CEAM020101

Operation & Maintenance Manual

830E-1AC

DUMP TRUCK

SERIAL NUMBERS **A30174 - A30209**

KOMATSU®

TABLE OF CONTENTS (cont.)

TABLE XI. PRESSURE CONVERSIONS
Pounds per square inch (psi) to Megapascals (MPa)
Formula: psi x 0.0069 = MPa

psi	0	10	20	30	40	50	60	70	80	90
0	**(MPa)**	0.069	0.14	0.21	0.28	0.34	0.41	0.48	0.55	0.62
100	0.69	0.76	0.83	0.90	0.97	1.03	1.10	1.17	1.24	1.31
200	1.38	1.45	1.52	1.59	1.65	1.72	1.79	1.86	1.93	2.00
300	2.07	2.14	2.21	2.28	2.34	2.41	2.48	2.55	2.62	2.69
400	2.76	2.83	2.90	2.96	3.03	3.10	3.17	3.24	3.31	3.38
500	3.45	3.52	3.59	3.65	3.72	3.79	3.86	3.93	4.00	4.07
600	4.14	4.21	4.27	4.34	4.41	4.48	4.55	4.62	4.69	4.76
700	4.83	4.90	4.96	5.03	5.10	5.17	5.24	5.31	5.38	5.45
800	5.52	5.58	5.65	5.72	5.79	5.86	5.93	6.00	6.07	6.14
900	6.21	6.27	6.34	6.41	6.48	6.55	6.62	6.69	6.76	6.83
See NOTE below regarding Table usage.										

NOTE: Tables such as Table VIII, IX, X, and XI may be used as in the following example:

Example: Convert 975 psi to kilopascals (kPa).

1. Select Table X.
2. Go to psi row 90, column 7; read 668.8
   97 psi = 668.8 kPa.
3. Multiply by 10:
   970 psi = 6688 kPa.
4. Go to psi row 0, column 5; read 34.475
   psi = 34.47 kPa. Add to step 3.
5. 970 + 5 psi = 6688 + 34 = 6722 kPa.

TABLE XII. TEMPERATURE CONVERSIONS
Formula: F° - 32 ³ 1.8 = C° or C° x 1.8 + 32 = F°

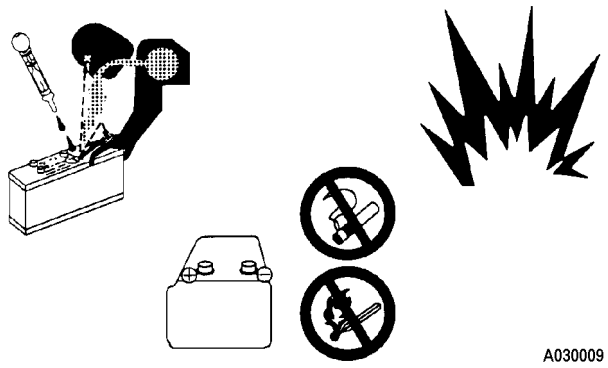
CELSIUS C°		FAHRENHEIT F°	CELSIUS C°		FAHRENHEIT F°	CELSIUS C°		FAHRENHEIT F°
121	250	482	63	145	293	4	40	104
118	245	473	60	140	284	2	35	95
116	240	464	57	135	275	– 1	30	86
113	235	455	54	130	266	– 4	25	77
110	230	446	52	125	257	– 7	20	68
107	225	437	49	120	248	– 9	15	59
104	220	428	46	115	239	– 12	10	50
102	215	419	43	110	230	– 15	5	41
99	210	410	41	105	221	– 18	0	32
96	205	401	38	100	212	– 21	– 5	23
93	200	392	35	95	293	– 23	– 10	14
91	195	383	32	90	194	– 26	– 15	5
88	190	374	29	85	185	– 29	– 20	– 4
85	185	365	27	80	176	– 32	– 25	– 13
82	180	356	24	75	167	– 34	– 30	– 22
79	175	347	21	70	158	– 37	– 35	– 31
77	170	338	18	65	149	– 40	– 40	– 40
74	165	329	15	60	140	– 43	– 45	– 49
71	160	320	13	55	131	– 46	– 50	– 58
68	155	311	10	50	122	– 48	– 55	– 67
66	150	302	7	45	113	– 51	– 60	– 76

Note: The numbers in the unmarked columns refer to temperature in either degrees Celsius (C°) or Fahrenheit (F°). Select a number in this unmarked column and read to the left to convert to degrees Celsius (C°) or read to the right to convert to degrees Fahrenheit (F°). If starting with a known temperature (either C° or F°), find that temperature in the marked column and read the converted temperature in the center, **unmarked** column.

WORKING NEAR BATTERIES

Battery Hazard Prevention

- Battery electrolyte contains sulfuric acid and can quickly burn the skin and eat holes in clothing. If electrolyte comes in contact with skin, immediately flush the area with water.
- Battery acid can cause blindness if splashed into the eyes. If acid gets into the eyes, flush them immediately with large quantities of water and see a doctor immediately.
- If acid is accidentally ingested, drink a large quantity of water, milk, beaten eggs or vegetable oil. Call a doctor or poison prevention center immediately.
- Always wear safety glasses or goggles when working with batteries.



