

# **Operation & Maintenance Manual**

## **PAYLOAD METER II PLMII**

**HD325-6**

**HD405-6**

**HD465-5**

**HD605-5**

**HD785-3**

**HD785-5**

**HD985-3**

**HD985-5**

**HD1200-1**

This material is proprietary to Komatsu America Corp. and is not to be reproduced, used, or disclosed except in accordance with written authorization from Komatsu America Corp.

It is our policy to improve our products whenever it is possible and practical to do so. We reserve the right to make changes or improvements at any time without incurring any obligation to install such changes on products sold previously.

Due to this continuous program of research and development, revisions may be made to this publication. It is recommended that customers contact their distributor for information on the latest revision.

Copyright 2004 Komatsu  
Printed in U.S.A.  
Komatsu America Corp.

# 1. INTRODUCTION

- The signals from the pressure sensors, clinometer (not installed on  $-60^{\circ}\text{C}$  specification machine), body float detection, and neutral detection are input to the payload meter. These signals are processed by the built-in micro computer, the payload is calculated and displayed on the panel. At the same time, the external display lamps show the loading condition.
- The payload meter always carries out self diagnosis of this system, and if any abnormality or warning is generated, it displays the details.
- Using the control switches on the payload meter, it is possible to display various data, such as the total payload from a certain time, the overall number of cycles, or the abnormalities and warnings that are now being generated or have occurred and have already been corrected.
- The payload meter automatically stores in memory various operating data for the dump truck such as the payload, time, distance, travel speed for each cycle, the date and time that the engine was started and stopped, the date and time of abnormalities or warnings that occurred or were canceled, and the total payload and the overall number of cycles from a certain time.
- These automatically recorded data are retained even when the power is switched off, so if a personal computer is connected to the payload meter through the connection port for the communications cable inside the cab, it is possible to send (download) the data later to a personal computer using cable communication (ANSI/EIA RS-232C).  
In addition, based on these data, it is possible to display the operation data on the screen of the computer, to print out the data, or to convert the data for use with Lotus 1-2-3 or EXCEL.
- It is also possible to set a memory card in the payload meter and to write the various data to the memory card. This memory card can then be used to load the data into a personal computer and to carry out the same data processing that is available using cable communications.

## NOTICE

**To download the data, read the data from the memory card to the personal computer, and carry out the data processing, it is necessary to use the personal computer software provided by Komatsu.**

- It is possible to set speed limit for each payload meter (that is, each machine).
- The values for US tons (short tons) are calculated by multiplying t (metric tons) by 0.907185.

## 2. PRECISE USE

### 1. Recorded payload

The recorded payload is written to memory when the dump lever is moved from FLOAT to any position other than FLOAT. The reasons for this are as follows.

(1) This method makes it possible to measure the payload actually being carried.

The load that is actually dumped can be measured accurately because the loss from spillage of the load during travel is removed.

(2) The measurement is made based on the pressure of each suspension.

The variation in the friction force at all points is averaged out after travel, so it becomes possible to measure accurately.

If the chassis sways and the payload display changes during the dumping operation, wait for the payload display to stabilize before continuing the dumping operation. (If the machine is stopped suddenly at the dumping point, it will take longer for the payload display to stabilize.)

### 2. The payload display at the loading point (immediately after loading) may be slightly lower than the value displayed at the dumping point (1 – 5 t).

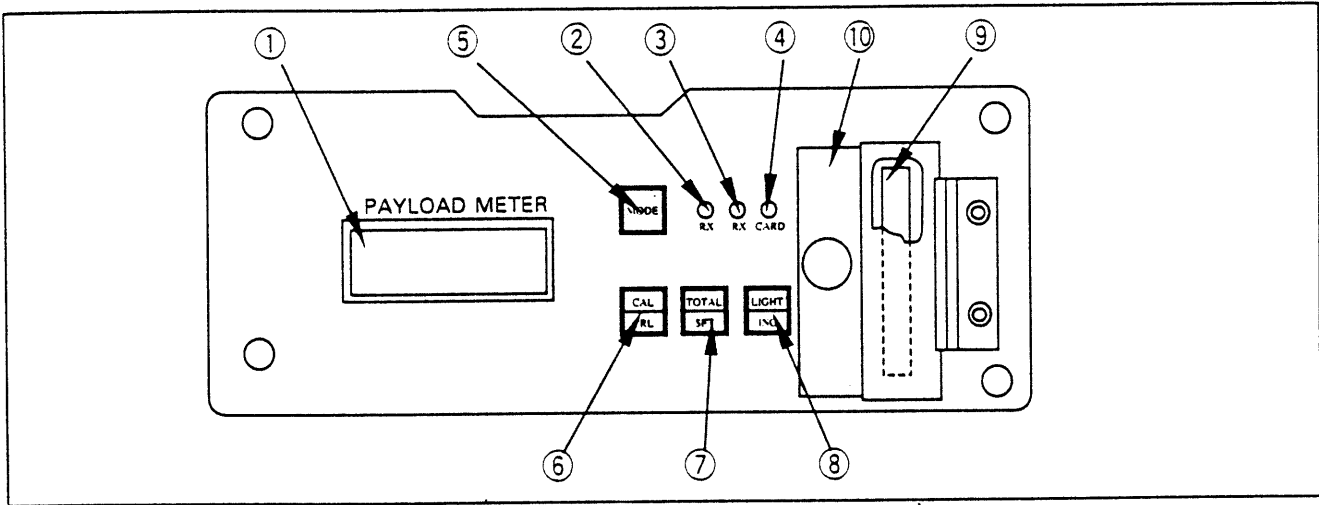
This is caused by the variation in the friction pressure of the suspension, and there is no way to remove this variation. Even if there is variation in the displayed value at the different measurement points, it does not indicate any failure in the payload meter.





### 3. CONTENTS

1. Introduction .....	1
2. Precise use .....	2
4. General locations .....	4
4.1 Front face of controller .....	4
4.2 Left face of controller .....	5
4.3 External display lamps .....	7
4.4 Communications cable connection port for personal computer .....	7
5. Content of display (controller, external display lamps) .....	8
5.1 When power is ON .....	8
5.2 Display during normal operations .....	9
6. External display lamps .....	13
6.1 Display level for lamps .....	13
6.2 Estimate display .....	14
7. Details of date stored in memory of payload meter .....	15
7.1 Cycle date .....	16
7.2 Engine ON/OFF data .....	17
7.3 Abnormality, warning date .....	18
7.4 Total payload, overall number of cycles date .....	19
7.5 Other data .....	19
8. Operation of switches .....	20
8.1 Carrying out calibration .....	21
8.2 Forced display of total payload and overall number of cycles .....	22
8.3 Operator check mode .....	26
8.4 Dimming lights on monitor display .....	41
8.5 Adjusting buzzer sound lever .....	41
8.6 Setting mass unit .....	41
8.7 Setting forced prohibition for switches .....	41
8.8 Service check mode .....	42
9. Abnormality and warning display (error code) .....	43
10. When F-09 is displayed for the error code (procedure for replacing battery) .....	51
10.1 Replacing battery .....	51
10.2 After replacing the battery, do as follows .....	53
11. Operation if <i>F-CRL</i> is displayed as an error code or the controller is replaced .....	54

## 4. GENERAL LOCATIONS

### 4.1 Front face of controller



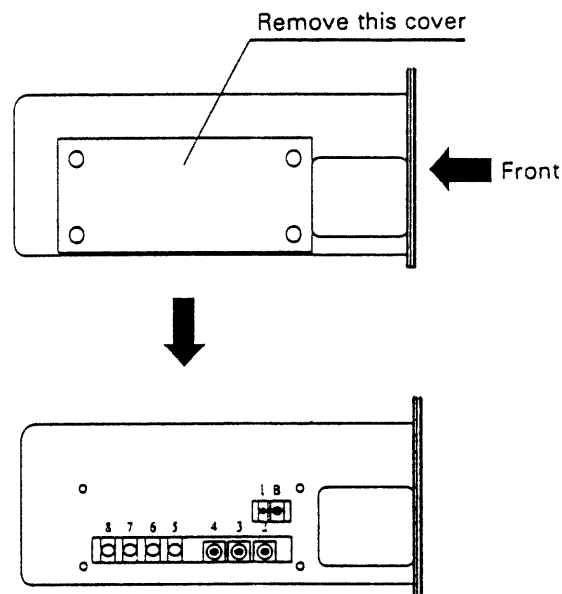
- ① Display panel
- ② Reception pilot lamp (Rx busy)
- ③ Transmission pilot lamp (Tx busy)
- ④ Memory card access lamp (CARD busy)
- ⑤ Mode switch 
- ⑥ Calibration/clear switch 
- ⑦ Total/shift switch 
- ⑧ Light/increment switch 
- ⑨ Memory card
- ⑩ Cover

**⚠ WARNING**  
 When not inserting or removing memory card ⑨, always keep cover ⑩ closed.

#### NOTICE

③. "Transmission pilot lamp" lights up when the communication cable is not connected to the personal computer or when it is not properly connected.

## 4.2 Left face of controller



### ● DETAILS OF SWITCHES ON LEFT SIDE

No.	NAME	TYPE	REMARKS
1	PAYLOAD GAIN ADJUSTMENT TRIMMER	ROTARY VOLUME	-20% to +20% (Turn to right) (Turn to left)
2	SPEED REGULATION SWITCH	0 - F ROTARY SWITCH	0: 107% - 7: 100% - F: 92%
3	DISTANCE REGULATION SWITCH	0 - F ROTARY SWITCH	0: 107% - 7: 100% - F: 92%
4	MODEL SELECTION SWITCH	0 - F ROTARY SWITCH	REFER TO MODEL SELECTION CHART
5	USE OF MEMORY-CARD SWITCH	TOGGLE SWITCH	UPPER: UNUSE, LOWER: USE
6	USE OF CLINOMETER SWITCH	TOGGLE SWITCH	UPPER: UNUSE, LOWER: USE
7	MASS UNIT SETTING SWITCH	TOGGLE SWITCH	UPPER: t (METRIC TONS) LOWER: US TONS (SHORT TONS)
8	FORCED PROHIBITION SETTING FOR SWITCHES	TOGGLE SWITCH	TOP: PERMITTED BOTTOM: PROHIBITED ACCORDING TO THE PERMITTED/PROHIBITED SETTING TABLE FOR SWITCHES
B	BUZZER VOLUME REGULATION	ROTARY VOLUME	For MIN volume, turn to RIGHT For MAX volume, turn to LEFT

### **⚠ WARNING**

The switches on the side are already set when they are shipped. Do not touch any switch except No. 7 and No. B.

If you wish to adjust any switch except No. 7 and No. B to compensate the payload calculation value or speed or distance calculation value, please contact your Komatsu distributor.

