CEAM011700

# Operation & Maintenance Manual

# 930E-2

DUMP TRUCK

SERIAL NUMBERS A30292

KOMATSU®

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### Standard Assembly Torques For 12-Point, Grade 9, Capscrews (SAE)

The following specifications apply to required assembly torques for all 12-Point, Grade 9 (170,000 psi minimum tensile), Capscrews.

- Capscrew threads and seats SHALL be lubricated when assembled.

*Unless instructions specifically recommend otherwise, these standard torque values are to be used with simple lithium base chassis grease (multi-purpose EP NLGI) or a rust- preventive grease (see list, this page) on the threads.*

- Torques are calculated to give a clamping force of approximately 75% of proof load.
- The maximum torque tolerance shall be ±10% of the torque value shown.

**TABLE II. - STANDARD ASSEMBLY TORQUE for 12-Point, Grade 9 Capscrews**

| CAPSCREW SIZE* | TORQUE ft. lbs. | TORQUE N.m | TORQUE kg.m |
|---|---|---|---|
| 0.250 - 20 | 12 | 16 | 1.7 |
| 0.312 - 18 | 24 | 33 | 3.3 |
| 0.375 - 16 | 42 | 57 | 5.8 |
| 0.438 -14 | 70 | 95 | 9.7 |
| 0.500 -13 | 105 | 142 | 14.5 |
| 0.562 - 12 | 150 | 203 | 20.7 |
| 0.625 - 11 | 205 | 278 | 28.3 |
| 0.750 - 10 | 360 | 488 | 49.7 |
| 0.875 - 9 | 575 | 780 | 79.4 |
| 1.000 - 8 | 860 | 1166 | 119 |
| 1.000 - 12 | 915 | 1240 | 126 |
| 1.125 - 7 | 1230 | 1670 | 170 |
| 1.125 - 12 | 1330 | 1800 | 184 |
| 1.250 - 7 | 1715 | 2325 | 237 |
| 1.250 - 12 | 1840 | 2495 | 254 |
| 1.375 - 6 | 2270 | 3080 | 313 |
| 1.375 - 12 | 2475 | 3355 | 342 |
| 1.500 - 6 | 2980 | 4040 | 411 |
| 1.500 - 12 | 3225 | 4375 | 445 |
| * Shank Diameter (in.) - Threads per inch | | | |
| This table represents standard values only. Do not use these values to replace torque values which are specified in assembly instructions. | | | |

### Standard Metric Assembly Torque For Class 10.9 Capscrews & Class 10 Nuts

The following specifications apply to required assembly torques for all metric Class 10.9 finished hexagon head capscrews and Class 10 nuts.

- Capscrew threads and seats SHALL NOT be lubricated when assembled. These specifications are based on all capscrews, nuts, and hardened washers being **phosphate and oil** coated.

*NOTE: If zinc-plated hardware is used, each piece must be lubricated with a Rust Preventive Grease or Lithium-base grease to achieve the same clamping forces provided below.*

- Torques are calculated to give a clamping force of approximately 75% of proof load.
- The maximum torque tolerance shall be within ±10% of the torque value shown.

**TABLE III. - STANDARD METRIC ASSEMBLY TORQUE**

| CAPSCREW SIZE* | TORQUE N.m | TORQUE ft.lbs. | TORQUE kg.m |
|---|---|---|---|
| M6 x1 | 12 | 9 | 1.22 |
| M8 x 1.25 | 30 | 22 | 3.06 |
| M10 x 1.5 | 55 | 40 | 5.61 |
| M12 x 1.75 | 95 | 70 | 9.69 |
| M14 x 2 | 155 | 114 | 15.81 |
| M16 x 2 | 240 | 177 | 24.48 |
| M20 x 2.25 | 465 | 343 | 47.43 |
| M24 x 3 | 800 | 590 | 81.6 |
| M30 x 3.5 | 1600 | 1180 | 163.2 |
| M36 x 4 | 2750 | 2028 | 280.5 |
| * Shank Diameter (mm) - Threads per millimeter | | | |
| This table represents standard values only. Do not use these values to replace torque values which are specified in assembly instructions. | | | |

### Suggested* Sources for Rust Preventive Grease:

- AMERICAN ANTI-RUST GREASE #3-X from Standard Oil Company (also American Oil Co.)
- GULF NORUST #3 from Gulf Oil Company.
- MOBILARMA 355, Product No. 66705 from Mobil Oil Corporation.
- RUST BAN 326 from Humble Oil Company.
- RUSTOLENE B GREASE from Sinclair Oil Co.
- RUST PREVENTIVE GREASE - CODE 312 from the Southwest Grease and Oil Company.

