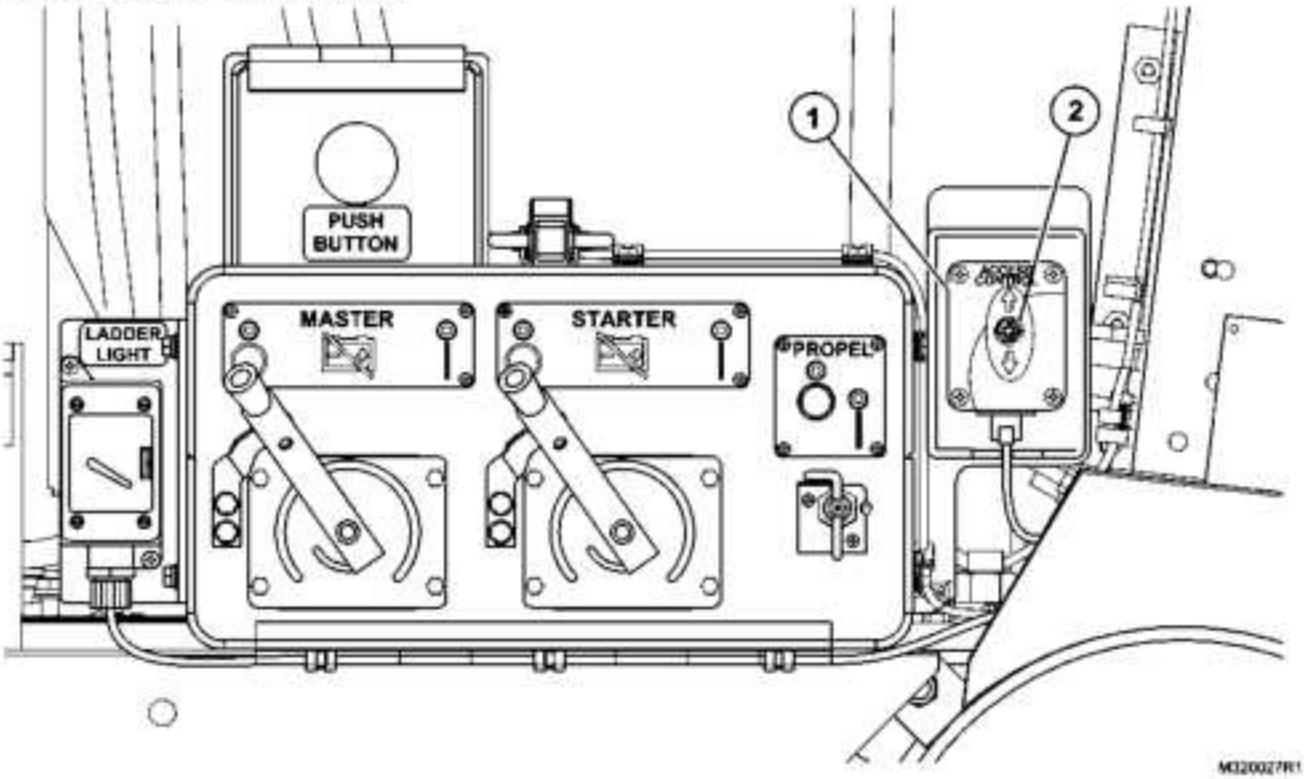
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Ground Level Control Box



1. Ground Level Control Box
2. Toggle Switch

Figure 5-4 GROUND LEVEL CONTROL BOX

Ground level control box (1, Figure 5-4 GROUND LEVEL CONTROL BOX, page 5-10) is located next to the battery isolation box and contains toggle switch (2) that lowers and raises the ladder.

NOTE: *The parking brake must be applied before the ladder can be lowered. If toggle switch (2) is held in either position for more than ten seconds, a fault will be activated and will need to be acknowledged by pressing either the [EXIT] or [ENTER] buttons located on the in-cab control panel.*

Raising the Ladder

To raise the ladder, push toggle switch (2) to the LADDER UP position and release. Ladder operation via this switch is the same as using the in-cab control panel. Any ladder movement will be shown on the in-cab control panel.

Lowering the Ladder

To lower the ladder, push toggle switch (2) to the LADDER DOWN position and release. Ladder operation via this switch is the same as using the in-cab control panel. Any ladder movement will be shown on the in-cab control panel.