● **MODEL SELECTION CHART**

NO. OF MODEL SELECTION SWITCH	MODEL
0 (*1)	HD1200-1 STD Large-tire CUMMINS ENGINE
1	HD785-3 STD Large-tire KOMATSU ENGINE
2	HD465-5 STD Small-tire KOMATSU ENGINE
3	HD325-6 STD Large-tire KOMATSU ENGINE
4	
5	
6	HD785-3 STD Small-tire KOMATSU ENGINE
7	HD465-5 STD Large-tire KOMATSU ENGINE
8	HD405-6 Heavy-duty Large-tire KOMATSU ENGINE
9	HD985-3/-5 STD 30.00-51 KOMATSU ENGINE
A	HD605-5 Heavy-duty Large-tire KOMATSU ENGINE
B	HD785-5 STD Large-tire KOMATSU ENGINE
C	
D	
E	
F	

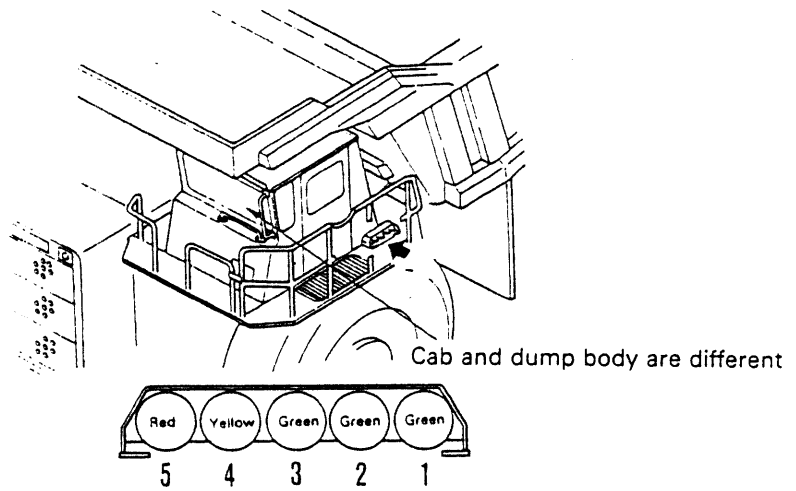
(\*1) The part number of the payload meter on the HD1200-2 is different.

● **PERMITTED/PROHIBITED SETTING TABLE FOR SWITCHES**

		Left side switch No. 8	
		Bottom (prohibited)	Top (permitted)
Left side switch No. 5	Top (memory card not used)	(1)	(2)
	Bottom (memory card used)	(3)	(4)

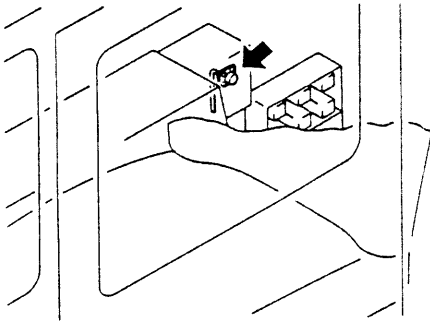
- (1) Left side switch No. 5 (top), No. 8 (bottom)  
Calibration, data all clear, time, date setting operations only are possible.
- (2) Left side switch No. 5 (top), No. 8 (top)  
All switches can be operated.
- (3) Left side switch No. 5 (bottom), No. 8 (bottom)  
Calibration, data all clear, card dump, time, date setting operations only are possible.
- (4) Left side switch No. 5 (bottom), No. 8 (top)  
All switches can be operated.

### 4.3 External display lamps

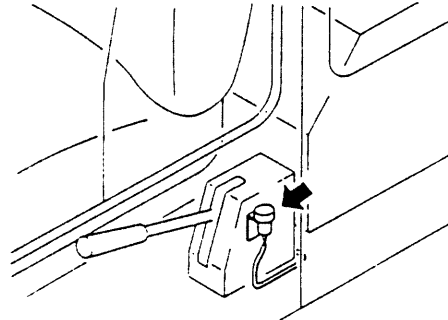


### 4.4 Communications cable connection port for personal computer

For HD1200-1



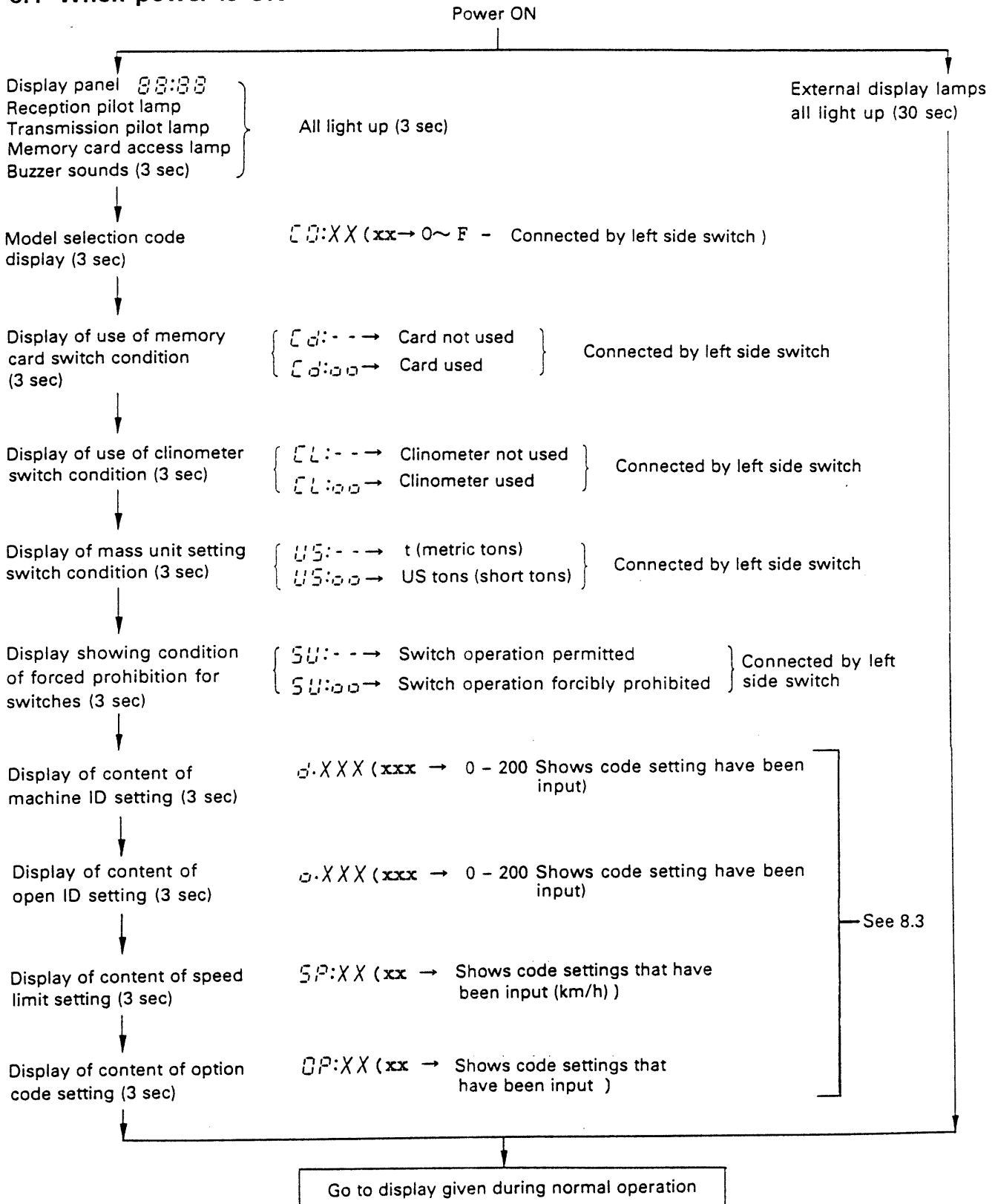
For models other than HD1200-1





# 5. CONTENT OF DISPLAY (CONTROLLER, EXTERNAL DISPLAY LAMPS)

## 5.1 When power is ON



If the engine is started during this flow of displays, even if there are items which should still be displayed, the display switches after several seconds to 5.2 Display during normal operations.

## 5.2 Display during normal operations

Condition of machine		[For HD1200-1] Condition of parking brake and brake lock	[For models other than HD1200-1] Position of shift lever	Dump lever position (*1)	Display panel	External display lamp (see 4)
When empty	Stopped	Parking brake ON or brake lock ON	N	FLOAT	Payload display (*2)	Payload display
	Traveling	Parking brake OFF or brake lock OFF	Except N	FLOAT	Time display	OFF
During loading, until 50% of standard load is reached	Stopped (*3)	Parking brake ON or brake lock ON	N	FLOAT	Payload display	Payload display and display of estimate
	Traveling	Parking brake OFF or brake lock OFF	Except N	FLOAT	Payload display	OFF
During loading, after 50% of standard load is reached	Stopped	Parking brake ON or brake lock ON	N	FLOAT	Payload display	Payload display and display of estimate
	Traveling (*4)	Parking brake OFF or brake lock OFF	Except N	FLOAT	Travel distance displayed in units of meter from 0 to 160 meter (every 5 m)	OFF
When loaded	Traveling	Parking brake OFF or brake lock OFF	Except N	FLOAT	After completion, time display	OFF
	Stopped (*5)	Parking brake ON or brake lock ON	N	FLOAT	Payload display	Payload display
When dumping (*6)		Parking brake ON or brake lock ON	N	FLOAT → RAISE → LOWER → FLOAT	Total payload display (*7)	OFF
When abnormality or warning is generated See 9		—	—	—	See 9 (error codes are displayed in order of priority)	See 9

The details of Notes \*1 to \*7 given in the table are as follows.

 **WARNING**

**(\*1) Between the start of the loading operation and the start of the dumping operation, do not operate the dump lever to any position other than FLOAT. If the dump lever is operated to any position other than FLOAT, the data will not be recorded when dumping, or the data will be recorded but the data for time, distance, and speed will not be recorded accurately.  
With the display, b-FL may be displayed instead of the total payload when dumping, and after completion of loading, the time display may be given instead of the distance display when starting to travel.**

(\*2) When the load is less than 50% of the standard payload, 0 t is displayed.

(\*3) If there is no fresh load within 5 minutes from the time of the previous load, both the display panel and the external display lamps will change for the display for "When empty, Stopped" in the table.

- (\*4) ① If the machine is stopped before traveling 160 m:  
both the panel display and the external display lamps will return to the display for "During loading, Stopped" in the table.
- ② If the load is dumped before traveling 160 m:  
both the panel display and the external display lamps will return to the display for "When dumping" in the table.

(\*5) When this happens, if loading is carried out again:  
Immediately after loading again, the panel display and external display lamp will both return to the display for "During loading, Stopped" in the table.

 **WARNING**

**(\*6) If the load that is dumped is not more than 50% of the standard payload, the machine will not think that a load has been dumped.  
It will consider it only as a movement of the dump lever. (See \*1)**

(\*7) The display for the total payload (see 7.4 Data for total payload, overall number of cycles) is displayed in units of 100 t. (The number is rounded to the nearest 100.)  
For the method of clearing the total payload (setting the measurement back to 0), see 8.2 Forced display of total payload, overall number of cycles.  
During dumping, while the shift lever is at any position other than N [other than HD1200-1] or if the parking brake is OFF [HD1200-1], b-FL will flash. If the dump lever is at any position other than FLOAT from the beginning of the loading operation to the ending of the dumping operation, the data will not be recorded accurately. (See \*1)

The payload meter keeps the existing condition for the machine when it is empty, during loading, and when it is loaded even if the power is turned off, so when the operator starts operation again, the system starts from the existing machine condition.