*NOTE: This list represents the current Engineering approved sources for use in Komatsu manufacture. It is not exclusive. Other products may meet the same specifications of this list.*

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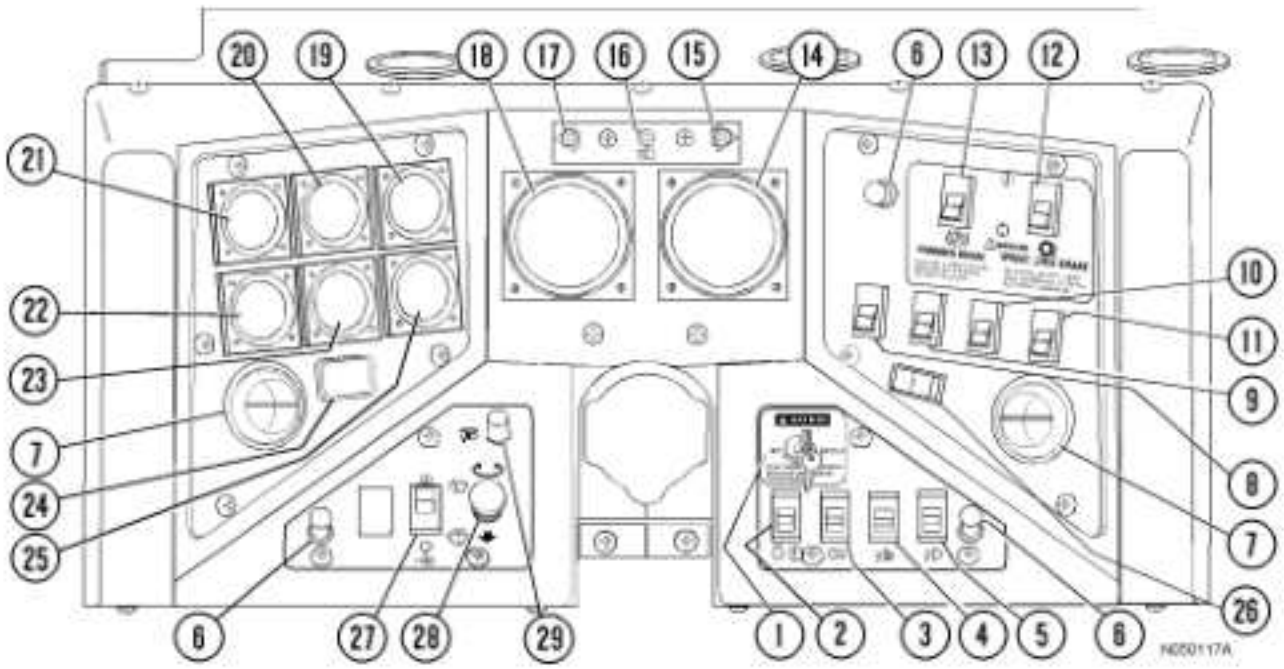



FIGURE 32-7. PANEL GAUGES, INDICATORS, AND CONTROLS

1. Keyswitch
2. Engine Shutdown Switch with Timer Delay
3. Backup Light Switch (N./O.)
4. Ladder Light Switch (3 - Way)
5. Fog Light Switch (N./O.)
6. Panel Illumination Light(s)
7. Vent(s) - Cab Air Conditioner/Heater
8. Not used on 930E
9. Rotating Beacon Light Switch (N./O.) (Optional)
10. Heated Mirror Switch (N./O.) (Optional)
11. Not used on 930E
12. Wheel Brake Lock Switch (N./O.)
13. Parking Brake Switch (N./O.)
14. Digital Tachometer
15. Right Turn Signal Indicator Light
16. High Beam Headlight Indicator Light
17. Left Turn Signal Indicator Light
18. Digital Speedometer
19. Voltmeter Gauge
20. Engine Oil Pressure Gauge
21. Engine Water Temperature Gauge
22. Fuel Gauge
23. AC Drive System Temperature
24. Engine Hourmeter
25. Hydraulic/Brake Oil Temperature
26. AC Rest Switch
27. Headlights Switch (N./O.)
28. Wiper / Washer Switch
29. Panel Illumination Lights Dimmer Rheostat