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EVERY 250 HOUR LUBRICATION AND MAINTENANCE E.28-0000051633

NOTE: *The 10 hour lubrication and maintenance checks must also be performed at this time. "Lube Key" references are to the lubrication chart.*

EVERY 250 HOUR LUBRICATION AND MAINTENANCE	
Item	**Task**
ENGINE	• Change the engine oil. (Lube Key "A"). • Replace engine oil filters. • Check belt tension and the condition of each accessory belt. Refer to the engine Operation & Maintenance manual for specific adjustment instructions. ***NOTE:*** *If the engine is equipped with the Centinel™ oil system and/or the Eliminator™ filter system, engine oil and filter change intervals are extended beyond 250 hours. Take an engine oil sample for analysis.* Refer to the engine Operation & Maintenance manual for complete specifications regarding engine lube oil specifications.
COOLING SYSTEM	• Check for proper coolant mixture. Add coolant as required. • Change coolant filters. • Check cooling system hoses for damage and signs of deterioration. • Check the torque on the cooling fan mounting capscrews: **237 N·m (175 ft lb)**. Refer to the engine maintenance manual for coolant filter replacement instructions and proper coolant mixture instructions.
FUEL SYSTEM	• Change the fuel filters (fuel separators). Refer to the engine Operation & Maintenance manual for specific filter replacement instructions. • Drain water and sediment from the fuel tank. Refer to FUEL SYSTEM SERVICE, page 7-6 for detailed instructions.
AIR INTAKE PIPING	Check all mounting hardware, joints and connections. Ensure that there are no air leaks and all hardware is properly tightened.
HYDRAULIC SYSTEM	• Add one or two applications of grease to each grease fitting on the pump drive shaft. Non - moly grease only. • Replace filter elements after the initial 250 hours of operation; then at each 500 hours of operation thereafter. Refer to (Lube Key "B"). Refer to HYDRAULIC SYSTEM SERVICE, page 7-2 for detailed instructions.
STEERING LINKAGE	• Check the torque on the pin retaining nuts located on the steering linkage - **1017 N·m (750 ft lb)**.
REAR WHEEL MOUNTING	Use a flashlight and a mirror on a long rod to inspect all inner and outer wheel mounting nuts and studs. Check for loose, damaged or missing hardware.

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MAJOR COMPONENT DESCRIPTION C.3-0000051647

Truck and Engine B.2-0000060881

The 930E-4 dump truck is an off-highway, rear dump truck with AC electric drive. The gross vehicle weight is 498 960 kg (1,100,000 lbs). The engine is a Komatsu SSDA16V160 rated at 2 014 kW (2,700 HP).

Traction Alternator D.13-0000051645

The diesel engine drives an in-line alternator at engine speed. The alternator produces AC current which is rectified to DC within the main control cabinet.

Cooling air for the control / power group and wheel motors, as well as the alternator itself, is provided by a fan mounted on the alternator shaft.

Main Control Cabinet A.2-0000060880

Each phase module contains paired positive and negative semiconductor switches referred to as insulated gate bipolar transistors (IGBT). The IGBTs cycle on and off at varying frequencies to create an AC power signal from the DC supply.

The AC power signal produced by each inverter is a variable-voltage, variable-frequency (VVVF) signal. Frequency and voltage are changed to suit the operating conditions.

AC Induction Traction Motorized Wheels C.3-0000051644

The alternator output supplies electrical energy to the two wheel motors attached to the rear axle housing. The motorized wheels use three-phase AC induction motors with full-wave AC power.

The two wheel motors convert electrical energy back to mechanical energy through built-in gear trains within the wheel motor assembly. The direction of the wheel motors is controlled by a forward or reverse hand selector switch located on the center console.

Suspension D.3-0000051643

Hydrair II® suspension cylinders located at each wheel provide a smooth and comfortable ride for the operator and dampens shock loads to the chassis during loading and operation.

Operator's Cab D.16-0000051642

The operator cab has been engineered for operator comfort and to allow for efficient and safe operation of the truck. The cab provides wide visibility, with an integral 4-post ROPS/FOPS structure, and an advanced analog operator environment. It includes a tinted safety-glass windshield and power-operated side windows, a deluxe interior with a fully adjustable seat with lumbar support, a fully adjustable tilt/telescope steering wheel, controls mounted within easy reach of the operator, and an analog instrument panel which provides the operator with all instruments and gauges which are necessary to control and/or monitor the truck's operating systems.