- Batteries generate hydrogen gas. Hydrogen gas is very EXPLOSIVE, and is easily ignited with a small spark or flame.
- Before working with batteries, stop the engine and turn the key switch to the OFF position. Wait two minutes after the engine has stopped, and if no warning lights illuminate, then turn the battery disconnect switches to the OFF position.
- Avoid short-circuiting the battery terminals through accidental contact with metallic objects, such as tools, across the terminals.
- When removing or installing a battery, positively identify the positive (+) terminal and negative (-) terminal and use precautions not to short circuit the terminals.
- Tighten battery caps securely.
- Tighten battery terminals securely. Loose terminals can generate sparks and lead to an explosion.

7. DO NOT weld on the rear of the control cabinet! The metal panels on the back of the cabinet are part of capacitors and cannot be heated.
8. DO NOT weld on the retard grid exhaust louvers - they are made of stainless steel. Some power cable panels throughout the truck are also made of aluminum or stainless steel. They must be repaired with the same material or the power cables may be damaged.
9. Power cables must be cleated in wood or other non-ferrous materials. DO NOT repair cable cleats by encircling the power cables with metal clamps or hardware. Always inspect power cable insulation prior to servicing the cables and prior to returning the truck to service. Discard cables with broken insulation.
10. Power cables and wiring harnesses must be protected from weld spatter and heat.

    Always fasten the welding machine ground (-) lead to the piece being welded; the grounding clamp must be attached as near as possible to the weld area.

    Always avoid laying welding cables over or near the vehicle electrical harnesses. Welding voltage could be induced into the electrical harness and cause damage to components.

    Never allow welding current to pass through ball bearings, roller bearings, suspensions, or hydraulic cylinders.
11. If the red lights on the exterior of the control cabinet and/or the back wall of the center console continue to be illuminated after following the above procedure, a fault has occurred.

    Leave all cabinet doors in place; DO NOT touch the retard grid elements; DO NOT disconnect any power cables, or use them as hand or foot holds.

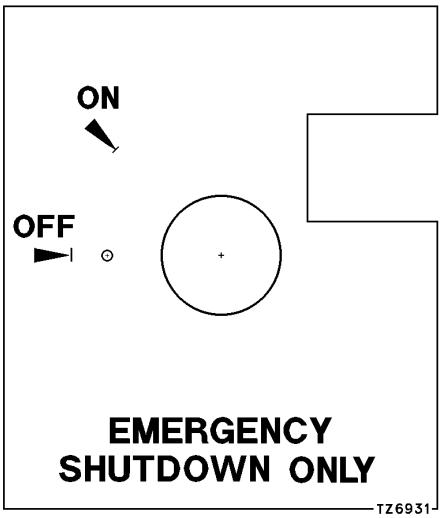
⚠WARNING

Notify your Komatsu service representative, immediately. Only qualified personnel, specifically trained for servicing the A-C drive system, can perform this service.

12. After welding or maintenance is complete, replace all covers and doors. Position the GF cutout switch and battery disconnect switches in their original positions. Reconnect all harnesses prior to starting the truck.

    Leave the drive system in the rest mode until the truck is to be moved.

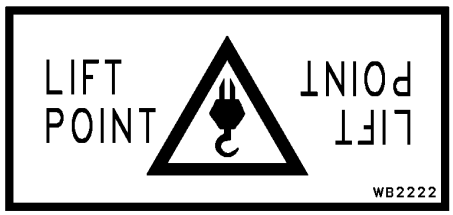
This decal is placed on the ground level engine shutdown switch which is mounted on the left side of the front bumper structure. It specifies that this switch is for emergency shutdown only.

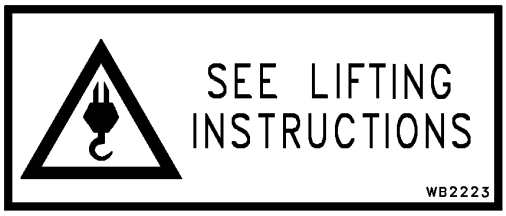


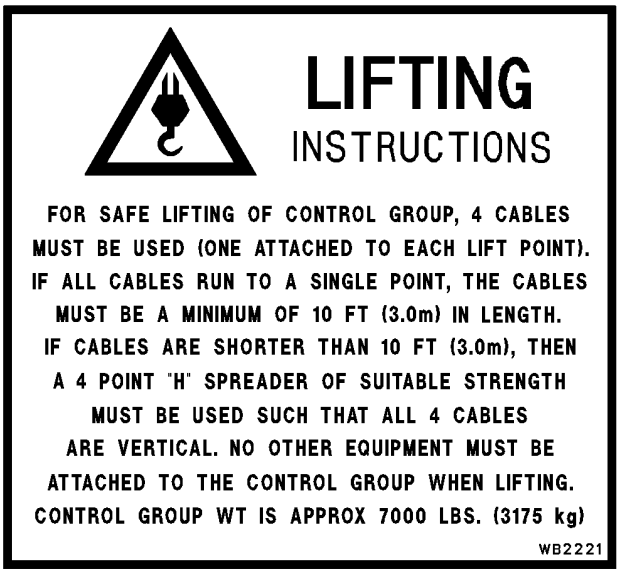
This page illustrates a variety of decals which are mounted on deck mounted cabinets, housings, and structures which must be lifted in a specific manner, and from specific points, in order to safely move or lift any of these structures.

