Operation & Maintenance Manual

Dump Truck

930E-4

Serial Numbers A31936 & UP

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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PEDALS AND RETARDER LEVER B.40-0000060899

Dynamic Retarding

Dynamic retarding is a braking torque (not a brake) produced through electrical generation by the wheelmotors when the truck motion (momentum) is the propelling force.

For normal truck operation, dynamic retarding must be used to slow and control truck speed.

Dynamic retarding is available in FORWARD/REVERSE at all truck speeds above 0 kph/mph; however, as the truck speed slows below 5 kph (3 mph), the available retarding force may not be effective. Use the service brakes to bring the truck to a complete stop.

Dynamic retarding will not hold a stationary truck on an incline. Use the parking brake or wheel brake lock for this purpose.

Dynamic retarding is available in NEUTRAL only when truck speed is above 5 kph (3 mph).

When dynamic retarding is in operation, engine rpm will automatically go to an advance retard speed setting. This rpm will vary depending on temperature of several electrical system components.

Dynamic retarding will be applied automatically if the speed of the truck obtains the maximum speed setting programmed in the control system software.

When dynamic retarding is activated, an indicator light will illuminate. The grade/speed retard chart must always be used to determine safe downhill speeds. Refer to the grade speed chart in the cab.

Retarder Lever

Retarder lever (5, Figure 6-2 STEERING WHEEL & CONTROLS, page 6-3) mounted on the right side of the steering column can be used to modulate retarding effort. The lever will command the full range of retarding and will remain at a fixed position when released.

- When the lever is rotated to full "up" (counterclockwise) position, it is in the OFF/no retard position. An adjustable detent holds the lever in the OFF position. Refer to the shop manual for adjustment procedures.
- When the lever is rotated to full "down" (clockwise) position, it is in the full ON/retard position.
- For long downhill hauls, the lever may be positioned to provide desired retarding effort, and it will remain where it is positioned.

NOTE: *The retarder lever must be rotated back to the OFF position before the truck will resume the propel mode of operation.*

The lever and foot-operated retarder/service brake pedal can be used simultaneously or independently. The Drive System Controller (DSC) will determine which device is requesting the most retarding effort and apply that amount.

Brake/Retarder Pedal

Brake/retarder pedal (2, Figure 6-1 CAB INTERIOR - OPERATOR VIEW, page 6-2) is a single, foot-operated pedal that controls both retarding and service brake functions. The first portion of pedal travel commands retarding effort through a rotary potentiometer. The second portion of pedal travel modulates service brake pressure directly through a hydraulic valve. Thus, the operator must first apply, and maintain, full dynamic retarding in order to apply the service brakes. Releasing the pedal returns brake and retarder to the OFF position.

When the pedal is partially depressed, the dynamic retarding is actuated. As the pedal is further depressed, to where dynamic retarding is fully applied; the service brakes (while maintaining full retarding) are actuated through a hydraulic valve which modulates pressure to the service brakes. **Completely depressing the pedal causes full application of both dynamic retarding and the service brakes.** Indicator light (15, Figure 6-12 STATUS INDICATOR LIGHTS, page 6-22) will illuminate, and an increase in pedal resistance will be felt when the service brakes are applied.

For normal truck operation, dynamic retarding (lever or foot-operated pedal) should be used to slow and control the speed of the truck.

Service brakes should be applied only when dynamic retarding requires additional braking force to slow the truck speed quickly or when bringing the truck to a complete stop.

Accelerator Pedal

Accelerator pedal (3, Figure 6-1 CAB INTERIOR - OPERATOR VIEW, page 6-2) is a foot-operated pedal which allows the operator to control engine rpm depending on pedal depression.

It is used by the operator to request torque from the motors when in forward or reverse. In this mode, the propulsion system controller commands the correct engine speed for the power required. In NEUTRAL, this pedal controls engine speed directly.