Power Steering D.1-0000051641

The truck is equipped with a full time power steering system which provides positive steering control with minimum operator effort. The system includes nitrogen-charged accumulators which automatically provide emergency power if the steering hydraulic pressure is reduced below an established minimum.

Dynamic Retarding Grid E.13-0000051640

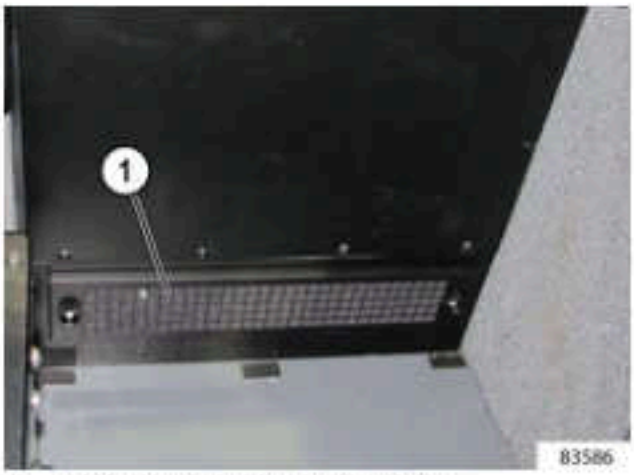
The dynamic retarding grid is used to slow the truck during normal operation or control speed coming down a grade. The dynamic retarding ability of the electric system is controlled by the operator through the activation of the retarder pedal (or by operating a lever on the steering column) in the operator's cab and by setting the speed control. Dynamic Retarding is automatically activated if the truck speed goes to a preset overspeed setting.

Brake System B.10-0000060879

Service brakes at each wheel are oil-cooled multiple disc brakes applied by an all-hydraulic actuation system. Depressing the brake pedal actuates both front and rear brakes after first applying the retarder. All wheel brakes will be applied automatically if the brake system pressure decreases below a preset minimum.

The parking brake is a dry disc type, mounted inboard on each rear wheel motor, and is spring-applied and hydraulically-released with wheel speed application protection (will not apply with truck moving).

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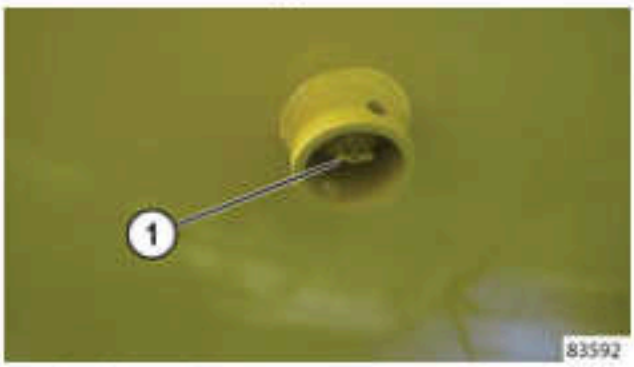
1. HVAC Recirculation Filter Element

Figure 7-7 HVAC RECIRCULATION FILTER LOCATION

1. Clean both filter elements (1, Figure 7-6 CAB AIR FILTER LOCATION, page 7-5 and Figure 7-7 HVAC RECIRCULATION FILTER LOCATION, page 7-6) with mild soap and water.
2. Rinse completely clean and air dry with a maximum of 275 kPa (40 psi).
3. Reinstall the filters.

FUEL SYSTEM SERVICE G.33-0000051601

Fuel Tank Cleaning

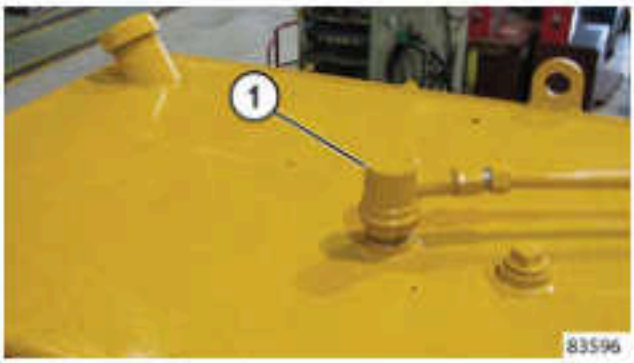


1. Fuel Tank Drain

Figure 7-8 FUEL TANK

Open fuel tank drain (1, Figure 7-8 FUEL TANK, page 7-6) to drain water and sediment from the fuel tank. The fuel tank is provided with a drain and a cleaning port in the side that allows steam or solvent to be utilized in cleaning tanks that have accumulated foreign material.

