Shop Manual

DG610



210M

DUMP TRUCK

SERIAL SUFFIX **BFA40A THRU BW**
23858 THRU 24370

KOMATSU®

MidWestTech | Komatsu 210M Dump Truck Service Manual | Publication DG610

Order the manual at mid-west-tech.com >

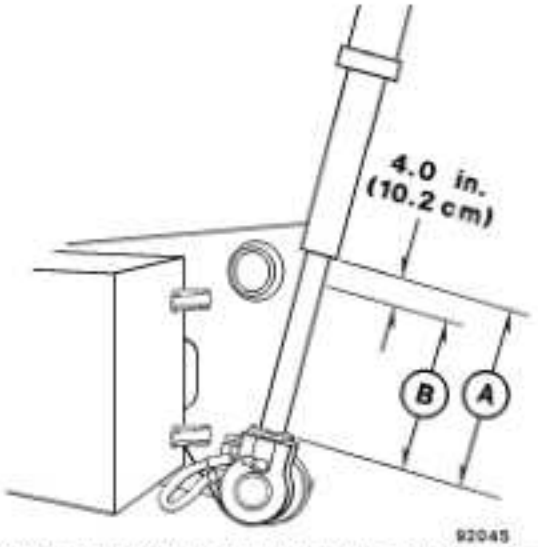


FIGURE 3-8. HOIST CYLINDER MEASUREMENT

A. Length of Cylinder Rod @ Complete Extension
B. Complete Extension less 4 in. (10.16 cm).

3. Measure length of lower hoist cylinder rod shown as "A", Figure 3-8. Record measurement.
4. Lower body to frame. Subtract 4 in. (10.16 cm.) from dimension found in Step 3 and record as dimension "B".
5. Raise body until exposed length of lower hoist cylinder rod equals dimension "B".
6. Install indicator arm plate (2, Figure 3-9). Loosen capscrews and nuts (4, Figure 3-10) and adjust gap between body-up limit switch (2) and indicator arm plate (1) to 0.25 in. (6.35 mm.) Tighten nuts (4) to standard torque.
7. Loosen capscrews (1, Figure 3-9) on indicator arm plate (2). Adjust arm to **overlap** end of switch (5) by 0.75 ± 0.25 in. (19.05 ± 6.35 mm). Tighten capscrews to standard torque.
8. Place hoist control switch in "Power Down" position and lower body to frame.