WIRE NUMBERS

1. 712/21PB/11S
2. 11S/11TD/11R
3. 712/47S/47L/710
4. 11L/48A/48B
5. 11L/48F
6. 49/710
7. N/A
8. 712/28E
9. 11L/11RB
10. 712/69M/SPR56/SPR57/ SPR58
11. 71/79M/SPR55/79H/72F/ SPR54
12. 712BL/52B/39H/710/SPR59
13. 71/52C/21PB/21
14. 41TS/74X/74Z/710
15. 45R/710
16. 41H/710
17. 45L/710
18. 41TS/77/77A/710
19. 712D/710/49
20. 712D/31PS/710/49
21. 712D/31TS/710/49
22. 712D/38G/710/49
23. 15V/72MT/49/710
24. 11L/36
25. 15V/34BT/710/49
26. 710/72RQ
27. 11D/41L/41TS
28. High 66S/Low 66L/710/66P Park/712W / Washer 66
29. 49/41TS


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# 500 HOUR LUBRICATION AND MAINTENANCE CHECKS

Maintenance requirements for every 10, 50, & 250 hour Lubrication and Maintenance Checks should also be carried out 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. | FINAL DRIVE CASE BREATHERS - Remove the breather elements for the motorized wheels. Clean or replace the elements. | | | |
| 2. | HYDRAULIC SYSTEM FILTERS - Replace the tank breathers and high pressure filter elements. Check the oil level. Add oil as necessary. Lube Key "B". | | | |
| 3. | HYDRAIR® SUSPENSION - Check for proper piston extension (front and rear). | | | |
| 4. | THROTTLE AND BRAKE PEDAL - Lubricate the treadle roller and hinge pins with lubricating oil. Lift the boot from the mounting plate and apply a few drops of lubricating oil between the mounting plate and the plunger. | | | |
| 5. | BODY-UP & HOIST LIMIT SWITCHES - Check operation of the switches. Clean and adjust as necessary. | | | |
| 6. | HOIST ACTUATOR LINKAGE - Check operation. Clean, lubricate, and adjust as necessary. | | | |
| 7. | PARKING BRAKE - Refer to Section J, Parking Brake Maintenance. Perform the recommended inspections. | | | |
| 8. | RESERVE ENGINE OIL SYSTEM (OPTIONAL)<br>a. Check electrical system connections for tightness, corrosion and physical damage. Check the battery, oil pressure switch, junction boxes, remote control fill box and the circuit breakers.<br>b. Examine all electrical cables over their entire length for possible damage.<br>c. Examine all hoses, including those on the reserve tank and the ones leading to and from the engine. Check for leaks, cracks or other damage. Check all fittings for tightness, leakage or damage. | | | |
| 9. | WHEEL MOTOR OIL ***(Initial 500 hours only)*** - Change or filter wheel motor gear oil only after initial 500 hours or operation. Wheel motor gear oil must be filtered or changed every 2500 hours of operation thereafter. | | | |

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## PLMIII SYSTEM CONFIGURATION

### Starting Communications

The PDM software allows users to download and configure the system.




Before connecting to the payload meter, select "Change Program Options" and confirm that the program has selected the correct laptop serial port. Most laptops use Comm 1 for serial communications. The units displayed for reports and graphs by the PC software can be set on this form. Click "Done" to return to the main menu.




From the main menu, click the "Connect to Payload Meter" button. The PC will try to connect to the payload meter and request basic information from the system. In the event of communications trouble, the PC will try 3 times to connect before "timing-out". This may take several seconds.

### Displayed Payload Units




Three options are available for the display of units in the PC software, reports, and graphs:

*Short Tons:* Payload is displayed in short tons, distances and speeds will be displayed in Miles

