CEAM032300

Operation & Maintenance Manual

PAYLOAD METER IV

December 2016

KOMATSU®

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GENERAL INFORMATION E.2-0000051234

This manual provides dual dimensioning for many specifications. Metric units are specified first, with U.S. standard units in parentheses. When torque values are not specified in the assembly instructions contained in this manual, use the standard torque value for the hardware being used. Standard value torque tables are contained in this chapter for metric and SAE hardware.

This truck is assembled with both metric and SAE (U.S.) hardware. Reference the correct table when determining the proper torque value.

⚠ CAUTION

- **References throughout the manual to standard torques or other standard values will be to one of the following tables. Do not use standard values to replace specific torque values in assembly instructions.**

For values not shown in any of the charts or tables, standard conversion factors for most commonly used measurements are provided in the following tables.

Effect Of Special Lubricants

The Komatsu engineering department does not recommend the use of special friction-reducing lubricants, such as Copper Coat, Never-Seez®, and other similar products, on the threads of standard fasteners where standard torque values are applied. The use of special friction-reducing lubricants will significantly alter the clamping force being applied to fasteners during the tightening process.

If special friction-reducing lubricants are used with the standard torque values listed in this chapter, excessive stress and possible breakage of the fasteners may result.

Where the torque tables specify "Lubricated Threads" for the standard torque values listed, these standard torque values are to be used with simple lithium base chassis grease (multi-purpose EP NLGI) or a rust-preventive grease (see below) on the threads and seats unless specified otherwise.

NOTE: *Ensure the threads of fasteners and tapped holes are free of burrs and other imperfections before assembling.*

Suggested Sources For Rust Preventive Grease

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.*

- 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.

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Load Calculation

The final load calculation is different from the last swingload calculation. The accuracy of the swingload 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 new 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 nonlinearity. 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 payload meter 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 two or three empty truck weights as an empty tare for the entire scale test will introduce significant errors when comparing scale weights to PLM IV weights.

SOURCES FOR PAYLOAD ERROR A.3-0000073398

Payload Error

The number one source of errors 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.

Critical Suspension Factors:

- Proper oil height.
- Proper charge with nitrogen to the correct suspension extension. See service manual for correct extension.

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.

Loading Conditions

Brake Lock engagement without using the Park Brake is critical during the loading process.

NOTE: *Only by engaging the Brake Lock with the truck in Neutral, No Park Brake, will the Payload Meter properly calculate swingloads.*

In addition, this condition reduces stress on the suspensions, drive system, brakes, and frame. A large number of "Continuous Loading" flags in payload data can be an indication of poor loading site practices. Addressing these "Continuous Loading" flags will create an opportunity for site improvement leading to better production.

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Connecting to PLM IV may take several seconds depending on the speed of local Ethernet activity. Allow at least 30 seconds for PLM IV box to boot after turning truck Key Switch ON. If the connection fails to open, verify the CAT5e cable is good. On the service laptop go to 'Network and Sharing' settings, choose "Change Adapter Settings" option, by right clicking choose "Disable" and then "Enable" on "Local Area Connection Network" icon.

If the connection problem persists then reboot the PLM IV by turning truck Key Switch OFF and Turning ON after all LED on Communication board turned off.

All payload meter configurations are set from the web server. After log-in credentials are entered, the PLM IV homepage looks like Figure 3-8 PLM IV HOMEPAGE, page 3-17 below.



Figure 3-8 PLM IV HOMEPAGE

Real Time Data Page

The Real Time Data (RTD) page is mainly for observing the data and time, suspension pressure values, truck speed, haul cycle status, digital outputs and other vital information. The page is refreshed itself every 1 second. With every refresh this page indicates normal operation of PLM IV. The suspension pressures are inputs from each four pressure sensors. Incline-angle is read from the on-board inclinometers. The suspension pressures are inputs from each of the four pressure sensors.

Incline-angle is read from the on-board Inclinometers.

NOTE: *The units are displayed here not on the electronic digital display on the truck.*

Each digital output lists the present condition "ON" or "OFF" and diagnostic status of "NORMAL", "OPEN" or "SHORT". Typical condition is NORMAL. If there is no lamp connected, or there is a broken wire, then the status will be OPEN. If there is electrical short circuit, the output will be disabled until the system restart and status will be displayed as "SHORT".

Status Flags are "Haul Cycle Warning Flags," indicate situations that the payload meter defines as abnormal to a standard haul cycle process.

Clean Tare Status will display the status "CLEAN TARE COMPLETE" normally as-well-as the final Clean Tare value, unless the user is performing a new clean tare. The operation typically takes 15 minutes. During this operation the Clean Tare Status shows "Clean Tare in Progress..."