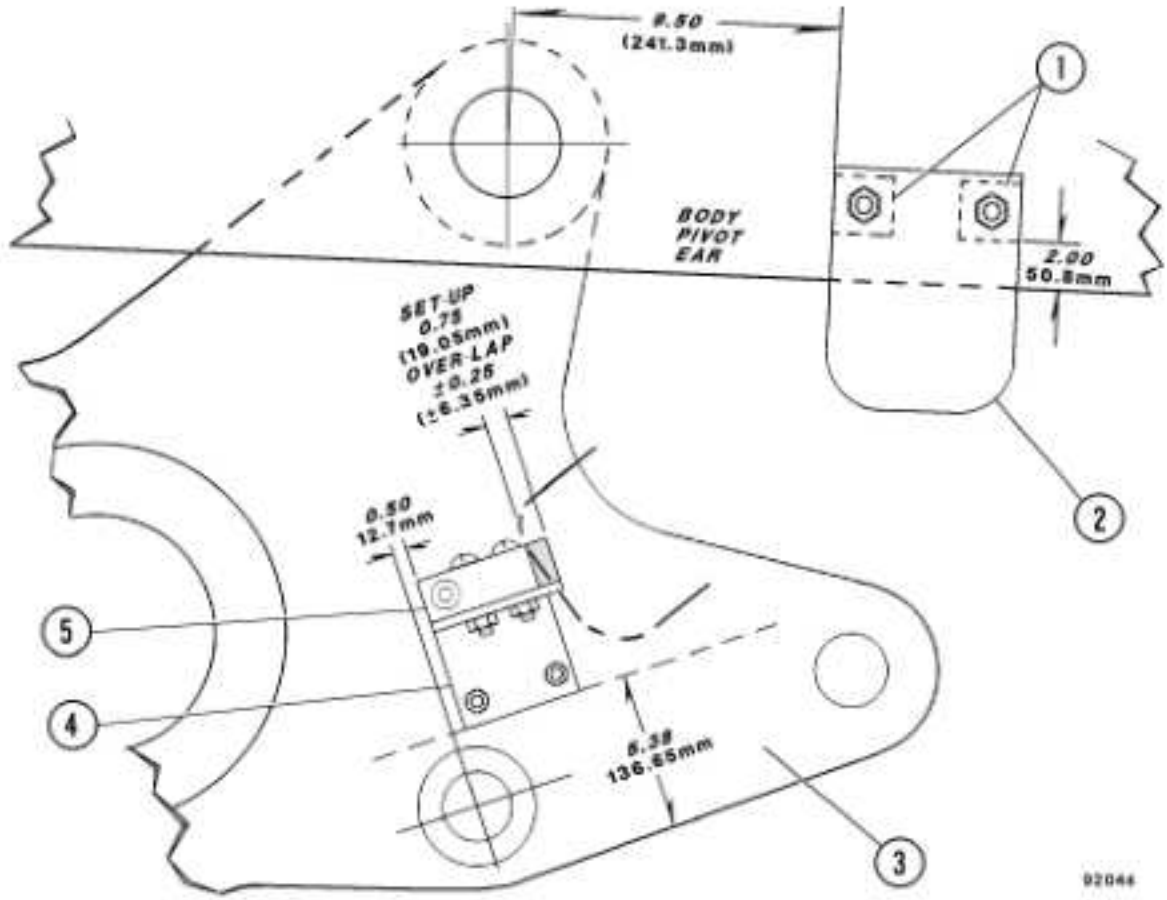


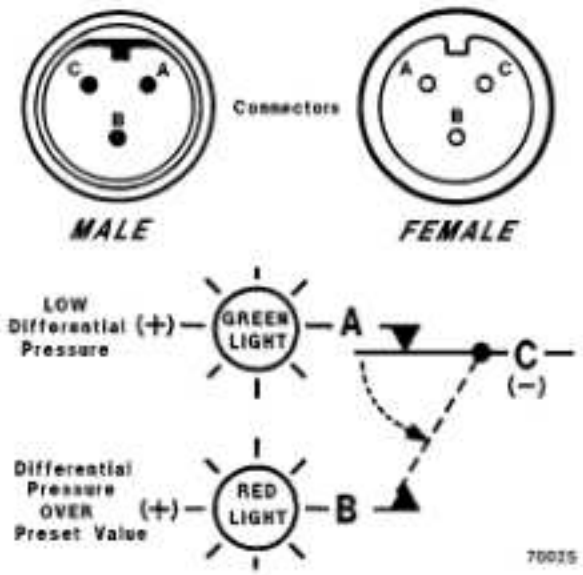
FIGURE 3-9. BODY-UP LIMIT SWITCH ADJUSTMENT

1. Tapped Pads and Capscrews
2. Indicator Arm Plate
3. R.H. Frame (Inboard Rear)
4. Mounting Bracket with Mounting Hardware
5. Body-Up Limit Switch with Mounting Hardware

MidWestTech | Komatsu 210M Dump Truck Service Manual | Publication DG610 Order the manual at mid-west-tech.com >

The following information is provided to assist in making (if desired) a temporary wiring harness for testing purposes.