It is not necessary to remove the tank from the truck for cleaning of sediment, however rust and scale on the walls and baffles may require complete tank removal. Prior to a cleaning procedure of this type, all vents, fuel gauge, and hose connections should be removed and temporarily sealed. After all scale, rust, and foreign material has been removed, the temporary plugs can be removed. A small amount of light oil must be sprayed into the tank to prevent rust if the tank is to remain out of service. All openings should be sealed for rust prevention.



1. Fuel Tank Breather

Figure 7-9 FUEL TANK BREATHER

Remove breather (1, Figure 7-9 FUEL TANK BREATHER, page 7-6) and clean in solvent. Dry with pressurized air and reinstall.

Fuel Filter Service



1. Water Drain Valves

Figure 7-10 WATER SEPARATOR DRAIN

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- -32° to 32°C (-25° to 90°F) - Use NLGI No. 1 multipurpose grease (MPG).
- Below -32°C (-25°F) - Refer to local supplier for extreme cold weather lubricant requirements.

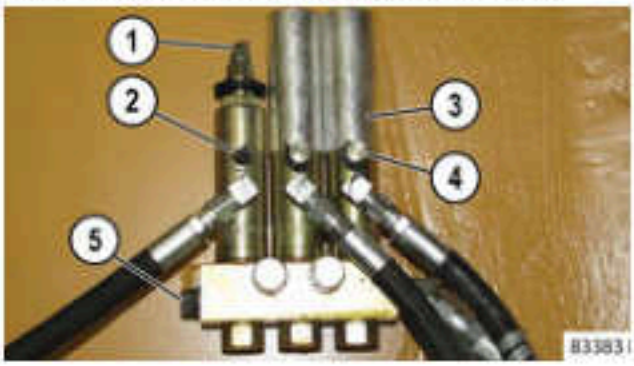
Priming The Automatic Lubrication System

The system must be full of grease and free of air pockets to function properly. After maintenance, if primary or secondary lubrication lines were replaced, it will be necessary to prime the system to eject all entrapped air.



1. Vent Valve
2. Main Supply Line

Figure 5-18 AUTO LUBE MAIN SUPPLY LINE



1. Injector Indicator
2. Injector Grease Zerk
3. Injector Cover
4. Injector Grease Zerk Cap
5. Injector Manifold Plug

Figure 5-19 INJECTOR MANIFOLD

To prime the main supply lines, perform the following:

1. Fill lube reservoir with lubricant, if necessary.
2. Remove injector manifold plug (5, Figure 5-19 INJECTOR MANIFOLD, page 5-50) from injector manifold. Always start with the injector manifold closest to the pump. The last grease line to be purged should be the main grease line to the rear axle (longest grease line).
3. Disconnect main supply line (2, Figure 5-18 AUTO LUBE MAIN SUPPLY LINE, page 5-50) from vent valve (1). Connect an external grease supply to main supply line (2).
4. Pump grease in main supply line (2) until grease appears at the injector manifold plug.
5. Re-install the injector manifold plug. Repeat for remaining injector groups.

After all main supply lines are purged of air, the injector circuits must now be primed.

To prime the secondary supply lines, perform the following:

1. If necessary, disconnect an injector grease line from the component that particular injector supplies grease to.
2. Remove injector grease zerk cap (4) from each injector and connect an external grease supply to injector grease zerk (2) on the injector.
3. Pump grease into the injector until grease appears at the far end of the individual grease line or the joint being greased.
4. Reconnect injector grease line to the component, remove the external grease supply, and reinstall injector grease zerk cap.
5. Repeat steps 1 through 4 until all secondary supply lines have been primed.
6. After all grease lines are primed, use the override switch to cycle the automatic lubrication pump a few times to lube the components.

PREVENTIVE MAINTENANCE PROCEDURES E.6-0000051465

Use the following maintenance procedures to ensure proper system operation.

Daily Lubrication System Inspection

1. Check the grease reservoir level after each shift of operation. Grease usage should be consistent from day-to-day operations. Lack of lubricant usage would indicate an inoperative system. Excessive usage would indicate a broken supply line.
2. Check filter bypass indicator when filling reservoir. Replace element if bypassing.
3. Check all grease hoses from the injectors to the lubrication points.
   a. Repair or replace all damaged feed line hoses.

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