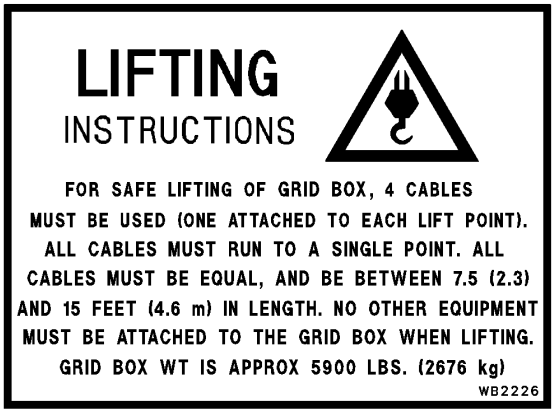
If any of these decals are damaged or defaced, so that it is no longer legible, it should be replaced immediately.

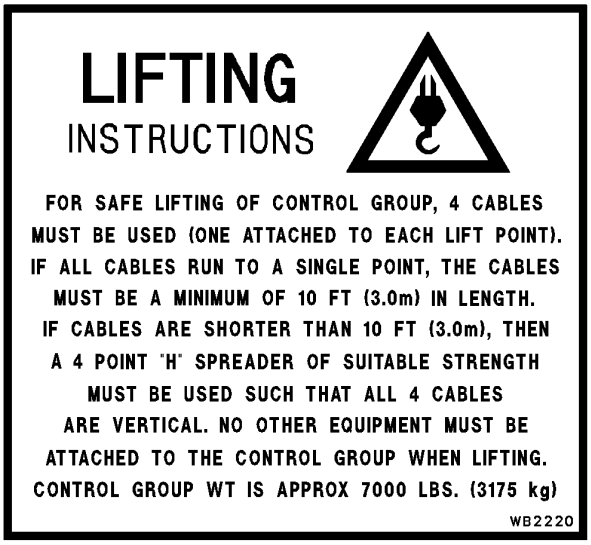
Maintenance personnel must follow these lifting instructions.











EMERGENCY STEERING SYSTEM

Operation

This truck is equipped with an emergency steering system. This system is a backup in the event of loss of oil supply to the main steering system. The emergency steering system was designed to meet or exceed SAE J1511 and ISO 5010 standards.

If the low steering system pressure indicator light and alarm are activated, a failure in the hydraulic oil supply to the steering and brake system exists. When the alarm is activated, typically there is enough hydraulic pressure stored in the brake and steering accumulators to allow brief operation of the steering and brake functions. However, this oil supply is limited. Therefore, it is important to stop the truck as quickly and safely as possible after the alarm is first activated.

If the oil supply pressure drops to a predetermined level, the low brake pressure warning light will also illuminate. If the oil pressure continues to decrease, the brake auto-apply feature will activate the service brakes to stop the truck.

Pre-Operation Testing

NOTE: Komatsu recommends that operators perform this test to verify that the steering accumulator precharge pressure is adequate at the beginning of each shift before operating the truck.

⚠WARNING

Ensure no one is near the front tires during this test. All personnel are warned that the clearances change when the truck is steered and this could cause serious injury.

This test can only be performed with an empty truck.

1. Park the empty truck on flat, level ground. Lower the dump body onto the frame and stop the engine. Ensure that the key switch is in the OFF position.
2. Wait at least 90 seconds to verify that all hydraulic pressure has been relieved from the steering accumulators. Turn the steering wheel from stop to stop. If the front wheels do not move, there is no hydraulic pressure.
3. Check the hydraulic tank oil level. The oil level must be visible in the center of the upper sight glass and must not cover the entire upper sight glass. Add oil if necessary. **DO NOT overfill.**
4. Turn the key switch to the ON position, but DO NOT start the engine.
   a. *Steering system pressure:* Verify that the low steering pressure warning light is illuminated. If it is not illuminated, immediately notify maintenance personnel. DO NOT operate the truck until the problem is corrected.
   b. *Steering accumulator precharge:* Verify that the low accumulator precharge warning light is not illuminated and the warning buzzer is not sounding. If the warning light is illuminated and the buzzer is sounding, immediately notify maintenance personnel. DO NOT operate the truck until the problem is corrected.
5. Start the engine and allow the steering accumulators to fully charge. Turn the steering wheel so that the front wheels are straight.
6. Check the hydraulic tank oil level while the engine is on.
   a. If the oil level is visible in center of the lower sight glass and does not cover the entire lower sight glass, the steering accumulators are adequately charged. Proceed to Step 7.
   b. If the oil level is below the lower sight glass, the steering accumulators are not adequately charged. Stop the engine and turn the key switch to the OFF position. Immediately notify maintenance personnel. DO NOT operate the truck until the problem is corrected.

Lowering the Body:

6. Place the hoist lever of the good truck in FLOAT to lower the body. If necessary, momentarily place the hoist control in POWER UP until the body is able to descend in FLOAT. Do not accelerate the engine.
7. After body is lowered, stop the engine and wait two minutes to allow the hydraulic system to bleeddown. Then disconnect the hoses.
8. Reduce power down relief valve pressure to normal on good truck by turning the adjustment counterclockwise the same number of turns as required in step 4 b.
9. Check power down relief pressure using instructions in Section L10.
10. Check hydraulic tank oil level.

TOWING

Before towing a truck, many factors must be carefully considered. Serious personal injury and/or significant property damage may result if important safety practices, procedures and preparation for moving heavy equipment are not observed.