FIGURE 3-18. INDICATOR LIGHT TEST WIRING HARNESS



Male Electrical Connector (on switch):

☐ MS3102R-10SL-3P (revised)

Female Mating Electrical Connector:

☐ MS3106-A10SL-3S (straight plug)

or

☐ MS3108-A10SL-3S (90° angle plug)

MidWestTech | Komatsu 210M Dump Truck Service Manual | Publication DG610 Order the manual at mid-west-tech.com >

TROUBLESHOOTING

PRE-DIAGNOSIS CHECKS

A lot of time and frustration can be saved if obvious causes of system problems are checked before connecting the manifold gauge set. If the system indicates Insufficient cooling or no cooling, the following points should be checked before proceeding with the system diagnosis procedures.

PREPARING FOR DIAGNOSIS

Successfully servicing an air conditioning system, beyond the basic procedures outlined in the previous section, requires additional knowledge of system testing and diagnosis.

A good working knowledge of the manifold gauge set is required to correctly test and diagnose an air conditioning system. An accurate testing sequence is usually the quickest way to diagnose an internal problem. When correctly done, diagnosis becomes an accurate procedure rather than guesswork.

- ☐ Compressor Belt - Must be tight, and properly aligned.
- ☐ Compressor Clutch - The clutch must engage. If it does not, check fuses, wiring, and switches.
- ☐ Oil Leaks - Inspect all connection or components for refrigeration oil leaks (especially in the area of the compressor shaft). A leak indicates an R-12 refrigerant leak.
- ☐ Electrical Check - Check all wires and connections for possible open circuits or shorts. Check all system fuses.

Note: Some systems use different safety devices in the compressor circuit to protect the compressor. Check the thermal fuse, the low pressure cutout switch, high pressure cutout switch or trinary pressure switch if equipped.

- ☐ Cooling System - Check for correct cooling system operation. Inspect the radiator hoses, heater hoses, clamps, belts, water pump, thermostat and the radiator for condition or proper operation.
- ☐ Radiator Shutters - Inspect for correct operation and controls, if equipped.
- ☐ Fan and Shroud - Check for proper operation of fan clutch. Check installation of fan and shroud.
- ☐ Heater/Water Valve - Check for malfunction or leaking.
- ☐ System Ducts and Doors - Check the ducts and doors for proper function.
- ☐ Refrigerant Charge - Make sure system is properly charged with the correct amount of refrigerant.

PRELIMINARY STEPS

The following steps outline the correct procedures necessary to prepare the truck and the system for testing and diagnosis:

1. Correctly connect the manifold gauge set to the system. Refer to the connection and purging procedures outlined in this section.
2. Run the engine with the air conditioning system on for five to ten minutes to stabilize the system.
3. With the engine and the system at normal operating temperature, conduct a Performance Test as outlined in this section.

DIAGNOSIS OF GAUGE READINGS & SYSTEM PERFORMANCE

The following Troubleshooting Chart lists typical malfunctions encountered in air conditioning systems. Indications and or problems may differ from one system to the next. Read all applicable situations, service procedures, and explanations to gain a full understanding of the system malfunction. Refer to "Suggested Corrective Action" for suggested service procedures.

MidWestTech | Komatsu 210M Dump Truck Service Manual | Publication DG610 Order the manual at mid-west-tech.com >

Refer to Figure 4-6 for a diagram describing the hookup of the various components.

The ATEC system operates primarily on 12VDC and is interfaced with many of the HAULPAK® truck circuits. Therefore, a Battery Equalizer (Figure 4-5) is provided to maintain equal charge on both truck batteries. The external 24VDC. functions of the truck related to the transmission system are controlled by relays which are controlled by the ECU or range selector. The ECU also monitors the system for abnormal fault conditions. When such a fault condition is detected, the ECU automatically responds in a manner which is safe for the operator, the truck, and the transmission. It also records an appropriate malfunction code in its memory. When the abnormal condition occurs, the "Check Transmission" light is turned on. Additionally, with some conditions, the "Do Not Shift" light and a buzzer is activated in the Range Selector alerting the operator to the potential problem.