 **WARNING**

When stopping the machine empty, stopping it during loading, and stopping it when loaded, always carry out the following operation after stopping the machine. (See the table for the display during normal operation.)

For HD1200-1: Parking brake ON or brake lock ON

For models other than HD1200-1: shift lever at N position

(If you do not do this, the period for stopping will not be calculated and will be included in the travel time when unloaded or the travel time when loaded. As a result, the travel speed will be reduced and the data stored in the payload meter will not be accurate.

In addition, the external display lamps will also stay off.)

 **WARNING**

In the following cases (1) to (4), the condition of the machine as seen by the payload meter will be different from the actual condition of the dump truck.

(1) When a new controller is installed

(2) When the controller is replaced ..... See 11

(3) When the built-in battery is replaced ..... See 10

(4) If any of the following conditions should occur

① If the external display lamps give the estimate display although no loading is taking place.

② When loading, even if more than 50% of the standard load is loaded and the machine travels, the display gives the time display (it does not display the distance from 0 to 160 m).

In the case of (1) or (4), carry out calibration with the machine empty, then load to close to the rated load. The payload meter will recognize the empty (stopped) condition. The cycle data (see 7) recorded when dumping the load may be partially inaccurate.

In the case of (2) and (3), see 11 and 10 respectively.

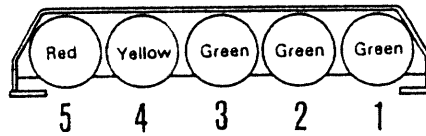
 **WARNING**

- See the Operation Manual for details of the difference in use of the parking brake and brake lock. [For HD1200-1]
- If the power switch is turned OFF during normal operations, the display for the payload meter will change to "Stopped" (Empty, Loading, or Loaded), regardless of the position of the parking brake lever or brake lock. [For HD1200-1]
- Do not turn the power switch OFF during the period from the point for starting to dump the load (dump lever moved from FLOAT to RAISE) to a point 5 seconds after the completion of the dumping operation (dump lever moved from LOWER to FLOAT).
- Even when not dumping, do not switch the power off within 5 seconds after moving the dump lever to the FLOAT position from any position other than the FLOAT position.
- When the starting switch has been at the ON position (power ON) for a long time without the engine being operated, and then the engine is to be started, first turn the starting switch OFF, then start the engine.  
if the engine is started without turning the starting switch OFF, the time that the engine was not running with the starting switch at the ON position will be calculated as "Stopped, Empty" time or as "Stopped, Loaded" time.

## 6. EXTERNAL DISPLAY LAMPS

### 6.1 Display level for lamps

When the external display lamps display the load, the lamps light up as shown in the table below.



	HD1200-1	HD985-3/-5	HD785-5	HD785-3	HD605-5
Lamp 1 (Green)	From 65 t to 80 t	From 55 t to 74 t	From 50 t to 67 t	From 47 t to 62 t	From 18 t to 27 t
Lamp 2 (Green)	From 80 t to 95 t	From 74 t to 93 t	From 67 t to 85 t	From 62 t to 78 t	From 27 t to 54 t
Lamp 3 (Green)	From 95 t to 110 t	From 93 t to 101 t	From 85 t to 91 t	From 78 t to 86 t	From 54 t to 60 t
Lamp 4 (Yellow)	From 110 t to 125 t	From 101 t to 105 t	From 91 t to 96 t	From 86 t to 94 t	From 60 t to 63 t
Lamp 5 (Red)	Over 125 t	Over 105 t	Over 96 t	Over 94 t	Over 63 t

	HD465-5	HD405-6	HD325-6		
Lamp 1 (Green)	From 13.8 t to 20.7 t	From 12 t to 18 t	From 9.6 t to 14.4 t		
Lamp 2 (Green)	From 20.7 t to 41.4 t	From 18 t to 36 t	From 14.4 t to 28.8 t		
Lamp 3 (Green)	From 41.4 t to 50.6 t	From 36 t to 40 t	From 28.8 t to 35.2 t		
Lamp 4 (Yellow)	From 50.6 t to 55.2 t	From 40 t to 42 t	From 35.2 t to 38.4 t		
Lamp 5 (Red)	Over 55.2 t	Over 42 t	Over 38.4 t		

- To prevent overloading, we recommend you to load to a point where the three green lamps light up. If the yellow lamp lights up, the limit for the specified load has been reached.

#### ⚠ WARNING

**If the red lamp lights up, the machine is overloaded. Do not travel with the machine in this condition.**

## 6.2 Estimate display

- The amount loaded changes in steps each time the bucket dumps a load in the dump body. The loads so far are calculated to give the average load, and this calculation is used to estimate what the total load in the dump body will be if one more bucket is loaded. The corresponding lamp flashes to indicate this value to the operator in order to prevent over-loading.
- The estimate display is given at the same time as the payload display.

Example [For HD1200-1]

1st load: 20 t

2nd load: 20 t (total: 40 t)

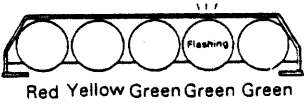
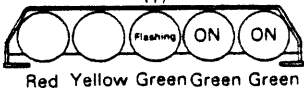
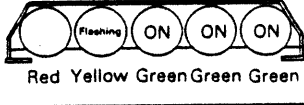
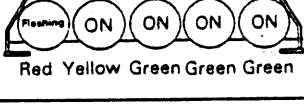
3rd load: 20 t (total 60 t)

4th load: 20 t (total 80 t)

5th load: 20 t (total 100 t)

6th load: 20 t (total 120 t)

If the dump body is loaded in this way, the external display lamps will give the display in the table below.

Number of loads	External display lamps	Remarks
3rd load	 <p>Red Yellow Green Green Green</p>	<ul style="list-style-type: none"> <li>● The amount that has actually been loaded is 60 t, so the first green lamp lights up.</li> <li>● The estimated load is 80 (20 x 4) t, so the second green lamp flashes.</li> </ul>
4th load	 <p>Red Yellow Green Green Green</p>	<ul style="list-style-type: none"> <li>● The amount that has actually been loaded is 80 (60 + 20) t, so the first two green lamps light up.</li> <li>● The estimated load is 100 (80 + 20) t, so the third green lamp flashes.</li> </ul>
5th load	 <p>Red Yellow Green Green Green</p>	<ul style="list-style-type: none"> <li>● The amount that has actually been loaded is 100 (80 + 20) t, so the three green lamps light up.</li> <li>● The estimated load is 120 (100 + 20) t, so the fourth lamp (yellow lamp) flashes.</li> </ul>
6th load	 <p>Red Yellow Green Green Green</p>	<ul style="list-style-type: none"> <li>● The amount that has actually been loaded is 120 (100 + 20) t, so the three green lamps and the yellow lamp light up.</li> <li>● The estimated load is 140 (120 + 20) t, so the red lamp flashes.</li> </ul>

## 7. DETAILS OF DATA STORED IN MEMORY OF PAYLOAD METER

- The payload meter stores the data in non-volatile RAM.
- These data are retained even when the power is switched off, so they can be used later as follows.
  - ① The data can be downloaded to a personal computer through a cable connected to the RS-232C port, and the personal computer can be used to display these data or to print them out using a printer. The data stored in the personal computer can be processed using Lotus 1-2-3 or EXCEL, and can be converted to a data base, so these data can be processed freely and used to make forms.
  - ② The data in the non-volatile RAM can be downloaded to the memory card inserted in the payload meter, and the data can be read from this memory card to a personal computer. After reading it to the personal computer, it can be processed in the same way as in Item ①.

### REMARK

- For details of the processes in Items ① and ②, please see the software manual provided with the personal computer.
- When using the software, apply the parking brake and turn the brake lock ON (brake lock for the HD1200-1 only), set the gearshift lever to the N position, check that the dump lever is at FLOAT, and operate only when the engine is not running. However, as an exception, the real time monitor display and calibration operation can be carried out when the machine is traveling.



## 7.1 Cycle data

- One cycle is taken as the time from the point where the load is dumped to the point where the next load is dumped, and the data between these two points is recorded.
- The cycle data is sent to the RAM every time the load is dumped.
- The maximum number of cycles that can be stored in memory for the cycle data is 2900 cycles.

Item	Unit	Range	
Engine operation number	Integer	1-65535	These show the value and set value when the load is dumped
Month	Month	1-12	
Day	Day	1-31	
Time Hour	Hour	24 hour clock	
Time Min	min	0-59	
Payload	t	0-6553.5	
Travel time when empty	min	0-6553.5	
Travel distance when empty	km	0-25.5	
Max. travel speed when empty	km/h	0-99	
Average travel speed when empty	km/h	0-99	
Stopping time when empty	min	0-6553.5	
Stopping time during loading	min	0-6553.5	
Travel time when loaded	min	0-6553.5	
Travel distance when loaded	km	0-25.5	
Max. travel speed when loaded	km/h	0-99	
Average travel speed when loaded	km/h	0-99	
Stopping time when loaded	min	0-6553.5	
Dumping time	min	0-25.5	
Speed limit	km/h	0-99	
Warning items for each cycle			
-----			
Analog spare 1			} See (*2)
Max. electric potential	V	0-4.0	
Min. electric potential	V	0-4.0	
Average electric potential	V	0-4.0	
Analog spare 2			
Max. electric potential	V	0-4.0	
Min. electric potential	V	0-4.0	
Average electric potential	V	0-4.0	
Digital spare 1			
Times for Lo		0-255	
Digital spare 2			
Times for Lo		0-255	

(\*1): The abnormalities and warnings that occur during the cycle are displayed simply.  
For details, see the output examples in the software manual.

(\*2): The data processing on the personal computer (display, printing, saving, etc.) is independent from the other data in the cycle data, and is handled as spare signal input data.

## 7.2 Engine ON/OFF data

- When the engine is started or stopped, these data are recorded in RAM.
- The maximum limit for engine ON/OFF data is 115 sets of ON/OFF data.

Item	Unit	Range	
Engine operation number	Integer	1-65535	Consecutive numbers for operation of engine (*1)
Last two digits of year	Year	0-99	Shows when engine was switched ON
Month	Month	1-12	
Day	Day	1-31	
Time Hour	Hour	24 hour clock	
Time Min	Min	0-59	
Last two digits of year	Year	0-99	Shows when engine was switched OFF
Month	Month	1-12	
Day	Day	1-31	
Time Hour	Hour	24 hour clock	
Time Min	Min	0-59	
Total payload	t	0-9999000	Total payload from time engine was switched ON to time engine was switched OFF
Overall number of cycles		0-9999	

(\*1): Every time the engine is switched ON, the engine operation number advances by 1, and is recorded. The engine operation numbers in the cycle data and the engine operation numbers in the abnormality and warning data, which are recorded from the time the engine is switched on to the time it is switched off, are all recorded as the same value.

As a result, when using a personal computer later to compile the data, it is possible to determine what time during the engine operation the cycle data or system abnormality refers to.

### 7.3 Abnormality, warning data

- When there is an abnormality or warning generated or cancelled by the payload meter system, these data are recorded in RAM.
- The maximum limit for abnormality or warning data is 230 sets of occurrence and cancellation.