A disabled machine may be towed after the following precautions have been taken.

- Do not tow the truck any faster than 8 kph (5 mph).
- Tow with a solid tow bar. DO NOT tow with a cable. Use a towing device with ample strength for the weight of this truck.
- Never tow a truck on a slope.
- Inspect towing components, such as tow bars and couplings, for any signs of damage. Never use damaged or worn components to tow a disabled vehicle.
- Keep a safe distance from the trucks and towing apparatus while towing a vehicle.
- After connecting a truck that is to be towed, do not allow anyone to go between the tow vehicle and the disabled vehicle.
- Set the coupling of the truck being towed in a straight line with the towing portion of the tow truck, and secure it in position.
- An operator is to remain in the cab of the towed vehicle at all times during the towing procedure.

Special Wiring Harness

Before towing, a special wiring harness must be made in order to release the parking brake. The harness will require approximately 9 meters (30 ft) of #14 wire, and one ON/OFF switch (capable of carrying 2 amps of current) and two ring terminals. Refer to Figure 30-4. Using a ring terminal, one end of the wire must connect to a 24VDC bus bar in the auxiliary control cabinet to supply 24V to the solenoid. Switch (2) must be positioned in the harness so the operator can operate the switch while seated in the operators seat. The harness must be fitted with a connector (4) to allow it to be plugged into parking brake solenoid (3) inside the brake cabinet. Wire (5) leading from this connector is to be connected to the ground block using a ring terminal. Refer to Figure 30-5 for an overview of the special wiring harness when installed on the truck.

The parts required to connect to the solenoid are: 1 housing (PB8538), 2 sockets (0819105430) and 1 wedge (PB8540).

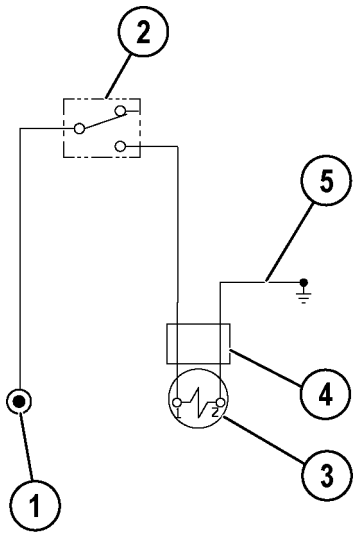


FIGURE 30-4. PARKING BRAKE HARNESS

1. 24VDC Connection
2. Switch (ON/OFF)
3. Park Brake Solenoid
4. Connector
5. Ground Wire

CENTER CONSOLE

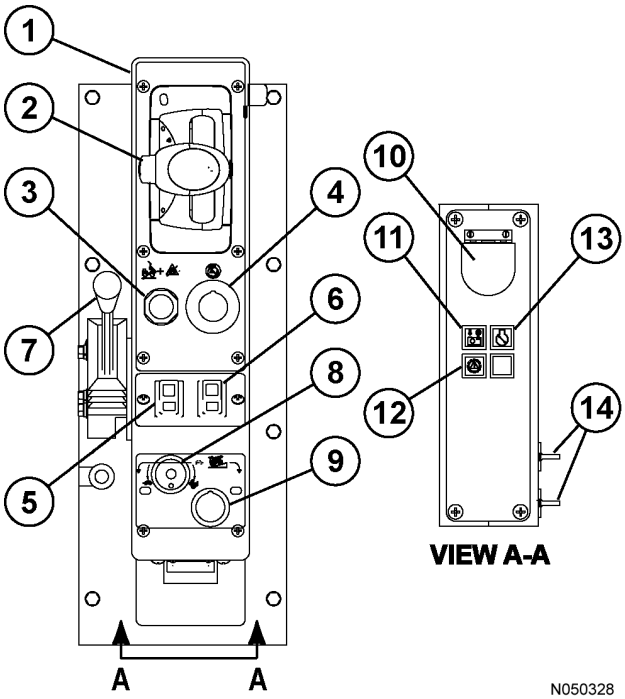


FIGURE 32-3. CENTER CONSOLE

1. Center Console
2. Directional Control Lever
3. Override/Fault Reset Switch
4. Engine Stop Switch
5. L.H. Window Control Switch
6. R.H. Window Control Switch
7. Hoist Control Lever
8. Retarder Speed Control Dial
9. RSC Switch
10. Data Store Button
11. VHMS Snapshot In Progress Light
12. Link Energized Light (Red)
13. Service Engine Light (Blue)
14. 12V Auxiliary Power Outlets

Directional Control Lever

Directional Control Lever (2, Figure 32-3) is mounted on a console to the right of the operator's seat. It is a four position lever that controls the park, reverse, neutral, and forward motion of the truck.

Before moving the directional control lever, apply the service brakes to completely stop the truck. Depress the button on the side to release the detent lock, then move the control lever to the desired position. When the control lever is in the center N position, it is in NEUTRAL. When the control lever is in the P position, it is in PARK, and the parking brake will be applied. The parking brake is spring applied and hydraulically released. It is designed to hold the truck stationary when the engine is off and the key switch is turned OFF. The truck must be completely stopped before moving the control lever to PARK, or damage may occur to the park brake. When the key switch is ON, and the control lever is in PARK, the parking brake indicator light (A3, overhead panel, Figure 32-8) will be illuminated.