⚠CAUTION

Before welding on truck, be sure alternator and battery equalizer are completely disconnected. Remove equalizer ground first, then disconnect 12 and 24 volt positive terminals. When connecting back in system, connect 24 and 12 volt positive terminals first, ground terminal last.
When disconnecting the truck batteries, the following procedure MUST be followed in the sequence shown to prevent damage to the ATEC system components:

1. Turn ATEC power switch "OFF".
2. Remove the battery 12V positive (+) terminal. DO NOT LET TERMINAL TOUCH CHASSIS GROUND!
3. Remove the battery 24V positive (+) terminal.
4. Remove the battery 24V negative (-) terminal.
5. Disconnect harness connectors at the ECU after disconnecting battery power.
6. Cover ATEC components and wiring to protect from hot sparks, etc. Do not connect welding cables to ATEC components. Do not weld on ATEC components. Remove ATEC components if welding within 10 in. (25 cm) of component.
7. When reconnecting components, reverse the order of steps 1 through 6. Check wiring and cables for proper routing and termination.

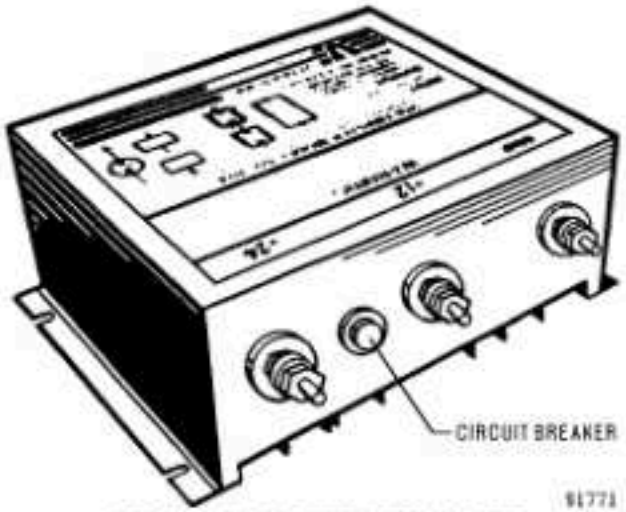


FIGURE 4-5. BATTERY EQUALIZER

TRANSMISSION CONTROL CIRCUITS

The following circuits can be affected by a problem in either the HAULPAK® electric or the ATEC circuit: engine starting, ATEC control power, backup horn and lights, speedometer, hoist interlock and a portion of ATEC warning system.

Refer to Electrical Schematic, Section "R" to determine if the problem is with the HAULPAK® or ATEC circuit. For example: the engine will not crank. If the problem is in the ATEC circuit, the *"Off-Highway ATEC Troubleshooting Manual"* should be used to determine component causing problem.

Battery Charging Circuit

Two 12 volt batteries connected in series, supply 24 volts to the system. The batteries are recharged from an engine driven alternator with built-in voltage regulator. The voltmeter indicates the output voltage of the battery charging alternator. Normal indicated voltage at high idle is 27 – 28 volts. When the key switch is "On" and engine is not running, the voltmeter indicates battery voltage.

One 12 volt battery supplies the transmission control circuit. To prevent unequal charge and discharge of the batteries, a battery equalizer is provided in the charge circuit. The battery equalizer balances charge and discharge of both batteries. Refer to Electrical Schematic in Section "R".