Item	Unit	Range	
Error code	According to 9		(*1)
Engine operation number at time of occurrence	Integer	0-65535	
Number of times of occurrence since engine was switched ON		1-255	
Last two digits of year	Year	0-99	
Month	Month	1-12	
Day	Day	1-31	
Time Hour	Hour	24 hour clock	
Time Min	Min	0-59	
Engine operation number when canceled	Integer	0-65535	(*2)
Last two digits of year	Year	0-99	
Month	Month	1-12	
Day	Day	1-31	
Time Hour	Hour	24 hour clock	
Time Min	Min	0-59	

(\*1), (\*2): See 7.2 Engine ON/OFF data (\*1).

If the engine operation number is 0, it shows that the problem occurred or was canceled when only the power was switched ON (using the starting switch key), and the engine was not started.

## 7.4 Total payload, overall number of cycles data

- The total payload and overall number of cycles can be calculated and recorded from any desired time with each act of dumping.
- The calculation of both values is started from the point where the ZERO CLEAR switch is pressed for the total payload and overall number of cycles.
- Both total values can be displayed on the monitor panel by using the operation given in 8.2 Forced display of total payload and overall number of cycles. (See the same section for details of the method for ZERO CLEAR.)  
The total payload is also displayed automatically when dumping.
- The maximum limit for the total payload and overall number of cycles is 999900.0 t and 9999 cycles.

Item	Unit	Range	
Total payload	MT OR ST	0-999900.0	This shows the total value from the point where ZERO CLEAR was pressed  The date and time show the point where the ZERO CLEAR was pressed
Overall number of cycles		0-9999	
Last two digits of year	Year	0-99	
Month	Month	1-12	
Day	Day	1-31	
Time Hour	Hour	24 hour clock	
Time Min	Min	0-59	

## 7.5 Other data

Content	Item	Unit	Range	
Set data for operator check mode	Machine ID	Integer	0 - 200	By using switch input operation, it is possible to set.  See 8.3 Operator check mode
	Open ID	Integer	0 - 200	
	Speed limit	km/h	0-99	
	Option code	Integer	0-11	
Calibration data	Last two digits or year	Year	0-99	Data and time when calibration was carried out
	Month	Month	1-12	
	Day	Day	1-31	
	Time Hour	Hour	24 hour clock	
	Time Min	Min	0-59	
Data written by user	Data 1		20 characters	Comments which can be written freely to the payload meter. However, they can only be input using the cable communications from the personal computer (see the software manual).
	Data 2		20 characters	
	Data 3		20 characters	
	Data 4		20 characters	

## 8. OPERATION OF SWITCHES

By operating the switches on the payload meter, it is possible to force the following operations.

- Calibration (see 8.1)
- Forced display of total payload (see 8.2) and overall number of cycles, forced display of occurrence of abnormalities and warnings.
- Operator check mode (see 8.3)
  - (a) Memory card dump
  - (b) Data all clear
  - (c) Display of input signal condition, cancel condition during occurrence of abnormality, warning
  - (d) Machine ID setting
  - (e) Open ID setting
  - (f) Speed limit setting
  - (g) Option code setting
  - (h) Adjusting time, data
- Dimming monitor panel (see 8.4)
- Adjusting buzzer sound level (see 8.5)
- Setting unit of mass (see 8.6)
- Setting of forced prohibition for switches (see 8.7)
- Service check mode (see 8.8)

## 8.1 Carrying out calibration

### 8.1.1 When carrying out calibration


#### NOTICE

Carry out calibration in the following cases.


- When delivering the machine, and once a month
- When the oil and gas pressure for the suspension cylinder have been adjusted. (When the suspension is adjusted.)
- When the chassis has been modified and the mass of the machine when empty has changed more than 100 kg.
- When the suspension pressure sensor has been replaced.
- When anything has been done to suspension related parts.
- When the condition of the machine as judged by the payload meter is different from the actual condition of the dump truck. (See the precautions for 5.2 Display during normal operation.)

### 8.1.2 Method of carrying out calibration (method of operation)

1. Empty the dump body. When doing this, remove all the mud that is stuck to the dump body.
2. For models other than HD1200-1: Move the shift lever to the N position and keep

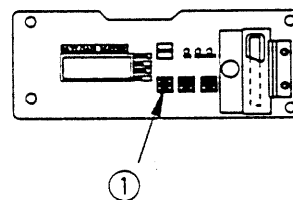
 switch ① pressed for at least 2 seconds. (The letters CAL flash)

3. Drive the machine, and when the travel speed reaches 10 km/h, press the

 switch ① again (the letters CAL



light up). In this condition, continue to drive the machine, and if the display changes to the time display after approx. 30 seconds, the procedure is completed.

4. Move the machine to a safe place and stop the engine.
5. Start the engine again.
6. Move the dump lever as follows: FLOAT → RAISE → LOWER → FLOAT.
7. This completes the operation  
Steps 4 – 7 are additional items to perform when installing new parts, but carry out these steps also to ensure accuracy.



#### NOTICE

- Carry out this operation on flat level ground.
- Travel in a straight line (travel distance: approx. 100 m)
- When traveling, keep the travel speed to a range of 5 to 10 km/h.  
The calibration data is stored in the RAM, and is retained even if the power is switched off.

- If you want to stop calibration during the operation, when the letters CAL in Step 2 are flashing, press  switch ① and the display will change from a flashing CAL to a flashing SCH. Press the  switch ① again, and the display will return to the normal display.

During the normal operation display, calibration can be carried out when the dump lever is at the FLOAT position. However, if some of the abnormality or warning items in Item 9 have occurred, the calibration cannot be carried out. (For details, see Item 9.)

## 8.2 Forced display of total payload and overall number of cycles

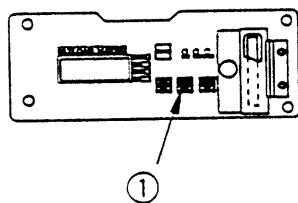
### 8.2.1 Forced display of abnormalities, warnings when they have occurred.


- The payload meter displays the total payload when the load is dumped, but it is also possible to use this operation at other times to display the total payload and overall number of cycles.
- For the total payload and overall number of cycles, each time the load is dumped, its weight is added. Furthermore, it is possible to clear this figure and return the total to 0 at any time. (See (2))
- However, when this operation is carried out, if any abnormality or warning given in Item 9 has occurred, the error code for that abnormality or warning is displayed. Even if multiple abnormalities and warnings occur, all of the error codes are displayed in turn. (During normal operation, only the item with the highest priority is displayed.)

#### (1) Method for forced display operation

The forced display of the total payload and overall number of cycles, zero clear, and forced display of the warning codes during occurrence can only be carried out if the dump lever is at the FLOAT position during display in normal operation.

If any new abnormality or warning should occur during the display, the system will return automatically to the display during normal operation.



1. Press  switch ①.

1-a If none of the abnormalities or warnings shown in Item 9 are occurring at present:



The total payload is displayed (100 t units, rounded to the nearest 100 t) (lights up)

2. Press 

TOTAL
SFT

 switch ① again.

Display the overall number of cycles. (unit: number of times) (lights up)

3. Press 

TOTAL
SFT

 switch ① again.

“:” is displayed (lights up) for 2 seconds, then the display returns to the display for normal operation. (end)

1-b If any of the abnormalities or warnings shown in Item 9 are now occurring:



The error code for that problem is displayed. (flashes)

2'. Press 

TOTAL
SFT

 switch ① again.

2'-a. If other abnormalities or warnings are now occurring:



The error code for that problem is displayed. (flashes)

3'. Repeat Step 2'.

2'-b. If no other abnormalities or warnings are occurring at present:



“:” is displayed (lights up) for 2 seconds, then the display returns to the display for normal operation. (end)

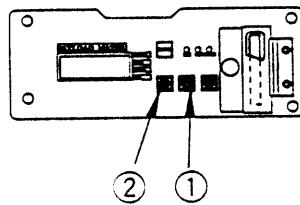




- It is possible to clear the total payload and overall number of cycles whenever desired. After the values are cleared, the total payload and overall number of cycles is calculated again from 0.

**⚠ WARNING**

**Before clearing the data, download the previous data for the total payload and overall number of cycles to a personal computer or save the data to the memory card if necessary.**

**(2) Method of clearing total payload and overall number of cycles**



1. Carry out the procedure up to Step 1 or Step 2 for Item (1) Method of operation for forced display, and display the total payload and overall number of cycles. (Do not go on to Step 3 of (1).)
2. Press  switch ② for at least 2 seconds.  
The total payload or overall number of cycles display will flash.
3. Press  switch ② for at least 2 seconds again.  
After "0000" is displayed for 2 seconds, if the display returns to the normal operation display, the zero clear operation is completed.

**NOTICE**

**The zero clear operation for the total payload and overall number of cycles is carried out at the same time. It is impossible to carry out the zero clear operation individually for only one of these items.**

- The maximum limit for the total payload and overall number of cycles is as follows.
  - Total payload: 999900.0 t
  - Overall number of cycles: 9999 times

**NOTICE**

If either the total payload or overall number of cycles goes above the set value, the error code given in Item 9 is displayed.

(See Item 9 (\*1) Notes (4) and (5))



**WARNING**

- Carry out the zero clear operation for the total payload and overall number of cycles before the error code is displayed.
- If either the total payload or overall number of cycles exceeds the maximum limit, both values will be automatically cleared.
- Once an error code is displayed, it is impossible to forcibly clear the data or cancel the display until the value exceeds the limit and the data are automatically cleared.

### 8.3 Operator check mode

- By using the operator check mode, it is possible to forcibly display, set, or correct the following.

Ⓐ **Memory card dump**

The data shown in Item 7 is written en bloc to the memory card inserted in the payload meter.

#### NOTICE

**This function only works when the No. 5 switch (memory card USED switch) on the left side of the controller is set to the USED condition.**

Ⓑ **Data all clear**

This function forcibly erases all the cycle data, engine ON/OFF data, and abnormality and warning data.

Note that the data for total payload and overall number of cycles are not cleared. See 8.2



#### WARNING

**Before clearing the data, download the necessary data to a personal computer or carry out Ⓐ memory card dump.**

Ⓒ **Display of abnormalities and warnings during occurrence, cancellation, condition of input signals**

This distinguishes between abnormalities and warnings that are now occurring and abnormalities and warnings that have occurred and have now been corrected and reset, and automatically displays the error code.

It also partially displays the condition of the signals from the sensors that are input to the payload meter.

Ⓓ **Setting machine ID**

This is used when inputting or correcting the value to set the dump truck ID.

Available range for setting: 0 – 200

Ⓔ **Setting open ID**

This is used when inputting or correcting the value to set the optional ID.

Available range for setting: 0 – 200

There is no effect on the function of the payload meter on the machine if this setting is not carried out.

[Example of use of open ID]

- Number to indicate location of facing
- Operator ID number

Ⓕ **Setting speed limit**

If there is a speed limit on the road that the dump truck uses, it is possible to display a warning on the payload meter if the dump truck exceeds that speed. Input or correct the value to set the speed limit.