⚠ IMPORTANT ⚠

The directional control lever must be in PARK to start the engine.

NOTE: DO NOT move the directional control lever to the PARK position at the shovel or dump.

The operator can select FORWARD drive by moving the control lever to the F position.

The operator can select REVERSE drive by moving the control lever to the R position. DO NOT allow the control lever to travel too far and go into the PARK position when REVERSE is desired.

NOTE: The truck must be completely stopped before the control lever is moved to a drive position or into PARK. A GE fault will be recorded if the control lever is placed into the PARK position while the truck is still moving.

High Beam Indicator

Indicator (12, Figure 32-7) illuminates to indicate that the truck headlights are on high beam. To switch the headlights to high beam, push the turn indicator lever away from the steering wheel. For low beam, pull the lever toward the steering wheel.

Speedometer/Payload Meter Display

Speedometer/payload meter display (13, Figure 32-7) indicates the truck speed in kilometers per hour (kph) or in miles per hour (mph). The display also shows payload meter information. For more information, see Section 60, Payload Meter III, in this manual.

Left Turn Signal Indicator

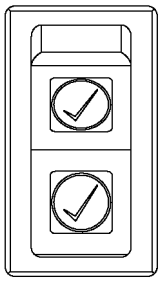
Indicator (14, Figure 32-7) illuminates to indicate that the left turn signals are operating when the turn signal lever on the steering column is moved downward. Moving the lever to its center position will turn the indicator off.

Water Temperature Gauge

Gauge (15, Figure 32-7) indicates the temperature of the coolant in the engine cooling system. The temperature range after engine warm-up and truck operating under normal conditions must be:

85°-97°C (185°-207°F)

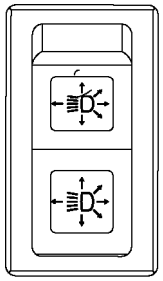
Lamp Test Switch



Switch (16, Figure 32-7) is provided to allow the operator to test the indicator lamps prior to starting the engine. To test the lamps and the warning horn, turn key switch (1, Figure 32-7) to the RUN position and press the top side of the rocker switch for the CHECK position. All lamps must illuminate except those which are for optional equipment that may not be installed. The warning horn must also sound. Any lamp bulbs which do not illuminate must be replaced before operating the truck. Releasing the spring-loaded switch will allow the switch to return to the OFF position. A green LED will illuminate in both switch positions.

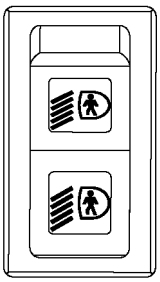
NOTE: Do not use the lamp check switch while the engine is on. Pressing this switch while the engine is on will cause false electrical system faults. Warning light (D5, Figure 32-8) will illuminate and engine shutdown is required to turn it off.

Light Switch



The instrument panel lights, clearance lights, and the headlights are controlled by this three-position rocker type switch (17, Figure 32-7). OFF is selected by pressing the bottom of the switch. Press the top of the switch until it reaches the first detent to select the panel lights, clearance lights and tail lights only. Press the top of the switch again until it reaches the second detent to select headlights, panel lights, clearance lights and tail lights.

Ladder Light Switch



Ladder light switch (18, Figure 32-7) turns the ladder lights on or off. Pressing the top of the rocker switch turns the lights on. Pressing the bottom of the switch turns the lights off. A green LED light will illuminate in both switch positions. Another ladder light switch is mounted at the right front corner of the truck near the base of ladder.

During normal truck operation, the red LED digits on the VHMS controller will count from 00-99 continuously.

When the key switch is turned OFF, the VHMS controller will remain on while it finishes processing internal data and saves the recent data into permanent memory. When the data has been safely stored, the two digit LED display will turn OFF. This process could take up to three minutes to complete.

⚠WARNING

If 24V power is disconnected (using the battery disconnect switches) from the VHMS controller before it has completed its shut down procedure, the VHMS controller will lose all data gathered since the key switch was last turned ON. Do not disconnect battery power until the VHMS controller has completed the shut down procedure and has turned the LED digits off.