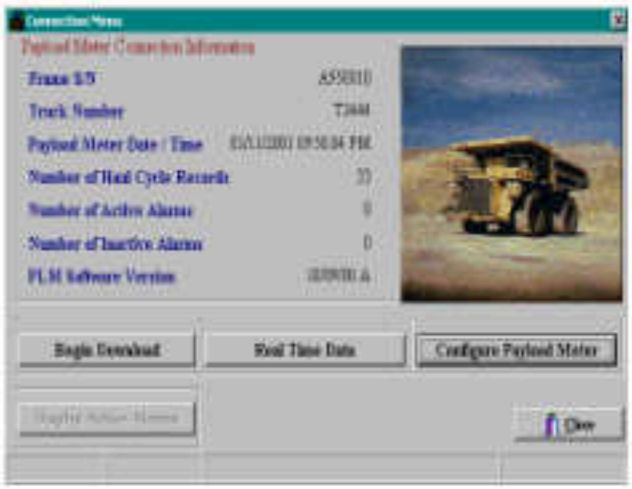
*Metric Tons:* Payload is displayed in metric tons, distances and speeds are displayed in Kilometers

*Long Tons:* Payload is displayed in long tons, distances and speeds are displayed in Miles

### Time Units

Minutes and Seconds Example:
Five minutes and thirty-two seconds = 5:32
Decimal Minutes Example:
Five minutes and thirty-two seconds = 5.53

### Connection Menu



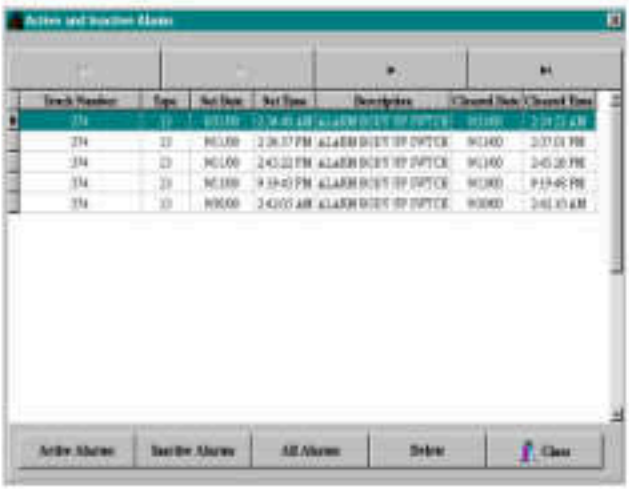

The connection screen displays basic system information to the user.

- Frame S/N should agree with the truck serial number from the serial plate located on the truck frame.
- Truck Number is an ID number assigned to the truck by the mine.
- The Payload Meter Date / Time values come from the payload meter at the moment of connection.
- Number of Haul Cycle Records is the number of haul cycles records stored in memory and available for download.
- Number of Active Alarms shows how many alarms are currently active in the system at the time of connection. If there are active alarms, the "Display Active Alarms" button is available.
- Number of Inactive Alarms shows how many alarms have been recorded in memory and are available for download.
- PLM Software Version displays the current version of software in the payload meter.


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### Viewing Alarms

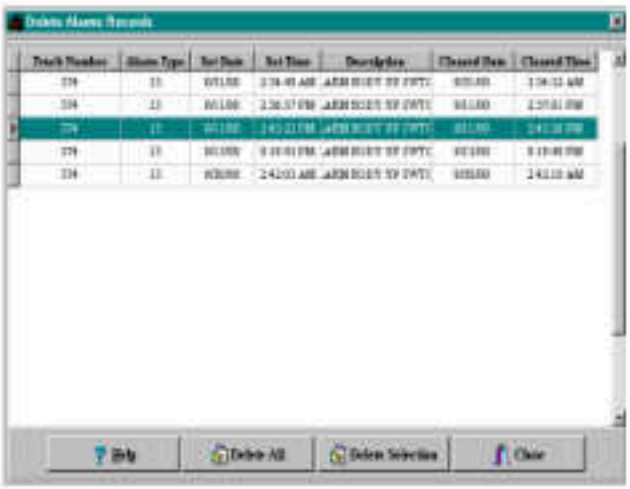
From the Payload Summary screen, click the "Alarms" button to display the alarm screen. The alarms are sorted by the query settings from the Payload Summary screen. Alarms can be displayed as Active or Inactive.



### Deleting Alarm Records

To delete alarm records from the main database, press the "Delete" button at the bottom of the "Alarm Display" screen. The program will display a summary of the alarms from the query. To delete an alarm, select one at a time and press the "Delete" button. It is recommended that the query data be exported to a ".zip" file for archival purposes before deletion. Multiple records may be selected by holding down the Shift key. Pressing the "Delete All" button will select all the alarms from the current query and delete them.

*NOTE: There is no recovery for alarms that have been deleted from the main database. It is highly recommended that all records be exported and archived in a compressed file format for future reference before being deleted.*




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