- Range of setting: 10 – 99 [km/h]

If the speed limit warning is not needed, set it to 99.

⑨ **Setting option code**

The option code can be set by inputting or correcting to set the baud to give the desired baud rate for the cable communications function (RS-232C), ON/OFF for the PMC and TALKS (option), and ON/OFF for the automatic transmission function. The code can be set as shown in the table below.

Option code	Communications baud rate (bit/sec)	Automatic transmission function	Optional setting		
			TALKS setting	PMC setting	Data transmission type when completing dumping (PMC setting)
0	9600	NO	NO	NO	-
1	9600	YES	NO	NO	-
2	1200	NO	NO	NO	-
3	1200	YES	NO	NO	-
4	9600	NO	YES	NO	-
5	9600	YES	YES	NO	-
6	1200	NO	YES	NO	-
7	1200	YES	YES	NO	-
8	9600	NO	YES	YES	Z1
9	9600	NO	YES	YES	Z2
10	9600	NO	NO	YES	Z1
11	9600	NO	NO	YES	Z2

 **WARNING**

When sending (downloading) the data set in the payload (see Item 7) to the personal computer using a cable, always set the option code to 0 or 2 before starting. (When PMC or TALKS are installed, set the option code to 4 - 11.)

We recommend that you normally set the option code to 0.

Set the communications baud rate to 9600 (bit/sec), except when the personal computer and software works only at 1200 (bit/sec).

⑩ **Setting time, date**

Set the time and date on the payload meter.

- Of the functions in the operator check mode, the following can be set from the personal computer depending on the version of the download software for the personal computer provided by Komatsu.
  - Machine ID
  - Setting open ID
  - Setting speed limit
  - Setting option code
  - However, the option code can only be corrected from 0 to 2, from 4 to 6 or from 2 to 0, from 6 to 4.
  - Setting time, date
 For details, please see the software manual.

### (1) Method of operation

The operator check mode can be actuated during the display for normal operations in the following conditions.

For HD1200-1: Parking brake ON or brake lock ON

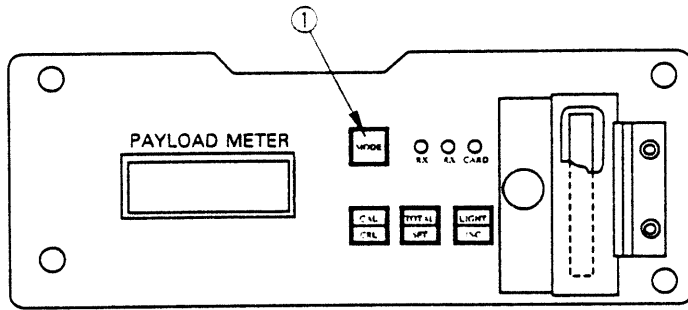
For models other than HD1200-1: Shift lever at N position, dump lever at FLOAT position.

However, it does not work during the period from starting the loading operation to completion of the loading operation.


### WARNING


**To operate the operator check mode, apply the parking brake and turn the brake lock ON (brake lock for the HD1200-1 only), set the gearshift lever to the N position, check that the dump lever is at FLOAT, and operate only when the engine is not running. If it is operated in any condition other than the above, the data input and set in the operator check mode may not be properly processed, or the data saved in memory may be damaged. In addition, do not turn the switch OFF before returning to the normal operating display after completing operation of the operator check mode.**

- If the year changes while the engine is still running, and the software is used to download the data and display it on the personal computer, the data for the completion of obtaining the data will not be displayed.




(\*1)

Press [MODE] switch ① for at least 2 sec.  
Display 

"  " shows that this part flashes


Go to ③ Memory card dump operation

(\*1) This function can only be used when the No. 5 switch (memory card USED switch) on the left side of the controller is set to USED.


Press [MODE] switch ① (\*2)  
Display 

(\*2) This function is actuated by pressing the switch for at least 2 seconds when the No. 5 switch (memory card USED switch) on the left side of the controller is set to NOT USED.


Go to ⑤ Data all clear operation

Press [MODE] switch ①.  
Display 

Go to operation ③ Display of abnormalities and warnings during occurrence, cancellation, condition of input signals

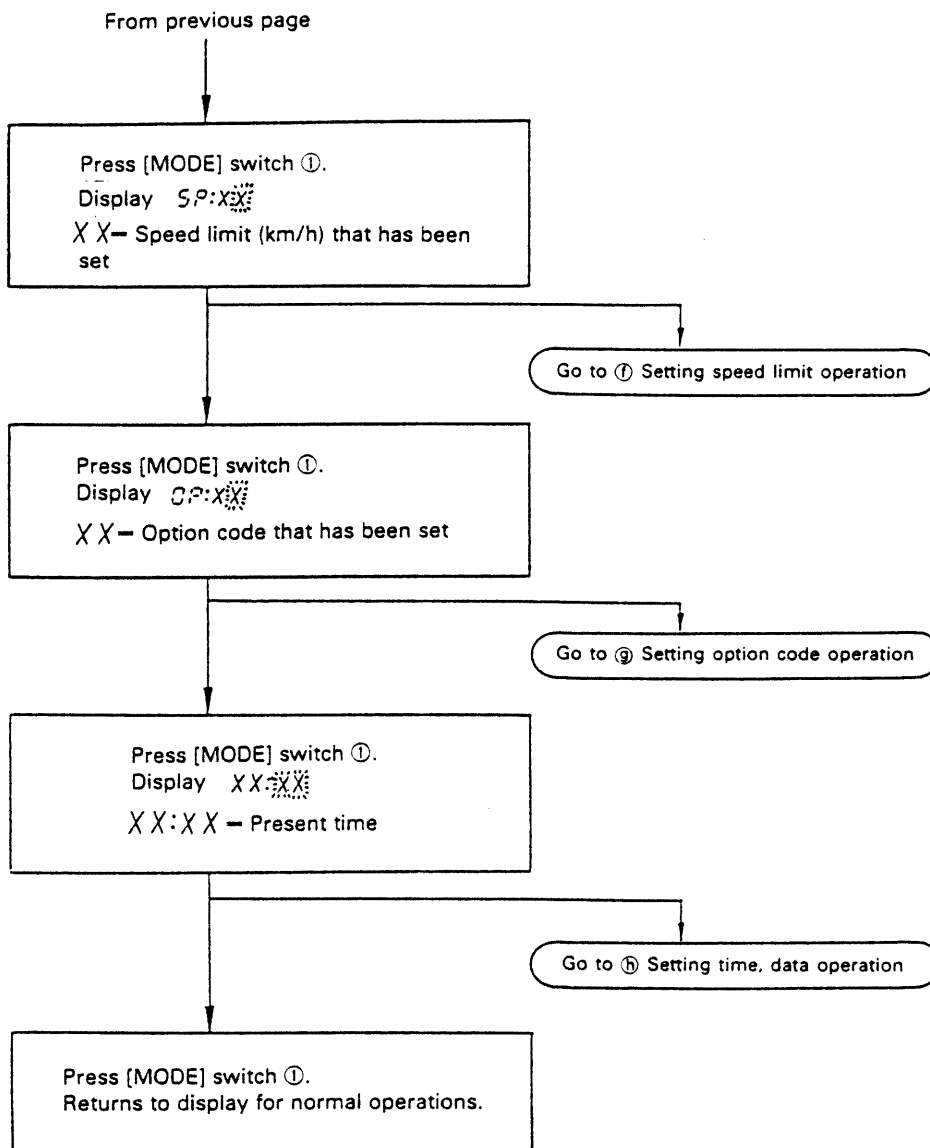
Press [MODE] switch ①.  
Display  X X X  
X X X - Machine ID that has been set

Go to ④ Setting machine ID

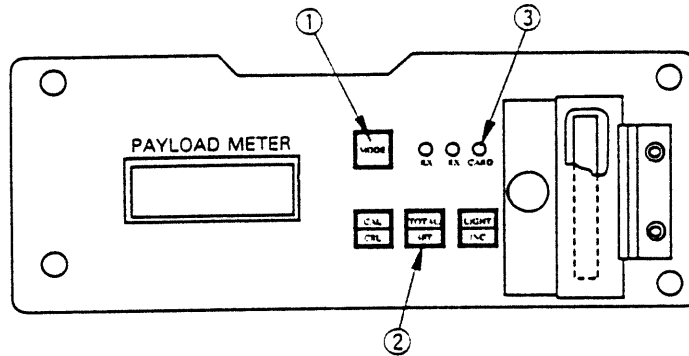
Press [MODE] switch ①.  
Display  X X X  
X X X - Operator ID that has been set

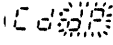

Go to operation ⑥ Setting open ID

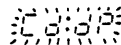
Go to next page



① Memory card dump operation



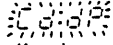

1. When the display is , press  switch ②.

Display 

2. Press  switch ② again.

The panel display goes out and memory card access lamp ③ lights up.

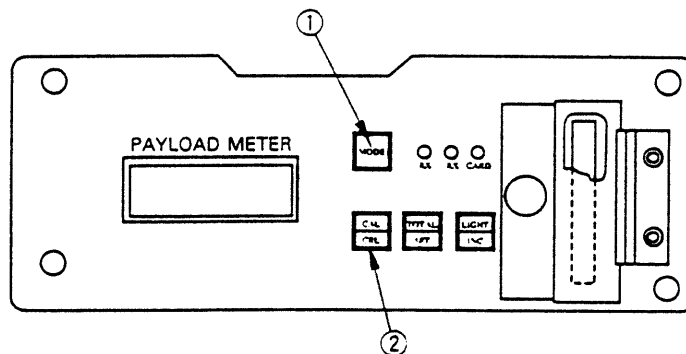
When the memory card dump operation is completed, it automatically returns to the display for normal operation. (end)

If you wish to stop the memory card dump operation when the display is , press  switch ①. The memory card dump operation is not carried out, and the display returns to the display for normal operations.

This function only works when the No. 5 switch (memory card USED switch) on the left side of the controller is set to the USED condition.



⑥ Data all clear operation



1. With the display showing *R-CLLE*, press **CAL/CRL** switch ② for at least 2 seconds.

Display *R-CLLE*

2. Press **CAL/CRL** switch ② for at least 2 seconds again.

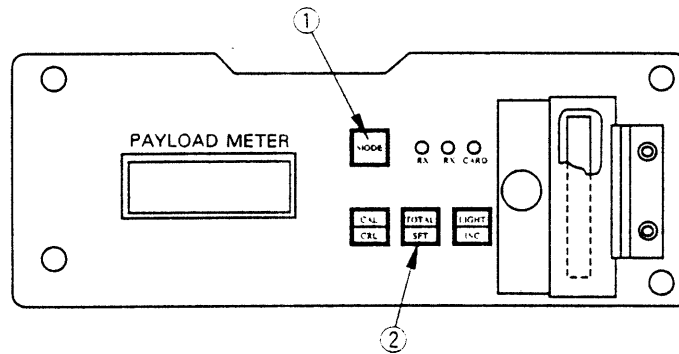
When the display becomes *R-CLLE* (lighted up) and the data clear operation is completed, the display automatically returns to the display for normal operations. (end)

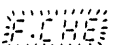

If you wish to stop the data all clear operation when the display is *R-CLLE*, press **MODE** switch ①. The data all clear operation is not carried out, and the display returns to the display for normal operations.

