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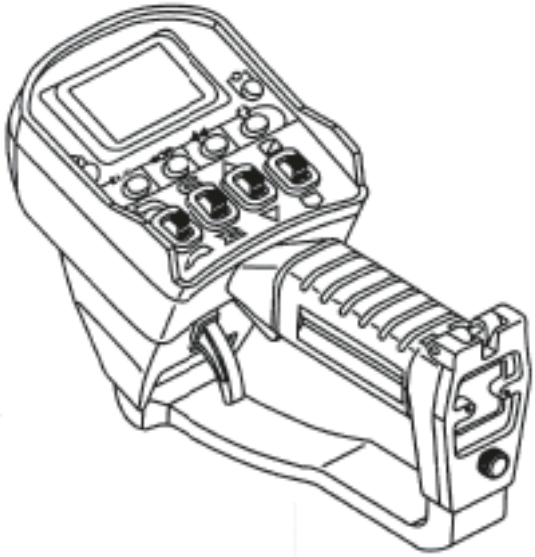
OPERATORS MANUAL

MAEDA MINI CRANE

REMOTE CONTROL SYSTEM

MCT300



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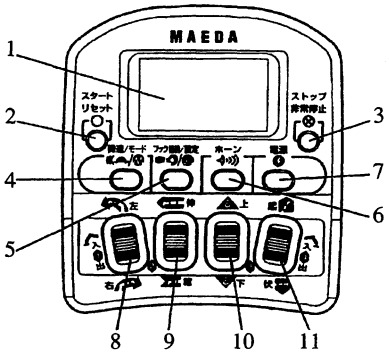
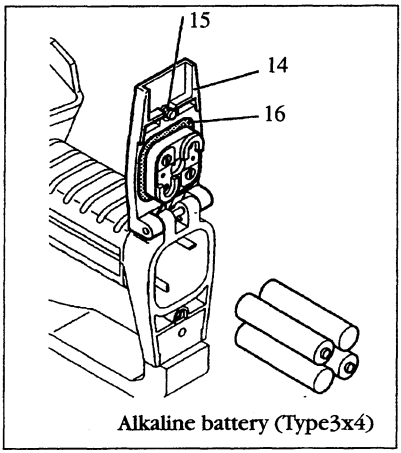
1. Nomenclature of Various Parts

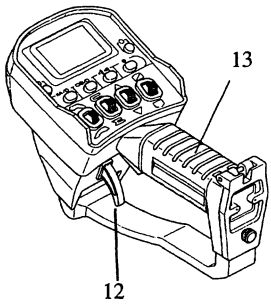
1.1 Transmitter

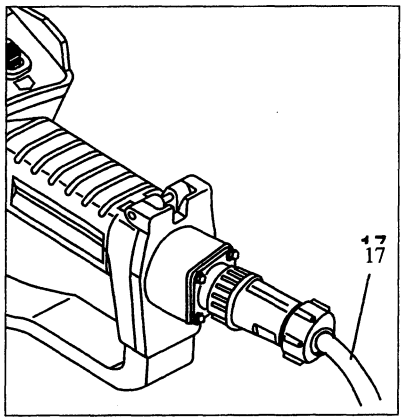


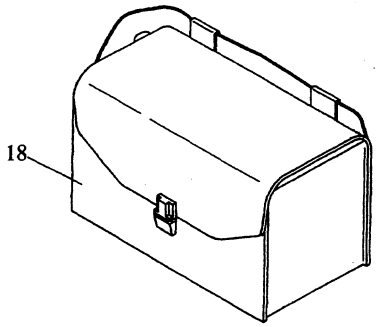
Radio controller

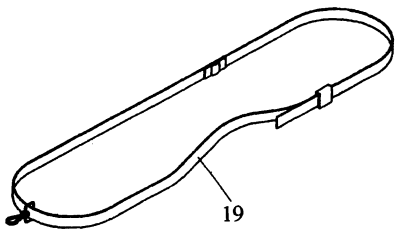


Remote controller









OPERATION

1. LCD (Liquid Crystal Display)

- Displays the operation of transmitter, set value in each mode or trouble with marks, characters and symbols in use.

2. Start / Rest button

- Start: To be used for starting up the crane engine.
- Rest button: For canceling emergency stop and trouble signal detected.

3. Stop / Emergency Stop button

- Stop: To be used for stopping the crane engine.
- Emergency stop button: To be used for stopping any crane action in case of emergency such as its motion does not stop otherwise. (There are modelswherein, for stopping any crane motion, the crane engine has to be shutdown while others does not need it to be done.)

4. Micro-speed / Mode button

- Micro-speed: During crane operation, if you want any motion to be performed at low speed, you can select this micro-speed control.
- Mode button: To be used for selecting the mode for operation via transmitter.

5. Hook Stow / Set-up button

- Hook Stow: To be used for stowing the hook, in case your crane has a quick hook (automatic hook stowing type). (There in no indicator for stowing hook if the crane is not equipped with the quick hook.)
- Set-up button: To be used for setting up each option shown on LCD in initial mode.

