WHT0103-101

SML-10

Maintenance Manual

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Maintenance No.1 Setting of A/D channel

Function

In A/D input signals, the A/D channel enables to exchange of ch0 with ch1 and ch2 with ch3.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.= 1 with ##.
4) Press ENTER.
5) LCD1

01: ADch
Press &.

LCD2 Channel condition
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.
7) LCD1

Select content with ##, and press &.
****

LCD2 Blinks

8) Press ## and select the channel condition.
The channel condition changes as follows.

→ 0123 ◄► 0132 ◄► 1023 ◄► 1032 ◄

Channel condition	A/D channel			
	Boom tention	Jib tention	Boom angle	Jib angle
0123	ch0	ch1	ch2	ch3
0132	ch0	ch1	ch3	ch2
1023	ch1	ch0	ch2	ch3
1032	ch1	ch0	ch3	ch2

When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD2 display goes out.

9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD2 shows the channel condition selected.
12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

0123

Setable value

0123 / 0132 / 1023 / 1032

Maintenance No.2 Setting of D/I polarity

Function

It can be corresponded at will for the difference of D/I input signals according to the difference contact polarity for the limit switches of boom upper limit, jib upper limit, and anti-two block limit.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.= 2 with ##.
4) Press ENTER.
5) LCD1

02: DI angle LS
& : next ## : other

LCD2 Polarity for the limit switches of boom upper limit, jib upper limit
LCD3 Polarity for the limit switch of anti-two block limit
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.
02: DI angle LS Setting of the polarity for the limit switches of boom upper limit, jib upper limit
↕
02: DI 2BLK LS Setting of the polarity for the limit switches of anti-two block limit

7) Press ENTER.
8) LCD1

Select content with ##, and press &.
*

LCD2 Blinks (When "02: DI angle LS" selected)
LCD3 Blinks (When "02: DI 2BLK LS" selected)

9) Press ## and select the polarity for the limit switches.
0 : When the limit switch does not function → GND
1 : When the limit switch does not function → OPEN

<<Caution>>
The point above does not show the limit switch itself.

When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
The blinking on the corresponding LCD display goes out.

10) Press ENTER.
11) Return to the step 5).
12) Make sure that the indication on the corresponding LCD shows the polarity selected.
13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

0 : When the limit switch does not function → GND

Setable value

0 / 1

Maintenance No.3 Setting of load ratio

Function

This enables to change the load ratio (forecast / alarm / limit).

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1 `Select content with ##, and press &.`
   `Mainte No.= 0`

   LCD2 to LCD5 Blank
3) Set the Mainte No.= 3 with ##.
4) Press ENTER.

5) LCD1 `03: forecast`
   `& : next ## : other`

   LCD2 Load ratio (forecast) [%]
   LCD3 Load ratio (alarm) [%]
   LCD4 Load ratio (limit) [%]
   LCD5 Blank

   (When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.

   03: forecast Setting of load ratio (forecast)
   ↕
   03: alarm Setting of load ratio (alarm)
   ↕
   03: limit Setting of load ratio (limit)

7) Press ENTER.

8) LCD1 `Select content with ##, and press &.`
   `****[%]`

   LCD2 Blinks (When "03: forecast" selected)
   LCD3 Blinks (When "03: alarm" selected)
   LCD4 Blinks (When "03: limit" selected)

9) Press ## and select the load ratio.

   When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
   The blinking on the corresponding LCD display goes out.

10) Press ENTER.
11) Return to the step 5).
12) Make sure that the indication on the corresponding LCD shows the load ratio selected.

13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

forecast : 90% alarm : 100% limit : 120%

Setable value

70% ≦ forecast ≦ 90% 90% ≦ alarm ≦ 110% 120% ≦ limit ≦ 1000%

Explanation

forecast : Yellow rotating lamp (D/O ch11) is output.
alarm : Overload limit (D/O ch00,15) and red rotating lamp (D/O ch10) are output.
limit : LCD1 (load ratio) ⟶ "- - - "
: LCD2 (rated load) and LCD3 (actual load) ⟶ Blank

Maintenance No.4 Setting of average cycles (Indication of load / angle)

Function

This enables to change the average cycles (Indication of load / angle).

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.= 4 with ##.
4) Press ENTER.
5) LCD1

04: average
Press &.

LCD2 Average cycles (Indication of load / angle)
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.
7) LCD1

Select content with ##, and press &.
***

LCD2 Blinks

8) Press ## and select the average cycles.
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD2 display goes out.

9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD2 shows the average cycles selected.
12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

3

Setable value

1 ≦ Average cycles ≦ 100

Maintenance No.5 Setting of delay coefficient (Indication of engine speed)

Function

This enables to change the delay coefficient (Indication of engine speed).

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1 | Select content with ##, and press &.
Mainte No.= 0 |

   LCD2 to LCD5 Blank
3) Set the Mainte No.= 5 with ##.
4) Press ENTER.

5) LCD1 | 05: ENG delay
Press &. |

   LCD2 Delay coefficient (Indication of engine speed)
   LCD3 to LCD5 Blank
   (When RETURN is pressed, go to the step 2).)

6) Press ENTER.

7) LCD1 | Select content with ##, and press &.
*.*** |

   LCD2 Blinks

8) Press ## and select the delay coefficient.
   When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
   The blinking on LCD2 display goes out.

9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD2 shows the delay coefficient selected.

12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

1.000

Setable value

0.000 < delay coefficient ≦ 1.000

Explanation

Indication of engine speed = Engine speed caluculated this time X Delay coefficient
+ Engine speed caluculated last time X (1.000 - Delay coefficient)

The response of indication of engine speed is slow as delay coefficient is near to 0.000 and is fast as near to 1.000.

Maintenance No.6 Setting of coefficient (Actual load calculated by moment calculation)

Function

This enables to change the coefficient (Actual load calculated by moment calculation).

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.= 6 with ##.
4) Press ENTER.

5) LCD1

06: LOAD DISP
Press &.

LCD2 Coefficient (Actual load calculated by moment calculation)
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.

7) LCD1

Select content with ##, and press &.
*.***

LCD2 Blinks

8) Press ## and select the coefficient.
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD2 display goes out.

9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD2 shows the coefficient selected.

12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

1.050

Setable value

0.000 ≦ coefficient ≦ 9.999

Explanation

Actual load for line pull limit
= Lifting load (incloud hook weight) X Coefficient
Actual load for calculation of load ratio
= (Lifting load (incloud hook weight) + Inside hook weight) X Coefficient
Indication of actual load
= The average value [Maintenance No.4 Average cycles] of actual load for calculation of load ratio

Maintenance No.7 Setting of voice alarm output

Function

This enables to change the voice alarm output standard time, Tref (seconds).
This enables to change the voice alarm output interval time, Tintvl (seconds).
This enables to change the setting of the voice alarm release possible / impossible with LMI voice alarm switch.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.= 7 with ##.
4) Press ENTER.

5) LCD1

7: Tref
&: next ##: other

LCD2 The voice alarm output standard time
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.

7: Tref Setting of the voice alarm output standard time
↕
7: Tintvl Setting of the voice alarm output interval time
↕
7: Release SW Setting of the voice alarm release possible / impossible

7) Press ENTER.

When selecting setting of the voice alarm output standard time → To 8-1)
When selecting setting of the voice alarm output interval time → To 8-2)
When selecting setting of the voice alarm release possible / impossible → To 8-3)

Setting of the voice alarm output standard time

8-1) LCD1

Select content with ##, and press &.
**

LCD2 Blinks

9-1) Press ## and select standard time.
When stopping the setting, press RETURN before making the step 10-1). (Go to the step 5).)
The blinking on LCD2 display goes out.

10-1) Press ENTER.
11-1) Return to the step 5).
12-1) Make sure that the indication on LCD2 shows standard time selected.

13-1) Press RETURN.
14-1) Return to the step 2).
15-1) Place the maintenance key switch in "OFF" position.

Initial value

5 seconds

Setable value

0 second ≦ standard time ≦ 99 seconds

Maintenance No.7 Setting of voice alarm output

Setting of the voice alarm output interval time

8-2) LCD1

```
1: Overload
& : next  ## : other
```

LCD2 The voice alarm output interval time
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 5).)

9-2) Press ## and select the setting item.

LCD1 display	Voice alarm	**Initial value** (seconds)
1: Overload	Overload Limit	0
2: forecast	Approaching Limit	0
3: Boom Upper	Boomhoist Limit	0
4: Jib Upper	Jibhoist Limit	0
5: Boom Lower	Boom Lower Limit	0
6: Jib Lower	Jib Lower Limit	0
7: 2BLK	Two-block Limit	0
8: Free mode	Free mode activated	0
9: Free fall	Freefall	0
10: Height limit	Height Limit Set	0
11: Radius limit	Radius Limit Set	0
12: LF protect	Luffing attachment protection activated	0
13: Boom protect	Boom protection activated	0
14: Pilot	Hydraulic control pressure reduced	0
15: Override	Override	0
16: Rigging mode	Rigging Mode	#

10-2) Press ENTER.

11-2) LCD1

```
Select content with ##, and press &.
**
```

LCD2 Blinks

12-2) Press ## and select interval time.
When stopping the setting, press RETURN before making the step 13-2). (Go to the step 8-2).)
The blinking on LCD2 display goes out.

13-2) Press ENTER.
14-2) Return to the step 8-2).
15-2) Make sure that the indication on LCD2 shows interval time selected.

16-2) Press RETURN.
17-2) Return to the step 5).
18-2) Press RETURN.
19-2) Return to the step 2).
20-2) Place the maintenance key switch in "OFF" position.

Setable value
0 second ≦ interval time ≦ 99 seconds

Maintenance No.7 Setting of voice alarm output

Setting of the voice alarm release possible / impossible

8-3) LCD1

```
1: Overload
& : next  ## : other
```

LCD2 The voice alarm release possible / impossible
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 5).)

9-3) Press ## and select the setting item.

LCD1 display	Voice alarm	Initial value	
1: Overload	Overload Limit	0 (Release possible)	※
2: forecast	Approaching Limit	0 (Release possible)	
3: Boom Upper	Boomhoist Limit	0 (Release possible)	※
4: Jib Upper	Jibhoist Limit	0 (Release possible)	
5: Boom Lower	Boom Lower Limit	0 (Release possible)	※
6: Jib Lower	Jib Lower Limit	0 (Release possible)	
7: 2BLK	Two-block Limit	0 (Release possible)	※
8: Free mode	Free mode activated	1 (Release impossible)	
9: Free fall	Freefall	1 (Release impossible)	
10: Height limit	Height Limit Set	0 (Release possible)	
11: Radius limit	Radius Limit Set	0 (Release possible)	
12: LF protect	Luffing attachment protection activated	1 (Release impossible)	
13: Boom protect	Boom protection activated	0 (Release possible)	
14: Pilot	Hydraulic control pressure reduced	0 (Release possible)	
15: Override	Override	1 (Release impossible)	
16: Rigging mode	Rigging Mode	1 (Release impossible)	

10-3) Press ENTER.

11-3) LCD1

```
Select content with ##, and press &.
*
```

LCD2 Blinks

12-3) Press ## and select release possible / impossible.
When stopping the setting, press RETURN before making the step 13-3). (Go to the step 8-3).)
The blinking on LCD2 display goes out.

13-3) Press ENTER.
14-3) Return to the step 8-2).
15-3) Make sure that the indication on LCD2 shows release possible / impossible selected.

16-3) Press RETURN.
17-3) Return to the step 5).
18-3) Press RETURN.
19-3) Return to the step 2).
20-3) Place the maintenance key switch in "OFF" position.

<<Caution>>
- This setting is each setting value for crane / luffing etc according to the curve data selected when carrying out the maintenance.
  This enables the difference setting for crane / luffing etc.
  ex) crane : 0 (Release possible) / luffing : 1 (Release impossible)
- The voice alarm with the mark ※ can not be released, having no relation with this setting at "LMI override mode".

Setable value

0 (Release possible)
When placing override master key switch in "ENABLE" side and placing each override switch in "override", the voice alarm is sounded.
1 (Release impossible)
2 (Release possible)
Even if override master key switch placed in "ENABLE" side and each override switch in "override", the voice alarm is kept released. (Setting is possible only for 8 and 9.)

Maintenance No.8 Setting of not use curve data

Function

This is to set not to be selected the curve data which must not use according to the machine specification in the curve data memorized on ROM.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.= 8 with ##.
4) Press ENTER.
5) LCD1

08: Not use curve
Press &.

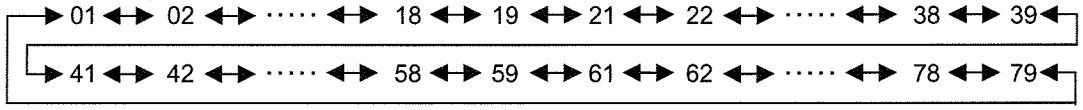
LCD2 Curve No.
LCD3 The memorized value
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.
7) LCD1

Select content with ##, and press &.
Curve No.**

LCD2 Blinks

8) Press ## and select Curve No..
Curve No. changes as follows.



When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD2 display goes out.

9) Press ENTER.
<<Caution>>
The curve No. with "E" displayed on LCD3 can not be selected as the curve data does not exist.
In this case, it does not need to set "0 (Not use)".

10) LCD1

Select content with ##, and press &.
*

LCD2 Blinking goes out
LCD3 Blinks

11) Press ## and select "0 (Not use)" / "1 (Use)".
When stopping the setting, press RETURN before making the step 12). (Go to the step 7).)
The blinking on LCD3 display goes out.

12) Press ENTER.
13) Return to the step 7).
14) Make sure that the indication on LCD3 shows value selected.
15) Press RETURN when completing the setting.
16) Return to the step 5).
17) Press RETURN.
18) Return to the step 2).
19) Place the maintenance key switch in "OFF" position.

Initial value

1 (Use)

Setable value

0 (Not use) / 1 (Use)

Maintenance No.9 Setting of initial value

Function

This is to write the initial value for every adjusting data and controlling data in SRAM (Backup area).

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.= 9 with ##.
4) Press ENTER.
5) LCD1
```
1: All
& : next ## : other
```
LCD2 to LCD3 - - - -
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)
6) Press ## and select initializing item. (Refer to next page.)
7) Press ENTER.
8) LCD1
```
Set content with ##, and press &.
INIT(**) 0
```
LCD2 to LCD3 - - - -
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)
9) Press ## and set 1919.
10) Press ENTER.
LCD2 to LCD3 - - - - → HHHH → - - - -
11) Return to the step 5).
12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Maintenance No.9 Setting of initial value

Initializing item

1 : All	INIT(01)	All initial It initializes all value (except hour meter and LMI power ON time).
2 : Boom tension	INIT(02)	Boom tension correction value initial (Maintenance No.11,21,31) It initializes boom tension correction value (ZERO/GAIN/DRIFT).
3 : Boom angle	INIT(03)	Boom angle correction value initial (Maintenance No.10,20,30) It initializes boom angle correction value (ZERO/GAIN/DRIFT).
4 : Jib tension	INIT(04)	Jib tension correction value initial (Maintenance No.13,23,33) It initializes jib tension correction value (ZERO/GAIN/DRIFT).
5 : Jib angle	INIT(05)	Jib angle correction value initial (Maintenance No.12,22,32) It initializes jib angle correction value (ZERO/GAIN/DRIFT).
6 : Pump	INIT(06)	Pump control data initial (Maintenance No.48,80,82,83) It initializes pump control data.
7 : Winch motor	INIT(07)	Winch motor control data initial (Maintenance No.84,85) It initializes winch motor control data.
9 : Grip	INIT(08)	Grip / Throttle volume control data initial (Maintenance No.14,24,34) It initializes grip / throttle volumu control data.
10 : Foot pedal	INIT(09)	Foot pedal throttle control data initial (Maintenance No.14,24,34) It initializes foot pedal throttle control data.
11 : Throttle	INIT(10)	Throttle motor control data initial (Maintenance No.17,27,37,41) It initializes throttle motor control data.
14 : Rack sensor	INIT(11)	Rack sensor data initial (Maintenance No.16,26) It initializes rack sensor data.
15 : LF protect	INIT(12)	Luffing protection device data initial (Maintenance No.46) It initializes luffing protection device data.
16 : SRAM check	INIT(13)	SRAM check data initial It initializes SRAM check data (judging SRAM abnormal [F-80]).
17 : LF Jib	INIT(14)	Jib angle for rigging mode correction value initial (Maintenance No.29) It initializes jib angle for rigging mode correction value (ZERO/GAIN/DRIFT).
18 : Rigging mode	INIT(15)	Rigging mode data initial (Maintenance No.49,58) It initializes rigging mode data.
20 : Voice release	INIT(16)	Voice alarm release select data initial (Maintenance No.7) It initializes voice alarm release select data.
21 : Voice spacing	INIT(17)	Voice alarm output interval data initial (Maintenance No.7) It initializes voice alarm output interval data.
22 : Self weight	INIT(18)	Self-weight correction value initial (Setting mode) It initializes all self-weight correction value.
23 : Hour meter	INIT(19)	Hour meter initial (Maintenance No.54) It initializes hour meter.
24 : Power ON	INIT(20)	LMI power ON time initial (Maintenance No.54) It initializes LMI power ON time.
25 : ECU	INIT(21)	ECU / ECM control data initial (Maintenance No.42) It initializes ECU / ECM control data.
26 : Radio	INIT(22)	Radio load cell correction value initial (Maintenance No.35,36,43,44,45) It initializes radio load cell correction value.

Maintenance No.10 Setting of boom angle zero point correction value (Bench)

Function
This is to memory A/D conversion value at 0V output of boom angle sensor as zero point correction value.

Preparation
It prepares so that 0V can be input to boom angle signal line.

Setting procedures ##: △▽ &: ↵
1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=10 with ##.
4) Press ENTER.

5) LCD1
```
10: B. Ang ZERO
Press &.
```
LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 A/D conversion value
(When RETURN is pressed, go to the step 2).)
<<Caution>>
Drift correction value differs from the curve data to the curve data.
- "Crane" and "Auxiliary sheaves without jib" is same value.
- "Luffing" and "Auxiliary sheaves with jib"and "Midfall" is same value.

6) Press ENTER.

7) LCD1
```
Input 0[V] to signal line and press &.
```
LCD2 Blinks
When stopping the setting, press RETURN before making the step 8). (Go to the step 5).)
The blinking on LCD2 display goes out.

8) Press ENTER.
9) Return to the step 5).
10) Make sure that the indication on LCD2 is same as LCD5.

11) Press RETURN.
12) Return to the step 2).
13) Place the maintenance key switch in "OFF" position.

Initial value
3167

Setable value
2800 ≦ Zero point correction value ≦ 3800

Maintenance No.11 Setting of boom tension zero point correction value (Bench)

Function

This is to memory A/D conversion value at 0V output of load cell for boom hoist rope tension detection as zero point correction value.

Preparation

(1) It prepares so that 0V can be input to load cell signal line for boom hoist rope tension detection.
◀— When adjusting ZERO/GAIN with the calibrator.
(2) It prepares so that the load cell for boom hoist rope tension detection is in no load with loosening the boom hoist wire rope.
◀— When adjusting with the load cell installed on the machine.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.=11 with ##.
4) Press ENTER.
5) LCD1

11: B. Te ZERO
Press &.

LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 A/D conversion value
(When RETURN is pressed, go to the step 2).)
6) Press ENTER.
7) LCD1

Input 0[V] to signal line and press &.

LCD2 Blinks
When stopping the setting, press RETURN before making the step 8). (Go to the step 5).)
The blinking on LCD2 display goes out.
8) Press ENTER.
9) Return to the step 5).
10) Make sure that the indication on LCD2 is same as LCD5.
11) Press RETURN.
12) Return to the step 2).
13) Place the maintenance key switch in "OFF" position.

Initial value

500

Setable value

0 ≦ Zero point correction value ≦ 1000

Maintenance No.12 Setting of jib angle zero point correction value (Bench)

Function
This is to memory A/D conversion value at 0V output of jib angle sensor as zero point correction value.

Preparation
It prepares so that 0V can be input to jib angle signal line.

Setting procedures ## : △▽ & : ↵
1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=12 with ##.
4) Press ENTER.
5) LCD1
```
12: J. Ang ZERO
Press &.
```
LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 A/D conversion value
(When RETURN is pressed, go to the step 2).)
6) Press ENTER.
7) LCD1
```
Input 0[V] to signal line and press &.
```
LCD2 Blinks
When stopping the setting, press RETURN before making the step 8). (Go to the step 5).)
The blinking on LCD2 display goes out.
8) Press ENTER.
9) Return to the step 5).
10) Make sure that the indication on LCD2 is same as LCD5.
11) Press RETURN.
12) Return to the step 2).
13) Place the maintenance key switch in "OFF" position.

Initial value
3167

Setable value
2800 ≦ Zero point correction value ≦ 3800

Maintenance No.13 Setting of jib tension zero point correction value (Bench)

Function

This is to memory A/D conversion value at 0V output of load cell for jib hoist rope tension detection as zero point correction value.

Preparation

(1) It prepares so that 0V can be input to load cell signal line for jib hoist rope tension detection.
◀— When adjusting ZERO/GAIN with the calibrator.
(2) It prepares so that the load cell for jib hoist rope tension detector is in no load with loosening the jib hoist wire rope.
◀— When adjusting with the load cell installed on the machine.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.=13 with ##.
4) Press ENTER.
5) LCD1

13: J. Te ZERO
Press &.

LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 A/D conversion value
(When RETURN is pressed, go to the step 2).)
6) Press ENTER.
7) LCD1

Input 0[V] to signal line and press &.

LCD2 Blinks
When stopping the setting, press RETURN before making the step 8). (Go to the step 5).)
The blinking on LCD2 display goes out.
8) Press ENTER.
9) Return to the step 5).
10) Make sure that the indication on LCD2 is same as LCD5.
11) Press RETURN.
12) Return to the step 2).
13) Place the maintenance key switch in "OFF" position.

Initial value

500

Setable value

0 ≦ Zero point correction value ≦ 1000

Maintenance No.14 Adjustment of grip / throttle volume / foot pedal (Actual machine)

Function

(1-1) This is to memory A/D conversion value of each output voltage in MIN and MAX position of the potentiometer built in the grip as adjusting value.
(1-2) This is to memory A/D conversion value of each output voltage in MIN(at idle) and MAX(at full) position of the potentiometer for the throttle volume position detection as adjusting value.
(2) This is to memory A/D conversion value of each output voltage in MIN(at idle) and MAX(at full) position of the potentiometer for the foot pedal position detection as adjusting value.

Confirmation items

(1-1) Make sure that the potentiometer signal built in the grip is normally input to LMI.
(1-2) Make sure that the potentiometer signal for the throttle volume position detection is normally input to LMI.
(2) Make sure that the potentiometer signal for the foot pedal position detection is normally input to LMI.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.=14 with ##.
4) Press ENTER.

5) LCD1

14: grip	MIN
& : next	## : other

LCD2 MIN position adjustment value
LCD3 MAX position adjustment value
LCD4 Blank
LCD5 A/D conversion value
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.

14: grip	MIN	Adjustment of grip / throttle volume MIN position
14: grip	MAX	Adjustment of grip / throttle volume MAX position
14: foot	MIN	Adjustment of foot pedal MIN position
14: foot	MAX	Adjustment of foot pedal MAX position

7) Press ENTER.

8) LCD1

14: @@@@ @@@
& / RETURN

LCD2 Blinks (When "14: grip MIN" or "14: foot MIN" selected)
LCD3 Blinks (When "14: grip MAX" or "14: foot MAX" selected)
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on the corresponding LCD display goes out.

9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on the corresponding LCD is same as LCD5.

12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Maintenance No.14　Adjustment of grip / throttle volume / foot pedal (Actual machine)

				Initial value	Setable value
grip	Tier2	LS-308HII LS-308H5 LS-348H5	Min	1440 [3.600V]	650 ≦ ≦ 2340 [1.625V] [5.850V]
			Max	2880 [7.200v]	1610 ≦ ≦ 4340 [4.025V] [10.850V]
	Tier3	LS-348H5			
throttle volume	Tier3	LS-238H5 LS-248H5 LS-108H5	Min	1650 [4.125V]	400 ≦ ≦ 3000 [1.000V] [7.500V]
			Max	3150 [7.875V]	1600 ≦ ≦ 4400 [4.000V] [11.000V]
foot pedal	Tier2 Tier3	LS-348H5	Min	1600 [4.000V]	400 ≦ ≦ 2400 [1.000V] [6.000V]
			Max	**3752** **[9.380V]**	**2400 ≦** ≦ 4400 **[6.000V]** [11.000V]
	Tier3	LS-238H5 LS-248H5 LS-108H5	Min	1600 [4.000V]	400 ≦ ≦ 2400 [1.000V] [6.000V]
			Max	**3200** **[8.000V]**	**2000 ≦** ≦ 4400 **[5.000V]** [11.000V]

Maintenance No.16 Adjustment of rack sensor (Actual machine)

Function

1.Zero point correction value

This is to memory the rack sensor output voltage with the engine shutdown as rack sensor zero point correction value.

Usage

Zero point correction value is used to judge the status which the engine speed is 0 rpm though the engine runs.

Error condition of E-43 (Engine speed wire broken)

" Rack sensor output voltage < Zero point correction value - 0.05V " and " Engine speed = 0 rpm "

2.Full rack characteristic auto-reading

It reads the characteristic values of rack sensor automatically.

Confirmation items

1.Zero point correction value

(1) Make sure that the rack sensor signal is normally input to LMI.
(2) Make sure that the engine is shutdown (Engine speed = 0 rpm) and only the power is "ON".

2.Full rack characteristic auto-reading

(1) Make sure that the rack sensor signal is normally input to LMI.
(2) Make sure that the engine speed detection signal is normallty input to LMI.
(3) Make sure that the power shift control pressure varies normally by varying of the power shift control voltage.
(4) Make sure that the engine speed normally changes according to outputting the engine throttle to the ECU.
(5) Make sure that it is set so that the upper does not swing even if operating the swing control lever as the method to give a full load to the engine.
(6) Make sure that it is set so that the machine does not travel even if operating the travel control lever as the method to give a full load to the engine.
(7) Make sure that the travel control pressure switch signal is normally input to LMI.

Setting procedures ##: ΔV &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

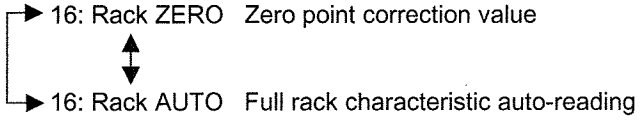
LCD2 to LCD5 Blank
3) Set the Mainte No.=16 with ##.
4) Press ENTER.

5) LCD1

16: Rack ZERO
& : next ## : other

LCD2 Zero point correction value [**.**V]
LCD3 to LCD4 Blank
LCD5 Rack sensor output voltage [**.**V]
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.



7) Press ENTER.

When selecting zero point correction value → To 8-1)
When selecting full rack characteristic auto-reading → To 8-2)

Maintenance No.16 Adjustment of rack sensor (Actual machine)

Zero point correction value

8-1) LCD1 Adjust zero point and press & .

LCD2 Zero point correction value [**.**V] Blinks
LCD3 to LCD4 Blank
LCD5 Rack sensor output voltage [**.**V]

When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on the corresponding LCD2 display goes out.

<<Caution>>
At abnormality, "HHHH" is displayed on LCD2 to LCD5.
(1) Make sure that the rack sensor signal is normally input to LMI.
(2) Make sure that the engine is shutdown (Engine speed = 0 rpm) and only the power is "ON".

Reference
" Rack sensor output voltage < 1.50V " or " Engine speed ≠ 0 rpm "

9-1) Press ENTER.
10-1) Return to the step 5).
11-1) Make sure that the indication on the LCD2 is same as LCD5.

When re-setting → To the step 6)
When finishing → To the step 12-1)

12-1) Press RETURN.
13-1) Return to the step 2).
14-1) Place the maintenance key switch in "OFF" position.

Initial value
LS-308HII, LS-308H5 : 3.85V [1925]

Setable value
1.50V [750] ≦ Zero point correction value ≦ 5.00V [2500]

Maintenance No.16 Adjustment of rack sensor (Actual machine)

Full rack characteristic auto-reading

8-2) Place the gate lock lever in "Operation" position.

9-2) LCD1 Set lever in neutral and press & .

LCD2	Engine speed	[****rpm]
LCD3	Rack sensor output voltage	[**.**V]
LCD4	Blank	
LCD5	4-EE	

<<Caution>>

At abnormality, "HELP" is displayed on LCD2 or LCD3.

A. Comfirm the followings when "HELP" is displayed on LCD2.

(1) Make sure that the engine runs.

(2) Make sure that the engine speed detection signal is normallty input to LMI when "HELP" is displayed through the engine runs.

Reference

Displaying condition of "HELP" on LCD2.

" Engine speed ≦ 20 rpm " or " Engine speed ≧ 2500 rpm "

B. Comfirm the followings when "HELP" is displayed on LCD3.

(1) Make sure that the rack sensor signal is normally input to LMI.

Reference

Displaying condition of "HELP" on LCD3.

In the machine with rack sensor,

" Rack sensor output voltage ≦ 0.25V " or " Rack sensor output voltage ≧ 5.00V "

10-2) Place the travel control lever in "Neutral" position.

11-2) Press ENTER and start the auto-reading.

12-2) LCD1 Calculating now.

LCD2	Engine speed	[****rpm]
LCD3	Rack sensor output voltage	[**.**V]
LCD4	Power shift control pressure	[**.**kgf/cm^2]
LCD5	4	

When stopping the adjustment after pressing ENTER at step 11-2), operate the followings.

This operation is effective for the step before placing the travel control lever in "Forward" or "Backward" position at step 15-2).

(1) Press RETURN.

(2) Place the travel control lever in "Forward" or "Backward" position.

<<Caution>>

Confirm the followings if "4" is not indicated with being left "4-EE" on LCD5 indicating even if ENTER is pressed with placing the travel control lever in "Neutral" position.

(1) Make sure that the ENTER is normally recognized.