**⚠ WARNING**

Before clearing the data, download the necessary data to a personal computer or carry out ③ memory card dump.

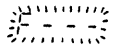
© Display of abnormalities and warnings during occurrence, cancellation, condition of input signals



1. With the display showing , press  switch ② and the monitor will proceed to the following display for the abnormality or warning that is now occurring.

1-a If none of the abnormalities or warnings given in Item 9 is now occurring:



Display  (6 seconds)

1-b If any of the abnormalities or warnings given in Item 9 is now occurring:

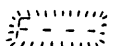


The error codes are displayed in order (each code flashes for 6 seconds)

2. In addition, the system will automatically proceed to the following display for abnormalities and warnings that have occurred in the past.

2-a If none of the abnormalities or warnings given in Item 9 has occurred in the past (no occurrence or cancellation data are stored in the payload meter memory)

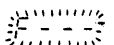


Display  (3 seconds)

2-b If any of the abnormalities or warnings given in Item 9 has occurred in the past but has now been reset to normal:



The error codes are displayed in order (each code flashes for 3 seconds)

After displaying all the error codes for problems that have occurred in the past,  is displayed (lights up) for 3 seconds.

3. The system then automatically proceeds to the following displays for the signals from the sensors that are input to the payload meter.

3-a Condition of parking brake, brake lock switch signal [HD1200-1]  
 Display: [ 1:XX (lights up for 3 seconds)

If either is ON: [ L:00  
 If both are OFF: [ L:- -

3-a' Condition of shift lever position signal  
 [Models other than HD1200-1]  
 Display: [ 1:XX (lights up for 3 sec)  
 N: [ L:00  
 Except N: [ L:- -

3-b Condition of signal for dump lever position  
 Display: [ 2:XX (lights up for 3 sec)  
 FLOAT: [ 2:00  
 Except FLOAT: [ 2:- -

3-c Condition of signal for engine oil pressure  
 Display: [ 3:XX (lights up for 3 sec)  
 Engine running: [ 3:00  
 Engine stopped : [ 3:- -

3-d Condition of signal for charge amount  
 Display: [ 4:XX (lights up for 3 sec)  
 Engine running: [ 4:00  
 Engine stopped : [ 4:- -

3-e Condition of signal for analog spare input 1  
 Display: [ 5:XX (lights up for 3 sec)  
 XX : Input signal (V)

3-f Condition of signal for analog spare input 2  
 Display: [ 5:XX (lights up for 3 sec)  
 XX : Same as C5

3-g Condition of signal for digital spare input 1  
 Display: [ 7:XX (lights up for 3 sec)  
 High: [ 7:00  
 Low: [ 7:- -

3-h Condition of signal for digital spare input 2  
 Display: [ 8:XX (lights up for 3 sec)  
 XX : Same as C7

4. With the display for 3-h, press 

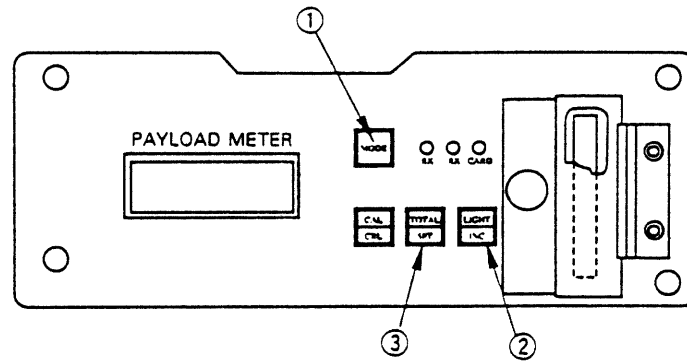
TOTAL
SFT












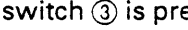



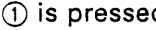
 switch ② and return once more to 1-a or 1-b.
5. From the display following 1-a or 1-b to the display for 3-h, if the 

MODE
------

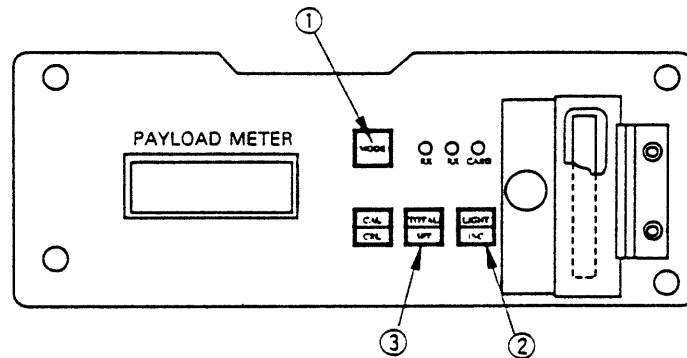
 switch ① is pressed at any time, the display will return to the display for normal operations. (end)









④ Setting machine ID



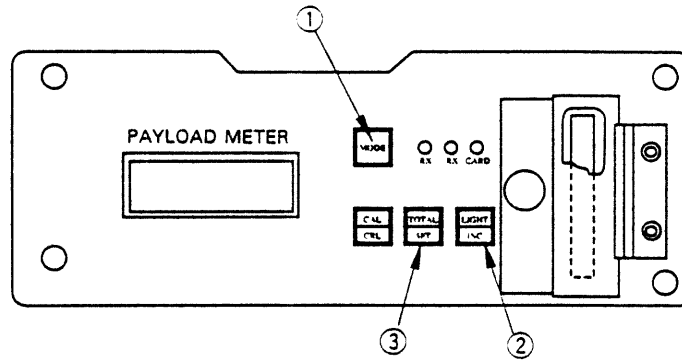
1. With the display at  $d.XXX$ , if it is necessary to correct the digit for the units, press  switch  and correct the number.
2. Press  switch . Display  $d.XXX$   
If it is necessary to correct the digit for the tens, press  switch .
3. Press  switch . Display  $d.XXX$   
If it is necessary to correct the digit for the hundreds, press  switch .
4. If  switch  is pressed again, the display will return to  $d.XXX$ , so it is possible to correct the numbers again.
5. From Step 1, if the correction is completed,  switch  can be pressed at any time to return to the display for normal operations. (end)  
If  switch  is pressed, but it is impossible to set the values, the system will return to Step 1.

e Setting open ID



1. With the display at  $\bar{0}.XX\bar{X}$ , if it is necessary to correct the digit for the units, press  switch ② and correct the number.
2. Press  switch ③.  
Display  $\bar{0}.XX\bar{X}$   
If it is necessary to correct the digit for the tens, press  switch ② and correct the number.
3. Press  switch ③.  
Display  $\bar{0}.XX\bar{X}$   
If it is necessary to correct the digit for the hundreds, press  switch ② and correct the number.
4. If  switch ③ is pressed again, the display will return to  $\bar{0}.XX\bar{X}$ , so it is possible to correct the numbers again.
5. From Step 1, if the correction is completed,  switch ① can be pressed at any time to return to the display for normal operations. (end)  
If  switch ① is pressed, but it is impossible to set the values, the system will return to Step 1.

ⓕ **Setting speed limit**



1. With the display at  $SP:XX$ , if it is necessary to change the digit for the units, press 

LIGHT
INC

 switch ② and correct the number.
2. Press 

TOTAL
SFT

 switch ③.  
 Display  $SP:XX$   
 If it is necessary to change the digit for the tens, press 

LIGHT
INC

 switch ② and correct the number.
3. If 

TOTAL
SFT

 switch ③ is pressed again, the display will return to  $SP:XX$ , so it is possible to correct the numbers again.
4. From Step 1, if the correction is completed, 

MODE
------

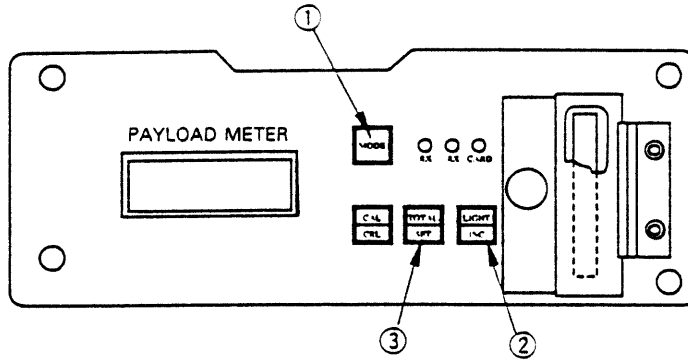
 switch ① can be pressed at any time to return the display to the display for normal operations. (end)

If 

MODE
------

 switch ① is pressed, but any of the values that have been input are not available for setting, the system will return to Step 1.


⑨ Setting option code




1. With the display at  $DP:X\text{X}\text{X}$ , if it is necessary to change the digit for the units, press





switch ② and correct the number.


2. Press  switch ③.

Display  $DP:X\text{X}\text{X}$

If it is necessary to change the digit for the tens, press  switch ② and correct the number.

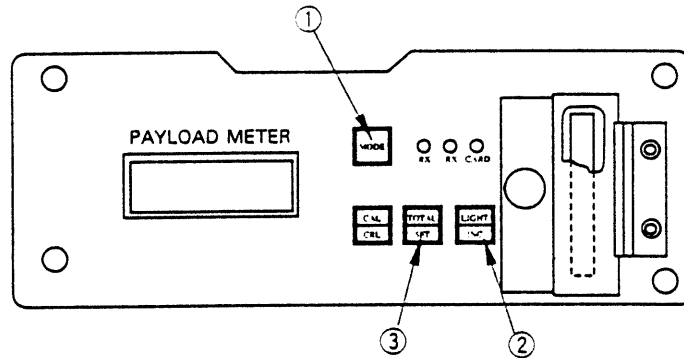
3. If  switch ③ is pressed again, the display will return to  $DP:X\text{X}\text{X}$ , so it is possible to correct the numbers again.

4. From Step 1, if the correction is completed,  switch ① can be pressed at any time to return the display to the display for normal operations. (end)

If  switch ① is pressed, but any of the values that have been input are not available for setting, the system will return to Step 1.



h) Setting time or date



1. With the display at  $XX\text{X}\text{X}$ , if it is necessary to change the digit for the minutes, press **LIGHT INC** switch ② and correct the number.

2. Press **TOTAL SFT** switch ③.

Display  $\text{X}\text{X}\text{X}\text{X}$

If it is necessary to change the digit for the hours, press **LIGHT INC** switch ② and correct the number.

Set the time using a 24 hour clock.


3. Following this, each time **TOTAL SFT** switch ③ is pressed, the point that flashes will move in turn to day, month, and year, so if the value needs to be corrected, press **LIGHT INC** switch ② and carry out the correction.

4. When the display for the year is flashing, if **TOTAL SFT** switch ③ is pressed again, the display will return to  $XX\text{X}\text{X}$  (hour:min), so it is possible to correct the numbers again.