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INITIAL 100 HOUR LUBRICATION AND MAINTENANCE INSPECTION E.3-0000051634

NOTE: *These checks are required only after the initial 100 hours of operation (such as: the commissioning of a new truck, or after a new or rebuilt component installation).*

INITIAL 100 HOUR LUBRICATION AND MAINTENANCE INSPECTION	
Item	**Task**
HYDRAULIC SYSTEM FILTERS	Replace filter elements only after the initial 100 and 250 hours of operation; then at each 500 hours of operation thereafter.

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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.16-0000051645

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.19-0000051642

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 a digital/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.17-0000051640

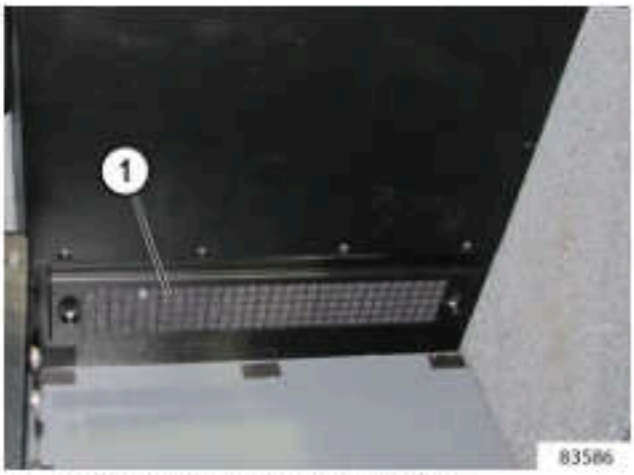
The dynamic retarding grid is used to slow the truck during normal operation or control speed coming down a grade. The dynamic retarding ability of the electric system is controlled by the operator through the activation of the retarder pedal (or by operating a lever on the steering column) in the operator's 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.11-0000060879

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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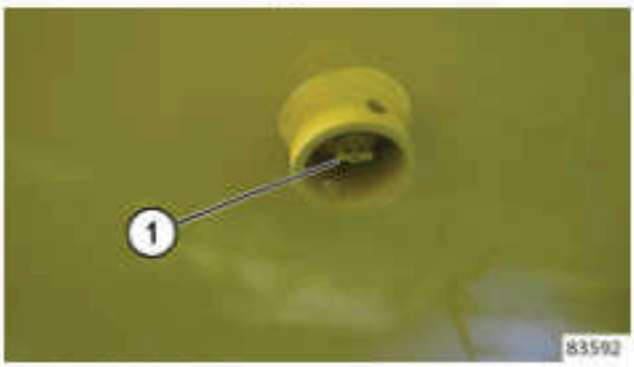
1. HVAC Recirculation Filter Element

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.45-0000051601

Fuel Tank Cleaning

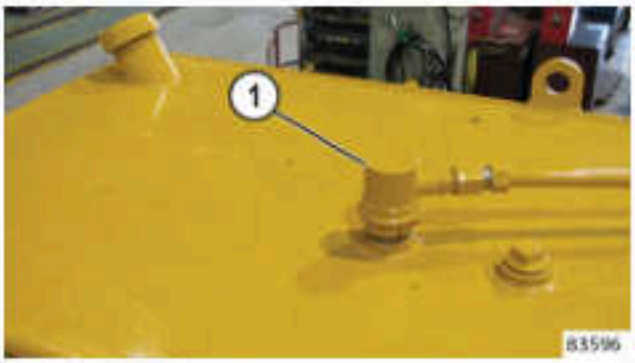


1. Fuel Tank Drain

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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NOTE: *Some of the configuration parameters require a password to change. The password for all parameters except the Payload Gain is "**Kac2300**". This is case sensitive. The password for the payload gain, which is a critical setting, is not included in this document.*