(2) Make sure that the travel control pressure switch signal is normally input to LMI.

13-2) Automatically, the engine speed rises to full and the P1&P2 pump displacement becomes maximum.

<<Caution>>

At abnormality, "5-EE" is displayed on LCD5.

(1) Make sure that the engine speed normally changes according to outputting the engine throttle to the ECU.

Reference

Displaying condition of "5-EE" on LCD5.

" Engine speed ≦ Engine rated speed + 50 rpm "

	LS-308HII, LS-308H5
Engine rated speed	1950 rpm

Maintenance No.16 Adjustment of rack sensor (Actual machine)

14-2) LCD1 Calculating now.

LCD2 Engine speed [****rpm]
LCD3 Rack sensor output voltage [**.**V]
LCD4 Power shift control pressure [**.**kgf/cm^2] = 40.0kgf/cm^2
LCD5 5

15-2) After "5" is displayed on LCD5, slowly operate the swing control lever and place the travel control lever "Forward" or "Backward" position.

<<Caution>>
(1) As the load amount is short with only the travel control lever operation ("Forward" or "Backward"), "6-EE" may be displayed on LCD5.
(2) If operating the lever suddenly, the load will increase suddenly and the engine speed decreases suddenly. Therefore, "5-EE" or "6-EE" may be displayed on LCD5.

16-2) LCD1 Calculating now.

LCD2 Engine speed [****rpm]
LCD3 Rack sensor output voltage [**.**V]
LCD4 Power shift control pressure [**.**kgf/cm^2] = 40.0kgf/cm^2 → Decrease
LCD5 6

17-2) The followings are gained by status of " Engine speed (LCD2) ", " Rack sensor output voltage (LCD3) ", and " Power shift control pressure (LCD4) ".

1. Engine speed ≧ Engine rated speed + Engine rated speed judgement speed < 1950 rpm >

A. Power shift control pressure < Max. power shift control pressure < 0.0kgf/cm^2 >

a. Rack sensor output voltage > Loading upper judgement value < 2.39V >
→ To the step 24-2) **[Abnormal end]**

b. Rack sensor output voltage ≦ Loading upper judgement value < 2.39V >
→ To the step 18-2) **[Normal end No.1]**

B. Power shift control pressure ≧ Max. power shift control pressure < 0.0kgf/cm^2 >
→ To the step 16-2) **[Continuation of calculating]**

2. Engine speed < Engine rated speed + Engine rated speed judgement speed < 1950 rpm >

A. Rack sensor output voltage > Rated point abnormal judgement value < 1.88V >
→ To the step 24-2) **[Abnormal end]**

B. Rack sensor output voltage ≦ Rated point abnormal judgement value < 1.88V >
→ To the step 18-2) **[Normal end No.2]**

	LS-308HII, LS-308H5
Engine rated speed	1950 rpm
Engine rated speed judgement speed	0 rpm
Max. power shift control pressure	0.0kgf/cm^2
Loading upper judgement value	2.39V [1195]
Rated point abnormal judgement value	1.88V [940]

Maintenance No.16 Adjustment of rack sensor (Actual machine)

[Normal end]

18-2) LCD1 Adjustment finished. Set lever in neutral.

LCD2 Engine speed when reading full rack characteristic [****rpm]
LCD3 Rack sensor output voltage at full load and engine full [**.**V]
LCD4 Max. power shift control pressure [**.**kgf/cm^2]
LCD5 7

<<Caution>>
In the case of **[Normal end No.1]**
The characteristic values of rack sensor are not rewritten.
These are values before being adjusted.

In the case of **[Normal end No.2]**
The following characteristic values of rack sensor are rewritten.
(Refer to "Maintenance No.26 Setting of rack sensor control data (Manual)".
1. Engine speed when reading full rack characteristic ← LCD2
2. Rack sensor output voltage at full load and engine idling
3. Rack sensor output voltage at full load and engine full ← LCD3
4. Desired rack sensor output voltage in engine low speed range
5. Desired rack sensor output voltage when engine speed detected is abnormal (Rack control[A])

19-2) Place the travel control lever and the swing control lever in "Neutral" position.
20-2) Return to the step 5).
21-2) Press RETURN.
22-2) Return to the step 2).
23-2) Place the maintenance key switch in "OFF" position.

[Abnormal end]

24-2) LCD1 Adjustment failed. Press RETURN.

LCD2 Engine speed [****rpm]
LCD3 Rack sensor output voltage [**.**V]
LCD4 Power shift control pressure [**.**kgf/cm^2]
LCD5 6-EE

25-2) Place the travel control lever and the swing control lever in "Neutral" position.

26-2) Press RETURN.
27-2) Confirm the followings, and readjust.

<<Caution>>
Confirm the followings when "6-EE" is displayed on LCD5.
(1) Make sure that the gate lock lever is placed in "Operation" position.
(2) Make sure that the swing control lever is operated and the travel control lever is placed in "Forward" or "Backward" slowly. (Refer to the step 15-2).)
(3) Make sure that "Maintenance No.52 Setting of Pz-DA curve - Adjustment of power shift control voltage (Actual machine)" is correctly set.
(4) Make sure that the power shift control pressure varies normally by varying of the power shift control voltage.

Initial value

	LS-308HII, LS-308H5
Engine speed when reading full rack characteristic	2000 rpm
Rack sensor output voltage at full load and engine idling	1.86V [930]
Rack sensor output voltage at full load and engine full	1.71V [855]
Desired rack sensor output voltage in engine low speed range	2.33V [1165]
Desired rack sensor output voltage when engine speed detected is abnormal (Rack control[A])	2.33V [1165]

Setable value

No limitation

Maintenance No.17 Throttle motor auto-adjustment (Actual machine)

Function

This is to memory A/D conversion value of each output voltage in the throttle motor position which the engine speed is in idle and full as adjusting value.

Confirmation items

(1) Make sure that the throttle motor link mechanism is correctly adjusted.
(2) Make sure that the throttle motor is normally controlled by the throttle motor control signal (UP/DOWN).
(3) Make sure that the throttle motor position signal is normally input to LMI.
(4) Make sure that the engine speed detection signal is normallty input to LMI.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.=17 with ##.
4) Press ENTER.

5) LCD1

17: Throttle AUTO
&: start

LCD2 Idle position adjustment value
LCD3 Full position adjustment value
LCD4 Engine speed [****rpm]
LCD5 A/D conversion value
(When RETURN is pressed, go to the step 2).)

The throttle motor is in stop status. (It is impossible to operate the throttle motor with operating the grip.)

6) Press ENTER and start the auto-adjustment.

When the auto adjustment does not start, refer to **[Signal abnormal]**.
When stopping the adjustment, press RETURN.

7) LCD1

Calculating now.

LCD2 HHHH
LCD3 HHHH
LCD4 Engine speed [****rpm]
LCD5 A/D conversion value

8) The throttle motor goes "UP" automatically and the engine speed rises every 3 seconds.
Throttle UP condition
" Engine speed this time > Engine speed last time " or " Engine speed this time < 1800 rpm "

9) The throttle motor goes "DOWN" automatically and the engine speed lowers every 3 seconds.
Throttle DOWN condition
" Engine speed this time < Engine speed last time " or " Engine speed this time > 1000 rpm "

10) The indication on LCD5 returns to the step 5).

Make sure that " Idle position adjustment value (LCD2) " and " Full position adjustment value (LCD3) " varied.
[Normal end]

When the adjustment is not finished normally,
refer to **[Abnormal end No.1]**, **[Abnormal end No.2]** and **[Abnormal end No.3]**.

11) Press RETURN.
12) Return to the step 2).
13) Place the maintenance key switch in "OFF" position.

Maintenance No.17 Throttle motor auto-adjustment (Actual machine)

[Signal abnormal]

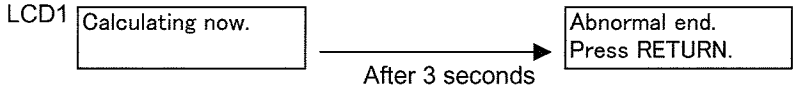
Throttle motor position signal abnormal / Engine speed detection signal abnormal

Display	LCD2 HELP
	LCD3 HELP
Condition	(1) " H-16 (Throttle motor position signal abnormal) " occurs.
	(2) " H-42 (Engine speed abnormal) " occurs.
Confirmation items	(1) Make sure that the throttle motor position signal is normally input to LMI.
	(2) Make sure that the engine speed detection signal is normallty input to LMI.

[Abnormal end No.1]

Full position setting range is over.

Display



LCD2 HELP ERR

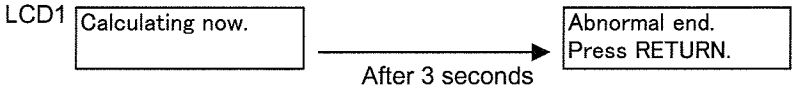
LCD3 HELP Blinks ERR

Condition	(1) When "Full position memory value" is out of setting range.
Confirmation items	(1) Make sure that the throttle motor link mechanism is correctly adjusted.
	(2) Make sure that the throttle motor is normally controlled by the throttle motor control signal (UP/DOWN).
	(3) Make sure that the throttle motor position signal is normally input to LMI.
	(4) Make sure that the engine speed detection signal is normallty input to LMI.

[Abnormal end No.2]

Idle position setting range is over.

Display



LCD2 HELP Blinks ERR

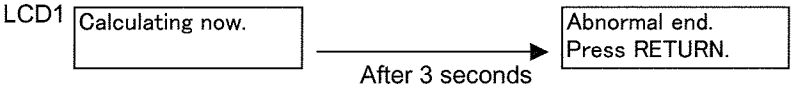
LCD3 HELP ERR

Condition	(1) When "Idle position memory value" is out of setting range.
Confirmation items	(1) Make sure that the throttle motor link mechanism is correctly adjusted.
	(2) Make sure that the throttle motor is normally controlled by the throttle motor control signal (UP/DOWN).
	(3) Make sure that the throttle motor position signal is normally input to LMI.
	(4) Make sure that the engine speed detection signal is normallty input to LMI.

[Abnormal end No.3]

Idle and full position setting range is over.

Display



LCD2 HELP Blinks ERR

LCD3 HELP Blinks ERR

Condition	(1) When both "Full position memory value" and "Idle position memory value" are out of setting range.
Confirmation items	(1) Make sure that the throttle motor link mechanism is correctly adjusted.
	(2) Make sure that the throttle motor is normally controlled by the throttle motor control signal (UP/DOWN).
	(3) Make sure that the throttle motor position signal is normally input to LMI.
	(4) Make sure that the engine speed detection signal is normallty input to LMI.

Initial value

Idle position adjustment value : 599 [1.499V]

Full position adjustment value : 4110 [10.275V]

Setable value

115 [0.288V] ≦ Idle position adjustment value ≦ 1083 [2.708V]

3626 [9.065V] ≦ Full position adjustment value ≦ 4594 [11.485V]

Maintenance No.18 Load history management data clear

Function

This clears all load history management data.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=18 with ##.
4) Press ENTER.
5) LCD1

Set content with ##, and press &.
18: Load 0

LCD2 to LCD3 - - - -
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and set 9191.
7) Press ENTER.
LCD2 to LCD3 - - - - ⟶ HHHH ⟶ - - - -
8) Return to the step 5).
9) Press RETURN.
10) Return to the step 2).
11) Place the maintenance key switch in "OFF" position.

Maintenance No.19 Error history management data clear

Function

This clears all err history management data.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=19 with ##.
4) Press ENTER.

5) LCD1

Set content with ##, and press &.
19: Error 0

LCD2 to LCD3 - - - -
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and set 7777.

7) Press ENTER.
LCD2 to LCD3 - - - - ⟶ HHHH ⟶ - - - -
8) Return to the step 5).

9) Press RETURN.
10) Return to the step 2).
11) Place the maintenance key switch in "OFF" position.

Maintenance No.20 Setting of boom angle gain correction value (Bench)

Function
This memorizes the boom angle gain correction value calculated by using the input voltage and the input angle.

Preparation
It prepares so that 1.8V or optional voltage can be input to boom angle signal line.

Setting procedures ## : △▽ & : ↵
1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=20 with ##.
4) Press ENTER.

5) LCD1
```
20: B. Ang GAIN
Press &.
```
LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 A/D conversion value
(When RETURN is pressed, go to the step 2).)
<<Caution>>
Drift correction value differs from the curve data to the curve data.
- "Crane" and "Auxiliary sheaves without jib" is same value.
- "Luffing" and "Auxiliary sheaves with jib"and "Midfall" is same value.

6) Press ENTER.

7) LCD1
```
Set content with ##, and press &.
90.0°
```
LCD3 Blinks

8) Press ## and set the angle that corresponds to the input voltage.
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD3 display goes out.

9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD3 is approx. 1.250.

12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value
1.250

Setable value
0.500 ≦ Gain correction value ≦ 3.000

Maintenance No.21 Setting of boom tension gain correction value (Bench)

Function

This memorizes the boom tension gain correction value calculated by using the input voltage and the input tension.

Preparation

Connect the calibrator to the boom tension signal line, or enable to input 18mV.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=21 with ##.
4) Press ENTER.

5) Connect the calibrator to the boom tension signal line and set at 1.5mV/V, or input 18mV.

6) LCD1

21: B. Te GAIN
Press &.

LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 A/D conversion value
(When RETURN is pressed, go to the step 2).)

7) Press ENTER.

8) LCD1

Set content with ##, and press &.
.ton

LCD3 Blinks

9) Press ## and set the tension that corresponds to the input voltage.
Tension that corresponds to the input voltage = Load cell capacity X 1.5

Load cell capacity	Tension that corresponds to the input voltage
3 ton	4.50 ton
6 ton	9.00 ton
9 ton	13.50 ton
20 ton	30.00 ton

When stopping the setting, press RETURN before making the step 10). (Go to the step 6).)
The blinking on LCD3 display goes out.

10) Press ENTER.
11) Return to the step 6).
12) Make sure that the indication on LCD3 is approx. 1.875.

13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

1.875

Setable value

0.500 ≦ Gain correction value ≦ 3.000

Maintenance No.22 Setting of jib angle gain correction value (Bench)

Function
This memorizes the jib angle gain correction value calculated by using the input voltage and the input angle.

Preparation
It prepares so that 1.8V or optional voltage can be input to jib angle signal line.

Setting procedures ##: △▽ &: ↵
1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=22 with ##.
4) Press ENTER.
5) LCD1
```
22: J. Ang GAIN
Press &.
```
LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 A/D conversion value
(When RETURN is pressed, go to the step 2).)
6) Press ENTER.
7) LCD1
```
Set content with ##, and press &.
90.0°
```
LCD3 Blinks
8) Press ## and set the angle that corresponds to the input voltage.
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD3 display goes out.
9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD3 is approx. 1.250.
12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value
1.250

Setable value
0.500 ≦ Gain correction value ≦ 3.000

Maintenance No.23 Setting of jib tension gain correction value (Bench)

Function

This memorizes the jib tension gain correction value calculated by using the input voltage and the input tension.

Preparation

Connect the calibrator to the jib tension signal line, or enable to input 18mV.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=23 with ##.
4) Press ENTER.

5) Connect the calibrator to the jib tension signal line and set at 1.5mV/V, or input 18mV.

6) LCD1

23: J. Te GAIN
Press &.

LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 A/D conversion value
(When RETURN is pressed, go to the step 2).)

7) Press ENTER.

8) LCD1

Set content with ##, and press &.
.ton

LCD3 Blinks

9) Press ## and set the tension that corresponds to the input voltage.
Tension that corresponds to the input voltage = Load cell capacity X 1.5

Load cell capacity	Tension that corresponds to the input voltage
3 ton	4.50 ton
6 ton	9.00 ton
9 ton	13.50 ton
20 ton	30.00 ton

When stopping the setting, press RETURN before making the step 10). (Go to the step 6).)
The blinking on LCD3 display goes out.

10) Press ENTER.
11) Return to the step 6).
12) Make sure that the indication on LCD3 is approx. 1.875.

13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

1.875

Setable value

0.500 ≦ Gain correction value ≦ 3.000

Maintenance No.24 Setting of grip / throttle volume / foot pedal dead band ratio

Function

(1-1) This is to set the dead band ratio at both ends of the grip movable range.
(1-2) This is to set the dead band ratio at both ends of the throttle volume movable range.
(2) This is to set the dead band ratio at both ends of the foot pedal movable range.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.=24 with ##.
4) Press ENTER.

5) LCD1

24: grip deadband
&: next ##: other

LCD2 Grip / Throttle volume dead band ratio [%]
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.
24: grip deadband Setting of grip / throttle volume dead band ratio
↕
24: foot deadband Setting of foot pedal dead band ratio

7) Press ENTER.

8) LCD1

Select content with ##, and press &.
**[%]

LCD2 Blinks

9) Press ## and select the dead band ratio.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
The blinking on LCD2 display goes out.

10) Press ENTER.
11) Return to the step 5).
12) Make sure that the indication on LCD2 shows the dead band ratio selected.

13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

grip / throttle volume / foot pedal : 5%

Setable value

grip / throttle volume / foot pedal : 0% ≦ dead band ratio ≦ 30%

Maintenance No.26 Setting of rack sensor control data (Manual)

Function

This is to set the rack sensor control data (power shift control).

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=26 with ##.
4) Press ENTER.
5) LCD1

26: Rack data **
& : next ## : other

LCD2 to LCD5 Refer to next page.
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item. (Refer to next page.)
7) Press ENTER.
8) LCD1

Select content with ##, and press &.
****

The indication on the corresponding LCD blinks.

9) Press ## and select the value.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
The blinking on the corresponding LCD display goes out.

10) Press ENTER.
11) Return to the step 5).
12) Make sure that the indication on the corresponding LCD shows a value selected.
13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Maintenance No.26 Setting of rack sensor control data (Manual)

Setting item

LCD1	LCD2	LCD3	LCD4	LCD5	Setting item	**Initial value** LS-308HII, LS-308H5
26:Rack data 1	**** rpm	**** rpm	Blank	Blank	1. Engine idling speed	750 rpm
26:Rack data 2					2. Engine rated speed	1950 rpm
26:Rack data 3	**** rpm	**** rpm	**** rpm	Blank	3. Ungleich end engine speed	1000 rpm
26:Rack data 4					4. Ungleich start engine speed	1200 rpm
26:Rack data 5					5. Engine speed when reading full rack characteristic	2000 rpm
26:Rack data 6	**** rpm	**** rpm	Blank	Blank	6. Engine speed 1 for calculating desired rack sensor output voltage	1400 rpm
26:Rack data 7					7. .Engine speed 2 for calculating desired rack sensor output voltage	850 rpm
26:Rack data 8	**.** V	**.** V	Blank	Blank	8. Rack sensor output voltage at full load and engine idling	1.86 V [930]
26:Rack data 9					9. Rack sensor output voltage at full load and engine full	1.71 V [855]
26:Rack data 10	**.** V	**.** V	Blank	Blank	10. Desired rack sensor output voltage in engine low speed range	2.33 V [1165]
26:Rack data 11					11. Desired rack sensor output voltage when engine speed detected is abnormal (Rack control[A])	2.33 V [1165]
26:Rack data 12	**.**	**.**	Blank	Blank	12. Proportional gain constant	0.100
26:Rack data 13					13. Integration constant	0.100
26:Rack data 14	****	**.** V	**.** V	Blank	14. Operating amount conversion coefficient	92
26:Rack data 15					15. Loading upper judgement value	2.39 V [1195]
26:Rack data 16					16. Rated point abnormal judgement value	1.88 V [940]
26:Rack data 17	**** rpm	**.** V	**.** V	Blank	17. Engine rated speed judgement speed	0 rpm
26:Rack data 18					18. Offset voltage for calculating the rack sensor target voltage	0.08 V [40]
26:Rack data 19					19. Offset voltage for calculating the rack sensor engine stall prevention judgement voltage	1.00 V [500]
26:Rack data 20	**** kgf/cm^2	Blank	Blank	Blank	20. Offset pressure for calculating the max. power shift control pressure of rack sensor control	3.0 kgf/cm^2 [303]

Data with under line : These data are adjusted with "Maintenance No.16 - Adjustment of rack sensor (Actual machine) - Full rack characteristic auto-reading".

Setable value No limitation

Maintenance No.27 Throttle motor manual adjustment (Actual machine)

Function

This is to memory A/D conversion value of each output voltage in the throttle motor position which the engine speed is in idle and full as adjusting value.

Confirmation items

(1) Make sure that the throttle motor link mechanism is correctly adjusted.
(2) Make sure that the throttle motor is normally controlled by the throttle motor control signal (UP/DOWN).
(3) Make sure that the throttle motor position signal is normally input to LMI.
(4) Make sure that the engine speed detection signal is normallty input to LMI.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.=27 with ##.
4) Press ENTER.
5) LCD1

27: Throttle MIN
& : next ## : other

LCD2 Idle position adjustment value
LCD3 Full position adjustment value
LCD4 Engine speed [****rpm]
LCD5 A/D conversion value
(When RETURN is pressed, go to the step 2).)

The throttle motor is in stop status. (It is impossible to operate the throttle motor with operating the grip.)

6) Press ## and select the setting item.
27: Throttle MIN Adjustment of throttle motor Idle position
↕
27: Throttle MAX Adjustment of throttle motor full position

7) Press ENTER.
8) LCD1

Select throttle position with ##, and press &.

LCD2 Blinks (When "27: Throttle MIN" selected)
LCD3 Blinks (When "27: Throttle MAX" selected)

9) Press ## and set the throttle motor position. (△: Throttle Up / ▽: Throttle Down)

When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
The blinking on the corresponding LCD display goes out.

10) Press ENTER.
11) Return to the step 5).
12) Make sure that the indication on the corresponding LCD is same as LCD5.

13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

Idle position adjustment value : 599 [1.499V]
Full position adjustment value : 4110 [10.275V]

Setable value

115 [0.288V] ≦ Idle position adjustment value ≦ 1083 [2.708V]
3626 [9.065V] ≦ Full position adjustment value ≦ 4594 [11.485V]

Maintenance No.28 Setting of display selection of LMI override mode (load / load ratio)

Function

This enables to set of display selection of LMI override mode (load / load ratio).

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.=28 with ##.
4) Press ENTER.

5) LCD1

28: Override
Press &.

LCD2 The memorized value
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.

7) LCD1

Select content with ##, and press &.
*

LCD2 Blinks

8) Press ## and select "0 (No display)" / "1 (Display)".
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD2 display goes out.

9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD2 shows value selected.

12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

1 (Display)

Setable value

0 (No display) / 1 (Display)

Explanation

LMI Override Mode
Load Ratio ≧ Load Ratio (limit) [Maintenance No.3 Setting of load ratio]

		0 (No display)	1 (Display)
LCD1	Load ratio	- - -	*** [%]
LCD2	Rated load	Blank	***.* [kips]
LCD3	Actual load	Blank	***.* [kips]

Maintenance No.29 Setting of jib angle for rigging mode correction value

Function

This is to memory the input signal of jib angle for rigging mode with holding jib horizontal as jib angle for rigging mode zero point correction value.
This enables to change jib angle for rigging mode zero point correction value.
This enables to change jib angle for rigging mode gain point correction value.
This enables to change jib angle for rigging mode drift point correction value.

Preparation

Hold the jib horizontal.

Setting procedures ## : ΔV & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

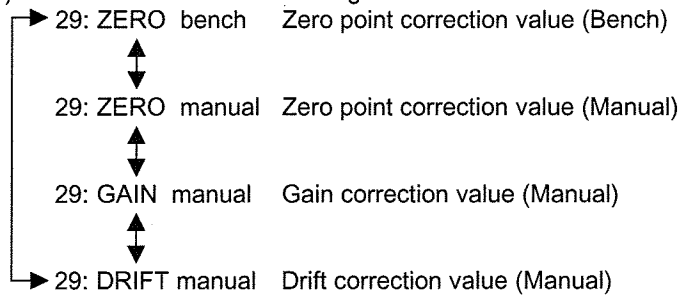
3) Set the Mainte No.=29 with ##.
4) Press ENTER.

5) LCD1

29: ZERO bench
& : next ## : other

LCD2 Zero point correction value
LCD3 Jib angle for rigging mode [***.* °]
LCD4 Jib angle [***.* °]
LCD5 A/D conversion value
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.



7) Press ENTER.

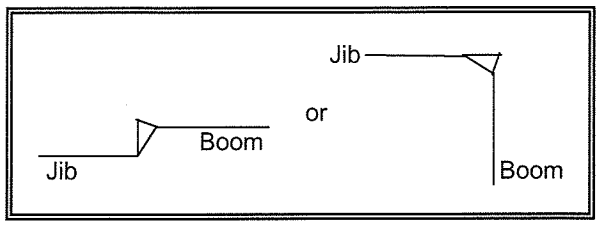
When selecting "Zero point correction value (Bench)". → To 8-1)
When selecting others. → To 8-2)

Maintenance No.29 Setting of jib angle for rigging mode correction value

Zero point correction value (Bench)

8-1) LCD1 Hold jib horizontal.
Press &.

LCD2 Zero point correction value
LCD3 Jib angle for rigging mode [***.* °]
LCD4 Jib angle [***.* °]
LCD5 A/D conversion value



When stopping the setting, press RETURN before making the step 9-1). (Go to the step 2).)

<<Caution>>
When selecting the curve data except "Luffing" and "Auxiliary sheaves with jib" and "Midfall", the indicated content on LCD1 changes to the following.

Select luffing
curve.

After executing the step 13-1) to 15-1), select the curve data of "Luffing" or "Auxiliary sheaves with jib" or "Midfall with setting mode and set the attachment make-up.

9-1) Hold the jib horizontal.
When stopping the setting, press RETURN before making the step 10-1). (Go to the step 5).)

10-1) Press ENTER.
11-1) Make sure that the indication on LCD2 is same as LCD5, and the indication on LCD3 is "0.0".
12-1) Return to the step 5).

13-1) Press RETURN.
14-1) Return to the step 2).
15-1) Place the maintenance key switch in "OFF" position.

Zero point / Gain / Drift correction value (Manual)

8-2) LCD1 Set content with ##, and press &.
****

LCD2 Zero point correction value Blinks (When "29: ZERO manual" selected)
LCD3 Gain correction value Blinks (When "29: GAIN manual" selected)
LCD4 Drift correction value Blinks (When "29: DRIFT manual" selected)
LCD5 Blank

When stopping the setting, press RETURN before making the step 9-2). (Go to the step 5).)

9-2) Press ## and set value.
When stopping the setting, press RETURN before making the step 10-2). (Go to the step 5).)

10-2) Press ENTER.
11-2) Make sure that the indication on the corresponding LCD shows value set.
12-2) Return to the step 5).

13-2) Press RETURN.
14-2) Return to the step 2).
15-2) Place the maintenance key switch in "OFF" position.

Initial value

Zero point correction value : 680 [1.700V]
Gain correction value : 8.333
Drift correction value : 0.00

Setable value

0 ≦ Zero point correction value ≦ 1000
0.100 ≦ Gain correction value ≦ 9.999
-10.00 < Drift correction value ≦ 10.00

Maintenance No.30 Setting of boom angle correction value (Manual)

Function

This enables to change the boom angle correction value (ZERO / GAIN / DRIFT).

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=30 with ##.
4) Press ENTER.
5) LCD1

30: B. Ang manual
Press &.

LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 Blank
(When RETURN is pressed, go to the step 2).)

<<Caution>>
Drift point correction value differs from the curve data to the curve data.
・ "Crane" and "Auxiliary sheaves without jib" is same value.
・ "Luffing" and "Auxiliary sheaves with jib"and "Midfall" is same value.

6) Press ENTER.
7) LCD1

Select content with ##, and press &.
ZERO GAIN DRIFT

8) Press ## and select the setting item.
9) Press ENTER.

When selecting setting of zero point correction value "ZERO" → To 10-1)
When selecting setting of gain correction value "GAIN" → To 10-2)
When selecting setting of drift correction value "DRIFT" → To 10-3)

Setting of zero point correction value

10-1) LCD1

Set content with ##, and press &.
****

LCD2 Blinks

11-1) Press ## and set the zero point correction value.
When stopping the setting, press RETURN before making the step 11-1). (Go to the step 5).)
The blinking on LCD2 display goes out.

12-1) Press ENTER.
13-1) Return to the step 5).
14-1) Make sure that the indication on LCD2 shows the zero point correction value set.

15-1) Press RETURN.
16-1) Return to the step 2).
17-1) Place the maintenance key switch in "OFF" position.

Maintenance No.30 Setting of boom angle correction value (Manual)

Setting of gain correction value

10-2) LCD1 Set content with ##, and press &.
*.***

LCD3 Blinks

11-2) Press ## and set the gain correction value.
When stopping the setting, press RETURN before making the step 11-2). (Go to the step 5).)
The blinking on LCD3 display goes out.

12-2) Press ENTER.
13-2) Return to the step 5).
14-2) Make sure that the indication on LCD3 shows the gain correction value set.

15-2) Press RETURN.
16-2) Return to the step 2).
17-2) Place the maintenance key switch in "OFF" position.

Setting of drift correction value

10-3) LCD1 Set content with ##, and press &.
.

LCD4 Blinks

11-3) Press ## and set the drift correction value.
When stopping the setting, press RETURN before making the step 11-3). (Go to the step 5).)
The blinking on LCD4 display goes out.
<<Caution>>
Drift point correction value differs from the curve data to the curve data.
- "Crane" and "Auxiliary sheaves without jib" is same value.
- "Luffing" and "Auxiliary sheaves with jib"and "Midfall" is same value.

12-3) Press ENTER.
13-3) Return to the step 5).
14-3) Make sure that the indication on LCD4 shows the drift correction value set.

15-3) Press RETURN.
16-3) Return to the step 2).
17-3) Place the maintenance key switch in "OFF" position.

Initial value

Zero point correction value : 3167
Gain correction value : 1.250
Drift correction value : 0.00

Setable value

2800 ≦ Zero point correction value ≦ 3800
0.500 ≦ Gain correction value ≦ 3.000
-9.99 ≦ Drift correction value ≦ 9.99

Maintenance No.31 Setting of boom tension correction value (Manual)

Function

This enables to change the boom tension correction value (ZERO / GAIN / DRIFT).