5. From Step 1, if the correction is completed, **MODE** switch ① can be pressed at any time to return the display to the display for normal operations. (end)

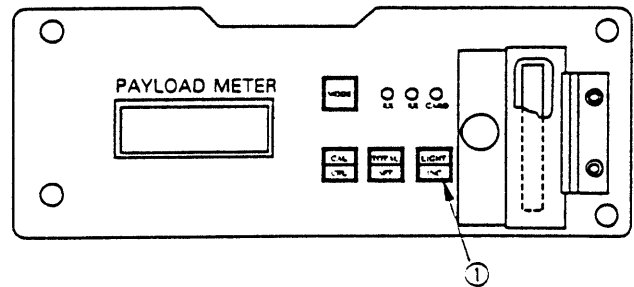
## 8.4 Dimming lights on monitor display

- If you want to change the brightness of the monitor display, do as follows.

1. Each time  switch ① is pressed, the lighting will become one level darker, and if the switch is pressed when the light is darkest, it will return to the brightest level.

The brightness changes in 10 stages.

If the switch is kept pressed, the brightness will change continuously.



## 8.5 Adjusting buzzer sound level

## 8.6 Setting mass unit

## 8.7 Setting forced prohibition for switches

- For both of these see 4. General locations, 4.2 Left face of controller.
- Adjust the buzzer sound level using switch No. B, set the mass unit using switch No. 7, and set the forced prohibition for the switches using switch No. 8.



### WARNING

Do not touch any other switch on the left side of the controller.

From the point where the setting for the mass unit is switched, the payload meter display unit will change. The values stored in the payload meter RAM will also have the value changed for any data put into memory from the time the setting is changed. The data already stored in memory will not have the unit converted, so we recommend that you download the data to the personal computer or carry out the memory card dump operation immediately before changing the setting.

## 8.8 Service check mode

- By operating the service check mode, it is possible to carry out display, setting, and correction forcibly of the following items.  
If it is desired to correct the method of operation and setting, please contact your Komatsu distributor.
  - Ⓐ Detailed display of calibration data  
The display shows the date, suspension pressure, etc. for the latest calibration.
  - Ⓑ Detailed display of payload calculation data (analog data)  
The display shows the suspension pressure and machine angle used when calculating the present payload.
  - Ⓒ Memory card dump (service area)  
This writes all the data displayed for Ⓐ and Ⓑ to the memory card inserted in the machine.
  - Ⓓ Data all clear (service area)  
This forcibly deletes calibration data Ⓐ and analog data Ⓑ, except for the latest calibration data.
  - Ⓔ Input signal condition display  
This displays some of the signal conditions for the sensors input to the payload meter and the present recognition condition of the payload meter.
  - Ⓕ Forced initialization  
This forcibly deletes all the data in the payload meter.
  - Ⓖ Extra payload setting when loading  
The extra load can be forcibly input or corrected to set the payload when loading.
  - Ⓗ Payload fixed display and cycle data recording, payload value setting
    - 1) Payload fixed display
      - ① TALKS OFF: The time that machine is stopped when loading at least 50% of set payload and traveling 160 m and starting to dump
      - ② TALKS ON: The time that machine is stopped from permission to move off to starting to dumpWhen displaying payload in ① and ②, it is possible to input and correct to set the display for the payload when loading is completed (when loading at least 50% of set payload and traveling 160 m and starting to dump), not the real-time payload.
    - 2) Switching payload fixed display and cycle data recording,  
If the payload fixed display in Item 1) above is applicable, it is possible to input and correct the data to set the payload inside the cycle data to the fixed display payload value.
  - Ⓘ Loading completion recognition travel distance setting  
This is used to input and correct the values to set the travel distance recognized as completion of loading by the payload meter.
  - Ⓚ Loading start recognition payload setting  
This is used to input and correct the values to set the payload recognized as the start of loading by the payload meter.
  - Ⓛ Zero ton display range setting  
This is used to input and correct the values to set the range of the zero display on the payload display.
  - ① External display lamp display range setting  
This is used to input and correct the values to set the lamp display payload range when displaying the payload.
- Of the service check mode functions, the following functions can be downloaded to a PC using the PC downloading software provided by Komatsu.
  - Calibration data
  - Payload calculation data (analog data)

## 9. ABNORMALITY AND WARNING DISPLAY (ERROR CODE)

- The payload meter always carries out self diagnosis of the system, and if abnormality or warning is generated, it is displayed by the monitor panel and the external display lamps.
- For details of the detection items and displays, see the abnormality and warning item table.

### NOTICE

- If any abnormality or warning occurs, if it is within the timing possible for display in the table, it is displayed on the monitor panel and the external display lamps, and a buzzer sounds for 3 seconds at the same time.
- If an abnormality or warning is currently being displayed, and a problem which has higher priority for display occurs, if the timing possible for display is duplicated, the newly occurring problem will be displayed and the buzzer will sound for 3 seconds. Following this, the abnormality and warning display will switch according to the timing possible for display for each problem. If the timing possible for display is duplicated, the problem with the higher display priority in the chart is displayed.

Table of abnormality and warning items

Priority of display	Content	Judgement standard	Error code display			Content of display		Timing possible for display	Recording of abnormality and warning data (Display code for personal computer software)	Remarks
			Panel display	External display lamps	Cancel display	Panel display	Cancel display			
1	Dump lever position not at FLOAT (except when dumping)	---	b-FL lights up	All flash	If problem removed	(For HD1200-1) When either parking brake or brake lock is ON	---	Possible timing for display for models other than 1200-1 Shift lever at position N		
			b-FL flashes	---	If problem removed	(For HD1200-1) When either parking brake or brake lock is ON	---	Possible timing for display for models other than 1200-1 Shift lever at position other than N		
			Cd flashes	---	If problem removed	Detection of removal only for card dump	---	Detected only when card dump operation is run		
3	Drop in backup battery voltage	Improper contact or voltage below 2.7V	F-09 flashes	---	If problem removed	Except when loading	Record 000-009	Rated voltage 3.6V		
			See (*1)	---	See (*1)	Except when loading	Record 000-011			
							000-012			
							000-013			
4	Cycle data memory FULL	See (*1)					000-014			
			Engine ON/OFF data memory FULL							
5	Disconnection at R terminal	Output with engine running is less than 2V	F-18 flashes	All flash	If problem removed	When engine is running	Record (000-018)	---		
6	Abnormality in sensor power source (18V)	Output below 15V and power source voltage over 20V	F-20 flashes	All flash	If problem removed	When normal	Record 000-020	Calibration cannot be carried out when this has occurred		

Priority of display	Content	Judgement standard	Error code display			Timing possible for display	Recording of abnormality and warning data (Display code for personal computer software)	Remarks
			Panel display	External display lamps	Cancel display			
7	Short circuit or disconnection in front left suspension pressure sensor system	Suspension pressure sensor input signal 0MPa (0 kg/cm <sup>2</sup> ) or below	F-21 flashes	All flash	If problem removed	When normal	Record 000-021	Calibration cannot be carried out when this has occurred
			F-22 flashes				000-022	
			F-23 flashes				000-023	
			F-24 flashes				Record 000-024	
8	Short circuit or disconnection in front right suspension pressure sensor system	Suspension pressure sensor input signal 19.61 MPa (200 kg/cm <sup>2</sup> ) or above	F-25 flashes	All flash	If problem removed	When normal	Record 000-025	Calibration cannot be carried out when this has occurred
			F-26 flashes				000-026	
			F-27 flashes				000-027	
			F-28 flashes				000-028	
9	Short circuit or disconnection in rear left suspension pressure sensor system	Inclinometer input signal more than +10° or more	F-31 flashes	All flash	If problem removed	When normal	Record 000-031	Applicable only when clinometer use switch is set to USED Calibration cannot be carried out when this has occurred
			F-32 flashes					
			F-33 flashes					
			F-34 flashes					
10	Short circuit or disconnection in rear right suspension pressure sensor system		F-35 flashes					
			F-36 flashes					
			F-37 flashes					
			F-38 flashes					
11	Short circuit with power source for front left suspension pressure sensor system		F-39 flashes					
			F-40 flashes					
			F-41 flashes					
			F-42 flashes					
12	Short circuit with power source for front right suspension pressure sensor system		F-43 flashes					
			F-44 flashes					
			F-45 flashes					
			F-46 flashes					
13	Short circuit with power source for rear left suspension pressure sensor system		F-47 flashes					
			F-48 flashes					
			F-49 flashes					
			F-50 flashes					
14	Short circuit with power source for rear right suspension pressure sensor system		F-51 flashes					
			F-52 flashes					
			F-53 flashes					
			F-54 flashes					
15	Short circuit of disconnection in clinometer system		F-55 flashes					
			F-56 flashes					
			F-57 flashes					
			F-58 flashes					

Priority of display	Content	Judgement standard	Error code display			Timing possible for display	Recording of abnormality and warning data (Display code for personal computer software)	Remarks
			Panel display	External display lamps	Cancel display			
16	Short circuit with power source for clinometer system	Inclinometer input signal more than +10° or more	F-32 flashes	All flash	If problem removed	When normal	000-032	Applicable only when clinometer use switch is set to USED Calibration cannot be carried out when this has occurred
17	Calibration not carried out or abnormality in RAM	Recorded data for calibration corrupted	F-CAL flashes	All flash	If problem removed	When normal	Record 000-019	When problem has occurred, calculation of payload is stopped
18	Short circuit in No. 1 relay for external display lamps	When coil continuity is ON, relay coil is short circuited with power source	F-41 flashes	See the Remarks column	If problem removed	Except when loading (see the Remarks column for details of the external display lamps)	Record 000-041	External display lamps are actuated as follows Applicable lamp When machine is stopped: Always ON When traveling: OFF Other lamps When loading: Actuated as specified When machine is stopped but not loading: Flashes When traveling: OFF
19	Short circuit in No. 2 relay for external display lamps		F-42 flashes				000-042	
20	Short circuit in No. 3 relay for external display lamps		F-43 flashes				000-043	
21	Short circuit in No. 4 relay for external display lamps		F-44 flashes				000-044	
22	Short circuit in No. 5 relay for external display lamps		F-45 flashes				000-045	
23	Defective payload for cycle data (*2)	See (*2)	L.bad flashes	---	Empty machine starts to travel	Between starting to dump and empty machine starting to travel	---	

Priority of display	Content	Judgement standard	Error code display Content of display			Timing possible for display	Recording of abnormality and warning data (Display code for personal computer software)	Remarks
			Panel display	External display lamps	Cancel display			
24	Exceeding speed limit	When travel speed is above set value for speed limit	SP:SP flashes	---	Set value -2 km/h	When problem has occurred	---	
25	Defective setting or defective option code setting		F-71 flashes F-73 flashes F-80 flashes F-81 flashes F-91 flashes F-92 flashes F-93 flashes F-94 flashes F-95 flashes F-96 flashes F-97 flashes F-98 flashes F-99 flashes	---	If problem removed	---	Record (000-071) (000-073) (000-080) (000-081) (000-091) (000-092) (000-093) (000-094) (000-095) (000-096) (000-097) (000-098) (000-099)	---





(3) Abnormality and warning data

- ① If more than 220 occurrences are recorded in memory (remaining capacity: less than 10 occurrences):

*F.FULL* flashes 7 times (3 sec)  
: flashes once This is repeated

- ② If the situation continues and 230 occurrences are recorded in memory (remaining capacity: 0):

*F.FULL* lights up (3 sec)  
: flashes once This is repeated

- ③ If more abnormalities or warnings occur, they are recorded as 231, 232, ..., but for each new occurrence that is recorded, the data for the oldest occurrence are deleted to make way for it.  
(The display stays the same as in Condition ②.)