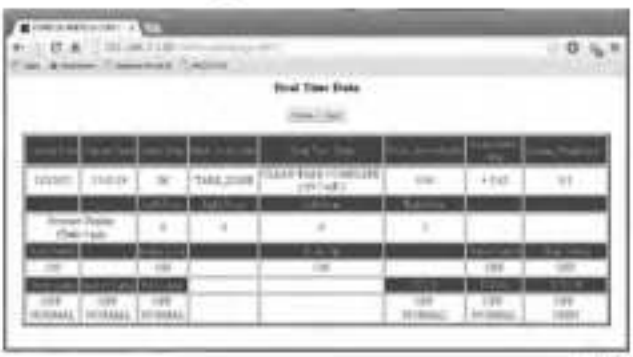


Figure 3-9 REAL TIME DATA

Payload Meter IV System Configuration

The configuration page has option to permanently save several truck specific settings. There is no need to reboot the payload meter after updating any of these configurations.

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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.*

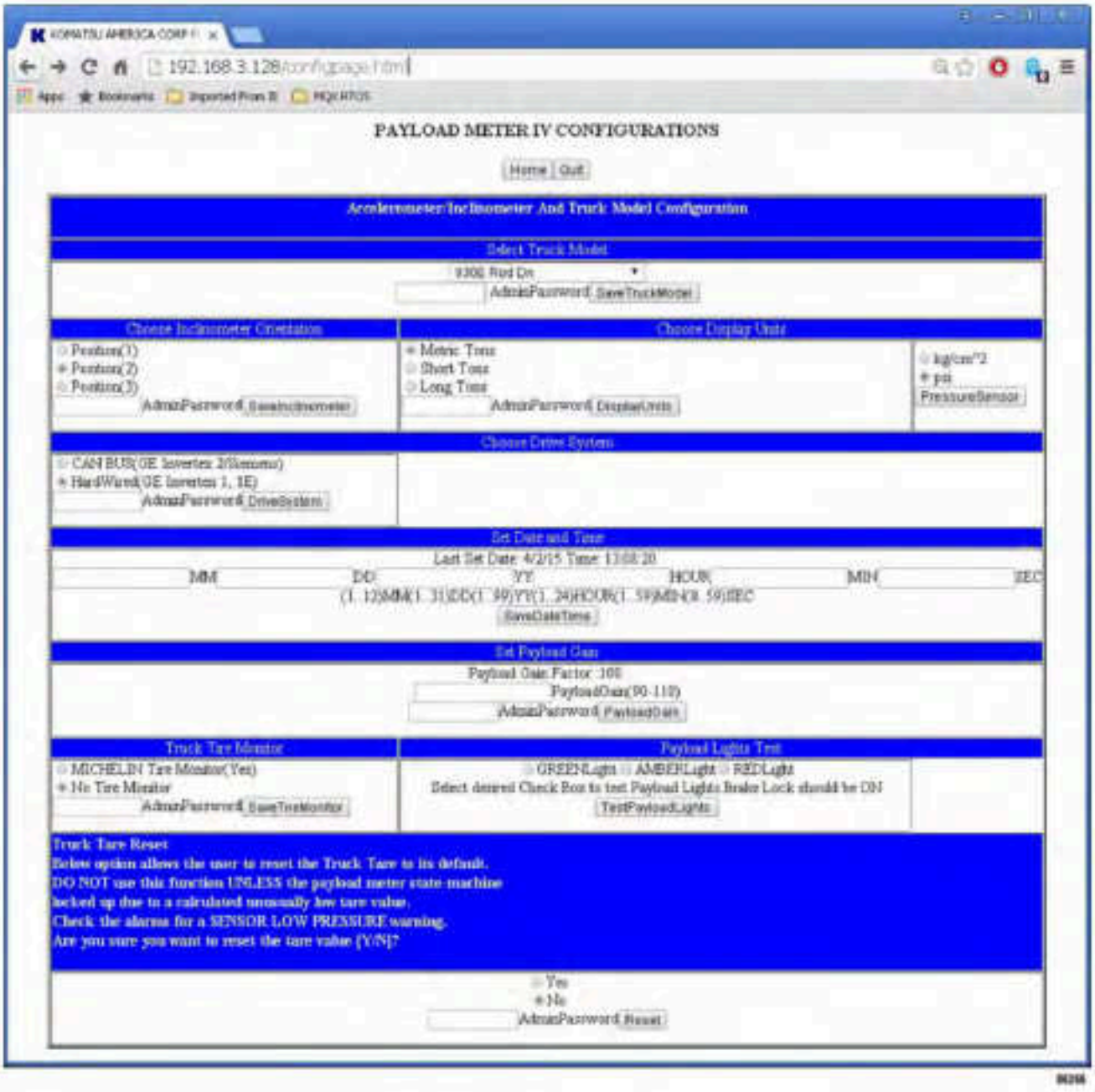


Figure 3-10 PAYLOAD METER IV CONFIGURATIONS

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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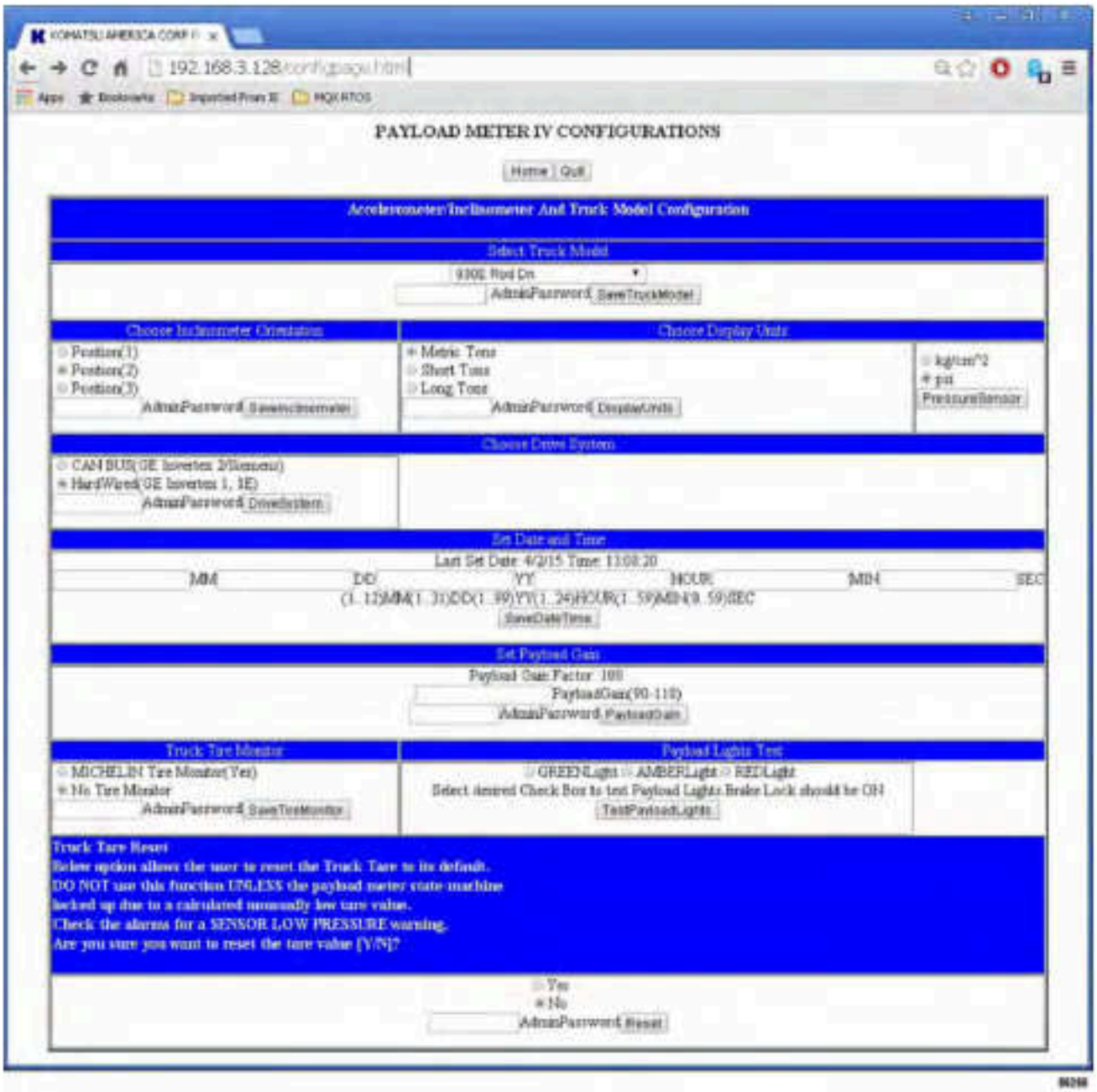


Figure 3-6 PLM IV CONFIGURATION

The units noted in table below are the actual units stored in the data file. The value for the haul cycle start time is the number of seconds since January 1, 1970 to start of the haul cycle. All other event times are referenced in seconds since the haul cycle start time. The following information is recorded for each haul cycle.

Table 3-1 HAUL CYCLE DATA

Data	Unit	Remark
Haul Cycle Record Number	Number	Haul cycle number since the start of the file
Truck #	alpha-numeric	Up to 22 characters can be stored in this field to identify the truck. Typically this field will be just the truck number

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