Setting procedures ## : ΔV & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=31 with ##.
4) Press ENTER.
5) LCD1
```
31: B. Te manual
Press &.
```
LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 Blank
(When RETURN is pressed, go to the step 2).)
6) Press ENTER.
7) LCD1
```
Select content with ##, and press &.
ZERO GAIN DRIFT
```
8) Press ## and select the setting item.
9) Press ENTER.

When selecting setting of zero point correction value "ZERO" → To 10-1)
When selecting setting of gain correction value "GAIN" → To 10-2)
When selecting setting of drift correction value "DRIFT" → To 10-3)

Setting of zero point correction value

10-1) LCD1
```
Set content with ##, and press &.
****
```
LCD2 Blinks

11-1) Press ## and set the zero point correction value.
When stopping the setting, press RETURN before making the step 12-1). (Go to the step 5).)
The blinking on LCD2 display goes out.

12-1) Press ENTER.
13-1) Return to the step 5).
14-1) Make sure that the indication on LCD2 shows the zero point correction value set.

15-1) Press RETURN.
16-1) Return to the step 2).
17-1) Place the maintenance key switch in "OFF" position.

Maintenance No.31 Setting of boom tension correction value (Manual)

Setting of gain correction value

10-2) LCD1 Set content with ##, and press &.
*.***

LCD3 Blinks

11-2) Press ## and set the gain correction value.
When stopping the setting, press RETURN before making the step 11-2). (Go to the step 5).)
The blinking on LCD3 display goes out.

12-2) Press ENTER.
13-2) Return to the step 5).
14-2) Make sure that the indication on LCD3 shows the gain correction value set.

15-2) Press RETURN.
16-2) Return to the step 2).
17-2) Place the maintenance key switch in "OFF" position.

Setting of drift correction value

10-3) LCD1 Set content with ##, and press &.
.

LCD4 Blinks

11-3) Press ## and set the drift correction value.
When stopping the setting, press RETURN before making the step 11-3). (Go to the step 5).)
The blinking on LCD4 display goes out.

12-3) Press ENTER.
13-3) Return to the step 5).
14-3) Make sure that the indication on LCD4 shows the drift correction value set.

15-3) Press RETURN.
16-3) Return to the step 2).
17-3) Place the maintenance key switch in "OFF" position.

Initial value

Zero point correction value : 500
Gain correction value : 1.875
Drift correction value : 0.00

Setable value

0 ≦ Zero point correction value ≦ 1000
0.500 ≦ Gain correction value ≦ 3.000
- (Load cell capacity X 0.1) ≦ Drift correction value ≦ (Load cell capacity X 0.1)

Maintenance No.32 Setting of jib angle correction value (Manual)

Function

This enables to change the boom angle correction value (ZERO / GAIN / DRIFT).

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=32 with ##.
4) Press ENTER.
5) LCD1

32: J. Ang manual
Press &.

LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.
7) LCD1

Select content with ##, and press &.
ZERO GAIN DRIFT

8) Press ## and select the setting item.
9) Press ENTER.

When selecting setting of zero point correction value "ZERO" → To 10-1)
When selecting setting of gain correction value "GAIN" → To 10-2)
When selecting setting of drift correction value "DRIFT" → To 10-3)

Setting of zero point correction value

10-1) LCD1

Set content with ##, and press &.
****

LCD2 Blinks

11-1) Press ## and set the zero point correction value.
When stopping the setting, press RETURN before making the step 11-1). (Go to the step 5).)
The blinking on LCD2 display goes out.

12-1) Press ENTER.
13-1) Return to the step 5).
14-1) Make sure that the indication on LCD2 shows the zero point correction value set.

15-1) Press RETURN.
16-1) Return to the step 2).
17-1) Place the maintenance key switch in "OFF" position.

Maintenance No.32 Setting of jib angle correction value (Manual)

Setting of gain correction value

10-2) LCD1 Set content with ##, and press &.
*.***

LCD3 Blinks

11-2) Press ## and set the gain correction value.
When stopping the setting, press RETURN before making the step 11-2). (Go to the step 5).)
The blinking on LCD3 display goes out.

12-2) Press ENTER.
13-2) Return to the step 5).
14-2) Make sure that the indication on LCD3 shows the gain correction value set.

15-2) Press RETURN.
16-2) Return to the step 2).
17-2) Place the maintenance key switch in "OFF" position.

Setting of drift correction value

10-3) LCD1 Set content with ##, and press &.
.

LCD4 Blinks

11-3) Press ## and set the drift correction value.
When stopping the setting, press RETURN before making the step 11-3). (Go to the step 5).)
The blinking on LCD4 display goes out.

12-3) Press ENTER.
13-3) Return to the step 5).
14-3) Make sure that the indication on LCD4 shows the drift correction value set.

15-3) Press RETURN.
16-3) Return to the step 2).
17-3) Place the maintenance key switch in "OFF" position.

Initial value

Zero point correction value : 3167
Gain correction value : 1.250
Drift correction value : 0.00

Setable value

2800 ≦ Zero point correction value ≦ 3800
0.500 ≦ Gain correction value ≦ 3.000
-9.99 ≦ Drift correction value ≦ 9.99

Maintenance No.33 Setting of jib tension correction value (Manual)

Function

This enables to change the jib tension correction value (ZERO / GAIN / DRIFT).

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=33 with ##.
4) Press ENTER.
5) LCD1
```
31: J. Te manual
Press &.
```
LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 Blank
(When RETURN is pressed, go to the step 2).)
6) Press ENTER.
7) LCD1
```
Select content with ##, and press &.
ZERO GAIN DRIFT
```
8) Press ## and select the setting item.
9) Press ENTER.

When selecting setting of zero point correction value "ZERO" → To 10-1)
When selecting setting of gain correction value "GAIN" → To 10-2)
When selecting setting of drift correction value "DRIFT" → To 10-3)

Setting of zero point correction value

10-1) LCD1
```
Set content with ##, and press &.
****
```
LCD2 Blinks

11-1) Press ## and set the zero point correction value.
When stopping the setting, press RETURN before making the step 11-1). (Go to the step 5).)
The blinking on LCD2 display goes out.

12-1) Press ENTER.
13-1) Return to the step 5).
14-1) Make sure that the indication on LCD2 shows the zero point correction value set.

15-1) Press RETURN.
16-1) Return to the step 2).
17-1) Place the maintenance key switch in "OFF" position.

Maintenance No.33 Setting of jib tension correction value (Manual)

Setting of gain correction value

10-2) LCD1 Set content with ##, and press &.
*.***

LCD3 Blinks

11-2) Press ## and set the gain correction value.
When stopping the setting, press RETURN before making the step 11-2). (Go to the step 5).)
The blinking on LCD3 display goes out.

12-2) Press ENTER.
13-2) Return to the step 5).
14-2) Make sure that the indication on LCD3 shows the gain correction value set.

15-2) Press RETURN.
16-2) Return to the step 2).
17-2) Place the maintenance key switch in "OFF" position.

Setting of drift correction value

10-3) LCD1 Set content with ##, and press &.
.

LCD4 Blinks

11-3) Press ## and set the drift correction value.
When stopping the setting, press RETURN before making the step 11-3). (Go to the step 5).)
The blinking on LCD4 display goes out.

12-3) Press ENTER.
13-3) Return to the step 5).
14-3) Make sure that the indication on LCD4 shows the drift correction value set.

15-3) Press RETURN.
16-3) Return to the step 2).
17-3) Place the maintenance key switch in "OFF" position.

Initial value

Zero point correction value : 500
Gain correction value : 1.875
Drift correction value : 0.00

Setable value

0 ≦ Zero point correction value ≦ 1000
0.500 ≦ Gain correction value ≦ 3.000
- (Load cell capacity X 0.1) ≦ Drift correction value ≦ (Load cell capacity X 0.1)

Maintenance No.34 Setting of grip / throttle volume / foot pedal adjustment value (Manual)

Function

(1-1) This enables to change the grip adjustment value (MIN and MAX position).
(1-2) This enables to change the throttle volume adjustment value (MIN(at idle) and MAX(at full) position).
(2) This enables to change the foot pedal adjustment value (MIN(at idle) and MAX(at full) position).

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

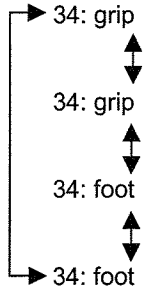
Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.=34 with ##.
4) Press ENTER.
5) LCD1

34: grip MIN
& : next ## : other

LCD2 MIN position adjustment value
LCD3 MAX position adjustment value
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.



34: grip	MIN	Setting of grip / throttle volume MIN position adjustment value
34: grip	MAX	Setting of grip / throttle volume MAX position adjustment value
34: foot	MIN	Setting of foot pedal MIN position adjustment value
34: foot	MAX	Setting of foot pedal MAX position adjustment value

7) Press ENTER.
8) LCD1

Select content with ##, and press &.
****

LCD2 Blinks (When "34: grip MIN" or "34: foot MIN" selected)
LCD3 Blinks (When "34: grip MAX" or "34: foot MAX" selected)

9) Set the adjustment value with ##.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
The blinking on the corresponding LCD display goes out.
10) Press ENTER.
11) Return to the step 5).
12) Make sure that the indication on the corresponding LCD shows a value set.
13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Maintenance No.34　Setting of grip / throttle volume / foot pedal adjustment value (Manual)

				Initial value	Setable value
grip	Tier2	LS-308HII LS-308H5 LS-348H5	Min	1440 [3.600V]	650 ≦ ≦ 2340 [1.625V] [5.850V]
			Max	2880 [7.200v]	1610 ≦ ≦ 4340 [4.025V] [10.850V]
	Tier3	LS-348H5			
throttle volume	Tier3	LS-238H5 LS-248H5 LS-108H5	Min	1650 [4.125V]	400 ≦ ≦ 3000 [1.000V] [7.500V]
			Max	3150 [7.875V]	1600 ≦ ≦ 4400 [4.000V] [11.000V]
foot pedal	Tier2 Tier3	LS-348H5	Min	1600 [4.000V]	400 ≦ ≦ 2400 [1.000V] [6.000V]
			Max	**3752** **[9.380V]**	**2400 ≦** ≦ 4400 **[6.000V]** [11.000V]
	Tier3	LS-238H5 LS-248H5 LS-108H5	Min	1600 [4.000V]	400 ≦ ≦ 2400 [1.000V] [6.000V]
			Max	**3200** **[8.000V]**	**2000 ≦** ≦ 4400 **[5.000V]** [11.000V]

Maintenance No.35 Setting of Luffing Test STEP

Function

This enables to change Luffing Test STEP.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=35 with ##.
4) Press ENTER.

5) LCD1

Luffing Test
Press &.

LCD2 The correction value
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.

7) LCD1

Select content with ##, and press &.
*

LCD2 Blinks

8) Set the correction value with ##.
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD2 display goes out.

9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD2 shows a value set.

12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

0 [Normal]

Setable value

0 [Normal], 1 [STEP 1], 2 [STEP 2], 3 [STEP 3]

Maintenance No.36 Setting of radio load cell capacity & coefficient (Indication of actual load) for radio load cell

Function

This enables to change radio load capacity value and coefficient (Indication of actual load) for radio load cell.

Setting procedures

: ΔV & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=36 with ##.
4) Press ENTER.
5) LCD1

36: Radio-Main-F & : next ## : other	↔	36: Radio-Aux-R/3 & : next ## : other

LCD2 Radio load cell - main[front] capacity [**.**kips]
LCD3 Radio load cell - aux[rear/3rd] capacity [**.**kips] LS-348H5 : Rear Drum / LS-248H5 : 3rd Drum
LCD4 to LCD5 Blank

↕

LCD1

36: LOAD DISP
& : next ## : other

LCD2 Coefficient (Indication of actual load) for radio load cell
LCD3 to LCD5 Blank

(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.

→ 36: Radio-Main-F Radio load cell - main[front] capacity
↕
36: Radio-Aux-R/3 Radio load cell - aux[rear/3rd] capacity
↕
→ 36: LOAD DISP Coefficient (Indication of actual load) for radio load cell

7) Press ENTER.

When selecting setting of radio load cell - main[front] & aux[rear/3rd] capacity → To 8-1)
When selecting setting of Coefficient (Indication of actual load) for radio load cell → To 8-2)

Maintenance No.36 Setting of radio load cell capacity & coefficient (Indication of actual load) for radio load cell

Setting of radio load cell - main[front] & aux[rear/3rd] capacity

8-1) LCD1 Select content with ##, and press &.
.kips

LCD2 Blinks (When "36: Radio-Main-F" selected)
LCD3 Blinks (When "36: Radio-Aux-R/3" selected)

9-1) Set the capacity with ##.
When stopping the setting, press RETURN before making the step 10-1). (Go to the step 5).)
The blinking on the corresponding LCD display goes out.

10-1) Press ENTER.
11-1) Return to the step 5).
12-1) Make sure that the indication on the corresponding LCD shows a value set.

13-1) Press RETURN.
14-1) Return to the step 2).
15-1) Place the maintenance key switch in "OFF" position.

Setting of coefficient (Indication of actual load) for radio load cell

8-2) LCD1 Select content with ##, and press &.
*.***

LCD2 Blinks

9-2) Press ## and select coefficient.
When stopping the setting, press RETURN before making the step 10-2). (Go to the step 5).)
The blinking on LCD2 display goes out.

10-2) Press ENTER.
11-2) Return to the step 5).
12-2) Make sure that the indication on LCD2 shows coefficient selected.

13-2) Press RETURN.
14-2) Return to the step 2).
15-2) Place the maintenance key switch in "OFF" position.

Initial value

Capacity : 45.00 kips
Coefficient : 1.000

Setable value

Capacity : No limitation
0.000 ≦ Coefficient ≦ 9.999

Maintenance No.37 Setting of throttle motor adjustment value (Manual)

Function

This enables to change the throttle motor adjustment value (idle and full position).

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

```
Select content with ##, and press &.
Mainte No.= 0
```

LCD2 to LCD5 Blank

3) Set the Mainte No.=37 with ##.
4) Press ENTER.

5) LCD1

```
37: IDLING
& : next  ## : other
```

LCD2 Idle position adjustment value
LCD3 Full position adjustment value
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.
37: IDLING Setting of throttle motor Idle position adjustment value
↕
37: FULL Setting of throttle motor full position adjustment value

7) Press ENTER.

8) LCD1

```
Select content with ##, and press &.
****
```

LCD2 Blinks (When "37: IDLING" selected)
LCD3 Blinks (When "37: FULL" selected)

9) Set the adjustment value with ##.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
The blinking on the corresponding LCD display goes out.

10) Press ENTER.
11) Return to the step 5).
12) Make sure that the indication on the corresponding LCD is same as LCD5.

13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

Idle position adjustment value : 599 [1.499V]
Full position adjustment value : 4110 [10.275V]

Setable value

115 [0.288V] ≦ Idle position adjustment value ≦ 1083 [2.708V]
3626 [9.065V] ≦ Full position adjustment value ≦ 4594 [11.485V]

Maintenance No.38 Setting of boom tension hysteresis correction value

Function

This enables to change the boom tension hysteresis to correct the hysteresis which occurs to the load cell detection signal for the boom hoist rope tension detection with the boom hoisting / lowering.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=38 with ##.
4) Press ENTER.

5) LCD1
```
38: HYST Boom
Press &.
```
LCD2 The boom tension hysteresis correction value
LCD3 The jib tension hysteresis correction value
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.

7) LCD1
```
Select content with ##, and press &.
*.***
```
LCD2 Blinks

8) Set the correction value with ##.
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD2 display goes out.

9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD2 shows a value set.

12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

Curve data	Crane	Auxiliary sheaves without jib	Auxiliary sheaves with jib
LS-108H5	1.021	N / A	N / A
LS-138H5	1.021	N / A	N / A
LS-218H5	1.015	1.015	1.015
LS-238H5	1.018	1.018	1.018
LS-248H5	1.024	N / A	N / A
LS-308HII LS-308H5	1.015	N / A	N / A
LS-348H5	1.036 ※1	1.036 ※2	1.036 ※2

※1: When the radio load cell is used with the crane attachment, this value is not used.
※2: This value is not used, because the radio load cell is used with the luffing attachment.
<<Caution>>
The folowings are given according to the curve data when the maintenance No.9 is executed, and an individual set is required.
A. When selecting "Crane", "Auxiliary sheaves with jib" and "Auxiliary sheaves without jib"
The jib tension hysteresis correction value = 1.000
>>>The setting with Maintenance No.39 is required.
B. When selecting "Luffing" and "Midfall"
The boom tension hysteresis correction value = 1.000
>>>The setting with Maintenance No.38 is required.

Setable value

0.500 ≦ Hysteresis correction value ≦ 3.000

Maintenance No.39 Setting of jib tension hysteresis correction value

Function

This enables to change the jib tension hysteresis to correct the hysteresis which occurs to the load cell detection signal for the jib hoist rope tension detection with the jib hoisting / lowering.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
   Select content with ##, and press &.
   Mainte No.= 0

   LCD2 to LCD5 Blank
3) Set the Mainte No.=39 with ##.
4) Press ENTER.

5) LCD1
   39: HYST Jib
   Press &.

   LCD2 The boom tension hysteresis correction value
   LCD3 The jib tension hysteresis correction value
   LCD4 to LCD5 Blank
   (When RETURN is pressed, go to the step 2).)

6) Press ENTER.

7) LCD1
   Select content with ##, and press &.
   *.***

   LCD3 Blinks

8) Set the correction value with ##.
   When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
   The blinking on LCD3 display goes out.

9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD3 shows a value set.

12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

Curve data	Luffing	Midfall
LS-108H5	N / A	N / A
LS-138H5	N / A	N / A
LS-218H5	1.012	N / A
LS-238H5	1.012	N / A
LS-248H5	1.015 ※1	1.015 ※1
LS-308HII LS-308H5	N / A	N / A
LS-348H5	1.015 ※1	1.015 ※1

※1: This value is not used, because the radio load cell is used with the luffing attachment.

<<Caution>>
The folowings are given according to the curve data when the maintenance No.9 is executed, and an individual set is required.
A. When selecting "Crane", "Auxiliary sheaves with jib" and "Auxiliary sheaves without jib"
   The jib tension hysteresis correction value = 1.000
   >>>The setting with Maintenance No.39 is required.
B. When selecting "Luffing" and "Midfall"
   The boom tension hysteresis correction value = 1.000
   >>>The setting with Maintenance No.38 is required.

Setable value

0.500 ≦ Hysteresis correction value ≦ 3.000

Maintenance No.40 Setting of pump / engine / winch motor control point

Function

This enables to change the pump / engine / winch motor control point.

Setting procedures ## : ΔV & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=40 with ##.
4) Press ENTER.
5) LCD1

40: Pump MIN 1
& : next ## : other

LCD2 Pump MIN point (At throttle variable)
LCD3 Pump MAX point (At throttle variable)
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.

40 : Pump MIN 1	Setting of pump control Min. point (At throttle variable)
40 : Pump MAX 1	Setting of pump control Max. point (At throttle variable)
40 : Pump MIN 2	Setting of pump control Min. point (At throttle fixed)
40 : Pump MAX 2	Setting of pump control Max. point (At throttle fixed)
40 : Engine MIN	Setting of engine control Min.[Idle] point (At throttle variable)
40 : Engine MAX	Setting of engine control Max.[Full] point (At throttle variable)
40 : Winch MAX 1	Setting of winch motor control Max.[1st speed] point (At throttle variable)
40 : Winch MIN 1	Setting of winch motor control Min.[2nd speed] point (At throttle variable)
40 : Winch MAX 2	Setting of winch motor control Max.[1st speed] point (At throttle fixed)
40 : Winch MIN 2	Setting of winch motor control Min.[2nd speed] point (At throttle fixed)

7) Press ENTER.
8) LCD1

Select content with ##, and press &.
****

LCD2 Blinks (When "40 : Pump MIN 1" or "40 : Pump MIN 2" or "40 : Engine MIN"
or "40 : Winch MAX 1" or "40 : Winch MAX 2" selected)
LCD3 Blinks (When "40 : Pump MAX 1" or "40 : Pump MAX 2" or "40 : Engine MAX"
or "40 : Winch MIN 1" or "40 : Winch MIN 2" selected)

9) Set the control point with ##.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
The blinking on the corresponding LCD display goes out.

Maintenance No.40 Setting of pump / engine / winch motor control point

10) Press ENTER.
11) Return to the step 5).
12) Make sure that the indication on the corresponding LCD shows a value set.

13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

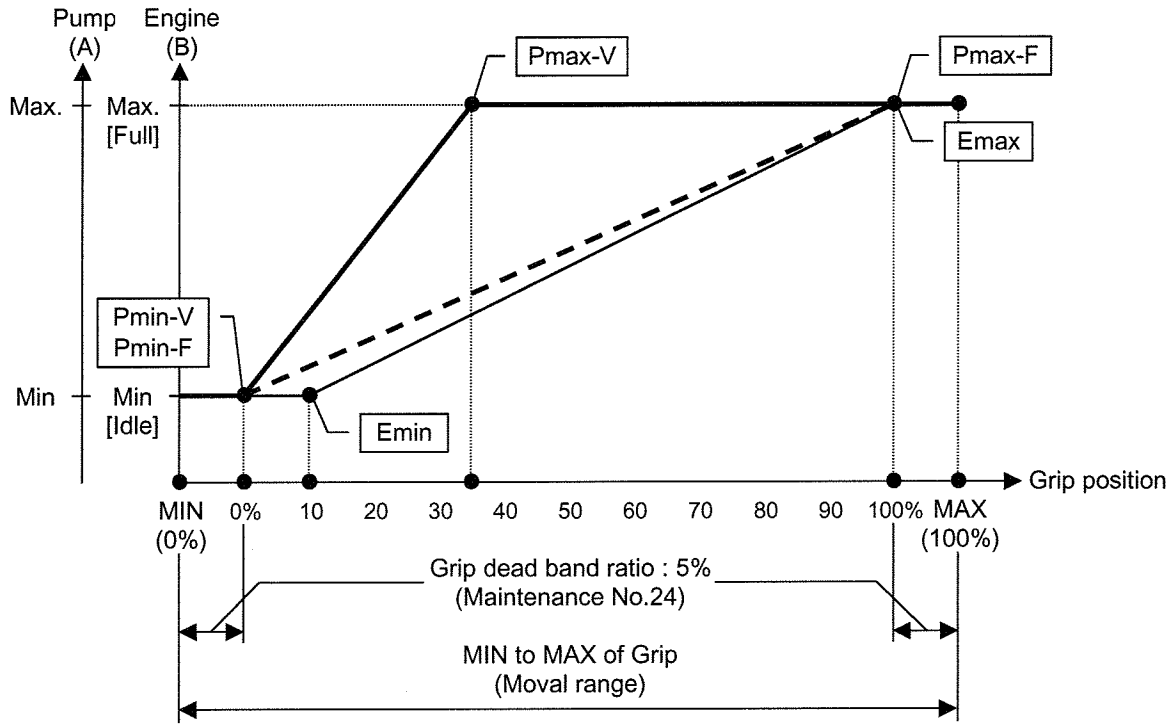
		At throttle variable		At throttle fixed	
Pump	Min. point	0%	Pmin-V	0%	Pmin-F
	Max. point	35%	Pmax-V	100%	Pmax-F
Engine	Min.[Idle] point	10%	Emin	-----	
	Max.[Full] point	100%	Emax	-----	
Winch motor	Max.[1st speed] point	100%		100%	
	Min.[2nd speed] point	100%		100%	

} These data are not used.

Setable value

Pump control point : 0% ≦ Min. point ≦ Max. point ≦ 100%
Engine control point : 0% ≦ Min.[Idle] point ≦ Max.[Full] point ≦ 100%
Winch motor control point : 0% ≦ Max.[1st speed] point ≦ Min.[2nd speed] point ≦ 100%

Explanation



Maintenance No.41 Setting of throttle motor control data

Function

This enables to change the throttle motor control data.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

```
Select content with ##, and press &.
Mainte No.= 0
```

LCD2 to LCD5 Blank

3) Set the Mainte No.=41 with ##.
4) Press ENTER.

5) LCD1

```
41: Throttle 1
& : next ## : other
```

LCD2 Throttle motor deadband engine speed
LCD3 High idle cut engine speed
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.

41: Throttle 1 Setting of throttle motor deadband engine speed
↕
41: Throttle 2 Setting of high idle cut engine speed

7) Press ENTER.

8) LCD1

```
Select content with ##, and press &.
****[rpm]
```

LCD2 Blinks (When "41: Throttle 1" selected)
LCD3 Blinks (When "41: Throttle 2" selected)
LCD4 to LCD5 Blank

9) Set the engine speed with ##.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)

10) Press ENTER.
11) Make sure that the indication on the corresponding LCD shows a value set.
12) Return to the step 5).

13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

Throttle motor deadband engine speed : 50rpm
High idle cut engine speed : 1850rpm [LS-348H5 Tier2]

Setable value

5rpm ≦ Throttle motor deadband engine speed ≦ 175rpm
2000rpm ≦ High idle cut engine speed ≦ 3000rpm

Explanation

・Throttle motor deadband engine speed
This is data for the throttle motor control to prevent the engine hunting phenomenon.
When setting value of "Maintenance No.59 - Throttle motor control" is "1 (Present)", this data is used.
| Demand position - Actual position | ≦ Throttle motor deadband engine speed → STOP
Demand position - Actual position > Throttle motor deadband engine speed → UP
Demand position - Actual position < Throttle motor deadband engine speed → DOWN

・High idle cut engine speed
This is data for the high idol cut control to protect the pump.
When setting value of "Maintenance No.59 - High idle cut control" is "1 (Present)", this data is used.

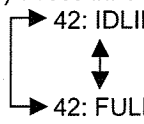
Maintenance No.42 Setting of ECU / ECM control data

Function

This enables to change the engine throttle output voltage (Idle and Full) to ECU / ECM.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=42 with ##.
4) Press ENTER.
5) LCD1
```
42: IDLING
& : next ## : other
```
LCD2 Idle output voltage
LCD3 Full output voltage
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)
6) Press ## and select the setting item.



42: IDLING Setting of engine throttle idle output voltage

42: FULL Setting of engine throttle full output voltage

7) Press ENTER.
8) LCD1
```
Select voltage with ##, and press &.
*.***[v]
```
LCD2 Blinks (When "42: IDLING" selected)
LCD3 Blinks (When "42: FULL" selected)
LCD4 to LCD5 Blank
9) Set the output voltage with ##.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
10) Press ENTER.
11) Make sure that the indication on the corresponding LCD shows a value set.
12) Return to the step 5).
13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

	Tier2	Tier3	
	ECU	ECU	ECM
	LS-308HII LS-308H5	LS-348H5	LS-238H5 LS-248H5 LS-108H5
Idle output voltage	2.042V [52]	0.902V [23]	
Full output voltage	3.704V [94]	4.118V [105]	

Setable value

0.000V ≦ Engine throttle output voltage ≦ 9.999V

Maintenance No.43 Setting of radio load cell - main[front] correction value (Manual)

Function

This enables to change radio load cell - main[front] correction value (ZERO / GAIN / DRIFT).

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=43 with ##.
4) Press ENTER.
5) LCD1
```
43: Radio-Main-F
Press &.
```
LCD2 Zero point correction value
LCD3 Gain correction value
LCD4 Drift correction value
LCD5 Blank
(When RETURN is pressed, go to the step 2).)
6) Press ENTER.
7) LCD1
```
Select content with ##, and press &.
ZERO GAIN DRIFT
```
8) Press ## and select the setting item.
9) Press ENTER.

When selecting setting of zero point correction value "ZERO" → To 10-1)
When selecting setting of gain correction value "GAIN" → To 10-2)
When selecting setting of drift correction value "DRIFT" → To 10-3)

Setting of zero point correction value

10-1) LCD1
```
Set content with ##, and press &.
****
```
LCD2 Blinks

11-1) Press ## and set the zero point correction value.
When stopping the setting, press RETURN before making the step 11-1). (Go to the step 5).)
The blinking on LCD2 display goes out.

12-1) Press ENTER.
13-1) Return to the step 5).
14-1) Make sure that the indication on LCD2 shows the zero point correction value set.

15-1) Press RETURN.
16-1) Return to the step 2).
17-1) Place the maintenance key switch in "OFF" position.

Maintenance No.43 Setting of radio load cell - main[front] correction value (Manual)

Setting of gain correction value

10-2) LCD1 Set content with ##, and press &.
*.***

LCD3 Blinks

11-2) Press ## and set the gain correction value.
When stopping the setting, press RETURN before making the step 11-2). (Go to the step 5).)
The blinking on LCD3 display goes out.

12-2) Press ENTER.
13-2) Return to the step 5).
14-2) Make sure that the indication on LCD3 shows the gain correction value set.

15-2) Press RETURN.
16-2) Return to the step 2).
17-2) Place the maintenance key switch in "OFF" position.

Setting of drift correction value

10-3) LCD1 Set content with ##, and press &.
.

LCD4 Blinks

11-3) Press ## and set the drift correction value.
When stopping the setting, press RETURN before making the step 11-3). (Go to the step 5).)
The blinking on LCD4 display goes out.

12-3) Press ENTER.
13-3) Return to the step 5).
14-3) Make sure that the indication on LCD4 shows the drift correction value set.

15-3) Press RETURN.
16-3) Return to the step 2).
17-3) Place the maintenance key switch in "OFF" position.

Initial value

Zero point correction value : 900
Gain correction value : 1.389
Drift correction value : 0.00

Setable value

50 ≦ Zero point correction value ≦ 1500
0.500 ≦ Gain correction value ≦ 3.000
- (Load cell capacity X 0.1) ≦ Drift correction value ≦ (Load cell capacity X 0.1)

Maintenance No.44 Setting of radio load cell - aux[rear/3rd] correction value (Manual)

Function

This enables to change radio load cell - aux[rear/3rd] correction value (ZERO / GAIN / DRIFT).
LS-348H5 : Rear Drum / LS-248H5 : 3rd Drum

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
   Select content with ##, and press &.
   Mainte No.= 0

   LCD2 to LCD5 Blank
3) Set the Mainte No.=44 with ##.
4) Press ENTER.