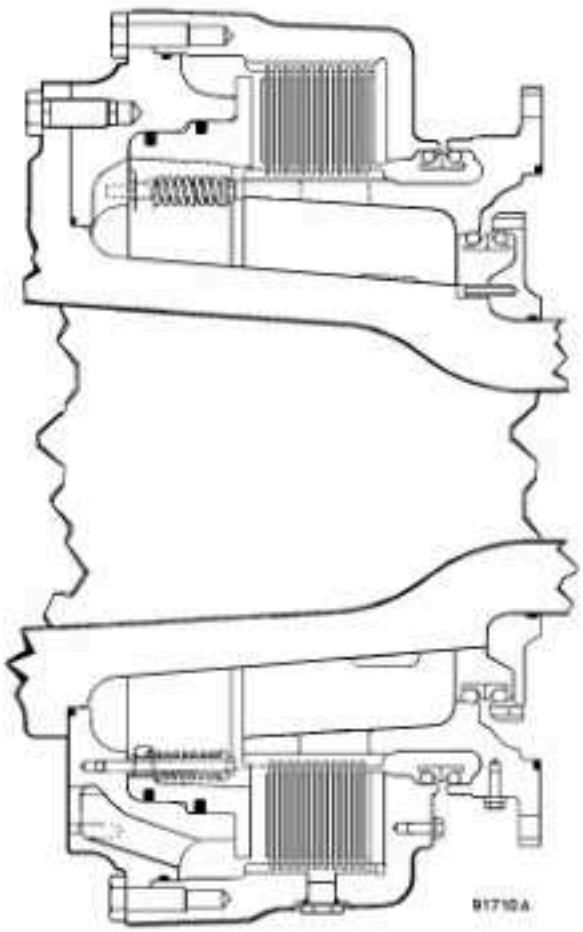
The equalizer is equipped with a circuit breaker for internal protection. If the breaker is activated, it must be reset to prevent one battery running down. The fault causing the breaker to activate must be corrected also.

MidWestTech | Komatsu 210M Dump Truck Service Manual | Publication DG610 Order the manual at mid-west-tech.com >

REAR WET DISC BRAKE ASSEMBLY

A Wet Disc Brake Assembly is mounted on both sides of the differential on the final drive housing and inboard from the wheel hub and planetary drive. This assembly contains a splined housing, two damper discs, ten separator plates, eleven friction discs, a spacer, a piston assembly, and a splined rotating hub.

The housing is internally splined to retain the steel damper and separator discs. The separator discs are alternately placed between the friction faced discs which are splined to the rotating hub. The inboard side of the assembly contains the piston assembly which is activated by hydraulic pressure from either the service brake treadle valve or the retarder treadle valve. As hydraulic pressure is applied, the piston moves and compresses the rotating friction faced discs against the stationary steel discs. The friction forces generated resist the rotation of the wheels. As hydraulic pressure increases, friction forces are increased and wheel rotation is slowed until maximum force is reached and the wheel is stopped.



WET DISC BRAKE ASSEMBLY

The complete brake disc pack is cooled by hydraulic oil. The cooling oil circuit is a low-pressure circuit which is completely separate from the high-pressure piston apply circuit. The cooling oil flows from the pump, through two 12 micron (absolute) filters, through a heat exchanger, to the brake assembly housing (from the outside of the housing inward to the rotating hub for maximum cooling) and then to the hydraulic tank.

Dynamic retarding is also provided by the wet disc brakes. When the operator's retarder pedal is depressed, front wheel brakes are not used; only the rear wet disc brakes are applied. The dynamic retarding is used to slow the truck during normal truck operation or to control speed coming down a grade.

WET DISC BRAKE ASSEMBLY

Removal

⚠WARNING

Before removing any brake lines or brake circuit components be sure brake accumulators are bled down. To bleeddown accumulators:

- ***BLOCK WHEELS OF TRUCK!***
- ***Turn key switch "Off", shut down engine and wait at least 90 seconds to bleed down steering accumulator. Rotate steering wheel back and forth; no front wheel movement should occur.***
- ***Bleed down brake accumulators by turning Accumulator Discharge Valve handles counterclockwise to open. Wait at least 90 seconds to let accumulators bleed down. When brake accumulators are completely bled down, close accumulator discharge valves by turning handles clockwise. Do not leave open.***

1. Remove rear wheels and tires, planetary drive, and wheel hubs. Refer to Section "G", Drive Axle, Spindles and Wheels.

MidWestTech | Komatsu 210M Dump Truck Service Manual | Publication DG610 Order the manual at mid-west-tech.com >