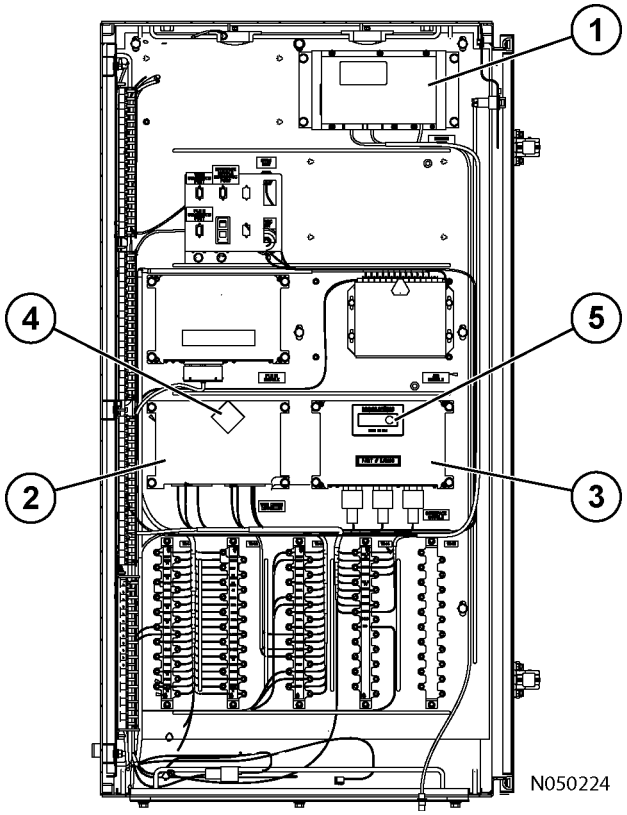


FIGURE 32-10. VHMS COMPONENT LOCATION

1. Orbcomm Controller
2. VHMS Controller
3. Interface Module
4. Red LED Lights
5. Green LED Light

The Orbcomm controller (1, Figure 32-10) transmits data through antenna (1, Figure 32-11) mounted on top of the cab. The antenna coaxial cable is routed through the inside of the cab to protect it from damage. If the antenna or coaxial cable is damaged, replace the parts.

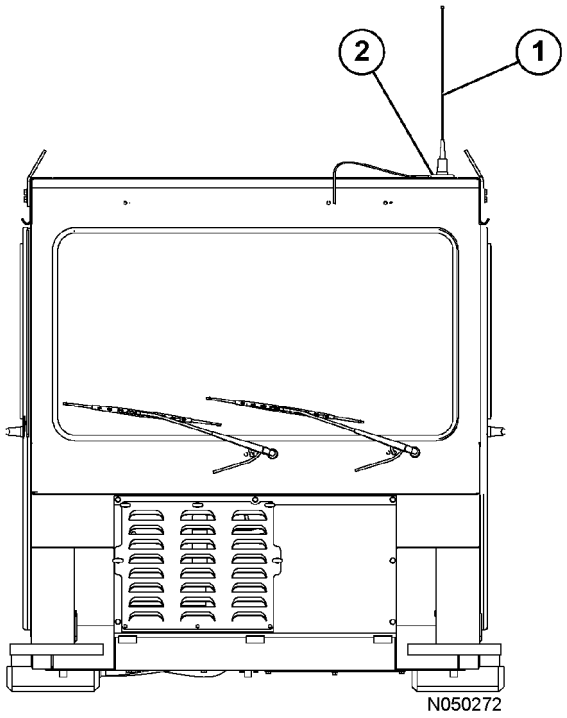


FIGURE 32-11. ORBCOMM

1. Orbcomm Antenna
2. Magnetic Base

Interface Module

Interface module (3, Figure 32-10) receives data from the sensors installed on the truck and sends this information to the VHMS controller. There is a small green LED light on the face of the controller. With the key switch ON, the light should be blinking. If the light is continuously illuminated, there is a problem in the controller.

When a new interface module controller is installed on the truck, new software has to be installed inside the controller. IM-Diag connector (1, Figure 32-12) is used to connect the interface module to a laptop PC for installing software.

10 HOUR (DAILY) INSPECTION (Continued)

Truck Serial Number_____ **Site Unit Number**_____ **Date**_____
Hourmeter_____ **Name of Service Technician**_____

	TASK	COMMENTS	CHECKED	INITIALS
7.	COOLING AIR DUCTWORK - Inspect ductwork from the blower to the rear drive case. Ensure that ductwork is secure, free of damage, and unrestricted.			
8.	AIR INTAKE PIPING - Check all mounting hardware, joints, and connections. Ensure no air leaks exist and all hardware is properly tightened. Figure 40-2.			
9.	AIR CLEANERS - Check the air cleaner vacuum gauges in the operator cab, Figure 40-3. The air cleaner(s) must be serviced if the gauge(s) shows the following maximum restriction: Komatsu SDA16V160 or SSDA16V160 Engines: . . . . . 25 in. of H_2O vacuum. Refer to Section C in the shop manual for servicing instructions for the air cleaner elements. Empty the air cleaner dust caps. *NOTE: After service, push the reset button on face of gauge to allow the gauge to return to zero.*			
10.	CAB AIR FILTER - Under normal operating conditions, clean every 250 hours. In extremely dusty conditions, service as frequently as required. Clean the filter element with mild soap and water. Rinse completely clean and air dry with a maximum of 275 kPa (40 psi). Reinstall the filter. Refer to Figure 40-4.			

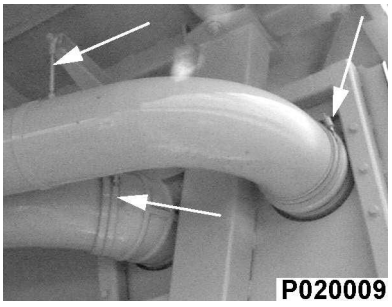


FIGURE 40-2.

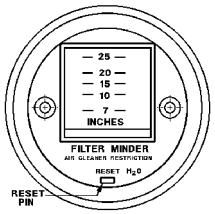


FIGURE 40-3.

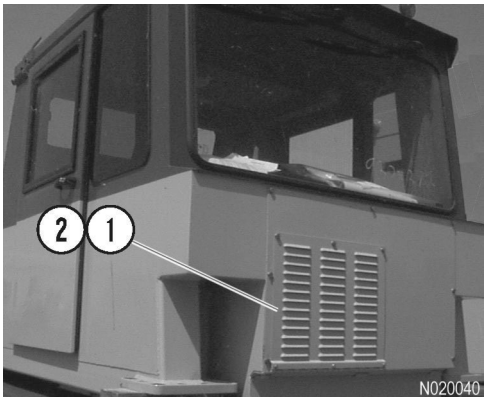


FIGURE 40-4.
1. Filter Cover 2. Cab Filter

2500 HOUR MAINTENANCE CHECKS

Maintenance for every 10, 250, & 500 hour Lubrication and Maintenance Checks should also be performed at this time.