5) LCD1
   44: Radio-Aux-R/3
   Press &.

   LCD2 Zero point correction value
   LCD3 Gain correction value
   LCD4 Drift correction value
   LCD5 Blank
   (When RETURN is pressed, go to the step 2).)

6) Press ENTER.

7) LCD1
   Select content with ##, and press &.
   ZERO GAIN DRIFT

8) Press ## and select the setting item.

9) Press ENTER.

When selecting setting of zero point correction value "ZERO" → To 10-1)
When selecting setting of gain correction value "GAIN" → To 10-2)
When selecting setting of drift correction value "DRIFT" → To 10-3)

Setting of zero point correction value

10-1) LCD1
   Set content with ##, and press &.
   ****

   LCD2 Blinks

11-1) Press ## and set the zero point correction value.
   When stopping the setting, press RETURN before making the step 11-1). (Go to the step 5).)
   The blinking on LCD2 display goes out.

12-1) Press ENTER.
13-1) Return to the step 5).
14-1) Make sure that the indication on LCD2 shows the zero point correction value set.

15-1) Press RETURN.
16-1) Return to the step 2).
17-1) Place the maintenance key switch in "OFF" position.

Maintenance No.44 Setting of radio load cell - aux[rear/3rd] correction value (Manual)

Setting of gain correction value

10-2) LCD1

```
Set content with ##, and press &.
*.***
```

LCD3 Blinks

11-2) Press ## and set the gain correction value.
When stopping the setting, press RETURN before making the step 11-2). (Go to the step 5).)
The blinking on LCD3 display goes out.

12-2) Press ENTER.
13-2) Return to the step 5).
14-2) Make sure that the indication on LCD3 shows the gain correction value set.

15-2) Press RETURN.
16-2) Return to the step 2).
17-2) Place the maintenance key switch in "OFF" position.

Setting of drift correction value

10-3) LCD1

```
Set content with ##, and press &.
**.**
```

LCD4 Blinks

11-3) Press ## and set the drift correction value.
When stopping the setting, press RETURN before making the step 11-3). (Go to the step 5).)
The blinking on LCD4 display goes out.

12-3) Press ENTER.
13-3) Return to the step 5).
14-3) Make sure that the indication on LCD4 shows the drift correction value set.

15-3) Press RETURN.
16-3) Return to the step 2).
17-3) Place the maintenance key switch in "OFF" position.

Initial value

Zero point correction value : 900
Gain correction value : 1.389
Drift correction value : 0.00

Setable value

50 ≦ Zero point correction value ≦ 1500
0.500 ≦ Gain correction value ≦ 3.000
- (Load cell capacity X 0.1) ≦ Drift correction value ≦ (Load cell capacity X 0.1)

Maintenance No.45 Setting of radio load cell hysteresis correction value (Manual)

Function

This enables to change radio load cell hysteresis correction value.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
   ```
   Select content with ##, and press &.
   Mainte No.= 0
   ```
   LCD2 to LCD5 Blank
3) Set the Mainte No.=45 with ##.
4) Press ENTER.
5) LCD1
   ```
   45: Radio-Main-F
   & : next ## : other
   ```
   LCD2 Radio load cell - main[front] hysteresis correction value
   LCD3 Radio load cell - aux[rear/3rd] hysteresis correction value
   LCD4 to LCD5 Blank
   (When RETURN is pressed, go to the step 2).)
6) Press ## and select the setting item.
   45: Radio-Main-F Radio load cell - main[front] hysteresis correction value
   ↕
   45: Radio-Aux-R/3 Radio load cell - aux[rear/3rd] hysteresis correction value
   LS-348H5 : Rear Drum / LS-248H5 : 3rd Drum
7) Press ENTER.
8) LCD1
   ```
   Select content with ##, and press &.
   *.***
   ```
   LCD2 Blinks (When "45: Radio-Main-F" selected)
   LCD3 Blinks (When "45: Radio-Aux-R/3" selected)
9) Set the correction value with ##.
   When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
   The blinking on the corresponding LCD display goes out.
10) Press ENTER.
11) Return to the step 5).
12) Make sure that the indication on the corresponding LCD shows a value set.
13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

1.000

Setable value

0.500 ≦ Hysteresis correction value ≦ 3.000

Maintenance No.46 Setting of luffing protection device (Luffing set mode) data

Function

This enables to change the luffing protection device (Luffing set mode) data, and this displays the jib tension judgement value.

<<Caution>>

The luffing protection device does not function in LBCE Model.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=46 with ##.
4) Press ENTER.
5) LCD1

LF protect 1
& : next ## : other

LCD2 Working status
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.

LCD1	LCD2	LCD3	LCD4	LCD5	Item	Initial value
LF protect 1 & : next ## : other	*	Blank	Blank	Blank	Setting of working status	0
LF protect 2 & : next ## : other	**.** °	Blank	Blank	Blank	Setting of jib angle when the jib catch limit switch functions	27.00°
LF protect 3	**.** ton Override	**.** ton Stop	Blank	Blank	Display of jib tension judgement value when raising the luffing boom	0.00ton 0.00ton
LF protect 4	**.** ton Override	**.** ton Stop	**.** ton Slow down	Blank	Display of jib tension judgement value when lowering the luffing boom	0.00ton 0.00ton 0.00ton
LF protect 5	**.** ton Override	**.** ton Stop	Blank	Blank	Display of jib tension judgement value when raising the luffing jib	0.00ton 0.00ton

When selecting setting of working status "LF protect 1" → To 7-1)
When selecting setting of jib angle when the jib catch limit switch functions "LF protect 2" → To 7-2)
When selecting display of jib tension judgement value "LF protect 3 / LF protect 4 / LF protect 5" → To 7-3)

Maintenance No.46 Setting of luffing protection device (Luffing set mode) data

Setting of working status

7-1) Press ENTER.

8-1) LCD1 Select content with ##, and press &.
*

LCD2 Working status
LCD3 to LCD5 Blank

9-1) Set the working status with ##.
When stopping the setting, press RETURN before making the step 10-1). (Go to the step 5).)

10-1) Press ENTER.
11-1) Make sure that the indication on LCD2 shows the working status set.
12-1) Return to the step 5).

13-1) Press RETURN.
14-1) Return to the step 2).
15-1) Place the maintenance key switch in "OFF" position.

Initial value

0 (Rigging mode, Crane set mode, Work mode)

Setable value

0 ≦ Working status ≦ 8

Setting of jib angle when the jib catch limit switch functions

7-2) Press ENTER.

8-2) LCD1 Select content with ##, and press &.
.°

LCD2 Jib angle
LCD3 to LCD5 Blank

9-2) Set the jib angle with ##.
When stopping the setting, press RETURN before making the step 10-2). (Go to the step 5).)

10-2) Press ENTER.
11-2) Make sure that the indication on LCD2 shows the jib angle set.
12-2) Return to the step 5).

13-2) Press RETURN.
14-2) Return to the step 2).
15-2) Place the maintenance key switch in "OFF" position.

Display of jib tension judgement value

7-3) The following are displayed.

LCD1	LCD2	LCD3	LCD4	LCD5	Item
LF protect 3	**.** ton Override	**.** ton Stop	Blank	Blank	Display of jib tension judgement value when raising the luffing boom
LF protect 4	**.** ton Override	**.** ton Stop	**.** ton Slow down	Blank	Display of jib tension judgement value when lowering the luffing boom
LF protect 5	**.** ton Override	**.** ton Stop	Blank	Blank	Display of jib tension judgement value when raising the luffing jib

8-3) Press RETURN.
9-3) Return to the step 2).
10-3) Place the maintenance key switch in "OFF" position.

Maintenance No.47 Setting of anti-two block limit data

Function

This enables to change the anti-two block limit data.

<<Caution>>

The anti-two block limit does not function in LBCE Model.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=47 with ##.
4) Press ENTER.
5) LCD1

47: start
& : next ## : other

LCD2 Deceleration start distance
LCD3 Deceleration end distance
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.

47: start Setting of deceleration start distance
↕
47: end Setting of deceleration end distance

7) Press ENTER.
8) LCD1

Select content with ##, and press &.
**.*[m]

LCD2 Blinks (When "47: start" selected)
LCD3 Blinks (When "47: end" selected)
LCD4 to LCD5 Blank

9) Set the distance with ##.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
10) Press ENTER.
11) Make sure that the indication on the corresponding LCD shows a value set.
12) Return to the step 5).
13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

Deceleration start distance : 1.0m
Deceleration end distance : 0.5m

Setable value

0.0m ≦ Deceleration end distance < Deceleration start distance ≦ 10.0m

Maintenance No.48 Setting of pump control data

Function

This enables to change the pump control data.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

```
Select content with ##, and press &.
Mainte No.= 0
```

LCD2 to LCD5 Blank

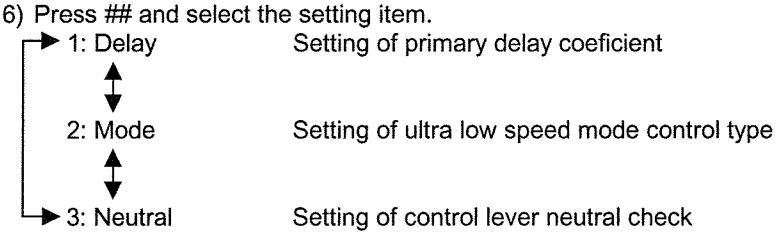
3) Set the Mainte No.=48 with ##.
4) Press ENTER.

5) LCD1

```
1: Delay
& : next ## : other
```

LCD2 Primary delay coeficient
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.



7) Press ENTER.

8) LCD1

```
Select content with ##, and press &.
***
```

LCD2 The memorized value
LCD3 to LCD5 Blank

9) Press ## and select value.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)

10) Press ENTER.
11) Make sure that the indication on LCD2 shows value selected.
12) Return to the step 5).

13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

Primary delay coeficient : 8%
Ultra low speed mode control type : 2 (Type 2)
Control lever neutral check : 1 (w/ interlock)

Setable value

0% ≦ Primary delay coeficient ≦ 100%
Ultra low speed mode control type : 2 (Type 2), 3(Type 3)
Control lever neutral check : 1 (w/ interlock), 0 (w/o interlock)

Maintenance No.49 Setting of rigging mode data

Function

This enables to change the rigging mode data.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

```
Select content with ##, and press &.
Mainte No.= 0
```

LCD2 to LCD5 Blank

3) Set the Mainte No.=49 with ##.
4) Press ENTER.
5) LCD1

```
Rigging mode 1
& : next ## : other
```

LCD2 Rigging mode judgement value
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.

Rigging mode 1	Rigging mode judgement value
↕	
Rigging mode 6	Angle sensor signal wire breakage judgement value
↕	
Rigging mode 8	Boom angle judgement value 1

7) Press ENTER.
8) LCD1

```
Select content with ##, and press &.
*****
```

LCD2 The memorized value
LCD3 to LCD5 Blank

9) Press ## and select value.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
10) Press ENTER.
11) Make sure that the indication on LCD2 shows value selected.
12) Return to the step 5).
13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

Rigging mode judgement value : 0 (Other modes)
Angle sensor signal wire breakage judgement value : 2.00deg
Boom angle judgement value 1 : 75.00deg [Other model] / 65.00deg [LS-348H5] / 80.00deg [LS-248H5]

Setable value

Rigging mode judgement value : 0 (Other modes) / 1 (Rigging mode) / 2 (Crane set mode) / 3 (Luffing set mode)
0.00deg ≦ Angle sensor signal wire breakage judgement value ≦ 10.00deg
0.00deg ≦ Boom angle judgement value 1 ≦ 90.00deg

Maintenance No.50 Setting of slowdown device reset time

Function

This enables to change the slowdown device reset time.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=50 with ##.
4) Press ENTER.

5) LCD1

50: Reset time
Press &.

LCD2 Slowdown device reset time
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.

7) LCD1

Select content with ##, and press &.
.[sec]

LCD2 Blinks

8) Press ## and select the slowdown device reset time.
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD2 display goes out.

9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD2 shows the slowdown device reset time selected.

12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

5.00seconds [100]

Setable value

0.00second [0] ≦ Slowdown device reset time ≦ 10.00seconds [200]
The setting is every 0.05 seconds.

Maintenance No.51 Setting of boom protection device judgement coefficient

Function

This enables to change the boom protection device judgement coefficient.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=51 with ##.
4) Press ENTER.

5) LCD1

51: Coefficient
Press &.

LCD2 Boom protection device judgement coefficient [%]
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.

7) LCD1

Select content with ##, and press &.
***[%]

LCD2 Blinks

8) Press ## and select the coefficient.
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD2 display goes out.

9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD2 shows the coefficient selected.

12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

50% [500]

Setable value

0% [0] < Coefficient ≦ 100% [1000]

Maintenance No.52 Setting of Pz-DA curve

Function

This enables to change Pz-DA curve that shows relation between Pz [Power shift pressure] and DA [Power shift output voltage].
Also this enables to make initializing.

Preparation

Connect the pressure gauge on the power shift pressure port when executing "Adjustment of power shift output voltage (Actual machine)" and "Pz [Power shift pressure] - Point ?".

Setting procedures ##: ΔV &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=52 with ##.
4) Press ENTER.

5) LCD1

52: Adjustment
&: next ##: other

LCD2	Pz [Power shift pressure] - Point ?	[***.*kgf/cm^2]
LCD3	DA [Power shift output voltage] - Point ?	[**.**V]
LCD4	Pzmax [Max. power shift pressure]	[0.0kgf/cm^2]
LCD5	Power shift output voltage	[**.**V]

(When RETURN is pressed, go to the step 2).)

	Power shift output voltage (displayed on LCD5)
All machine	0.00V

6) Press ## and select the setting item.

52: Adjustment	Adjustment of power shift output voltage (Actual machine)
52: Point 1 PZ	Pz [Power shift pressure] - Point 1
:	:
52: Point 6 PZ	Pz [Power shift pressure] - Point 6
52: Point 1 DA	DA [Power shift output voltage] - Point 1
:	:
52: Point 6 DA	DA [Power shift output voltage] - Point 6
52: Offset	Offset amount of power shift output voltage
52: PZ-DA initial	Pz-DA curve initial

7) Press ENTER.

When selecting adjustment of power shift output voltage (Actual machine) "52: Adjustment" → To 8-1)
When selecting Pz [Power shift pressure] - Point ? "52: Point ? PZ" → To 8-2)
When selecting DA [Power shift output voltage] - Point ? "52: Point ? DA" → To 8-3)
When selecting offset amount of power shift output voltage "52: Offset" → To 8-4)
When selecting Pz-DA curve initial "52: PZ-DA initial" → To 8-5)

Maintenance No.52 Setting of Pz-DA curve

Adjustment of power shift output voltage (Actual machine)

- Find out the power shift output voltage when the power shift pressure that read with watching the pressure gauge is same as Pz [Power shift pressure] (displayed on LCD2) and correct the individual differrence.
- The gap between the actual machine adjustment value and the initial value is reflected in DA of other points.

		Adjustment	Reflection
Tier2	LS-308HII / LS-308H5	Point 5	Point 1, 2, 3, 4, 6
	LS-348H5	Point 5	Point 1, 2, 3, 4, 6
	LS-138H5 from LS138-4264	Point 2	Point 1, 3, 4, 5
Tier3	LS-238H5	Point 3	Point 1, 2, 4, 5
	LS-248H5	Point 3	Point 1, 2, 4, 5
	LS-348H5	Point 3	Point 1, 2, 4, 5

8-1) LCD1

52: Adjustment
& : start

LCD2 Pz [Power shift pressure] - Point ? [***.*kgf/cm^2]
LCD3 DA [Power shift output voltage] - Point ? [**.**V]
LCD4 Pzmax [Max. power shift pressure] [0.0kgf/cm^2]
LCD5 Power shift output voltage [**.**V]

(When RETURN is pressed, go to the step 2).)

		Power shift output voltage (displayed on LCD5)
Tier2	LS-308HII / LS-308H5	DA Point 5 - 3.00V
	LS-348H5	DA Point 5 - 3.00V
	LS-138H5 from LS138-4264	10.00V
Tier3	LS-238H5	DA Point 3 - 3.00V
	LS-248H5	DA Point 3 - 3.00V
	LS-348H5	10.00V → DA Point 3 + 3.00V

9-1) Press ##.

10-1) LCD1

52: Adjustment
& : Set voltage

LCD3 DA [Power shift output voltage] - Point ? [**.**V] Blinks

11-1) The power shift output voltage (displayed on LCD5) changes by 0.1V, and the power shift pressure (the pressure gauge) changes.

		Power shift output voltage (displayed on LCD5)	Power shift pressure (the pressure gauge)
Tier2	LS-308HII / LS-308H5	0.10V increase	Fall
	LS-348H5	0.10V increase	Fall
	LS-138H5 from LS138-4264	0.10V decrease	Fall
Tier3	LS-238H5	0.10V increase	Rise
	LS-248H5	0.10V increase	Rise
	LS-348H5	0.10V decrease	Rise

When stopping the setting, press RETURN before making the step 12-1). (Go to the step 5).)

12-1) Press ENTER when the power shift pressure (the pressure gauge) is same as Pz [Power shift pressure] (displayed on LCD2).

13-1) Return to the step 5).
14-1) Make sure that the indication on LCD3 shows the power shift output voltage (displayed on LCD5) with ENTER pressed.

15-1) Press RETURN.
16-1) Return to the step 2).
17-1) Place the maintenance key switch in "OFF" position.

Maintenance No.52 Setting of Pz-DA curve

Pz [Power shift pressure] - Point ?

8-2) LCD1

Select content with ##, and press &.
Pz ? ***.*

LCD2	Pz [Power shift pressure] - Point ?	[***.*kgf/cm^2]	Blinks
LCD3	DA [Power shift output voltage] - Point ?	[**.**V]	
LCD4	Pzmax [Max. power shift pressure]	[0.0kgf/cm^2]	
LCD5	Blank		

The power shift output voltage displayed on LCD3 is output.
(When RETURN is pressed, go to the step 5).)

9-2) Read the power shift pressure with watching the pressure gauge connected on the power shift pressure port.
10-2) Press ## and select the power shift pressure that read with watching the pressure gauge.
When stopping the setting, press RETURN before making the step 11-2). (Go to the step 5).)

11-2) Press ENTER.
12-2) Return to the step 5).
13-2) Make sure that the indication on LCD2 shows the power shift pressure selected.

14-2) Press RETURN.
15-2) Return to the step 2).
16-2) Place the maintenance key switch in "OFF" position.

DA [Power shift output voltage] - Point ?

8-3) LCD1

Select content with ##, and press &.
DA ? **.**

LCD2	Pz [Power shift pressure] - Point ?	[***.*kgf/cm^2]	
LCD3	DA [Power shift output voltage] - Point ?	[**.**V]	Blinks
LCD4	Pzmax [Max. power shift pressure]	[0.0kgf/cm^2]	
LCD5	Blank		

The power shift output voltage displayed on LCD3 is output.
(When RETURN is pressed, go to the step 5).)

9-3) Press ## and select the power shift output voltage.
When stopping the setting, press RETURN before making the step 10-3). (Go to the step 5).)

10-3) Press ENTER.
11-3) Return to the step 5).
12-3) Make sure that the indication on LCD3 shows the power shift output voltage selected.

13-3) Press RETURN.
14-3) Return to the step 2).
15-3) Place the maintenance key switch in "OFF" position.

Maintenance No.52 Setting of Pz-DA curve

Offset amount of power shift output voltage

8-4) LCD1 Select content with ##, and press &.
.

LCD2 Offset amount of power shift output voltage [**.**V] Blinks
LCD3 to LCD5 Blank

9-4) Press ## and select the offset amount of power shift output voltage.
When stopping the setting, press RETURN before making the step 10-4). (Go to the step 5).)

10-4) Press ENTER.
11-4) Return to the step 5).
12-4) Make sure that the indication on LCD2 shows the offset amount of power shift output voltage selected.

13-4) Press RETURN.
14-4) Return to the step 2).
15-4) Place the maintenance key switch in "OFF" position.

Pz-DA curve initial

8-5) LCD1 Select content with ##, and press &.
****

LCD2 to LCD3 - - - -
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 5).)

9-5) Press ## and select 5252.

10-5) Press ENTER.
LCD2 to LCD3 - - - - → HHHH → - - - -

11-5) Press RETURN.
12-5) Return to the step 5).
13-5) Press RETURN.

14-5) Return to the step 2).
15-5) Place the maintenance key switch in "OFF" position.

Initial value

Pz-DA curve : Refer to the table.
Offset amount of power shift output voltage : 0.00V

Setable value

0.0kgf/cm² ≦ Pz [Power shift pressure] ≦ 50.0kgf/cm²
0.00V ≦ DA [Power shift output voltage] ≦ 10.00V
0.00V ≦ Offset amount of power shift output voltage ≦ 10.00V

Maintenance No.52 Setting of Pz-DA curve - Table

		Initial value											
		LS-108H5		LS-138H5		LS-218H5	LS-238H5		LS-248H5		LS-348H5		LS-308HII / LS-308H5
		Tier2	Tier3	Tier2		Tier2	Tier2	Tier3	Tier2	Tier3	Tier2	Tier3	Tier2
					From LS138-4264								
Pz (kgf/cm^2) [Power shift pressure]	Point 1	40.0	40.0	40.0	21.8	40.0	40.0	40.0	40.0	40.0	35.1	31.3	34.6
	Point 2	40.0	40.0	40.0	17.5	40.0	40.0	21.0	40.0	21.0	26.0	24.5	32.6
	Point 3	40.0	40.0	40.0	9.0	40.0	40.0	11.0	40.0	11.0	16.9	19.0	16.7
	Point 4	40.0	40.0	40.0	5.5	40.0	40.0	7.3	40.0	7.3	11.3	11.0	10.0
	Point 5	40.0	40.0	40.0	1.0	40.0	40.0	3.5	40.0	3.5	5.7	3.0	3.3
	Point 6	40.0	40.0	40.0	0.0	40.0	40.0	0.0	40.0	0.0	0.0	0.0	0.0
DA (V) [Power shift output voltage]	Point 1	0.00	0.00	0.00	10.00 [10.000]	0.00	0.00	8.88 [8.884]	0.00	8.88 [8.884]	0.58 [0.580]	0.58 [0.580]	0.36 [0.362]
	Point 2	0.00	0.00	0.00	8.55 [8.551]	0.00	0.00	5.65 [5.652]	0.00	5.65 [5.652]	2.82 [2.826]	2.75 [2.754]	1.23 [1.232]
	Point 3	0.00	0.00	0.00	5.65 [5.652]	0.00	0.00	3.47 [3.478]	0.00	3.47 [3.478]	5.07 [5.072]	4.20 [4.203]	4.92 [4.928]
	Point 4	0.00	0.00	0.00	4.20 [4.203]	0.00	0.00	2.75 [2.754]	0.00	2.75 [2.754]	6.05 [6.058]	5.65 [5.652]	6.08 [6.087]
	Point 5	0.00	0.00	0.00	2.75 [2.754]	0.00	0.00	2.02 [2.029]	0.00	2.02 [2.029]	7.04 [7.043]	7.10 [7.101]	7.24 [7.246]
	Point 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.04 [8.047]	10.00 [10.000]	7.81 [7.817]

<Reference>

Pressure-reducing valve Current-pressure profile	None	None	None	Direct proportion	None	None	Direct proportion	None	Direct proportion	Inverse proportion	Inverse proportion	Inverse proportion

Maintenance No.53 Setting of N-Pz curve

Function

This enables to change Pz [Power shift pressure] of Pz-DA curve that shows relation between N [Engine speed] and Pz [Power shift pressure].
Also this enables to make initializing.

Setting procedures ##: ΔV &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.=53 with ##.
4) Press ENTER.

5) LCD1

N Point1 PZ1
&: next ##: other

LCD2 N [Engine speed] - Point 1 [****rpm]
LCD3 Pz [Power shift pressure] No.1 - Point 1 [***.*kgf/cm^2]
LCD4 Pz [Power shift pressure] No.2 - Point 1 [***.*kgf/cm^2]
LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.

N Point1 PZ1	Pz [Power shift pressure] No.1 - Point 1
N Point2 PZ1	Pz [Power shift pressure] No.1 - Point 2
:	:
N Point10 PZ1	Pz [Power shift pressure] No.1 - Point 10
N Point1 PZ2	Pz [Power shift pressure] No.2 - Point 1
:	:
N Point10 PZ2	Pz [Power shift pressure] No.2 - Point 10
N-PZ initial	N-Pz curve initial

7) Press ENTER.

When selecting Pz [Power shift pressure] No.1- Point ? "N Point ? PZ1" → To 8-1)
When selecting Pz [Power shift pressure] No.2- Point ? "N Point ? PZ2" → To 8-2)
When selecting N-Pz curve initial "N-PZ initial" → To 8-3)

Pz [Power shift pressure] No.1- Point ?

8-1) LCD1

Select content with ##, and press &.
Pz ? ***.*

LCD2 N [Engine speed] - Point ? [****rpm]
LCD3 Pz [Power shift pressure] No.1 - Point ? [***.*kgf/cm^2] Blinks
LCD4 Pz [Power shift pressure] No.2 - Point ? [***.*kgf/cm^2]
LCD5 Blank
(When RETURN is pressed, go to the step 5).)

9-1) Press ## and select the power shift pressure that read with watching the pressure gauge.
When stopping the setting, press RETURN before making the step 10-1). (Go to the step 5).)

10-1) Press ENTER.
11-1) Return to the step 5).
12-1) Make sure that the indication on LCD3 shows the power shift pressure selected.

13-1) Press RETURN.
14-1) Return to the step 2).
15-1) Place the maintenance key switch in "OFF" position.

Maintenance No.53 Setting of N-Pz curve

Pz [Power shift pressure] No.2- Point ?

8-2) LCD1 Select content with ##, and press &.
Pz ? ***.*

LCD2 N [Engine speed] - Point ? [****rpm]
LCD3 Pz [Power shift pressure] No.1 - Point ? [***.*kgf/cm^2]
LCD4 Pz [Power shift pressure] No.2 - Point ? [***.*kgf/cm^2] Blinks
LCD5 Blank
(When RETURN is pressed, go to the step 5).)

9-2) Press ## and select the power shift pressure that read with watching the pressure gauge.
When stopping the setting, press RETURN before making the step 10-2). (Go to the step 5).)

10-2) Press ENTER.
11-2) Return to the step 5).
12-2) Make sure that the indication on LCD4 shows the power shift pressure selected.

13-2) Press RETURN.
14-2) Return to the step 2).
15-2) Place the maintenance key switch in "OFF" position.

N-Pz curve initial

8-3) LCD1 Select content with ##, and press &.
****

LCD2 to LCD3 - - - -
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 5).)

9-3) Press ## and select 5353.

10-3) Press ENTER.
LCD2 to LCD3 - - - - ⟶ HHHH ⟶ - - - -

11-3) Press RETURN.
12-3) Return to the step 5).
13-3) Press RETURN.

14-3) Return to the step 2).
15-3) Place the maintenance key switch in "OFF" position.

Initial value
Refer to the table.