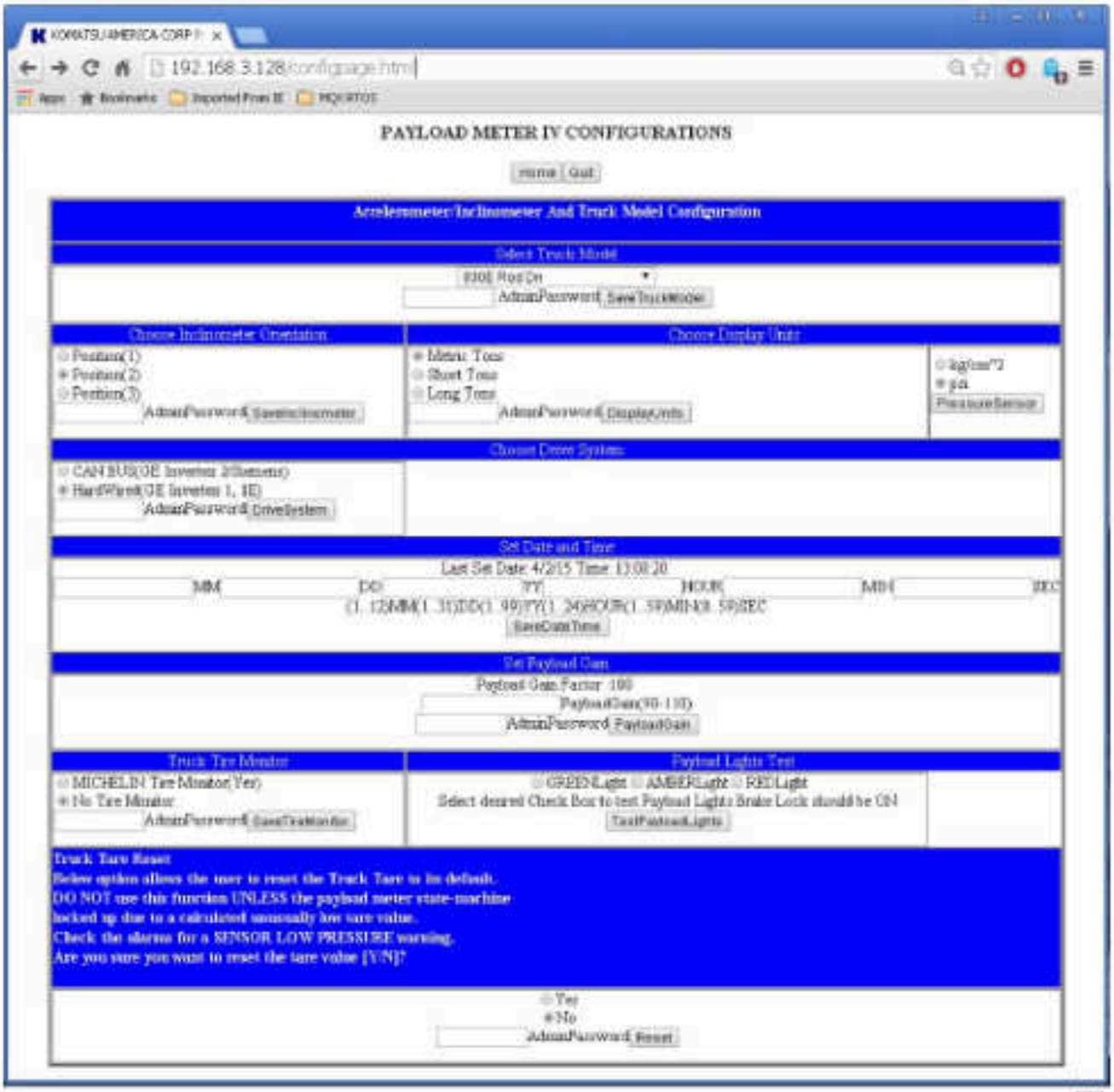


Figure 5-35 PAYLOAD METER IV CONFIGURATIONS

There are ten configuration parameters on this page. Below is a description of each.

- Truck Model
- PLM IV Mounting Orientation
- Gauge Display Units
- Pressure Sensor Units (for RTD web page only)
- Date and Time
- Payload Gain Factor
- Payload Light Test
- Truck Tare Reset

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