NOTE: "Lube Key" references are to the lubrication chart.

Truck Serial Number_____ **Site Unit Number**_____ **Date**_____
Hourmeter_____ **Name of Service Technician**_____

	TASK	COMMENTS	CHECKED	INITIALS
1.	WHEEL MOTOR GEAR OIL - Wheel motor gear oil must be replaced every 2500 hours of operation. Refer to G.E. Motorized Wheel Service & Maintenance manual.			
2.	FRONT WHEELS - Drain and refill with oil. Refer to Section G in this manual for detailed instructions on changing the oil. Lube key "E". *NOTE: Oil may need to be changed more frequently, depending on mine conditions and the results of the oil sample tests.*			

5000 HOUR MAINTENANCE CHECKS

Maintenance for every 10, 250, 500 1,000 & 2,500 hour Lubrication and Maintenance Checks should also be performed at this time.

NOTE: "Lube Key" references are to the lubrication chart.

Truck Serial Number_____ **Site Unit Number**_____ **Date**_____
Hourmeter_____ **Name of Service Technician**_____

	TASK	COMMENTS	CHECKED	INITIALS
1.	AIR CLEANERS - Clean the Donaclone tubes in the pre-cleaner section of the air filter. Use low pressure cold water or low pressure air to clean the tubes. Refer to Section C, Air Cleaners. *NOTE: Do not use a hot pressure washer or high pressure air to clean the tubes. Hot water/high pressure causes the pre-cleaner tubes to distort.*			
2.	FRONT WHEELS - If oil sampling is done every 500 hours - And the contamination trends are not rising, do not replace the wheel bearings. Refer to Section G of the service manual for more detailed instructions on oil sampling. If oil samples are not taken - Drain oil and completely disassemble the front wheel bearings and check all parts for wear or damage. Refer to Section G of the service manual for disassembly and assembly procedures. Refill with oil. Check the oil level at the oil level plug on wheel hub. Lube key "E".			

PREVENTIVE MAINTENANCE PROCEDURES

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 SL-1 Injectors to the lubrication points.
   a. Repair or replace all damaged feed line hoses.
   b. Ensure that all air is purged and all new feed line hoses are filled with grease before returning the truck to service.
4. Inspect key lubrication points for a bead of lubricant around seal. If a lubrication point appears dry, troubleshoot and repair problem.

250 Hour Inspection

1. Check all grease hoses from the SL-1 Injectors to the lubrication points (see Figure 42-2).
   a. Repair or replace all worn or broken hoses.
   b. Ensure that all air is purged and all new feed line hoses are filled with grease before returning the truck to service.
2. Check all grease supply line hoses from the pump to the SL-1 injectors.
   a. Repair or replace all worn / broken supply lines.
   b. Ensure that all air is purged and all new supply line hoses are filled with grease before returning the truck to service.
3. Check the grease reservoir level.
   a. Fill the reservoir if the grease level is low. Check the filter bypass indicator when filling the reservoir. Replace the element if bypassing.
   b. Check the reservoir for contaminants. Clean the reservoir, if required.
   c. Ensure that all filler plugs, covers and breather vents on the reservoir are intact and free of contaminants.
4. Inspect all bearing points for a bead of lubricant around the bearing seal.

   It is good practice to manually lube each bearing point at the grease fitting provided on each Injector. This will indicate if there are any frozen or plugged bearings, and will help flush the bearings of contaminants.
5. System Checkout
   a. Remove all SL-1 injector cover caps to allow visual inspection of the injector cycle indicator pins during system operation.
   b. Start truck engine.
   c. Actuate lube system override switch (6, Figure 42-1). The hydraulic motor and grease pump should operate.
   d. With the grease under pressure, check each SL-1 injector assembly.
      The cycle indicator pin should be retracted inside the injector body.
   e. When the system is at 16 203 - 17 237 kPa (2,350 - 2,500 psi), the pump should shut off and the pressure in the system should drop to zero, venting back to the grease reservoir.
   f. After the system has vented, check the SL-1 injector indicator pins. All of the pins should be visible. Replace or repair any defective injectors.
   g. Install all injector cover caps.
   h. Check the lubrication timer operation.

NOTE: With the engine on, the lube system should activate within five minutes. The system should build to 13 790 kPa (2,000 psi) at the rear axle during normal pump cycle.

   i. If the system is working properly, the machine is ready for operation.
   j. If the system is malfunctioning, refer to the troubleshooting chart.

1000 Hour Inspection

1. Check the pump housing oil level. If necessary, refill with SAE 10W-30 motor oil to the bottom of the oil level plug.

PAYLOAD METER III™

INDEX

Load Calculation

The final load calculation is different from the last swingload calculation. The accuracy of the swing load calculation depends on loading conditions and the position of the truck during loading. The last swingload calculation is not the value recorded in memory as the final load. The final load is determined by a series of calculations made while the truck is traveling to the dump site.

Carry Back

Carry back is calculated as the difference between the current truck tare and the clean truck tare. The clean truck tare is calculated using the PC software. When the suspensions are serviced or changes are made that may affect the sprung weight of the truck, a new clean truck tare should be calculated.