Setable value
0.0kgf/cm^2 ≦ Pz [Power shift pressure] ≦ 50.0kgf/cm^2

Maintenance No.53 Setting of N-Pz curve - Table

			Initial value										
			LS-108H5		LS-138H5		LS-218H5	LS-238H5		LS-248H5		LS-348H5		LS-308HII / LS-308H5
			Tier2	Tier3	Tier2		Tier2	Tier2	Tier3	Tier2	Tier3	Tier2	Tier3	Tier2
						From LS138-4264								
N (rpm) [Engine speed]		Point 1	600	600	600	600	600	600	700	600	700	700	600	600
		Point 2	800	800	800	800	800	800	900	800	900	900	800	800
		Point 3	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1000	1000
		Point 4	1200	1200	1200	1100	1200	1200	1100	1200	1100	1300	1100	1200
		Point 5	1400	1400	1400	1200	1400	1400	1200	1400	1200	1400	1200	1400
		Point 6	1600	1600	1600	1300	1600	1600	1300	1600	1300	1500	1300	1600
		Point 7	1800	1800	1800	1400	1800	1800	1400	1800	1400	1600	1400	1800
		Point 8	2000	2000	2000	1500	2000	2000	1500	2000	1500	1700	1600	2000
		Point 9	2200	2200	2200	1600	2200	2200	1600	2200	1600	1800	1800	2200
		Point 10	2400	2400	2400	2400	2400	2400	2400	2400	2400	2200	2000	2400
Pz (kgf/cm^2) [Power shift pressure]	No.1 For w/ Rack sensor <Normal>	Point 1	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	26.2 [26.29]	40.0 [40.00]	40.0 [40.00]	32.9 [32.90]	40.0 [40.00]	29.8 [29.82]	7.1 [7.10]	23.3 [23.37]	34.6 [34.60]
		Point 2	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	24.8 [24.81]	40.0 [40.00]	40.0 [40.00]	23.3 [23.33]	40.0 [40.00]	21.2 [21.28]	7.1 [7.10]	12.7 [12.71]	34.6 [34.60]
		Point 3	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	15.2 [15.28]	40.0 [40.00]	40.0 [40.00]	18.6 [18.67]	40.0 [40.00]	17.0 [17.00]	2.2 [2.20]	3.1 [3.10]	29.9 [29.91]
		Point 4	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	11.0 [11.08]	40.0 [40.00]	40.0 [40.00]	14.9 [14.95]	40.0 [40.00]	13.7 [13.70]	0.0	0.0	22.3 [22.31]
		Point 5	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	7.6 [7.62]	40.0 [40.00]	40.0 [40.00]	11.0 [11.02]	40.0 [40.00]	10.0 [10.00]	0.0	0.0	17.5 [17.51]
		Point 6	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	3.9 [3.97]	40.0 [40.00]	40.0 [40.00]	7.3 [7.31]	40.0 [40.00]	6.6 [6.67]	0.0	0.0	11.4 [11.41]
		Point 7	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	0.6 [0.68]	40.0 [40.00]	40.0 [40.00]	3.6 [3.67]	40.0 [40.00]	3.3 [3.35]	0.0	0.0	7.7 [7.78]
		Point 8	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	0.0	40.0 [40.00]	40.0 [40.00]	0.0	40.0 [40.00]	0.0	0.0	0.0	7.7 [7.78]
		Point 9	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	0.0	40.0 [40.00]	40.0 [40.00]	0.0	40.0 [40.00]	0.0	0.0	0.0	7.7 [7.78]
		Point 10	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	0.0	40.0 [40.00]	40.0 [40.00]	0.0	40.0 [40.00]	0.0	0.0	0.0	7.7 [7.78]
	No.2 For w/ Rack sensor <Abnormal> For w/o Rack sensor	Point 1	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	26.2 [26.29]	40.0 [40.00]	40.0 [40.00]	32.9 [32.90]	40.0 [40.00]	29.8 [29.82]	35.1 [35.10]	23.3 [23.37]	34.6 [34.60]
		Point 2	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	24.8 [24.81]	40.0 [40.00]	40.0 [40.00]	23.3 [23.33]	40.0 [40.00]	21.2 [21.28]	24.4 [24.40]	12.7 [12.71]	34.6 [34.60]
		Point 3	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	15.2 [15.28]	40.0 [40.00]	40.0 [40.00]	18.6 [18.67]	40.0 [40.00]	17.0 [17.00]	14.5 [14.50]	3.1 [3.10]	29.9 [29.91]
		Point 4	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	11.0 [11.08]	40.0 [40.00]	40.0 [40.00]	14.9 [14.95]	40.0 [40.00]	13.7 [13.70]	5.5 [5.50]	0.0	22.3 [22.31]
		Point 5	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	7.6 [7.62]	40.0 [40.00]	40.0 [40.00]	11.0 [11.02]	40.0 [40.00]	10.0 [10.00]	3.5 [3.50]	0.0	17.5 [17.51]
		Point 6	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	3.9 [3.97]	40.0 [40.00]	40.0 [40.00]	7.3 [7.31]	40.0 [40.00]	6.6 [6.67]	3.0 [3.00]	0.0	13.7 [13.74]
		Point 7	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	0.6 [0.68]	40.0 [40.00]	40.0 [40.00]	3.6 [3.67]	40.0 [40.00]	3.3 [3.35]	3.0 [3.00]	0.0	15.6 [15.67]
		Point 8	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	0.0	40.0 [40.00]	40.0 [40.00]	0.0	40.0 [40.00]	0.0	3.2 [3.20]	0.0	18.9 [18.90]
		Point 9	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	0.0	40.0 [40.00]	40.0 [40.00]	0.0	40.0 [40.00]	0.0	3.5 [3.50]	0.0	18.9 [18.90]
		Point 10	40.0 [40.00]	40.0 [40.00]	40.0 [40.00]	0.0	40.0 [40.00]	40.0 [40.00]	0.0	40.0 [40.00]	0.0	3.5 [3.50]	0.0	18.9 [18.90]

Maintenance No.54 Setting of management time

Function

This enables to change the hour meter and the LMI power ON time.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

```
Select content with ##, and press &.
Mainte No.= 0
```

LCD2 to LCD5 Blank

3) Set the Mainte No.=54 with ##.
4) Press ENTER.
5) LCD1

```
54: Hour meter
& : next  ## : other
```

LCD2 Hour meter (Place of 10000)
LCD3 Hour meter (Place of 1 to 1000)
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.

54: Hour meter Setting of hour meter
↕
54: Power ON Setting of LMI power ON time

7) Press ENTER.

When selecting setting of hour meter "54: Hour meter" → To 8-1)
When selecting setting of LMI power ON time "54: Power ON" → To 8-2)

Setting of hour meter

8-1) LCD1

```
Select content with ##, and press &.
*****
```

LCD2 Hour meter (Place of 10000)
LCD3 Hour meter (Place of 1 to 1000)
LCD4 to LCD5 Blank

9-1) Press ## and set the hour meter.
When stopping the setting, press RETURN before making the step 10-1). (Go to the step 5).)

10-1) Press ENTER.
11-1) Return to the step 5).

12-1) Press RETURN.
13-1) Return to the step 2).
14-1) Place the maintenance key switch in "OFF" position.

Maintenance No.54 Setting of management time

Setting of LMI power ON time

8-2) LCD1

Select content with ##, and press &.
*****

LCD2 LMI power ON time (Place of 10000)
LCD3 LMI power ON time (Place of 1 to 1000)
LCD4 to LCD5 Blank

9-2) Press ## and set the LMI power ON time.
When stopping the setting, press RETURN before making the step 10-2). (Go to the step 5).)

10-2) Press ENTER.
11-2) Return to the step 5).

12-2) Press RETURN.
13-2) Return to the step 2).
14-2) Place the maintenance key switch in "OFF" position.

Initial value

0 hour
<<Caution>>
These times are not initialized by Maintenance No.9 (Setting of initial value) - "1.All initial".
Hour meter is initialized by Maintenance No.9 (Setting of initial value) - "23.Hour meter initial".
LMI Power ON time is initialized by Maintenance No.9 (Setting of initial value) - "24.LMI Power ON time initial".

Setable value

0hour ≦ Hour meter ≦ 49999hours
0hour ≦ LMI Power ON time ≦ 49999hours

Maintenance No.55 Setting of boom protection device auto stop judgement time

Function

This enables to change the boom protection device auto stop judgement time.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=55 with ##.
4) Press ENTER.
5) LCD1

55: Judge time
Press &.

LCD2 Boom protection device auto stop judgement time [seconds]
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.
7) LCD1

Select content with ##, and press &.
.[sec]

LCD2 Blinks

8) Press ## and select the judgement time.
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD2 display goes out.
9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD2 shows the judgement time selected.
12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

0.25seconds [5]

Setable value

0.00second [0] ≦ Boom protection device auto stop judgement time ≦ 10.00seconds [200]
The setting is every 0.05 seconds.

Maintenance No.58 Setting of rigging mode selection

Function

This enables to change the rigging mode selection.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

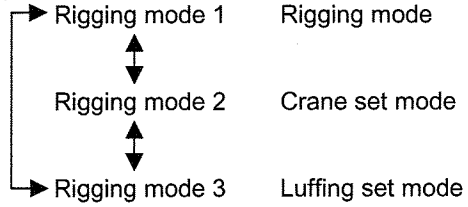
LCD2 to LCD5 Blank

3) Set the Mainte No.=58 with ##.
4) Press ENTER.
5) LCD1

Rigging mode 1
& : next ## : other

LCD2 Rigging mode
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.



7) Press ENTER.
8) LCD1

Select content with ##, and press &.
*

9) Press ## and select the value.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
10) Press ENTER.
11) Return to the step 5).
12) Make sure that the indication on LCD2 shows a value selected.
13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

Rigging mode	1 : Present
Crane set mode	1 : Present
Luffing set mode	2 : Present

Setable value

Rigging mode	0 : None	1 : Present
Crane set mode	0 : None	1 : Present
Luffing set mode	0 : None	2 : Present

Maintenance No.59 Setting of control selection

Function

This enables to change "Present" or "None" for corresponding to various controls & functions.
Also this enables to make initializing.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1 [Select content with ##, and press &. / Mainte No.= 0]

   LCD2 to LCD5 Blank
3) Set the Mainte No.=59 with ##.
4) Press ENTER.

5) LCD1 [Control select 1 / & : next ## : other]

   LCD2 Setting Value
   LCD3 to LCD5 Blank
   (When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item. (Refer to the table.)

7) Press ENTER.

When selecting "Control select??". → To 8-1)
When selecting "Pressure - 3.Fixed power shift pressure". → To 8-2)
When selecting "Initialize - 19.Initial". → To 8-3)

[Control select??]

8-1) LCD1 [Select content with ##, and press &. / @]

   LCD2 Setting Value Blinks
   LCD3 to LCD5 Blank
   (When RETURN is pressed, go to the step 2).)

9-1) Press ## and select setting value.
10-1) Press ENTER.
11-1) Make sure that the indication on LCD2 shows value selected.

12-1) Return to the step 5).
13-1) Press RETURN.
14-1) Return to the step 2).
15-1) Place the maintenance key switch in "OFF" position.

[Pressure - 3.Fixed power shift pressure]

8-2) LCD1 [Sellect content with ##, and press &. / @@@.@]

   LCD2 Setting Value - Fixed power shift pressure (kgf/cm^2) Blinks
   LCD3 to LCD5 Blank
   (When RETURN is pressed, go to the step 2).)

9-2) Press ## and select setting value.
10-2) Press ENTER.
11-2) Make sure that the indication on LCD2 shows value selected.

12-2) Return to the step 5).
13-2) Press RETURN.
14-2) Return to the step 2).
15-2) Place the maintenance key switch in "OFF" position.

Maintenance No.59 Setting of control selection

Initialize - 19.Initial

8-3) LCD1 Sellect content with ##, and press &.
@@@@

LCD2 to LCD5 Blank

(When RETURN is pressed, go to the step 2).)

9-3) Press ## and set 5959.
10-3) Press ENTER.
LCD2 to LCD3 Blank ⟶ HHHH ⟶ Blank

11-3) Return to the step 5).
12-3) Press RETURN.
13-3) Return to the step 2).
14-3) Place the maintenance key switch in "OFF" position.

Initial value
Refer to the table.

Setable value
Refer to the table.

Maintenance No.59 Setting of control selection - Table

LCD1	Setting item	Setable value	Initial value										
			LS-108H5		LS-138H5	LS-218H5	LS-238H5		LS-248H5		LS-348H5		LS-308HII / LS-308H5
			Tier2	Tier3	Tier2	Tier2	Tier2	Tier3	Tier2	Tier3	Tier2	Tier3	Tier2
Control select 1	1.Power shift control	0 : None 1 : Present - Tier2 I-Pz Inverse proportion 2 : Present - Tier2 I-Pz Direct proportion 3 : Present - Tier3 I-Pz Inverse proportion 4 : Present - Tier3 I-Pz Direct proportion	0	0	0 / 2 From LS138-4264	0	0	4	0	4	1	3	1
Control select 2	2.Fixed power shift control	0 : None 1 : Present	0	0	0	0	0	0	0	0	0	0	0
Pressure	3.Fixed power shift pressure	0.0kgf/cm^2≦≦40.0kgf/cm^2	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Control select 3	4.Pump control	0 : None 1 : Present	0	0	0	0	0	0	0	0	1	1	1
Control select 5	6.Winch motor control	0 : None 1 : Present	0	0	0	0	0	0	0	0	1	1	1
Control select 6	7.Throttle motor control	0 : None 1 : Present	0	0	0	0	0	0	0	0	1	0	0
Control select 7	8.Foot pedal throttle control	0 : None 1 : Present	0	1	0	0	0	1	0	1	1	1	0
Control select10	11.Boom protection device	0 : None 1 : Present	1	1	1	1	1	1	1	1	1	1	1
Control select11	12.Slowdown device	0 : None 1 : Present	0	0	0	0	0	0	0	0	1	1	1
Control select12	13.Rigging mode	0 : None 1 : Present - Other models 3 : Present - LS-348H5 4 : Present - LS-248H5	1	1	1	1	1	1	4	4	3	3	1
Control select13	14.Anti-two block limit	0 : None 1 : Present	0	0	0	0	0	0	0	0	0	0	0
Control select14	15.Anti-two block limit (slowdown)	0 : None 1 : Present	0	0	0	0	0	0	0	0	0	0	0
Control select15	16.Hook height indicator	0 : None 1 : Present	0	0	0	0	0	0	0	0	0	0	0
Control select17	18.High idle cut control	0 : None 1 : Present	0	0	0	0	0	0	0	0	1	0	0
Initialize	19.Initial	0 : None 1 : Present	---	---	---	---	---	---	---	---	---	---	---
Control select18	20.Engine speed display	0 : None 1 : Present	0	1	1	1	1	1	1	1	1	1	1
Control select19	21.Winch motor control (Switch control mode)	0 : None 1 : Present	0	0	0	0	0	0	0	0	1	1	1
Control select20	22.S/C control mode	0 : None 1 : Present	0	0	0	0	0	0	0	0	0	0	0
Control select21	23.ECU / ECM control	0 : None 1 : Present - Grip 2 : Present - Throttle volume	0	2	0	0	0	2	0	2	0	1	1
Control select22	24.Winch motor control (3rd speed)	0 : None 1 : Present	0	0	0	0	0	0	0	0	0	0	1

Maintenance No.60 A/D check

Function

This displays A/D signals.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=60 with ##.
4) Press ENTER.
5) LCD1

60: AD 0– 3
: Select ch

LCD2 to LCD5 A/D conversion value (Refer to the followings)

6) Press ## and select the channel.

		Signal name <For LBCE Model>	Analogue circuit input signal	A/D conversion value
LCD1	60 : AD 0- 3			
LCD2	ch 0	BOOM HOISTING ROPE TENSION	0 - 18mV	500 - 4500
LCD3	ch 1	JIB HOISTING ROPE TENSION	0 - 18mV	500 - 4500
LCD4	ch 2	BOOM ANGLE	-3.6 - 1.8V	500 - 4500
LCD5	ch 3	JIB ANGLE	-3.6 - 1.8V	500 - 4500
LCD1	60 : AD 4- 7			
LCD2	ch 4	GRIP THROTTLE ROTATING ANG. THROTTLE VOLUME ROTATING ANG.	0 - 12V	0 - 4800
LCD3	ch 5	-----	0 - 12V	0 - 4800
LCD4	ch 6	THROTTLE MOTOR FEEDBACK	0 - 12V	0 - 4800
LCD5	ch 7	RACK SENSOR	0 - 5V	0 - 2500
LCD1	60 : AD 8-11			
LCD2	ch 8	FRONT DRUM ROPE TENSION [RADIO LOAD CELL]	0 - 5V	0 - 2500
LCD3	ch 9	REAR/3RD DRUM ROPE TENSION [RADIO LOAD CELL]	0 - 5V	0 - 2500
LCD4	ch 10	JIB ANGLE FOR RIGGING MODE [RELATIVE ANGLE]	0 - 12V	0 - 4800
LCD5	ch 11	FOOT THROTTLE	0 - 12V	0 - 4800
LCD1	60 : AD 12-15			
LCD2	ch 12	-----	0 - 12V	0 - 4800
LCD3	ch 13	-----	0 - 12V	0 - 4800
LCD4	ch 14	MAINTENANCE MODE SW	0 - 12V	0 - 4800
LCD5	ch 15	SENSOR POWER SUPPLY	-----	3662

E-25 Sensor power supply error
"A/D conversion value＜3510" or "A/D conversion value≧3814"

7) Press RETURN.
8) Return to the step 2).
9) Place the maintenance key switch in "OFF" position.

Maintenance No.61 D/I check

Function

This displays the condition of D/I signals.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

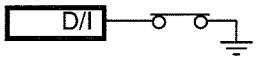
3) Set the Mainte No.=61 with ##.
4) Press ENTER.
5) LCD1

61: DI 0- 7
: Select ch

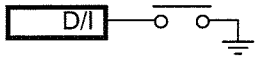
LCD2 to LCD5 Condition of D/I signals (Refer to the followings)

6) Press ## and select the channel.

0 : GND



1 : OPEN



			Signal name <For LBCE Model>	
LCD1	61 : DI	0- 7		
LCD2	ch 1	ch 0	ch 0	WINCH OPERATION MODE SW
LCD3	ch 3	ch 2	ch 1	FRONT MOTOR HI SPEED SW
LCD4	ch 5	ch 4	ch 2	-----
LCD5	ch 7	ch 6	ch 3	-----
			ch 4	-----
			ch 5	THROTTLE FIXING SW
			ch 6	REAR MOTOR HI SPEED SW
			ch 7	RIGGING MODE SW
LCD1	61 : DI	8-15		
LCD2	ch 9	ch 8	ch 8	DIAG LAMP-1 RED
LCD3	ch 11	ch 10	ch 9	BY-PASS CONNECTOR
LCD4	ch 13	ch 12	ch 10	LMI OVERRIDE MODE SW
LCD5	ch 15	ch 14	ch 11	LUFFER MODE DETECTION
			ch 12	3rd/4th DRUM HOISTING DETECT
			ch 13	INSPECTION MODE SW
			ch 14	LUFFER BOOM ANGLE FIXING
			ch 15	TRAVEL DETECTION PSW
LCD1	61 : DI	16-23		
LCD2	ch 17	ch 16	ch 16	FRONT DRUM HOISTING DETECT
LCD3	ch 19	ch 18	ch 17	FRONT DRUM LOWERING DETECT
LCD4	ch 21	ch 20	ch 18	VOICE ALARM ON-OFF
LCD5	ch 23	ch 22	ch 19	3rd/4th DRUM LOWERING DETECT
			ch 20	BOOM HOISTING DETECT
			ch 21	BOOM LOWERING DETECT
			ch 22	REAR DRUM HOISTING DETECT
			ch 23	REAR DRUM LOWERING DETECT
LCD1	61 : DI	24-31		
LCD2	ch 25	ch 24	ch 24	BOOM HOIST LIMIT
LCD3	ch 27	ch 26	ch 25	JIB HOIST LIMIT
LCD4	ch 29	ch 28	ch 26	ANTI-TWO BLOCK
LCD5	ch 31	ch 30	ch 27	FREEFALL ALARM
			ch 28	PUMP CONTROL SW HIGH SPEED
			ch 29	PILOT PRESS. DETECT
			ch 30	FREE MODE ALARM
			ch 31	-----

Maintenance No.61 D/I check

			Signal name <For LBCE Model>	
LCD1	61 : DI	32-39		
LCD2	ch 33	ch 32	ch 32	VOICE ALARM ON-OFF
LCD3	ch 35	ch 34	ch 33	WORKING MODE SELECT
LCD4	ch 37	ch 36	ch 34	-----
LCD5	ch 39	ch 38	ch 35	OVERRIDE MASTER CONTROL KEY
			ch 36	PUMP CONTROL SW ULTRA-LOW SPEED
			ch 37	-----
			ch 38	-----
			ch 39	DRUM REVOLUTION DETECT. STOP

LCD1	61 : DIPSW	0- 7	
LCD2	SW1	SW0	These switches are not used though equipped in SML-10.
LCD3	SW3	SW2	
LCD4	SW5	SW4	
LCD5	SW7	SW6	

LCD1	61 : DIPSW	8-15	
LCD2	SW9	SW8	These switches are not equipped in SML-10.
LCD3	SW11	SW10	
LCD4	SW13	SW12	
LCD5	SW15	SW14	

7) Press RETURN.
8) Return to the step 2).
9) Place the maintenance key switch in "OFF" position.

Maintenance No.62 Touch switch check

Function

This displays the condition of touch switch signals.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

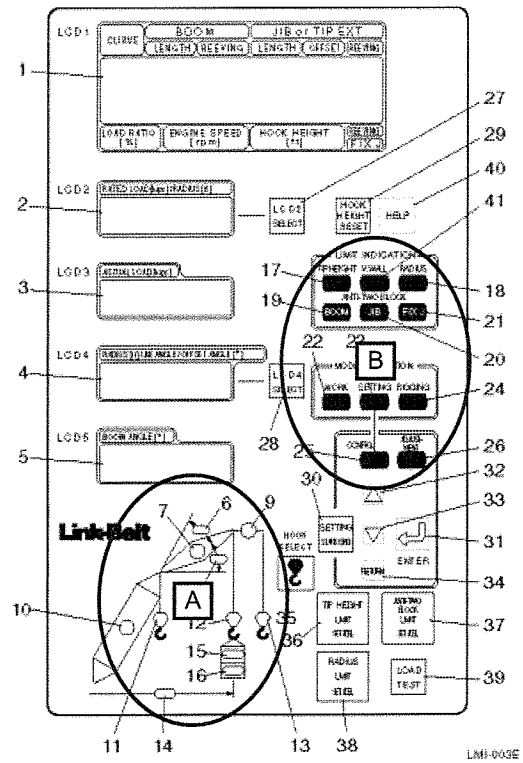
LCD2 to LCD5 Blank

3) Set the Mainte No.=62 with ##.
4) Press ENTER.
5) LCD1

62: Touch SW ??

LCD2 to LCD5 Blank

6) While the touch switch is pressed, the number is displayed on LCD1 and the LEDs are lit.



	Number	LED	
27. LCD2 Select Switch	01	A	
(LCD3 Select Switch	04	A	)
28. LCD4 Select Switch	05	A	
(LCD5 Select Switch	06	A	)
29. Hook Height Reset Switch	02	B	
30. Setting Mode Start/End Switch	08	B	
31. Enter Switch	10	B	
32. △Switch	07	B	
33. ▽Switch	09	B	
34. Return Switch	Return to the step 2).		
35. Hook Select Switch	11	A	
36. Tip Height Limit Set/Delete Switch	13	A	
37. Anti-two Block Limit Set/Delete Switch	14	A	
38. Radius Limit Set/Delete Switch	15	A	
39. Load Test Switch	16	A	
40. Help Switch	Help message is displayed on LCD1.		

7) Press RETURN.
8) Return to the step 2).
9) Place the maintenance key switch in "OFF" position.

Maintenance No.63 Counter check

Function

This displays counter signals.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=63 with ##.
4) Press ENTER.
5) LCD1

63: CNT
: Select

LCD2 to LCD4 Number of pulses (Refer to the followings)
LCD5 Blank

6) Press ## and select counter.

Single phase counter

		Signal name <For LBCE Model>
LCD1	63 : CNT	
LCD2	ch 0	ENGINE REV.
LCD3	ch 1	-----
LCD4	ch 2	-----
LCD5	Blank	

Two phase counter

		Signal name <For LBCE Model>	
LCD1	63 : U/D CNT		
LCD2	ch 0	FRONT DRUM REVOLUTION	<Not used>
LCD3	ch 1	REAR DRUM REVOLUTION	<Not used>
LCD4	ch 2	-----	
LCD5	Blank		

<Reference>
When pushing "Hook Height Reset Switch", the two phase counter are reset to "0 pulse".

7) Press RETURN.
8) Return to the step 2).
9) Place the maintenance key switch in "OFF" position.

Maintenance No.64 LCD & LED check

Function

This checks LCDs and LEDs.

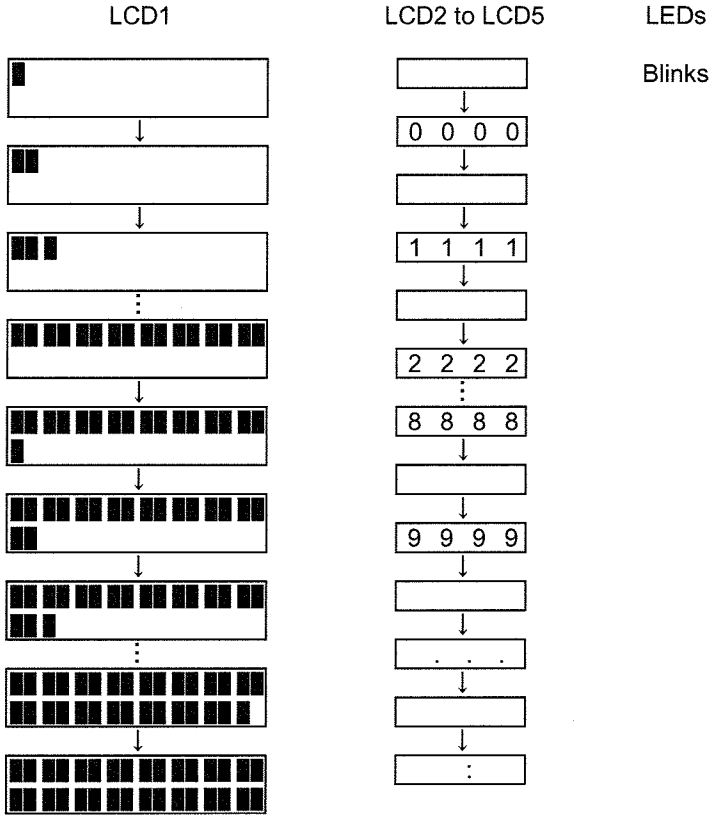
Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=64 with ##.
4) Press ENTER.
5)



6) Press RETURN.
7) Return to the step 2).
8) Place the maintenance key switch in "OFF" position.

Maintenance No.65 D/O check

Function

This enables to output D/O signals.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=65 with ##.
4) Press ENTER.
5) LCD1

65: D/O & : Output
: Select ch ??

LCD2 Condition of D/O signal oFF ◀▶ on
LCD3 to LCD5 Blank

6) Press ## and select the channel.

Signal name <For LBCE Model>

ch 00	OVERLOAD LIMIT
ch 01	BOOM HOISTING LIMIT
ch 02	BOOM LOWERING LIMIT
ch 03	JIB HOISTING LIMIT
ch 04	JIB LOWERING LIMIT
ch 05	ANTI-TWO BLOCK LIMIT
ch 06	BOOM PROTECTION
ch 07	LMI OVERRIDE MODE
ch 08	-----
ch 09	-----
ch 10	RED ROTATING LAMP
ch 11	YELLOW ROTATING LAMP
ch 12	LIMIT STOP RELEASE
ch 13	THROTTLE UP
ch 14	THROTTLE DOWN
ch 15	OVERLOAD LIMIT
ch 16	OFFSET ANGLE LIMIT
ch 17	JIB ANGLE LIMIT
ch 18	OFFSET ANGLE LIMIT
ch 19	BRINK SIGNAL
ch 20	LMI OVERRIDE MODE
ch 21	TIMER SIGNAL
ch 22	LUFFER TOP LIFTING
ch 23	-----
ch 24	BUZZER in SML-10

7) While ENTER is pressed, D/O signal of the selected channel is output, and "on" is displayed on LCD2.
8) Press RETURN.
9) Return to the step 2).
10) Place the maintenance key switch in "OFF" position.

Maintenance No.66 Voice alarm check

Function

This enables to output the voice alarm.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=66 with ##.
4) Press ENTER.

5) LCD1

66: V/O & : Output
: Select ch ??

LCD2 Condition of the voice alarm oFF ◀▶ on
LCD3 to LCD5 Blank

6) Press ## and select the channel.

Voice alarm ROM [IC52] <CXR0659 Ver0.0>

ch 00	Overload Limit
ch 01	Approaching Limit
ch 02	Boomhoist Limit
ch 03	Jibhoist Limit
ch 04	Boom Lower Limit
ch 05	Jib Lower Limit
ch 06	Two-block Limit
ch 07	Free mode activated
ch 08	Freefall
ch 09	Height Limit Set
ch 10	Radius Limit Set
ch 11	Luffing attachment protection activated
ch 12	Boom protection activated
ch 13	Hydraulic control pressure reduced
ch 14	Override
ch 15	Rigging Mode

7) While ENTER is pressed, the voice alarm of the selected channel is output, and "on" is displayed on LCD2.

8) Press RETURN.
9) Return to the step 2).
10) Place the maintenance key switch in "OFF" position.

Maintenance No.67 D/A check

Function

This enables to output D/A signals.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=67 with ##.
4) Press ENTER.
5) LCD1
```
67: D/A ## : Select ch → Press &
?ch **.**v
```
ch : Blinks

LCD2	D/A channel	
LCD3	Output voltage	[**.**V]
LCD4	Condition of D/A signal	oFF
LCD5	Blank	

6) Press ## and select the channel.

	Signal name <For LBCE Model>
ch 0	POWER SHIFT CONTROL
ch 1	MAIN PUMP CONTROL
ch 2	-----
ch 3	FRONT MOTOR CONTROL
ch 4	REAR MOTOR CONTROL
ch 5	-----
ch 6	-----
ch 7	ENGINE THROTTLE

7) Press ENTER.
8) LCD1
```
67: D/A ## : Set voltage → Press &
?ch $$.$$v
```
v : Blinks

LCD2	D/A channel selected at the step 6)	
LCD3	Output voltage	[**.**V]
LCD4	Condition of D/A signal	oFF
LCD5	Blank	

9) Press ## and set the output voltage.
10) Press ENTER.
11) LCD1
```
67: D/A & : Output
?ch $$.$$v
```

LCD2	D/A channel selected at the step 6)	
LCD3	Output voltage set at the step 9)	[**.**V]
LCD4	Condition of D/A signal	oFF ◀▶ on
LCD5	Blank	

12) While ENTER is pressed, the set output voltage of the selected channel is output, and "on" is displayed on LCD4.
13) When changing the output voltage ⟶ Press RETURN once. (To the step 8).)
When changing the channel ⟶ Press RETURN twice. (To the step 5).)
14) Press RETURN three times.
15) Return to the step 2).
16) Place the maintenance key switch in "OFF" position.

<Reference>

D/A 8bits	0V - 10V
	0 - 255
Resolution	39mV/bit

Maintenance No.68 Communication check (RS232C)

Function
This is to check communication RS232C.

Preparation
It prepares so that the transferring data can be received.

Setting procedures ##: △▽ &: ↵
1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=68 with ##.
4) Press ENTER.
5) LCD1
```
68: RS232C check
Press &.
```
LCD2 to LCD5 Blank
6) Press ENTER.
7) LCD1
```
RS232C READY
&.: start
```
LCD2 to LCD5 Blank
8) Press ENTER.
9) LCD1
```
RS232C checking
RETURN : stop
```

LCD2	Transferring data counts	(Transferring data : 55H)
LCD3	Receiving data counts	(Recieving data : 55H)
LCD4	Transferring data counts	(Transferring data : AAH)
LCD5	Receiving data counts	(Recieving data : AAH)

<Reference>
The transferring and the receiving of 55H and AAH are executed 5000 times respectively.
When the transferring and the receiving are finished, the count of the data correctly received are displayed.

10) When data are correctly received
→ LCD1
```
RS232C check end
Press &.
```

LCD2	5000
LCD3	5000
LCD4	5000
LCD5	5000

When data are not correctly received
→ LCD1
```
RS232C error
Press &.
```

LCD2	5000
LCD3	????
LCD4	5000
LCD5	????