(4) Data for total payload, overall number of cycles

- ① If the overall number of cycles goes above 9994 times (remaining capacity: 5 times) or the difference between the total payload recorded in memory and the maximum limit of 999900 t is less than 5 times the rated load:

*H.FULL* flashes 7 times (3 sec)  
: flashes This is repeated

- ② If the overall number of cycles goes above 9997 times (remaining capacity: 2 times) or the difference between the total payload recorded in memory and the maximum limit of 999900 t is less than 2 times the rated load:

*H.FULL* lights up (3 sec)  
: flashes This is repeated

- ③ If the overall number of cycles reaches 9999 times or the total payload exceeds 999900 t, both the total payload and overall number of cycles are cleared automatically.  
The data for both values are then calculated again from 0. (The display returns to the display for normal operation.)

(5) To cancel the data (FULL) for Items (1) to (3), see 8. Operation of switches, 8.3 Operator check mode.

If data FULL is displayed for (4) it cannot be canceled until it is automatically cleared.

Before the data FULL display appears, use the forced ZERO CLEAR to clear the data. For details of the method, see 8. Operation of switches, 8.2 Forced display of total payload and overall number of cycles.

(6) There is no order of priority for displays (1) to (4).

If multiple data FULL occur at the same time, they are displayed in order except during loading.

(\*2) Defective cycle data payload

- The payload meter carries out the detection of the payload based on the signal from the suspension pressure sensor. To make the measurement of the payload more accurate, the payload meter detects the payload immediately before the load is dumped, when the dynamic friction of the suspension while the machine is being loaded is canceled by traveling with the machine loaded, and this is written to the memory. (It is recorded as one part of the cycle data.)
- For this reason, if the dumping operation (operation of dump lever) is carried out while the chassis is still pitching after the machine is stopped at the spoil ground, the payload sent to the payload meter memory may not be accurate.
- Furthermore, if the dump truck is stopped at the spoil ground by braking hard, or if it mounts the blocks for the wheels, or hits something and stops, the payload that is sent to the memory may not be accurate.
- If the load is dumped while the dump truck is still pitching as in the conditions given above, the payload meter will display the defective cycle data payload in the Table of Abnormality and Warning Items to warn the operator.

In this case, the detected payload is also written to memory.

 **WARNING**

- **When stopping at the spoil ground, avoid braking suddenly or stopping the machine on top of the wheel blocks or rocks.**
- **When operating the dump lever to dump the load, stop the machine at the spoil ground and wait for the pitching to stop before operating the lever.  
(As a guideline, wait for at least 3 seconds before operating the dump lever.)**
- **Make the spoil ground as flat as possible, and make the unevenness of the road as small as possible.**

## 10. WHEN F-09 IS DISPLAYED FOR THE ERROR CODE (PROCEDURE FOR REPLACING BATTERY)

The payload meter has an internal battery to prevent the recorded data from being erased when the key in the starting switch is turned to the OFF position.

If the voltage of the battery drops, F-09 is displayed as an error message, so replace the battery as follows.

### 10.1 Replacing battery

#### WARNING

When replacing the battery, first move the machine in an unloaded condition to a safe place.

- Parts to prepare

Crosshead screwdriver

New battery (581-86-55710)

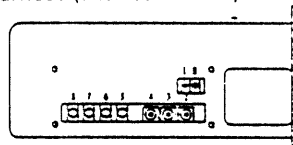
- 1) Turn the key in the starting switch to the ON position and download the data stored in the payload meter to a personal computer, or carry out the memory card dump operation.

#### NOTICE

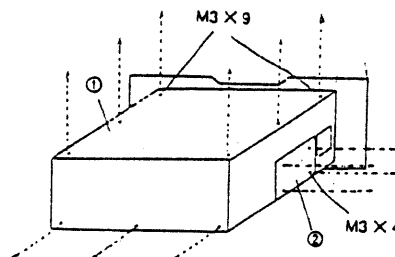
When this is being done, the engine must not be started.

- 2) Turn the starting switch to the OFF position.

Meter wiring harness (with connector)



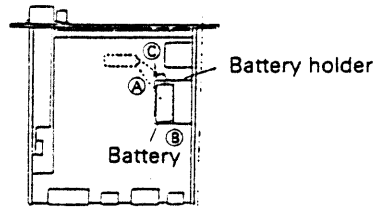
- 3) Remove the four screws (M6) holding the payload meter, and pull the payload meter out to the front.



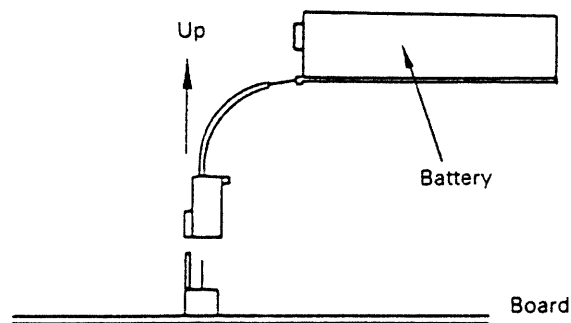
- 4) Remove the connector, then remove the screws (top surface M3 x 9, left side M3 x 4) of cover ① on top of the payload meter, and then remove the left side cover.

- 5) Remove the cover of the PLM body. As seen from the top, a battery box is installed to position "B" in the center of the diagram on the right. Using procedure "A" in the diagram, remove the battery from the battery box, then put it carefully on top of the motherboard.

**Note: It is difficult to remove the battery connector ("C" in the diagram), so do not use force to remove it.**



- 6) Insert the connector of the new battery directly into the connector on the board. Put the battery in the battery holder, and pass the wiring through the notch. When doing this, insert the wiring into the bottom of the holder and pass it through the notch.



- 7) Install the top cover.
- 8) Assemble the payload meter to its original position in the panel.

#### NOTICE

- Do not wear gloves when carrying out this operation.
- Be careful not to let dirt or metal get inside the controller. Be careful not to drop any nuts or washers inside the controller.

## 10.2 After replacing the battery, do as follows.

When replacing the battery, the backup power source for the non-volatile memory inside the payload meter is momentarily cut, so unwanted data (garbage) may enter the memory and affect the payload meter's recognition of the condition of the machine. The following operation is necessary to remove these data.

- 1) Turn the starting switch to the ON position. ( F-**CL** may flash.)
- 2) Using the operator check mode, set speed limit, option code, time and date.
- 3) Without turning the starting switch to the OFF position, start the engine. ( F-**CL** may flash)
- 4) Carry out calibration.
- 5) Load to near the rated payload, then dump the load.
- 6) Move the machine to a safe place, wait for at least 5 seconds after dumping the load in Step 5), then stop the engine.
- 7) Turn the starting switch to the ON position again.  
When doing this, do not start the engine.
- 8) Carry out the DATA ALL CLEAR in the operator check mode.
- 9) Forcibly clear the data for the total payload and overall number of cycles.

With this operation, all the unwanted data inside the payload meter are cleared. Apart from the calibration data, all the data recorded in Steps 1) to 6) (these data are all inaccurate data) are also erased.

If this operation is carried out in the wrong order, the cycle data (beginning only) will be defective.

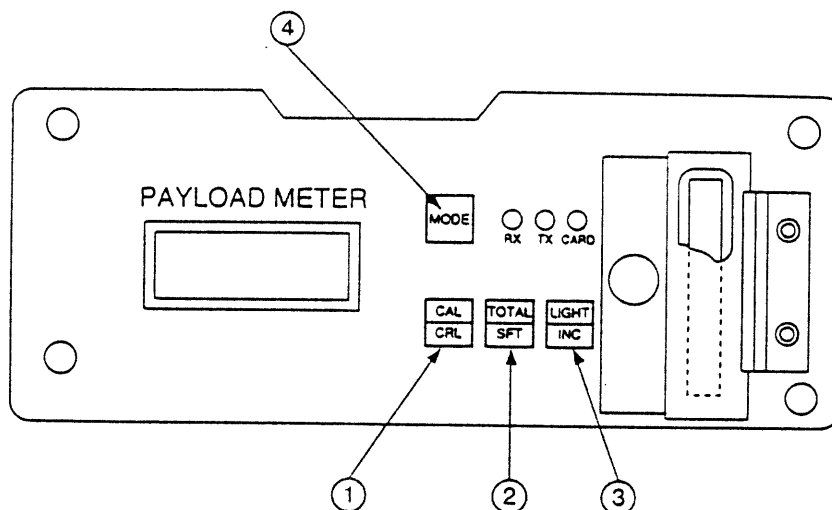
- 10) Following this, the payload meter will function normally.
  - Replace the battery within 48 hours.
  - The life of the battery is approx. 2 years.

## 11. OPERATION IF F-ERR IS DISPLAYED AS AN ERROR CODE OR THE CONTROLLER IS REPLACED

If F-ERR is displayed, mistaken data have probably been written to the memory inside the payload meter. When the controller is replaced, there may be old data remaining in the new controller, or the machine condition recognized by the controller may be different from the actual condition. To remove these data, carry out the following operation.

- 1) Turn the ACC ON.
- 2) Forcibly carry out initialization.  
(For details of the procedure, see "Carrying out forced initialization".)
- 3) Turn the starting switch to the ON position. ( F-ERR may flash.)
- 4) Using the operator check mode, set speed limit, option code, time and date.
- 5) Without turning the starting switch to the OFF position, start the engine. ( F-ERR may flash)
- 6) Carry out calibration.
- 7) Load to near the rated payload, then dump the load.
- 8) Move the machine to a safe place, wait for at least 5 seconds after dumping the load in Step 7), then stop the engine.
- 9) Turn the starting switch to the ON position again.  
When doing this, do not start the engine.
- 10) Carry out the DATA ALL CLEAR in the operator check mode.
- 11) Forcibly clear the data for the total payload and overall number of cycles.  
With this operation, all the unwanted data inside the payload meter are cleared. Apart from the calibration data, all the data recorded in Steps 3) to 8) (these data are all inaccurate data) are also erased.
- 12) Following this, the payload meter will function normally.



## Carrying out forced initialization




Check the date and time before starting.  
 Always make sure that the machine is empty when carrying out this procedure.  
 This procedure is possible only when the power is ON.

### WARNING

If this function is carried out, all the data in the payload meter will be erased, so never carry out this operation unless necessary.



1. In the normal display condition, press  and  switches ③ and ④ at the same time for at least 2 seconds.

Display 




2. When  is displayed, press    switches ①, ②, and ③ at the same time for at least 2 seconds.

Display 

3. Press  switch ① for at least 2 seconds.

Display  lights up for 2 seconds, and when all the data are cleared, the display changes automatically to  (end)

After this, carry out the procedure from 10.3.

If it is desired to stop the forced initialization when  is displayed, press  switch ④ and the display will change to  without carrying out the forced initialization.



**PAYLOAD METER II (PLM II)**

---

Form No. SEAT000904