Measurement Accuracy

Payload measurements are typically repeatable within 1%. Accuracy for a particular scale test depends on specific combinations of pressure sensors and payload meters as well as the specifics of each scale test. Comparisons from different scale tests are often made without considering the differences introduced by the specific installation and operation of the scales for each test. In addition, each pressure sensor and payload meter introduces it's own non-linearity. Each truck becomes an individual combination of sensors and payload meter. Errors from these sources can introduce up to a ±7% bias in the payload meter calculations for a specific scale test, for an individual truck.

Because the PLMIII calculates a new empty tare for each payload, a detailed scale test must weigh the trucks empty and loaded for each haul cycle. Using a simple average of 2 or 3 empty truck weights as an empty tare for the entire scale test will introduce significant error when comparing scale weights to PLMIII weights.

SOURCES FOR PAYLOAD ERROR

Payload Error

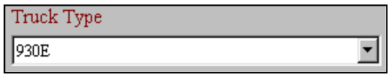
The number one source of error in payload calculation is improperly serviced suspensions. The payload meter calculates payload by measuring differences in the sprung weight of the truck when it is empty and when it is loaded. The sprung weight is the weight of the truck supported by the suspensions. The only method for determining sprung weight is by measuring the pressure of the nitrogen gas in the suspensions. If the suspensions are not properly maintained, the payload meter cannot determine an accurate value for payload. The two critical factors are proper oil height and proper nitrogen charge.

If the suspensions are overcharged, the payload meter will not be able to determine the empty sprung weight of the truck. The suspension cylinder must be able to travel up and down as the truck drives empty. The pressure in an overcharged suspension can push the suspension rod to full extension. In this case, the pressure inside the cylinder does not accurately represent the force necessary to support that portion of the truck.

If the suspensions are undercharged, the payload meter will not be able to determine the loaded sprung weight of the truck. The suspension cylinder must be able to travel up and down as the truck drives loaded. If the pressure in an undercharged suspension cannot support the load, the suspension will collapse and make metal-to-metal contact. In this case, the pressure inside the cylinder does not accurately represent the force necessary to support that portion of the truck.

Low oil height can also introduce errors by not correctly supporting a loaded truck. This is why the correct oil height and nitrogen charge are the most critical factors in the measurement of payload. If the suspensions are not properly maintained, accurate payload measurement is not possible. In addition, suspension maintenance is very important to the life of the truck.

Setting the Truck Type



1. From the Truck Configuration screen, use the pull-down menu to select the truck type that the payload meter is installed on.
2. Press the "Save Changes" button to program the change into the meter.

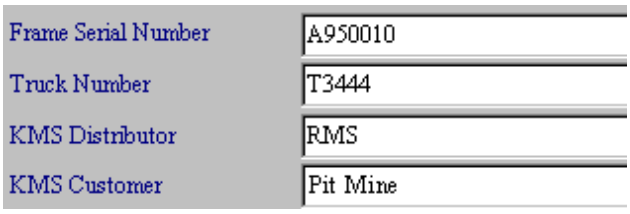
Setting the Gauge Display Units

The payload meter speedometer / display gauge displays the speed on the upper display. The units for the speed display are selected using a jumper on the rear of the case.

The payload units on the lower display can be changed from metric to short tons or long tons using the Truck Configuration screen. This selection also switches between metric (kg/cm^2) and psi (lbs/in^2) for the live display of pressure on the gauge.

1. From the Truck Configuration screen, select the payload units to be used on the lower display of the speedometer/display gauge.
2. Press the "Save Changes" button to program the change into the payload meter.

Setting the Frame Serial Number



The frame serial number is located on the plate mounted to the truck frame. The plate is outboard on the lower right rail facing the right front tire. It is very important to enter the correct frame serial number. This number is one of the key fields used within the haul cycle database. The field will hold 20 alpha-numeric characters.

1. On the Truck Configuration screen, enter the truck frame serial number in the appropriate field.
2. Press the "Save Changes" button to program the change into the payload meter.

Setting the Truck Number

Most mining operations assign a number to each piece of equipment for quick identification. This number or name can be entered in the Truck Number field. It is very important to enter a unique truck number for each truck using the PLMIII system. This number is one of the key fields used within the haul cycle database. The field will hold 20 alpha-numeric characters.

1. On the Truck Configuration screen, enter the truck number in the appropriate field.
2. Press the "Save Changes" button to program the change into the payload meter.

Setting the Komatsu Distributor

This field in the haul cycle record can hold the name of the Komatsu distributor that helped install the system. Komatsu also assigns a distributor number to each distributor. This number is used on all warranty claims. This Komatsu distributor number can also be put into this field. The field will hold 20 alpha-numeric characters.

1. On the Truck Configuration screen, enter the distributor name or number in the appropriate field.
2. Press the "Save Changes" button to program the change into the payload meter.

Setting the Komatsu Customer

This field in the haul cycle record can hold the name of the mine or operation where the truck is in service. Komatsu also assigns a customer number to each customer. This number is used on all warranty claims. This Komatsu customer number can also be put into this field. The field will hold 20 alpha-numeric characters.

1. On the Truck Configuration screen, enter the customer name or number in the appropriate field.
2. Press the "Save Changes" button to program the change into the payload meter.

NOTES