11) Press ENTER.
12) Return to the step 5).
13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Maintenance No.69 Communication check (RS485)

Function

This is to check communication RS485.

Preparation

It prepares so that the transferring data can be received.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=69 with ##.
4) Press ENTER.
5) LCD1

69: RS485 check
Press &.

LCD2 to LCD5 Blank

6) Press ENTER.
7) LCD1

RS485 READY
&.: start

LCD2 to LCD5 Blank

8) Press ENTER.
9) LCD1

RS485 checking
RETURN : stop

LCD2	Transferring data counts	(Transferring data : 55H)
LCD3	Receiving data counts	(Recieving data : 55H)
LCD4	Transferring data counts	(Transferring data : AAH)
LCD5	Receiving data counts	(Recieving data : AAH)

<Reference>
The transferring and the receiving of 55H and AAH are executed 5000 times respectively.
When the transferring and the receiving are finished, the count of the data correctly received are displayed.

10) When data are correctly received

→ LCD1

RS485 check end
Press &.

LCD2	5000
LCD3	5000
LCD4	5000
LCD5	5000

When data are not correctly received

→ LCD1

RS485 error
Press &.

LCD2	5000
LCD3	????
LCD4	5000
LCD5	????

11) Press ENTER.
12) Return to the step 5).
13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Maintenance No.70 Display of load history

Function

This displays load history.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=70 with ##.
4) Press ENTER.
5) LCD1
```
70: Load history
Press &.
```
LCD2 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)
6) Press ENTER.
7) LCD1
```
Select content with ##, and press &.
? !!!!!!!!!!!!!!!
```
LCD2 to LCD5 Blank
(When RETURN is pressed, go to the step 5).)

? !!!!!!!!!!!!!!!
1 Overload count
2 Maximum ratio
3 Maximum load
4 Load frequency
5 Every one hour

8) Press ## and select content.
9) Press ENTER and decide content.
10) LCD1
```
Select content with ##, and press &.
?% @@@@@@@@
```
LCD2 to LCD5 Blank
(When RETURN is pressed, go to the step 7).)

? % @@@@@@@@

C	Crane	(Crane [Normal mode])
B	Override	(Crane [LMI override mode])
L	Luffing	(Luffing)
A	ASw/ j	(Auxiliary sheaves with jib)
a	ASw/o j	(Auxiliary sheaves without jib)
M	Midfall	(Midfall)

11) Press ## and select content.
12) Press ENTER and decide content.
13) LCD1
```
Select indication with ##.
?% $$$$
```
LCD2 to LCD5 Refer to the following pages
(When RETURN is pressed, go to the step 10).)

$$$$: Displayed values differ from the display content to the display content.

14) Press ## and select No.($$$$).
15) Record the value displayed on LCD2 to LCD5.
16) Press RETURN.
17) Return to the step 10).
18) Press RETURN.
19) Return to the step 7).
20) Press RETURN.
21) Return to the step 5).
22) Press RETURN.
23) Return to the step 2).
24) Place the maintenance key switch in "OFF" position.

Maintenance No.70 Display of load history

1.Overload count

LCD1 lower column display ?%
1C : Crane [Normal mode]
1B : Crane [LMI override mode]
1L : Luffing
1A : Auxiliary sheaves with jib
1a : Auxiliary sheaves without jib
1M : Midfall

$$$$	Mode	Perfomance	Display data
0000	Work mode	Present	Overload count
0001			Occurred date / time
0002		Extrapolation	Overload count
0003			Occurred date / time
0004		None	Overload count
0005			Occurred date / time
0006	Setting mode	Present	Overload count
0007			Occurred date / time
0008		Extrapolation	Overload count
0009			Occurred date / time
0010		None	Overload count
0011			Occurred date / time
0012	Inspection mode	Present	Overload count
0013			Occurred date / time
0014		Extrapolation	Overload count
0015			Occurred date / time
0016		None	Overload count
0017			Occurred date / time
0018	Rigging mode	Present	Overload count
0019			Occurred date / time
0020		Extrapolation	Overload count
0021			Occurred date / time
0022		None	Overload count
0023			Occurred date / time

Select indication with ##.
1% $$$$

1
2345
6789

Overload count
ex) 123456789 times
(Maximum = 4294967294 times)

Select indication with ##.
1% $$$$

2003	Year	2000
5. 8	Month and date	0. 0
THU	A day of the week	SUN
19:05	Time	00:00

<Reference>
When data are not recorded.

ex) 19:05 May 8, 2003 (Tursday)

Maintenance No.70 Display of load history

2.Maximum ratio

LCD1 lower column display ?%
2C : Crane [Normal mode]
2B : Crane [LMI override mode]
2L : Luffing
2A : Auxiliary sheaves with jib
2a : Auxiliary sheaves without jib
2M : Midfall

$$$$	Mode	Perfomance	Display data
0000	Work mode	Present	Boom length, Boom hook reeving, Jib length
0001			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0002			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0003			Curve number, Load ratio, Actual load, Rated load
0004			Boom angle, Jib angle
0005			Radius, Hook selected condition, Drum selected condition
0006			Tip height limit setting condition & setting height
0007			Radius limit setting condition & setting radius
0008			Occurred date / time
0010		Extrapolation	Boom length, Boom hook reeving, Jib length
0011			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0012			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0013			Curve number, Load ratio, Actual load, Rated load
0014			Boom angle, Jib angle
0015			Radius, Hook selected condition, Drum selected condition
0016			Tip height limit setting condition & setting height
0017			Radius limit setting condition & setting radius
0018			Occurred date / time
0020	Setting mode	Present	Boom length, Boom hook reeving, Jib length
0021			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0022			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0023			Curve number, Load ratio, Actual load, Rated load
0024			Boom angle, Jib angle
0025			Radius, Hook selected condition, Drum selected condition
0026			Tip height limit setting condition & setting height
0027			Radius limit setting condition & setting radius
0028			Occurred date / time
0030		Extrapolation	Boom length, Boom hook reeving, Jib length
0031			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0032			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0033			Curve number, Load ratio, Actual load, Rated load
0034			Boom angle, Jib angle
0035			Radius, Hook selected condition, Drum selected condition
0036			Tip height limit setting condition & setting height
0037			Radius limit setting condition & setting radius
0038			Occurred date / time

Maintenance No.70　Display of load history management data

$$$$	Mode	Perfomance	Display data
0040	Inspection mode	Present	Boom length, Boom hook reeving, Jib length
0041			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0042			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0043			Curve number, Load ratio, Actual load, Rated load
0044			Boom angle, Jib angle
0045			Radius, Hook selected condition, Drum selected condition
0046			Tip height limit setting condition & setting height
0047			Radius limit setting condition & setting radius
0048			Occurred date / time
0050		Extrapolation	Boom length, Boom hook reeving, Jib length
0051			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0052			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0053			Curve number, Load ratio, Actual load, Rated load
0054			Boom angle, Jib angle
0055			Radius, Hook selected condition, Drum selected condition
0056			Tip height limit setting condition & setting height
0057			Radius limit setting condition & setting radius
0058			Occurred date / time
0060	Rigging mode	Present	Boom length, Boom hook reeving, Jib length
0061			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0062			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0063			Curve number, Load ratio, Actual load, Rated load
0064			Boom angle, Jib angle
0065			Radius, Hook selected condition, Drum selected condition
0066			Tip height limit setting condition & setting height
0067			Radius limit setting condition & setting radius
0068			Occurred date / time
0070		Extrapolation	Boom length, Boom hook reeving, Jib length
0071			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0072			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0073			Curve number, Load ratio, Actual load, Rated load
0074			Boom angle, Jib angle
0075			Radius, Hook selected condition, Drum selected condition
0076			Tip height limit setting condition & setting height
0077			Radius limit setting condition & setting radius
0078			Occurred date / time

Maintenance No.70 Display of load history management data

Select indication with ##.
2% $$$0

18.0	Boom length
14	Boom hook reeving
0.0	Jib length

ex) Boom length 18.0(m)
Boom hook reeving 14(reevings)
Jib length 0.0(m)

Select indication with ##.
2% $$$1

0	With or without midfall extension
0.0	Jib offset
1	Jib hook reeving
0	With or without fixed jib

ex) With or without midfall extensior 0 "without" (1 "with")
Jib offset 0.0(deg)
Jib hook reeving 1(reeving)
With or without fixed jib 0 "without" (1 "with")

Select indication with ##.
2% $$$2

0.00	Midfall hook weight
6.12	Boom hook weight
0.52	Jib hook weight
0.00	Fixed jib hook weight

ex) Midfall hook weight 0.00(t)
Boom hook weight 6.12(t)
Jib hook weight 0.52(t)
Fixed jib hook weight 0.00(t)

Select indication with ##.
2% $$$3

2	Curve number
110.0	Load ratio
123.0	Actual load
112.0	Rated load

ex) Curve number 2
Load ratio 110.0(%)
Actual load 123.0(t)
Rated load 112.0(t)

Select indication with ##.
2% $$$4

75.0	Boom angle
0.0	Jib angle

ex) Boom angle 75.0(deg)
Jib angle 0.0(deg)
<Reference>
"Crane" and "Auxiliary sheaves without jib"
→ Jib angle = 0.0(deg)

Select indication with ##.
2% $$$5

12.3	Radius
0	Hook selected condition
[F]	Drum selected condition

ex) Radius 12.3(m)
Hook selected condition
0 "Boom hook" (1 "Jib hook" / 2 "Fixed jib hook")
(3 "Midfall hook")
Drum selected condition
[F] "Fromt drum ([R] "Rear drum" / [3] "3rd drum")
<Reference>
Drum selected condition is blank
when data are not recorded.

Select indication with ##.
2% $$$6

1	Tip height limit setting condition
13.0	Tip height limit setting height

ex) Tip height limit setting condition
1 "Performed" (0 "Not performed")
Tip height limit setting height
13.0(m) "Performed' (- - - -(m) "Not performed")

Select indication with ##.
2% $$$7

1	Radius limit setting condition
14.0	Radius limit setting height

ex) Radius limit setting condition
1 "Performed" (0 "Not performed")
Radius limit setting height
14.0(m) "Performed' (- - - -(m) "Not performed")

Select indication with ##.
2% $$$8

<Reference>
When data are not recorded.

2003	Year	2000
5. 8	Month and date	0. 0
THU	A day of the week	SUN
19:05	Time	00:00

ex) 19:05 May 8, 2003 (Tursday)

Maintenance No.70 Display of load history

3.Maximum load

LCD1 lower column display ?%
3C : Crane [Normal mode]
3B : Crane [LMI override mode]
3L : Luffing
3A : Auxiliary sheaves with jib
3a : Auxiliary sheaves without jib
3M : Midfall

$$$$	Mode	Perfomance	Display data
0000	Work mode	Present	Boom length, Boom hook reeving, Jib length
0001			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0002			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0003			Curve number, Load ratio, Actual load, Rated load
0004			Boom angle, Jib angle
0005			Radius, Hook selected condition, Drum selected condition
0006			Tip height limit setting condition & setting height
0007			Radius limit setting condition & setting radius
0008			Occurred date / time
0010		Extrapolation	Boom length, Boom hook reeving, Jib length
0011			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0012			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0013			Curve number, Load ratio, Actual load, Rated load
0014			Boom angle, Jib angle
0015			Radius, Hook selected condition, Drum selected condition
0016			Tip height limit setting condition & setting height
0017			Radius limit setting condition & setting radius
0018			Occurred date / time
0020	Setting mode	Present	Boom length, Boom hook reeving, Jib length
0021			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0022			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0023			Curve number, Load ratio, Actual load, Rated load
0024			Boom angle, Jib angle
0025			Radius, Hook selected condition, Drum selected condition
0026			Tip height limit setting condition & setting height
0027			Radius limit setting condition & setting radius
0028			Occurred date / time
0030		Extrapolation	Boom length, Boom hook reeving, Jib length
0031			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0032			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0033			Curve number, Load ratio, Actual load, Rated load
0034			Boom angle, Jib angle
0035			Radius, Hook selected condition, Drum selected condition
0036			Tip height limit setting condition & setting height
0037			Radius limit setting condition & setting radius
0038			Occurred date / time

Maintenance No.70　Display of load history management data

$$$$	Mode	Perfomance	Display data
0040	Inspection mode	Present	Boom length, Boom hook reeving, Jib length
0041			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0042			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0043			Curve number, Load ratio, Actual load, Rated load
0044			Boom angle, Jib angle
0045			Radius, Hook selected condition, Drum selected condition
0046			Tip height limit setting condition & setting height
0047			Radius limit setting condition & setting radius
0048			Occurred date / time
0050		Extrapolation	Boom length, Boom hook reeving, Jib length
0051			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0052			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0053			Curve number, Load ratio, Actual load, Rated load
0054			Boom angle, Jib angle
0055			Radius, Hook selected condition, Drum selected condition
0056			Tip height limit setting condition & setting height
0057			Radius limit setting condition & setting radius
0058			Occurred date / time
0060	Rigging mode	Present	Boom length, Boom hook reeving, Jib length
0061			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0062			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0063			Curve number, Load ratio, Actual load, Rated load
0064			Boom angle, Jib angle
0065			Radius, Hook selected condition, Drum selected condition
0066			Tip height limit setting condition & setting height
0067			Radius limit setting condition & setting radius
0068			Occurred date / time
0070		Extrapolation	Boom length, Boom hook reeving, Jib length
0071			With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0072			Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0073			Curve number, Load ratio, Actual load, Rated load
0074			Boom angle, Jib angle
0075			Radius, Hook selected condition, Drum selected condition
0076			Tip height limit setting condition & setting height
0077			Radius limit setting condition & setting radius
0078			Occurred date / time

Maintenance No.70 Display of load history management data

Select indication with ##.
3% $$$0

18.0	Boom length
14	Boom hook reeving
0.0	Jib length

ex) Boom length 18.0(m)
Boom hook reeving 14(reevings)
Jib length 0.0(m)

Select indication with ##.
3% $$$1

0	With or without midfall extension
0.0	Jib offset
1	Jib hook reeving
0	With or without fixed jib

ex) With or without midfall extensior 0 "without" (1 "with")
Jib offset 0.0(deg)
Jib hook reeving 1(reeving)
With or without fixed jib 0 "without" (1 "with")

Select indication with ##.
3% $$$2

0.00	Midfall hook weight
6.12	Boom hook weight
0.52	Jib hook weight
0.00	Fixed jib hook weight

ex) Midfall hook weight 0.00(t)
Boom hook weight 6.12(t)
Jib hook weight 0.52(t)
Fixed jib hook weight 0.00(t)

Select indication with ##.
3% $$$3

2	Curve number
110.0	Load ratio
123.0	Actual load
112.0	Rated load

ex) Curve number 2
Load ratio 110.0(%)
Actual load 123.0(t)
Rated load 112.0(t)

Select indication with ##.
3% $$$4

75.0	Boom angle
0.0	Jib angle

ex) Boom angle 75.0(deg)
Jib angle 0.0(deg)
<Reference>
"Crane" and "Auxiliary sheaves without jib"
→ Jib angle = 0.0(deg)

Select indication with ##.
3% $$$5

12.3	Radius
0	Hook selected condition
[F]	Drum selected condition

ex) Radius 12.3(m)
Hook selected condition
0 "Boom hook" (1 "Jib hook" / 2 "Fixed jib hook")
(3 "Midfall hook")
Drum selected condition
[F] "Fromt drum ([R] "Rear drum" / [3] "3rd drum")
<Reference>
Drum selected condition is blank
when data are not recorded.

Select indication with ##.
3% $$$6

1	Tip height limit setting condition
13.0	Tip height limit setting height

ex) Tip height limit setting condition
1 "Performed" (0 "Not performed")
Tip height limit setting height
13.0(m) "Performed' (- - - -(m) "Not performed")

Select indication with ##.
3% $$$7

1	Radius limit setting condition
14.0	Radius limit setting height

ex) Radius limit setting condition
1 "Performed" (0 "Not performed")
Radius limit setting height
14.0(m) "Performed' (- - - -(m) "Not performed")

Select indication with ##.
3% $$$8

<Reference>
When data are not recorded.

2003	Year	2000
5. 8	Month and date	0. 0
THU	A day of the week	SUN
19:05	Time	00:00

ex) 19:05 May 8, 2003 (Tursday)

Maintenance No.70 Display of load history

4.Load frequency

LCD1 lower column display ?%
4C : Crane [Normal mode]
4B : Crane [LMI override mode]
4L : Luffing
4A : Auxiliary sheaves with jib
4a : Auxiliary sheaves without jib
4M : Midfall

$$$$	Mode	Perfomance	Display data		
0000	Work mode	Present	0% ≦	< 30%	Frequency
0001		&	30% ≦	< 50%	Frequency
0002		Extrapolation	50% ≦	< 70%	Frequency
0003			70% ≦	< 90%	Frequency
0004			90% ≦	< 110%	Frequency
0005			110% ≦	< 130%	Frequency
0006			130% ≦	< 150%	Frequency
0007			150% ≦	< 200%	Frequency
0008			200% ≦	< 300%	Frequency
0009			300% ≦	< 400%	Frequency
0010			400% ≦	< 500%	Frequency
0011			500% ≦		Frequency
0020	Setting mode	Present	0% ≦	< 30%	Frequency
0021		&	30% ≦	< 50%	Frequency
0022		Extrapolation	50% ≦	< 70%	Frequency
0023			70% ≦	< 90%	Frequency
0024			90% ≦	< 110%	Frequency
0025			110% ≦	< 130%	Frequency
0026			130% ≦	< 150%	Frequency
0027			150% ≦	< 200%	Frequency
0028			200% ≦	< 300%	Frequency
0029			300% ≦	< 400%	Frequency
0030			400% ≦	< 500%	Frequency
0031			500% ≦		Frequency
0040	Inspection mode	Present	0% ≦	< 30%	Frequency
0041		&	30% ≦	< 50%	Frequency
0042		Extrapolation	50% ≦	< 70%	Frequency
0043			70% ≦	< 90%	Frequency
0044			90% ≦	< 110%	Frequency
0045			110% ≦	< 130%	Frequency
0046			130% ≦	< 150%	Frequency
0047			150% ≦	< 200%	Frequency
0048			200% ≦	< 300%	Frequency
0049			300% ≦	< 400%	Frequency
0050			400% ≦	< 500%	Frequency
0051			500% ≦		Frequency

Maintenance No.70 Display of load history management data

$$$$	Mode	Perfomance	Display data		
0060	Rigging mode	Present	0% ≦	< 30%	Frequency
0061		&	30% ≦	< 50%	Frequency
0062		Extrapolation	50% ≦	< 70%	Frequency
0063			70% ≦	< 90%	Frequency
0064			90% ≦	< 110%	Frequency
0065			110% ≦	< 130%	Frequency
0066			130% ≦	< 150%	Frequency
0067			150% ≦	< 200%	Frequency
0068			200% ≦	< 300%	Frequency
0069			300% ≦	< 400%	Frequency
0070			400% ≦	< 500%	Frequency
0071			500% ≦		Frequency

Select indication with ##.
4% $$$$

1
2345
6789

Frequency of the selected load ratio range condition

ex) 123456789 times
(Maximum = 4294967294 times)

Maintenance No.70 Display of load history

5.Maximum load ratio condition for every one hour

LCD1 lower column display ?%
5 : Crane [Normal mode]
Crane [LMI override mode]
Luffing
Auxiliary sheaves with jib
Auxiliary sheaves without jib
Midfall

$$$$	Mode	Display data
0000	The newest data	Boom length, Boom hook reeving, Jib length
0001		With or without midfall extension, Jib offset, Jib hook reeving, With or without fixed jib
0002		Midfall hook weight, Boom hook weight, Jib hook weight, Fixed jib hook weight
0003		Curve number, Load ratio, Actual load, Rated load
0004		Boom angle, Jib angle
0005		Radius, Hook selected condition, Drum selected condition
0006		Tip height limit setting condition & setting height
0007		Radius limit setting condition & setting radius
0008		Mode, Perfomance
0009		Occurred date / time
001$		
002$		
003$		
004$		
005$		
006$		
007$		
008$		
009$		
010$		
011$		
012$		
013$		
014$		
015$		
016$		
017$		
018$		
019$		
020$		
021$		
022$		
023$	The oldest data	

Maintenance No.70 Display of load history management data

Select indication with ##.
5 $$$0

18.0	Boom length
14	Boom hook reeving
0.0	Jib length

ex) Boom length 18.0(m)
Boom hook reeving 14(reevings)
Jib length 0.0(m)

Select indication with ##.
5 $$$1

0	With or without midfall extension
0.0	Jib offset
1	Jib hook reeving
0	With or without fixed jib

ex) With or without midfall extensior 0 "without" (1 "with")
Jib offset 0.0(deg)
Jib hook reeving 1(reeving)
With or without fixed jib 0 "without" (1 "with")

Select indication with ##.
5 $$$2

0.00	Midfall hook weight
6.12	Boom hook weight
0.52	Jib hook weight
0.00	Fixed jib hook weight

ex) Midfall hook weight 0.00(t)
Boom hook weight 6.12(t)
Jib hook weight 0.52(t)
Fixed jib hook weight 0.00(t)

Select indication with ##.
5 $$$3

2	Curve number
110.0	Load ratio
123.0	Actual load
112.0	Rated load

ex) Curve number 2
Load ratio 110.0(%)
Actual load 123.0(t)
Rated load 112.0(t)

Select indication with ##.
5 $$$4

75.0	Boom angle
0.0	Jib angle

ex) Boom angle 75.0(deg)
Jib angle 0.0(deg)
<Reference>
"Crane" and "Auxiliary sheaves without jib"
→ Jib angle = 0.0(deg)

Select indication with ##.
5 $$$5

12.3	Radius
0	Hook selected condition
[F]	Drum selected condition

ex) Radius 12.3(m)
Hook selected condition
0 "Boom hook" (1 "Jib hook" / 2 "Fixed jib hook")
(3 "Midfall hook")
Drum selected condition
[F] "Fromt drum ([R] "Rear drum" / [3] "3rd drum")
<Reference>
Drum selected condition is blank
when data are not recorded.

Select indication with ##.
5 $$$6

1	Tip height limit setting condition
13.0	Tip height limit setting height

ex) Tip height limit setting condition
1 "Performed" (0 "Not performed")
Tip height limit setting height
13.0(m) "Performed' (- - - -(m) "Not performed")

Select indication with ##.
5 $$$7

1	Radius limit setting condition
14.0	Radius limit setting height

ex) Radius limit setting condition
1 "Performed" (0 "Not performed")
Radius limit setting height
14.0(m) "Performed' (- - - -(m) "Not performed")

Select indication with ##.
5 $$$8

0	Mode
0	Performance

ex) Mode
0 "Work mode" (1 "Setting mode")
(2 "Inspection mode") (3 "Rigging mode")
Performance
0 "Present" (1 "Extrapolation" / 2 "None")

Select indication with ##.
5 $$$9

<Reference>
When data are not recorded.

2003	Year	2000
5. 8	Month and date	0. 0
THU	A day of the week	SUN
19:05	Time	00:00

ex) 19:05 May 8, 2003 (Tursday)

Maintenance No.71 Display of error history

Function

This displays error history.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=71 with ##.
4) Press ENTER.
5) LCD1

71: Error history
Press &.

LCD2 to LCD5 Blank

(When RETURN is pressed, go to the step 2).)

6) Press ENTER.
7) LCD1

Select content with ##, and press &.
@-@@ ?????????

@-@@ : Error code C-@@ , E-@@ , H-@@ , S-@@ , F-@@
????????? : Content Cycles : Error occurred cycles
Date/Time : Error occurred date and time
Data : Abnormal value

LCD2 to LCD5 Blank

(When RETURN is pressed, go to the step 5).)

8) Press ## and select error code.
<Reference>
The error code to which the history data is memorized can be selected.
9) Press ENTER.
10) Press ## and select content.

(When RETURN is pressed, go to the step 7).)

Select indication with ##.
@-@@ Cycles

1
2345
6789

Error cycles
ex) 123456789 times
(Maximum = 4294967294 times)

Select indication with ##.
@-@@ Date/Time

2003	Year
5. 8	Month and date
THU	A day of the week
19:05	Time

ex) 19:05 May 8, 2003 (Tursday)

Select indication with ##.
E-10 Data

5000	A/D conversion value

ex) E-10 Boom tension signal error

<Reference>
The value displayed on LCD2 to LCD5 when "Data" is selected are different according to the error code.
Refer to the table for details.

11) Record the values displayed on LCD2 to LCD5.
12) Press RETURN.
13) Return to the step 7).
14) Go to the step 15) after all are recorded.
15) Press RETURN.
16) Return to the step 5).
17) Press RETURN.
18) Return to the step 2).
19) Place the maintenance key switch in "OFF" position.

Maintenance No.71 Display of error history - Table

Code	Name	Error occurred cycles [times]				Error occurred date and time				Abnormal value			
		LCD2	LCD3	LCD4	LCD5	LCD2 Year	LCD3 Month Date	LCD4 A day of the week	LCD5 Time	LCD2	LCD3	LCD4	LCD5
C-2	Layer number error									Drum [F]:Front / [R]:Rear / [3d]:3rd	Layer		
C-4	Total pulse count error									Drum [F]:Front / [R]:Rear / [3d]:3rd	Total pulse count	Total pulse count	Total pulse count
E-10	Boom tension signal error									A/D conversion value (A/Dch0)			
E-11	Jib tension signal error									A/D conversion value (A/Dch1)			
E-12	Boom angle signal error									A/D conversion value (A/Dch2)			
E-13	Jib angle signal error									A/D conversion value (A/Dch3)			
H-14	Grip signal error									A/D conversion value (A/Dch4)			
H-16	Throttle motor signal error									A/D conversion value (A/Dch6)			
H-17	Rack sensor signal error									A/D conversion value (A/Dch7)			
E-20	Jib angle signal for rigging mode error									A/D conversion value (A/Dch10)			
H-21	Foot throttle signal error									A/D conversion value (A/Dch11)			
E-22	Radio Load Cell - MAIN [Front] signal error									A/D conversion value (A/Dch8)			
E-23	Radio Load Cell - AUX [Rear/3rd] signal error									A/D conversion value (A/Dch9)			
E-25	Sensor power supply error									A/D conversion value (A/Dch15)			
E-26	Boom angle signal disconnection									A/D conversion value (A/Dch2)			
E-27	Jib angle signal disconnection									A/D conversion value (A/Dch3)			
E-28	Angle detector connection error									Boom angle [degrees]	Jib angle [degrees]		
S-32	Attachment mode signal error									LMI override mode SW (D/Ich10) 1:ON / 0:OFF	Luffer mode detection (D/Ich11) 1:ON / 0:OFF	Curve number	Attachment mode data
S-33	Mode combination error									LMI override mode SW (D/Ich10) 1:ON / 0:OFF	Luffer mode detection (D/Ich11) 1:ON / 0:OFF	Curve number	Attachment mode data
S-34	Boom hoisting/lowering signal error									Boom hoisting detect (D/Ich20) 1:ON / 0:OFF	Boom lowering detect (D/Ich21) 1:ON / 0:OFF		
S-35	Rear drum hoisting/lowering signal error									Rear drum hoisting detect (D/Ich22) 1:ON / 0:OFF	Rear drum lowering detect (D/Ich23) 1:ON / 0:OFF		
S-36	Front drum hoisting/lowering signal error									Front drum hoisting detect (D/Ich16) 1:ON / 0:OFF	Front drum lowering detect (D/Ich17) 1:ON / 0:OFF		
S-37	3rd drum hoisting/lowering signal error									Rear drum hoisting detect (D/Ich12) 1:ON / 0:OFF	Rear drum lowering detect (D/Ich19) 1:ON / 0:OFF		
S-38	LMI override mode selection error									LMI override mode SW (D/Ich10) 1:ON / 0:OFF	Luffer mode detection (D/Ich11) 1:ON / 0:OFF	Curve number	Attachment mode data
H-40	Throttle motor position error									Throttle motor position [rpm]			
H-41	Throttle motor following error									Required throttle motor position [rpm]	Throttle motor position [rpm]		
H-42	Engine speed error									Engine speed [rpm]	Max. engine speed [rpm] (ROM data)		
H-43	Engine speed signal disconnection									Engine speed [rpm]	Rack sensor signal [V]	Rack sensor zero point correction value [V]	
E-50	Table data none									Table number	Index (0)	Index (1)	Index (2)
A-60	Zero point correction value error												
A-61	Gain correction value error												
A-62	Drift correction value error												
A-65	Adjustment range over												
A-70	Adjustment value error												
F-80	SRAM error									SRAM check data 1 [HEX]	SRAM check data 2 [HEX]	SRAM check data 3 [HEX]	
F-81	Display error												
E-95	Overflow error												

Maintenance No.72 Display of error code

Function

This displays the error codes that occur currently.
This displays the error codes not displayed on the work mode.

Setting procedures ## : ΔV & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=72 with ##.
4) Press ENTER.

5) LCD1

72: Error 0 – 3
##: Select

LCD2 to LCD5 Blank / Error code
(When RETURN is pressed, go to the step 2).)

6) Press ## and select error code block.

Error code block
0- 3
4- 7
8-11
12-15
⋮
24-27
28-31
32-35
36-39

<Reference>
The maximum number of displayed error codes is 40.

7) Record the error codes displayed on LCD2 to LCD5.

8) Press RETURN.
9) Return to the step 2).
10) Place the maintenance key switch in "OFF" position.

Maintenance No.73 Display of ROM data for load calculating

Function

This displays ROM data for load calculating.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=73 with ##.
4) Press ENTER.
5) LCD1

Select content with ##.
BL/JL/OFFSET/SJ

LCD2 Boom length
LCD3 Jib length
LCD4 Jib offset
LCD5 With or without fixed jib
(When RETURN is pressed, go to the step 2).)

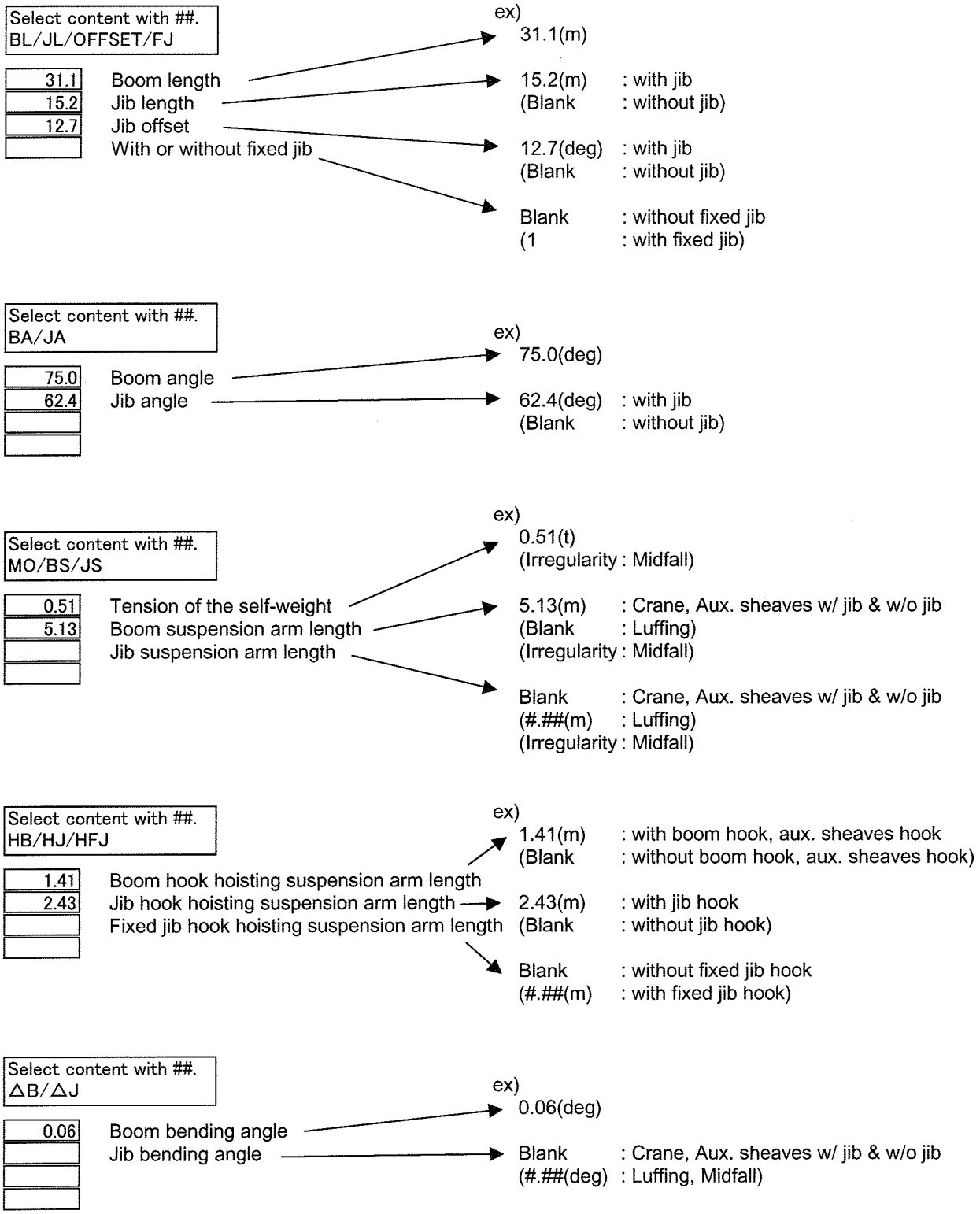
6) Press ## and select content.

BL/JL/OFFSET/FJ	: Boom length / Jib length / Jib offset / With or without fixed jib
BA/JA	: Boom angle / Jib angle
MO/BS/JS	: Tension of the self-weight / Boom suspension arm length / Jib suspension arm length
HB/HJ/HFJ	: Boom hook hoisting suspension arm length / Jib hook hoisting suspension arm length / Fixed jib hook hoisting suspension arm length
△B/△J	: Boom bending angle / Jib bending angle

Refer to the next page for details.

7) Record the error codes displayed on LCD2 to LCD5.
8) Press RETURN.
9) Return to the step 2).
10) Place the maintenance key switch in "OFF" position.

Maintenance No.73 Display of ROM data for load calculating



Maintenance No.74 Display of data number

Function

This displays the data number of the selected curve number.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=74 with ##.
4) Press ENTER.

5) LCD1

74: Data No.

LCD2 Data number
LCD3 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Confirm the number displayed on LCD2.

7) Press RETURN.
8) Return to the step 2).
9) Place the maintenance key switch in "OFF" position.

Maintenance No.75 Display and rewrite of AJST data

Function

This displays and rewrites the various memorized values in RAM.

Setting procedures ## : ΔV & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=75 with ##.
4) Press ENTER.

5) LCD1

75: AJST data
Press &.

LCD2 to LCD5 Blank

(When RETURN is pressed, go to the step 2).)

6) Press ENTER.

7) LCD1

Select content with ##, and press &.
Data No.= ????

LCD2 to LCD5 Blank

(When RETURN is pressed, go to the step 5).)

8) Press ## and select data number.
9) Press ENTER.

10) LCD1

Select content with ##, and press &.
Setting Yes No

LCD2 Data number
LCD3 Memorized value 0~FFFF(hex)
LCD4 to LCD5 Blank

(When RETURN is pressed, go to the step 5).)

11) Press ## and select "Yes/No".

If setting the data, select "Yes" and press ENTER. → To 12)
If not setting the data, select "No" and press ENTER.→ To 5)

12) LCD1

Select content with ##, and press &.
&&&&

LCD2 Data number
LCD3 Memorized value 0~FFFF(hex) Blinks
LCD4 to LCD5 Blank

When stopping the setting, press RETURN before making the step 13). (Go to the step 5).)
The blinking on LCD3 display goes out.

13) Press ## and select the value.
14) Press ENTER.
15) Return to the step 10).
16) Make sure that the indication on LCD3 shows a value set.

17) Press RETURN.
18) Return to the step 5).
19) Press RETURN.
20) Return to the step 2).
21) Place the maintenance key switch in "OFF" position.

Maintenance No.77 Setting of calendar

Function

This displays and set the calendar informations.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=77 with ##.
4) Press ENTER.
5) LCD1

77: Indication
& : next ## : other

LCD2 to LCD5 Blank

(When RETURN is pressed, go to the step 2).)

6) Press ## and select the item.

77: Indication	Display of calendar
77: Setting date	Setting of calendar (Year/Month/Date/A day of the week)
77: Setting time	Setting of calendar (Time)

7) Press ENTER.

When selecting display of calendar "77: Indication" → To 8-1)
When selecting setting of calendar (Year/Month/Date/A day of the week) "77: Setting date" → To 8-2)
When selecting setting of calendar (Time) "77: Setting time" → To 8-3)

Display of calendar

8-1) LCD1

Indication finished.
Press &.

LCD2 Year
LCD3 Month/Date
LCD4 A day of the week
LCD5 Time

SUN : Sunday	THU : Thursday
MON : Monday	FRI : Friday
TUE : Tuesday	SAT : Saturday
WED : Wednesday	

(When RETURN is pressed, go to the step 5).)

9-1) Confirm the display.
10-1) Press ENTER.

11-1) Return to the step 5).
12-1) Press RETURN.
13-1) Return to the step 2).
14-1) Place the maintenance key switch in "OFF" position.

Maintenance No.77 Setting of calendar

Setting of calendar (Year/Month/Date/A day of the week)

8-2) LCD1

```
Select content with ##, and press &.
##/$$/%% XXX
```

##	: Year	20##
$$	: Month	01 to 12
%%	: Date	01 to 31
XXX	: A day of the week	

LCD2	Year	Blinks
LCD3	Month/Date	Blinks
LCD4	A day of the week	Blinks
LCD5	Time	

SUN : Sunday	THU : Thursday
MON : Monday	FRI : Friday
TUE : Tuesday	SAT : Saturday
WED : Wednesday	

(When RETURN is pressed, go to the step 5).)

9-2) Press ## and select Year/Month/Date/A day of the week.
10-2) Press ENTER.

11-2) LCD1

```
Setting finished.
Press &.
```

12-2) Make sure that the indication on LCD2 to LCD4 show Year/Month/Date/A day of the week selected.
13-2) Press ENTER.

14-2) Return to the step 5).
15-2) Press RETURN.
16-2) Return to the step 2).
17-2) Place the maintenance key switch in "OFF" position.

Setting of calendar (Time)

8-3) LCD1

```
Select content with ##, and press &.
@@:&&
```

@@	: Hour	00 to 23
&&	: Minute	00 to 59

LCD2	Year	
LCD3	Month/Date	
LCD4	A day of the week	
LCD5	Time	Blinks

SUN : Sunday	THU : Thursday
MON : Monday	FRI : Friday
TUE : Tuesday	SAT : Saturday
WED : Wednesday	

(When RETURN is pressed, go to the step 5).)

9-3) Press ## and select Hour/Minute.
10-3) Press ENTER.

11-3) LCD1

```
Setting finished.
Press &.
```

12-3) Make sure that the indication on LCD5 shows Hour/Minute selected.
13-3) Press ENTER.

14-3) Return to the step 5).
15-3) Press RETURN.
16-3) Return to the step 2).
17-3) Place the maintenance key switch in "OFF" position.

Maintenance No.78 Setting of communication (RS232C)

Function

This selects RS232C communication object and re-initializes the hardware to match with the object.

Setting procedures ## : ΔV & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.=78 with ##.
4) Press ENTER.
5) LCD1

78: RS232C Set
Press &.

LCD2 Number
LCD3 Communication object
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.
7) LCD1

Select content with ##, and press &.
? ###

? ### 0 DEF : Not connected
1 RMT : Remote control communication

LCD2 Number Blinks
LCD3 Communication object Blinks
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 5).)

8) Press ## and select Number/Communication object.
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD3 display goes out.
9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD2 to LCD3 show Number/Communication object selected.
12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

0 DEF : Not connected

Setable value

0 DEF : Not connected
1 RMT : Remote control communication

Maintenance No.79 Setting of communication (RS485)

Function

This selects RS485 communication object and re-initializes the hardware to match with the object.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=79 with ##.
4) Press ENTER.
5) LCD1

79: RS485 Set
Press &.

LCD2 Number
LCD3 Communication object
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ENTER.
7) LCD1

Select content with ##, and press &.
? ###

? ### 0 DEF : Not connected

LCD2 Number Blinks
LCD3 Communication object Blinks
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 5).)

8) Press ## and select Number/Communication object.
When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
The blinking on LCD3 display goes out.
9) Press ENTER.
10) Return to the step 5).
11) Make sure that the indication on LCD2 to LCD3 show Number/Communication object selected.
12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

0 DEF : Not connected

Setable value

0 DEF : Not connected

Maintenance No.80 Setting of slowdown ratio voltage (Manual)

Function

This enables to change the slowdown ratio voltage (0% and 100% point voltage) for S/C control mode.
<<Caution>>
S/C control mode does not function in LBCE Model.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.=80 with ##.
4) Press ENTER.

5) LCD1

80: 0% point
&: next ##: other

LCD2 0% point voltage
LCD3 100% point voltage
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.
80 : 0% Setting of 0% point voltage
↕
80 : 100% Setting of 100% point voltage

7) Press ENTER.

8) LCD1

Select content with ##, and press &.
****

LCD2 Blinks (When "80 : 0%" selected)
LCD3 Blinks (When "80 : 100%" selected)
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 5).)

9) Press ## and select the value.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)
The blinking on the corresponding LCD display goes out.

10) Press ENTER.
11) Return to the step 5).
12) Make sure that the indication on the corresponding LCD shows a value selected.

13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

0% point voltage : 400 [1.000V]
100% point voltage : 3600 [9.000V]

Setable value

0 [0.000V] ≦ 0% point voltage ≦ 5000 [12.500V]
0 [0.000V] ≦ 100% point voltage ≦ 5000 [12.500V]

Maintenance No.82 Setting of pump control adjustment value (Manual)

Function

This enables to change the pump control adjustment value (Voltage/Displacement).

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

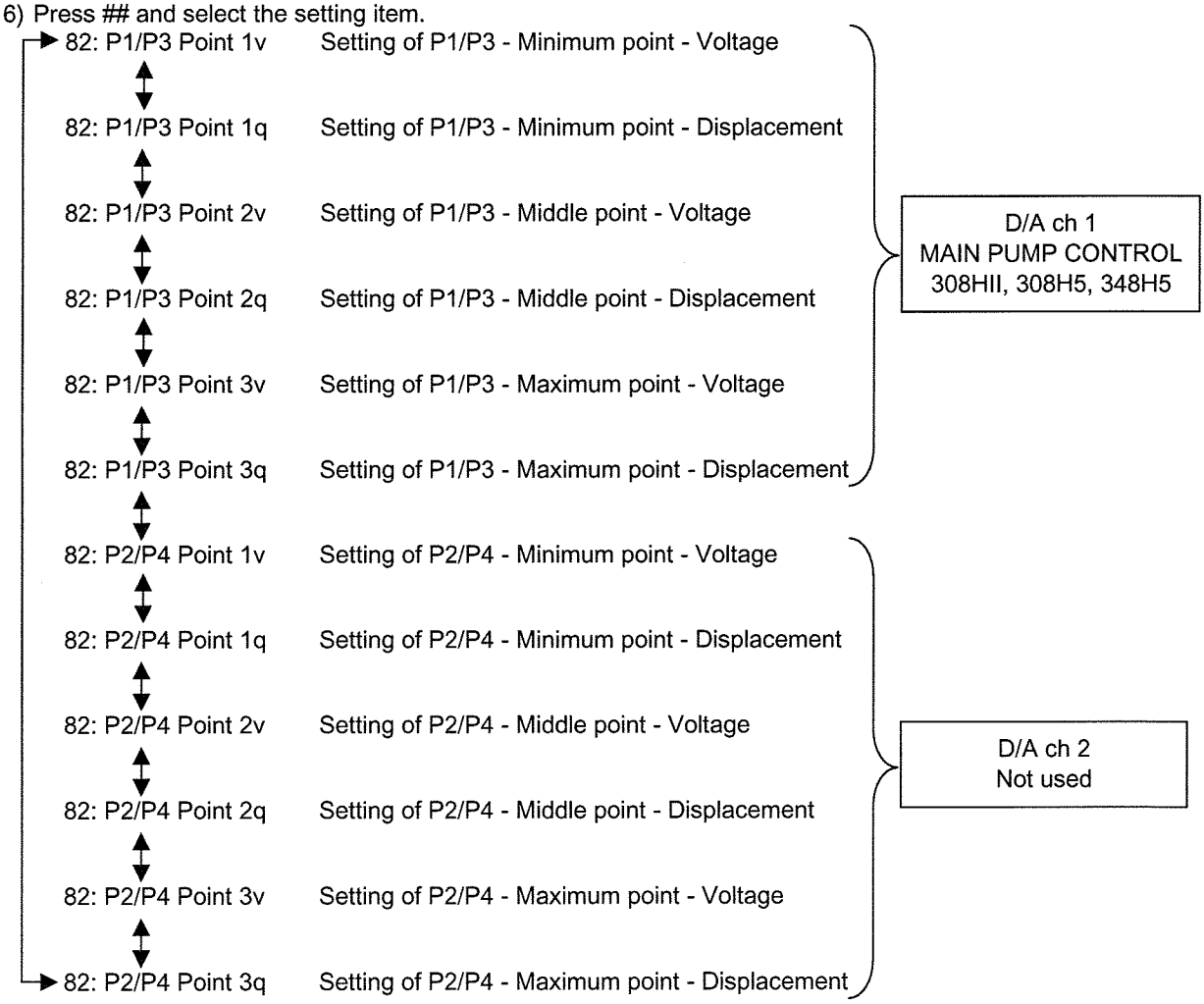
LCD2 to LCD5 Blank

3) Set the Mainte No.=82 with ##.
4) Press ENTER.
5) LCD1

82: P1/P3 Point 1v
& : next ## : other

LCD2 Voltage [*.***V]
LCD3 Displacement [***.*cc/rev]
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

6) Press ## and select the setting item.



7) Press ENTER.

When selecting setting of P?/P? - ##### point - Voltage "82: P?/P? Point %v" → To 8-1)
When selecting setting of P?/P? - ##### point - Displacement "82: P?/P? Point %q" → To 8-2)

Maintenance No.82 Setting of pump control adjustment value (Manual)

Setting of P?/P? - ##### point - Voltage

8-1) LCD1 Select voltage with ##, and press &.
*.***[V]

LCD2 Voltage [*.***V] Blinks
LCD3 Displacement [***.*cc/rev]
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 5).)

9-1) Set the voltage with ##.
When stopping the setting, press RETURN before making the step 10-1). (Go to the step 5).)
The blinking on LCD2 display goes out.

10-1) Press ENTER.
11-1) Return to the step 5).
12-1) Make sure that the indication on LCD2 shows the voltage set.

13-1) Press RETURN.
14-1) Return to the step 2).
15-1) Place the maintenance key switch in "OFF" position.

Setting of P?/P? - ##### point - Displacement

8-2) LCD1 Select displacement with ##, and press &.
***.*[cc/rev]

LCD2 Voltage [*.***V]
LCD3 Displacement [***.*cc/rev] Blinks
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 5).)

9-2) Set the displacement with ##.
When stopping the setting, press RETURN before making the step 10-1). (Go to the step 5).)
The blinking on LCD3 display goes out.

10-2) Press ENTER.
11-2) Return to the step 5).
12-2) Make sure that the indication on LCD3 shows the displacement set.

13-2) Press RETURN.
14-2) Return to the step 2).
15-2) Place the maintenance key switch in "OFF" position.

Initial value
Refer to the table.

Setable value
0.000V ≦ Voltage ≦ 9.999V
0.0cc/rev ≦ Displacement ≦ 999.9cc/rev

Maintenance No.83 Setting of pump control adjustment value (Actual machine)

Function

This enables the adjustment of the pump control adjustment value (Voltage) by detecting the drum revolution.

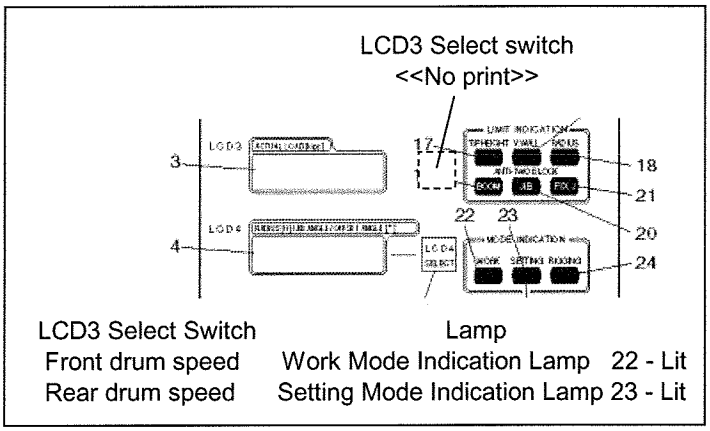
Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1 `Select content with ##, and press &.`
   `Mainte No.= 0`

   LCD2 to LCD5 Blank
3) Set the Mainte No.=83 with ##.
4) Press ENTER.
5) LCD1 `83: Minimum Point`
   `& : next ## : other`

   LCD2 Engine speed [****rpm]
   LCD3 Front/Rear Drum speed [***.*rpm]
   LCD4 Target drum speed [***.*rpm]
   LCD5 Voltage [*.***V]

   (When RETURN is pressed, go to the step 2).)



LCD3 Select Switch	Lamp
Front drum speed	Work Mode Indication Lamp 22 - Lit
Rear drum speed	Setting Mode Indication Lamp 23 - Lit

6) Press ## and select the setting item.

   83: Minimum Point Setting of Minimum point - Voltage
   ↕
   83: Normal Point Setting of Middle point - Voltage
   ↕
   83: Maximum Point Setting of Maximum point - Voltage

7) Press ENTER.
8) LCD1 `Set voltage with ##, and press &.`
   `*.***V Memory No`

   LCD2 Engine speed [****rpm]
   LCD3 Front/Rear Drum speed [***.*rpm]
   LCD4 Target drum speed [***.*rpm]
   LCD5 Voltage [*.***V] Blinks

   (When RETURN is pressed, go to the step 5).)

9) Press ## and set the voltage.
10) Press ENTER.
11) LCD1 `Select processing with ##, and press &.`
    `*.***V Memory No`

    Memory : Blinks

    LCD2 Engine speed [****rpm]
    LCD3 Front/Rear Drum speed [***.*rpm]
    LCD4 Target drum speed [***.*rpm]
    LCD5 Voltage [*.***V] Blinks

    (When RETURN is pressed, go to the step 8).)

Maintenance No.83 Setting of pump control adjustment value (Actual machine)

12) Set the engine speed to 1000 rpm, and operate the front/rear control lever to the 2nd speed position of the hoisting side.
<<Caution>>
The front and rear drum speed become 1st speed, because the front and rear motor displacement become the maximum by FRONT MOTOR CONTROL [D/Ach03] and REAR MOTOR CONTROL [D/Ach04].

13) Confirm whether the front/rear drum speed (LCD3) becomes the target drum speed (LCD4).
Return the control lever to the neutral position after confirming.
<<Caution>>
Confirm the drum speed after 5 seconds or more have passed after ENTER is pressed on the step 10).

When the front/rear drum speed dose not become the target drum speed → To 14)
When the front/rear drum speed becomes the target drum speed → To 16)

When the front/rear drum speed dose not become the target drum speed
14) Select "No" with ##, and press ENTER.
15) Return to the step 8), and set the voltage again.

When the front/rear drum speed becomes the target drum speed
16) Select "Memory" with ##, and press ENTER.
17) Make sure that the indication on LCD5 shows the voltage set.

18) Return to the step 5).
19) Press RETURN.
20) Return to the step 2).
21) Place the maintenance key switch in "OFF" position.

Initial value
Refer to the table.

Setable value
0.000V ≦ Voltage ≦ 9.999V

Maintenance No.82 Setting of pump control adjustment value (Manual) - Table
Maintenance No.83 Setting of pump control adjustment value (Actual machine) - Table

		Initial value										
		LS-108H5		LS-138H5		LS-218H5	LS-238H5		LS-248H5		LS-348H5		LS-308HII / LS-308H5
		Tier2	Tier3	Tier2	From LS138-4264	Tier2	Tier2	Tier3	Tier2	Tier3	Tier2	Tier3	Tier2
Minimum point	Voltage (V)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.587	7.486	7.543
	Displacement (cc/rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.0	35.7	22.0
Middle point	Voltage (V)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.700	7.486	5.700
	Displacement (cc/rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	35.7	100.0
Maximum point	Voltage (V)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.254	2.094	2.399
	Displacement (cc/rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	200.0	200.0	194.0
		Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used			

Maintenance No.84 Setting of winch motor control adjustment value (Manual)

Function

This enables to change the winch motor control adjustment value (Voltage/Displacement).

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

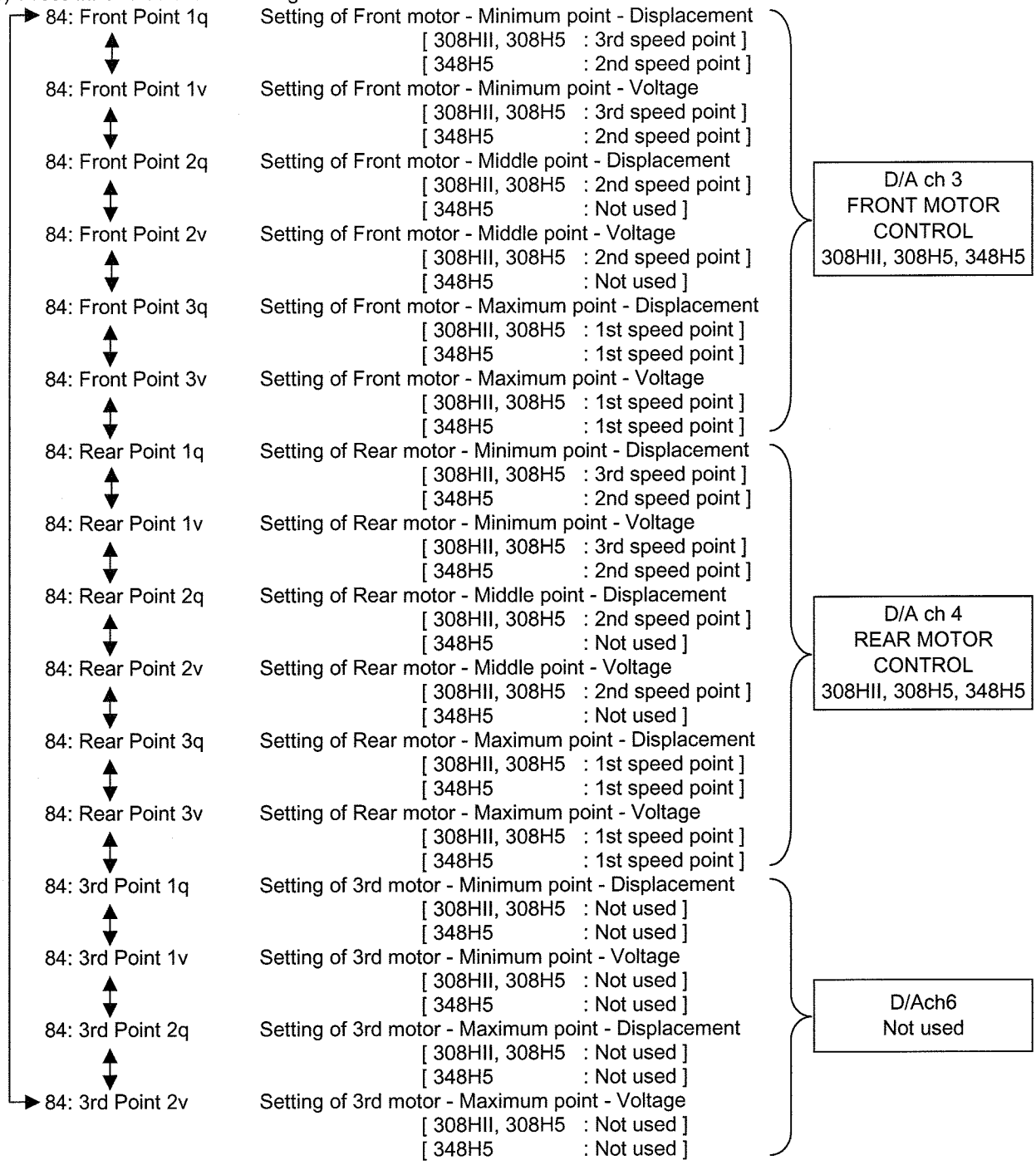
3) Set the Mainte No.=84 with ##.
4) Press ENTER.
5) LCD1

84: Front Point 1q
& : next ## : other

LCD2 Displacement [****cc/rev]
LCD3 Voltage [*.***V]
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)

Maintenance No.84 Setting of winch motor control adjustment value (Manual)

6) Press ## and select the setting item.



7) Press ENTER.

When selecting setting of ????? motor - ##### point - Displacement "84: ????? Point %q" → To 8-1)
When selecting setting of ????? motor - ##### point - Voltage "84: ????? Point %v" → To 8-2)

Maintenance No.84 Setting of winch motor control adjustment value (Manual)

Setting of ????? motor - ##### point - Displacement

8-1) LCD1 Select displacement with ##, and press &.
****[cc/rev]

LCD2 Displacement [****cc/rev] Blinks
LCD3 Voltage [*.***V]
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 5).)

9-1) Set the displacement with ##.
When stopping the setting, press RETURN before making the step 10-1). (Go to the step 5).)
The blinking on LCD2 display goes out.

10-1) Press ENTER.
11-1) Return to the step 5).
12-1) Make sure that the indication on LCD2 shows the displacement set.

13-1) Press RETURN.
14-1) Return to the step 2).
15-1) Place the maintenance key switch in "OFF" position.

Setting of ????? motor - ##### point - Voltage

8-2) LCD1 Select voltage with ##, and press &.
*.***[V]

LCD2 Displacement [****cc/rev]
LCD3 Voltage [*.***V] Blinks
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 5).)

9-2) Set the voltage with ##.
When stopping the setting, press RETURN before making the step 10-2). (Go to the step 5).)
The blinking on LCD3 display goes out.

10-2) Press ENTER.
11-2) Return to the step 5).
12-2) Make sure that the indication on LCD3 shows the voltage set.

13-3) Press RETURN.
14-3) Return to the step 2).
15-2) Place the maintenance key switch in "OFF" position.

Initial value
Refer to the table.

Setable value
0cc/rev ≦ Displacement ≦ 9999cc/rev
0.000V ≦ Voltage ≦ 9.999V

Maintenance No.85 Setting of winch motor control adjustment value (Actual machine)

Function

This enables the adjustment of the winch motor control adjustment value (Voltage) by detecting the drum revolution.

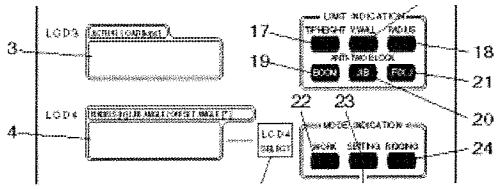
Setting procedures ## : ΔV & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1 | Select content with ##, and press &.
Mainte No.= 0 |

   LCD2 to LCD5 Blank
3) Set the Mainte No.=85 with ##.
4) Press ENTER.
5) LCD1 | 85: F 1st point
& : next ## : other |

LCD2	Engine speed	[****rpm]
LCD3	Front/Rear/3rd Drum speed	[***.*rpm]
LCD4	Target drum speed	[***.*rpm]
LCD5	Voltage	[*.***V]

(When RETURN is pressed, go to the step 2).)



Content	Lamp	
Front drum	Work Mode Indication Lamp	22 - Lit
Rear drum	Setting Mode Indication Lamp	23 - Lit
3rd drum	Rigging Mode Indication Lamp	24 - Lit

6) Press ## and select the setting item.

85: F 1st point	Setting of Front motor - Maximum point - Voltage	D/A ch 3 FRONT MOTOR CONTROL 308HII, 308H5, 348H5
	[308HII, 308H5 : 1st speed point]	
	[348H5 : 1st speed point]	
85: F 3rd point	Setting of Front motor - Minimum point - Voltage	
	[308HII, 308H5 : 3rd speed point]	
	[348H5 : 2nd speed point]	
85: R 1st point	Setting of Rear motor - Maximum point - Voltage	D/A ch 4 REAR MOTOR CONTROL 308HII, 308H5, 348H5
	[308HII, 308H5 : 1st speed point]	
	[348H5 : 1st speed point]	
85: R 3rd point	Setting of Rear motor - Minimum point - Voltage	
	[308HII, 308H5 : 3rd speed point]	
	[348H5 : 2nd speed point]	
85: 3 1st point	Setting of 3rd motor - Maximum point - Voltage	D/A ch 6 Not used
	[308HII, 308H5 : Not used]	
	[348H5 : Not used]	
85: 3 2nd point	Setting of 3rd motor - Minimum point - Voltage	
	[308HII, 308H5 : Not used]	
	[348H5 : Not used]	

7) Press ENTER.
8) LCD1 | Set voltage with ##, and press &.
*.***V Memory No |

LCD2	Engine speed	[****rpm]	
LCD3	Front/Rear/3rd Drum speed	[***.*rpm]	
LCD4	Target drum speed	[***.*rpm]	
LCD5	Voltage	[*.***V]	Blinks

(When RETURN is pressed, go to the step 5).)

9) Press ## and set the voltage.
10) Press ENTER.

Maintenance No.85 Setting of winch motor control adjustment value (Actual machine)

11) LCD1 | Select processing with ##, and press &.
*.***V Memory No | Memory : Blinks

LCD2	Engine speed	[****rpm]
LCD3	Front/Rear/3rd Drum speed	[***.*rpm]
LCD4	Target drum speed	[***.*rpm]
LCD5	Voltage	[*.***V] Blinks

(When RETURN is pressed, go to the step 8).)

12) Set the engine speed to 1000 rpm, and operate the front/rear/3rd control lever to the 2nd speed position of the hoisting side.
<<Caution>>
It takes time to becoming the set voltage after the control lever is operated.

13) Confirm whether the front/rear/3rd drum speed (LCD3) becomes the target drum speed (LCD4).
Return the control lever to the neutral position after confirming.
<<Caution>>
A. 85: F 1st point / 85: R 1st point / 85: 3 1st point
Confirm the drum speed after 14 seconds or more have passed after the control lever is operated on the step 12).
B. 85: F 3rd point / 85: R 3rd point / 85: 3 2nd point
Confirm the drum speed after 7 seconds or more have passed after the control lever is operated on the step 12).

When the front/rear/3rd drum speed dose not become the target drum speed → To 14)
When the front/rear/3rd drum speed becomes the target drum speed → To 16)

When the front/rear/3rd drum speed dose not become the target drum speed

14) Select "No" with ##, and press ENTER.
<<Caution>>
It becomes effective when ENTER is pressed after 3 seconds pass after the control lever is returned to the neutral position.
When ENTER is pressed before the time of the step 13), it becomes invalid.

15) Return to the step 8), and set the voltage again.

When the front/rear/3rd drum speed becomes the target drum speed

16) Select "Memory" with ##, and press ENTER.
<<Caution>>
It becomes effective when ENTER is pressed after 3 seconds pass after the control lever is returned to the neutral position.
When ENTER is pressed before the time of the step 13), it becomes invalid.

17) Make sure that the indication on LCD5 shows the voltage set.

18) Return to the step 5).
19) Press RETURN.
20) Return to the step 2).
21) Place the maintenance key switch in "OFF" position.

Initial value
Refer to the table.

Setable value
0.000V ≦ Voltage ≦ 9.999V

Maintenance No.84 Setting of winch motor control adjustment value (Manual) - Table
Maintenance No.85 Setting of winch motor control adjustment value (Actual machine) - Table

			Initial value											
			LS-108H5		LS-138H5		LS-218H5	LS-238H5		LS-248H5		LS-348H5		LS-308HII / LS-308H5
			Tier2	Tier3	Tier2		Tier2	Tier2	Tier3	Tier2	Tier3	Tier2	Tier3	Tier2
						From LS138-4264								Only LS308-4000 / From LS308-4001
Front & Rear motor	Minimum point	Displacement (cc/rev)	0	0	0	0	0	0	0	0	0	533	533	533 / 533
		Voltage (V)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.891	4.891	4.891 / 4.703
	Middle point	Displacement (cc/rev)	0	0	0	0	0	0	0	0	0	0	0	300 / 300
		Voltage (V)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.377 / 3.232
	Maximum point	Displacement (cc/rev)	0	0	0	0	0	0	0	0	0	192	192	192 / 192
		Voltage (V)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.935	1.935	1.935 / 1.804
			Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used			
3rd motor	Minimum point	Displacement (cc/rev)	0	0	0	0	0	0	0	0	0	0	0	0 / 0
		Voltage (V)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000 / 0.000
	Maximum point	Displacement (cc/rev)	0	0	0	0	0	0	0	0	0	0	0	0 / 0
		Voltage (V)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000 / 0.000
			Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used / Not used

Maintenance No.87 Display of drum speed

Function

This displays the drum speed.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=87 with ##.
4) Press ENTER.
5) LCD1

87: Drum speed

LCD2 Front drum speed [***.*rpm]
LCD3 Rear drum speed [***.*rpm]
LCD4 3rd drum speed [***.*rpm]
LCD5 Blank

6) Press RETURN.
7) Return to the step 2).
8) Place the maintenance key switch in "OFF" position.

Maintenance No.88 Debug mode

Function

This displays various control values.

Setting procedures ## : ΔV & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=88 with ##.
4) Press ENTER.
5) Press ## and select content. (Refer to the followings)
6) Press RETURN.
7) Return to the step 2).
8) Place the maintenance key switch in "OFF" position.

0 : S SMo P1v P2v ## : other	Throttle control Pump control		
＊＊＊＊	rpm	Required throttle	
＊＊＊＊	rpm	Throttle motor position	
＊.＊＊＊	V	Output voltage : MAIN PUMP CONTROL	(D/A ch 1)
＊.＊＊＊	V	Output voltage : Not used	(D/A ch 2)

1 : Sg St Ego Egc ## : other	Throttle control Engine speed display		
＊＊＊＊	rpm	Required throttle : Grip / Throttle volume	(A/D ch 4)
＊＊＊＊	rpm	Required throttle : Foot pedal	(A/D ch 11)
＊＊＊＊	rpm	Engine speed : For control	(CNT ch 0)
＊＊＊＊	rpm	Engine speed : For display	(CNT ch 0)

2 : P1c P2c P1v P2v ## : other	Pump control		
＊＊＊.＊	cc/rev	Required displacement : MAIN PUMP CONTROL	
＊＊＊.＊	cc/rev	Required displacement : Not used	
＊.＊＊＊	V	Output voltage : MAIN PUMP CONTROL	(D/A ch 1)
＊.＊＊＊	V	Output voltage : Not used	(D/A ch 2)

3 : Fdc Rdc Fdv Rdv ## : other	Winch motor control		
＊＊＊	cc/rev	Required displacement : FRONT MOTOR CONTROL	
＊＊＊	cc/rev	Required displacement : REAR MOTOR CONTROL	
＊＊.＊＊	V	Output voltage : FRONT MOTOR CONTROL	(D/A ch 3)
＊＊.＊＊	V	Output voltage : REAR MOTOR CONTROL	(D/A ch 4)

4 : Fds Rds Fdc Rdc ## : other	Drum revolution detection Winch motor control		
＊＊＊.＊	rpm	Drum revolution : Front <Not used>	(U/D CNT ch 0)
＊＊＊.＊	rpm	Drum revolution : Rear <Not used>	(U/D CNT ch 1)
＊＊＊	cc/rev	Required displacement : FRONT MOTOR CONTROL	
＊＊＊	cc/rev	Required displacement : REAR MOTOR CONTROL	

Maintenance No.88 Debug mode

13 : Egc Pzt Pzr Pz ## : other	Power shift control		
＊＊＊＊	rpm	Engine speed : For control	(CNT ch 0)
＊＊.＊＊	kgf/cm^2	Power shift pressure : N-Pz curve control	
＊＊.＊＊	kgf/cm^2	Power shift pressure : Rack sensor control	
＊＊.＊＊	kgf/cm^2	Power shift pressure : Final value	

14 : Egc Pz Pzmax DA ## : other	Power shift control		
＊＊＊＊	rpm	Engine speed : For control	(CNT ch 0)
＊＊.＊＊	kgf/cm^2	Power shift pressure : Final value	
＊＊.＊＊	kgf/cm^2	Maximum power shift pressure	
＊＊.＊＊	V	Output voltage : POWER SHIFT CONTROL	(D/A ch 0)

15 : Egc Ra Rh Rlim ## : other	Power shift control		
＊＊＊＊	rpm	Engine speed : For control	(CNT ch 0)
＊＊.＊＊	V	Rack sensor voltage	(A/D ch 7)
＊＊.＊＊	V	Rack sensor target voltage	
＊＊.＊＊	V	Rack sensor engine stall prevention judgement voltage	

16 : pump 1 ## : other	Pump control - MAIN PUMP CONTROL	
＊＊＊.＊	cc/rev	Required displacement - This time
＊＊＊.＊	cc/rev	Required displacement - Last time
＊＊＊.＊	cc/rev	Required displacement - First delay processing - Last time
＊＊＊.＊	cc/rev	Required displacement - First delay processing - This time

17 : pump 2 ## : other	Pump control - MAIN PUMP CONTROL	
＊＊＊.＊	cc/rev	Required displacement - First delay processing - Last time
＊＊＊.＊	cc/rev	Required displacement - First delay processing - This time
＊＊＊.＊	cc/rev	Required displacement - First delay processing
＊＊＊.＊	cc/rev	Required displacement - Final

18 : ECU ## : other	ECU/ECM control	
＊＊＊＊	A/D conversion value : Grip	(A/D ch 4)
＊＊＊.＊	D/A conversion value - Calculation 1st : ENGINE THROTTLE	(D/A ch 7)
＊＊＊.＊	D/A conversion value - Calculation 2nd : ENGINE THROTTLE	(D/A ch 7)
＊＊＊	D/A conversion value - Output : ENGINE THROTTLE	(D/A ch 7)

19 : DA 0-3 ## : other		
＊＊＊	D/A conversion value - Output : POWER SHIFT CONTROL	(D/A ch 0)
＊＊＊	D/A conversion value - Output : MAIN PUMP CONTROL	(D/A ch 1)
＊＊＊	D/A conversion value - Output : Not used	(D/A ch 2)
＊＊＊	D/A conversion value - Output : FRONT MOTOR CONTROL	(D/A ch 3)

20 : DA 4-7 ## : other		
＊＊＊	D/A conversion value - Output : REAR MOTOR CONTROL	(D/A ch 4)
＊＊＊	D/A conversion value - Output : Not used	(D/A ch 5)
＊＊＊	D/A conversion value - Output : Not used	(D/A ch 6)
＊＊＊	D/A conversion value - Output : ENGINE THROTTLE	(D/A ch 7)

Maintenance No.89 Boom protection device non-function mode

Function

This is the mode that functions the same to the work mode except the boom protection device.
It doesn't shift from this mode to "Setting Mode/Rigging Mode/Inspection Mode".

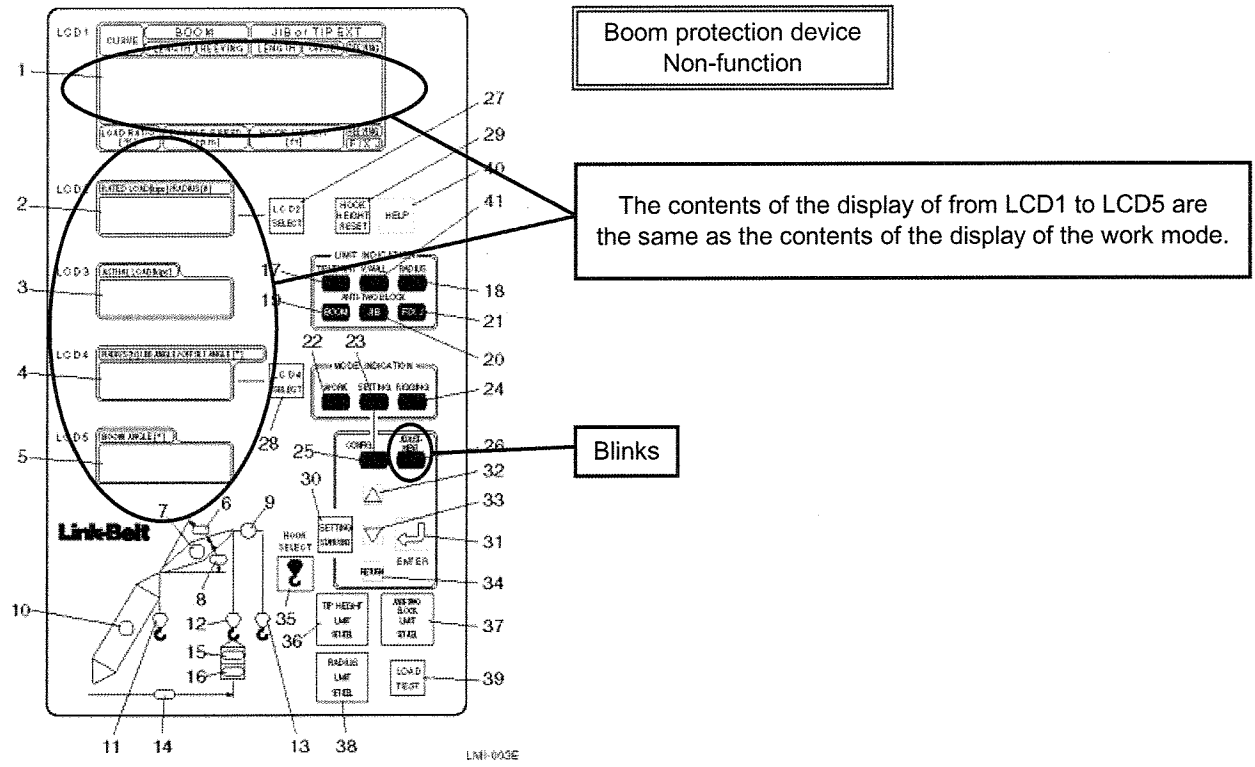
Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank
3) Set the Mainte No.=89 with ##.
4) Press ENTER.

5) The contents of the display of from LCD1 to LCD5 are the same as the contents of the display of the work mode.



6) Press RETURN.
7) Return to the step 2).
8) Place the maintenance key switch in "OFF" position.

Maintenance No.91 Display of tension

Function

This enables to display the boom/jib load cell detection tension.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=91 with ##.
4) Press ENTER.
5) LCD1

91: Tension

LCD2	Boom load cell detection tension	[**.**t]
LCD3	Jib load cell detection tension	[**.**t]
LCD4	Blank	
LCD5	Actual load	[***.*t]

Reference

The tension displayed on the this maintenance is T1.
The tension to be used with the actual load calculation is T3.

T1 [t] = ((A/D conversion value - Zero point correction value) x Gain correction value)
x Load cell capacity / 5000

T2 [t] = T1 - Drift correction value

<Hoisting> T3 [t] = T2 x hysteresis correction value
<Lowering> T3 [t] = T2 / hysteresis correction value

6) Press RETURN.
7) Return to the step 2).
8) Place the maintenance key switch in "OFF" position.

Maintenance No.92 Display of angle

Function

This enables to display the boom/jib angle.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=92 with ##.
4) Press ENTER.
5) LCD1

92: Angle

LCD2 Boom angle [***.*deg]
LCD3 Jib angle [***.*deg]
LCD4 to LCD5 Blank

Reference

The angle displayed on the this maintenance is θ 1.
The angle to be used with the working radius calculation and displayed on the work mode is θ 3.

θ 1 [deg] = ((A/D conversion value - Zero point correction value) x Gain correction value + 3333) x 90 / 5000

θ 2 [deg] = θ 1 - Drift correction value

θ 3 [deg] = θ 2 + Bending angle

6) Press RETURN.
7) Return to the step 2).
8) Place the maintenance key switch in "OFF" position.

Maintenance No.95 Setting of self-weight correction value (Manual)

Function

This enables to change the self-weight correction value.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
```
Select content with ##, and press &.
Mainte No.= 0
```
LCD2 to LCD5 Blank
3) Set the Mainte No.=95 with ##.
4) Press ENTER.
5) LCD1
```
95: Adjust point 1
& : next ## : other
```
LCD2 Self-weight correction value [*.***]
LCD3 Angle of correction point [**.**deg]
LCD4 to LCD5 Blank
(When RETURN is pressed, go to the step 2).)
6) Press ## and select the setting item.

95: Adjust point 1 Setting of self-weight correction value - Correction point No.1
↕
95: Adjust point 2 Setting of self-weight correction value - Correction point No.2
↕
95: Adjust point 3 Setting of self-weight correction value - Correction point No.3
↕
95: Adjust point 4 Setting of self-weight correction value - Correction point No.4
↕
95: Adjust point 5 Setting of self-weight correction value - Correction point No.5
↕
95: Adjust point 6 Setting of self-weight correction value - Correction point No.6
↕
95: Adjust point 7 Setting of self-weight correction value - Correction point No.7 <<Only Luffing>>
↕
95: Adjust point 8 Setting of self-weight correction value - Correction point No.8 <<Only Luffing>>
↕
95: Adjust point 9 Setting of self-weight correction value - Correction point No.9 <<Only Luffing>>
↕
95: Adjust point 0 Setting of self-weight correction value - Correction point No.1(<<Only Luffing>>

7) Press ENTER.
8) LCD1
```
Select content with ##, and press &.
*.***
```
LCD2 Self-weight correction value [*.***] Blinks
LCD3 Angle of adjust point [**.**deg]
LCD4 to LCD5 Blank
9) Set the self-weight correction value with ##.
When stopping the setting, press RETURN before making the step 10). (Go to the step 5).)

Maintenance No.95 Setting of self-weight correction value (Manual)

10) Press ENTER.
11) Make sure that the indication on LCD2 shows the self-weight correction value set.
12) Return to the step 5).

13) Press RETURN.
14) Return to the step 2).
15) Place the maintenance key switch in "OFF" position.

Initial value

Self-weight correction value : 1.000
Angle of correction point : Refer to the table.

Setable value

0.000 < Self-weight correction value ≦ 9.999

Maintenance No.95 Setting of self-weight correction value (Manual) - Table

Crane

Correction point							
No.	Boom angle [deg]						
	LS-108H5	LS-138H5	LS-218H5	LS-238H5	LS-308HII / LS-308H5	LS-248H5	LS-348H5
6	80.10	80.10	80.10	78.10	80.00	80.10	HD : 81.10 LR : 80.10
5	77.10	75.30	75.30	72.70	75.00	75.00	74.00
4	65.00	65.00	65.00	65.00	65.00	65.00	65.00
3	55.00	55.00	55.00	55.00	55.00	55.00	55.00
2	40.00	40.00	40.00	40.00	40.00	40.00	40.00
1	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Luffing

Correction point							
No.	Luffing jib angle [deg]						
	LS-108H5	LS-138H5	LS-218H5	LS-238H5	LS-308HII / LS-308H5	LS-248H5	LS-348H5
10	N/A	N/A	73.10	73.10	N/A	No correction	No correction
9	N/A	N/A	65.00	65.00	N/A	No correction	No correction
8	N/A	N/A	60.00	60.00	N/A	No correction	No correction
7	N/A	N/A	55.00	55.00	N/A	No correction	No correction
6	N/A	N/A	50.00	50.00	N/A	No correction	No correction
5	N/A	N/A	45.00	45.00	N/A	No correction	No correction
4	N/A	N/A	40.00	40.00	N/A	No correction	No correction
3	N/A	N/A	35.00	35.00	N/A	No correction	No correction
2	N/A	N/A	20.00	20.00	N/A	No correction	No correction
1	N/A	N/A	5.00	5.00	N/A	No correction	No correction

LS-248H5 & LS-348H5

No self-weight correction, because these models use radio load cell.

Maintenance No.95 Setting of self-weight correction value (Manual) - Table

Aux. Sheaves w/ Jib

No.	Correction point						
	Luffing boom angle [deg]						
	LS-108H5	LS-138H5	LS-218H5	LS-238H5	LS-308HII / LS-308H5	LS-248H5	LS-348H5
6	N/A	N/A	78.10	78.10	N/A	N/A	No correction
5	N/A	N/A	75.10	72.70	N/A	N/A	No correction
4	N/A	N/A	70.00	70.00	N/A	N/A	No correction
3	N/A	N/A	65.00	65.00	N/A	N/A	No correction
2	N/A	N/A	60.00	60.00	N/A	N/A	No correction
1	N/A	N/A	55.00	55.00	N/A	N/A	No correction

LS-348H5

No self-weight correction, because this model use radio load cell.

Aux. Sheaves w/o Jib

No.	Correction point						
	Luffing boom angle [deg]						
	LS-108H5	LS-138H5	LS-218H5	LS-238H5	LS-308HII / LS-308H5	LS-248H5	LS-348H5
6	N/A	N/A	78.10	78.10	N/A	N/A	No correction
5	N/A	N/A	75.10	72.70	N/A	N/A	No correction
4	N/A	N/A	65.00	65.00	N/A	N/A	No correction
3	N/A	N/A	55.00	55.00	N/A	N/A	No correction
2	N/A	N/A	40.00	40.00	N/A	N/A	No correction
1	N/A	N/A	20.00	20.00	N/A	N/A	No correction

LS-348H5

No self-weight correction, because this model use radio load cell.

Maintenance No.96 Setting of tension drift correction value (Actual machine)

Function

This enables to adjust the drift correction value of the load cell for boom/jib hoist rope tension detection.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1 | Select content with ##, and press &.
Mainte No.= 0 |

   LCD2 to LCD5 Blank
3) Set the Mainte No.=96 with ##.
4) Press ENTER.

5) LCD1 | 96: Tension drift
Press &. |

   LCD2 Drift correction value - Boom load cell
   LCD3 Drift correction value - Jib load cell
   LCD4 to LCD5 Content same as Work mode
   (When RETURN is pressed, go to the step 2).)

6) Press ENTER.

Setting of curve number
Crane, Aux. Sheaves w/ Jib, Aux. Sheaves w/o Jib → To 7-1)
Luffing → To 7-2)

Drift correction value of boom load cell

7-1) LCD1 | Hoist up boom/jib hook to overhoist position and press &. |

Hoist up the boom/jib hook to the anti-two block limit switch position.
When stopping the setting, press RETURN before making the step 8-1). (Go to the step 5).)

8-1) Press ENTER.

9-1) LCD1 | Set hook selection sw at target hook and press &. |

Select the boom hook with the hook selection switch.
When the boom hook is not attached, select the jib hook.
When stopping the setting, press RETURN before making the step 10-1). (Go to the step 7-1).)

10-1) Press ENTER.

11-1) Return to the step 5).
12-1) Make sure that the indication on LCD2 changes.

13-1) Press RETURN.
14-1) Return to the step 2).
15-1) Place the maintenance key switch in "OFF" position.

Maintenance No.96 Setting of tension drift correction value (Actual machine)

Drift correction value of jib load cell

7-2) LCD1 Hoist up jib/short jib hook to overhoist position and press &.

Hoist up the luffing jib/fixed jib hook to the anti-two block limit switch position.
When stopping the setting, press RETURN before making the step 8-2). (Go to the step 5).)

8-2) Press ENTER.

9-2) LCD1 Set hook selection sw at target hook and press &.

Select the luffing jib hook with the hook selection switch.
When the luffing jib hook is not attached, select the fixed jib hook.
When stopping the setting, press RETURN before making the step 10-2). (Go to the step 7-2).)

10-2) Press ENTER.

11-2) Return to the step 5).
12-2) Make sure that the indication on LCD3 changes.

13-2) Press RETURN.
14-2) Return to the step 2).
15-2) Place the maintenance key switch in "OFF" position.

Initial value

Drift correction value : 0.00

Setable value

- (Load cell capacity X 0.1) ≦ Drift correction value ≦ (Load cell capacity X 0.1)

Maintenance No.97 Setting of offset angle drift correction value (Manual)

Function

This enables to change the drift correction value of crane jib offset angle.

Setting procedures ##: △▽ &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1
   Select content with ##, and press &.
   Mainte No.= 0

   LCD2 to LCD5 Blank
3) Set the Mainte No.=97 with ##.
4) Press ENTER.

5) LCD1
   97: Offset drift
   Press &.

   LCD2 Drift correction value
   LCD3 to LCD5 Blank
   (When RETURN is pressed, go to the step 2).)

   <<Caution>>
   CASE1 : The setting of the configuration is not "Crane w/Jib".
   LCD1 Cannot be set, in this style. → Press RETURN, and return to the step 2).

   CASE2 : "Setting of offset angle drift correction value (Actual machine) [Maintenance No.98]" is not executed.
   LCD1 Not adjusted, in this style. → Press RETURN, and return to the step 2).

6) Press ENTER.

7) LCD1
   Select content with ##, and press &.
   .

   LCD2 Drift correction value [**.**deg] Blinks
   LCD3 to LCD5 Blank
   (When RETURN is pressed, go to the step 5).)

8) Set the offset angle drift correction value with ##.
   When stopping the setting, press RETURN before making the step 9). (Go to the step 5).)
   The blinking on LCD2 display goes out.

9) Press ENTER.
10) Make sure that the indication on LCD2 shows the drift correction value set.
11) Return to the step 5).

12) Press RETURN.
13) Return to the step 2).
14) Place the maintenance key switch in "OFF" position.

Initial value

Drift correction value : 0.00

Setable value

-9.99 ≦ Drift correction value ≦ 9.99

Maintenance No.98 Setting of offset angle drift correction value (Actual machine)

Function

This enables to adjust the drift correction value of crane jib offset angle.

Setting procedures ## : △▽ & : ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1 Select content with ##, and press &.
   Mainte No.= 0

   LCD2 to LCD5 Blank
3) Set the Mainte No.=98 with ##.
4) Press ENTER.

5) LCD1 Select adjustment with ##, and press &.
   Adjust Clear

   LCD2 Drift correction value
   LCD3 Execution condition of adjustment "- - - -" Blinks : Unexecution / Blank : Done
   LCD4 to LCD5 Content same as Work mode
   (When RETURN is pressed, go to the step 2).)

When adjusting the offset angle drift correction value → To 6-1)
When clearing the offset angle drift correction value → To 6-2)

Adjusting the offset angle drift correction value

6-1) Select "Adjust" with ##, and press ENTER.

7-1) LCD1 Set boom angle at 60° , and press &.

When stopping the setting, press RETURN before making the step 8-1). (Go to the step 2).)

8-1) Adjust the boom angle to 60±1° on LCD5 with the boom raising or lowering.
9-1) Press ENTER.
10-1) LCD1 Set hook selection at jib hook, and press &.

11-1) Select the jib hook with the hook selection switch.
12-1) Press ENTER.
13-1) LCD1 Set measured jib hook radius with ##, and press &.
.m

14-1) Measure the working radius of the jib hook.
15-1) Set the measured working radius with ##.

When stopping the setting, press RETURN before making the step 16-1). (Go to the step 2).)

16-1) Press ENTER.
17-1) LCD1 Calculating now.

18-1) LCD1 Adjustment completed. Press &.

The drift correction value displayed on LCD2 changes.
The execution condition of adjustment displayed on LCD3 changes to blank.

19-1) Press ENTER.
20-1) Return to the step 5).
21-1) Press RETURN.
22-1) Return to the step 2).
23-1) Place the maintenance key switch in "OFF" position.

Maintenance No.98 Setting of offset angle drift correction value (Actual machine)

Clearing the offset angle drift correction value

6-2) Select "Adjust" with ##, and press ENTER.

7-2) LCD1

```
Select adjustment with ##, and press &.
Only  All
```

When stopping the setting, press RETURN before making the step 8-1). (Go to the step 2).)

8-2) Select the clearing content with ##, and press ENTER.
9-2) CASE1 : When selecting "Only"

LCD1

```
Clear current corrected values only. Press &.
```

CASE2 : When selecting "All"

LCD1

```
Clear all corrected values. Press &.
```

10-2) Press ENTER.
11-2) LCD1

```
Calculating now.
```

12-2) LCD1

```
Clearing completed. Press &.
```

The drift correction value displayed on LCD2 changes to 0.00° .
The execution condition of adjustment displayed on LCD3 changes to "----" blinks.

13-2) Press ENTER.
14-2) Return to the step 5).
15-2) Press RETURN.
16-2) Return to the step 2).
17-2) Place the maintenance key switch in "OFF" position.

Initial value

Drift correction value : 0.00

Setable value

-9.99 ≦ Drift correction value ≦ 9.99

Maintenance No.99 Display of ROM informations

Function

This displays the ROM informations.

Setting procedures ##: ΔV &: ↵

1) Place the maintenance key switch in "ON" position. (Input 2.5V or more at A/D ch14.)
2) LCD1

Select content with ##, and press &.
Mainte No.= 0

LCD2 to LCD5 Blank

3) Set the Mainte No.=99 with ##.
4) Press ENTER.
5) Press ## and select content. (Refer to the followings)
6) Press RETURN.
7) Return to the step 2).
8) Place the maintenance key switch in "OFF" position.

99 : Program
: other

Program ROM [IC26]

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Program Code
Program Version

99 : Data
: other

Data ROM [IC35, IC44]

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Data ROM Parts Number
Data ROM Version
Data ROM Parts Number

	Display		Display		Display
BER	001	CAR	101	SER	201
BLR	002	CBR	102		
BMR	003	CCR	103		
BUR	004	CDR	104		
BJR	005	CER	105		
BWR	006	CNR	106		
		CPR	107		
		CSR	108		

99 : SYS1
: other

System Common Data (1)

****
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System Common Data (1) Number
System Common Data (1) Version

99 : SYS2
: other

System Common Data (2)

****
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System Common Data (2) Number
System Common Data (2) Version