6. Horn button:

- To be used for alarming personnel around, before starting or during your crane operation.

7. Power lamp:

- To be used for turning ON/OFF the transmitter power.

8. Swing / No. 1 Outrigger Control lever

- To be used for swinging the crane to the right or left and extending or retracting No.1 outrigger.

9. Boom Telescoping / No.2 Outrigger Control lever

- To be used for extending or retracting crane boom and extending or retracting No.2 outrigger.

10. Hook Hoist / Lower and No.3 Outrigger Control lever

- To be used for hoisting or lowering crane hook and extending or retracting No.3 outrigger.
- To be used in initial mode for moving arrow cursors on LCD.

11. Boom Hoist / Lower and No.4 Outrigger Control lever

- To be used for hoisting or lowering crane boom and extending or retracting No.4 outrigger.

12. Accelerator Control lever

- Enables you to change the speed of engine, which drives the crane, freely for controlling the speed of crane motion.

13. Grip

- This has been installed for transmitter operator to hold. In case of radio controlling type system, dry batteries for starting up the transmitter are contained in it.

14. Battery cover 15. Lock bolt 16. Packing

- For removing and reinstalling batteries, loosen lock bolt 15 before opening the battery cover. Packing 16 has been provided for prevention of rain water from entering after the cover is locked.

17. Remote control cable

- This is the cable to connect transmitter with receiver when remote control system is in use, with or without radio control.

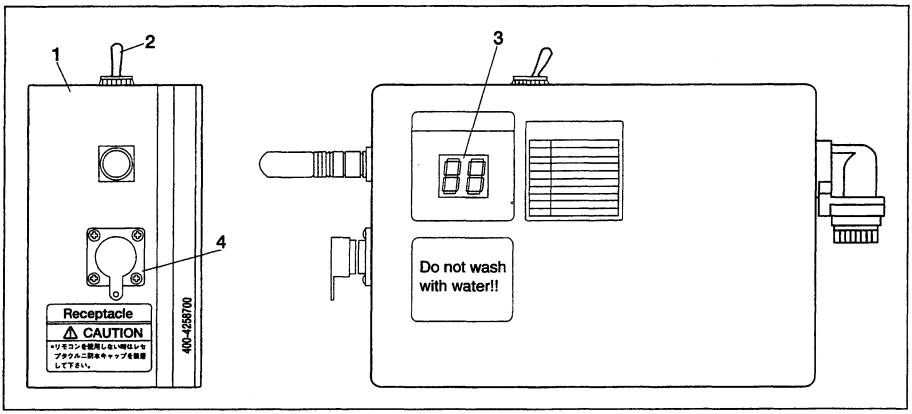
18. Stow case

- To stow the transmitter when it is not used. Make sure the power of transmitter is turned OFF before placing it in this case.

19. Hook belt

- To be used for preventing the transmitter from falling down while in use.

1.2 Receiver



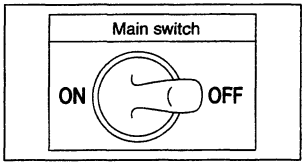
* Location may be different depending on the model.

1. Control box

In this box, contained are the receiver system and control system.
Never attempt to disassemble this control box.

2. Main switch

This is for turning ON/OFF the power to the control system. Before starting up the vehicle engine, be sure to turn off this main switch.
For manual control, have this main switch turned OFF.



3. Monitor display

Error will be displayed when trouble detector system of the controller is actuated. In such case, press the reset switch on radio transmitter. If the Error display still persists, turn of the power once before turning it on again.
If the Error display persists even after resetting the power, trouble in radio transmitter or radio controller in control box is conceivable.
Contact your dealer for checking. Trouble Shooting for detail of the error display.)

4. Receptacle

For using remote control while crane is in remote control mode or radio remote control mode, insert here the remote control switch cable plug to enable the remote control switch operation.

Insert the remote control plug only after turning OFF the main switch and tighten the thread securely. While remote control is not in use, be sure to cover the receptacle with water proof cap.

* If your crane is not equipped with remote control system, even if it has this receptacle, remote control can not be utilized. Have the receptacle covered with water proof cap.

1.3 Safety Systems

[1] Interference Preventive Circuit (Radio control system)

"E2" will be displayed on the receiver monitor if it incurs any effect of radio wave disturbance, jamming or noise for 1 second or longer, and crane will stop its motion. Push the reset switch for resetting.

[2] ID code (Radio control system)

Each crane is provided with individual identification code (ID code) for prevention of malfunctioning due to signal wave by other radio system.

[3] Trouble Signal Detection Circuit

So that the crane does not actuate immediately after the main switch of receiver is turned ON, for the period of 3-4 seconds, this circuit probes for any crane control signal. If there is such signal, it automatically turns OFF the power to stop crane. If the crane stops, push the reset switch.

[4] Auto Power Off Circuit

Transmitter power will be automatically turned OFF in certain period of time after crane operation is completed by means of radio control.

For resuming crane operation, turn ON the transmitter power button.

[5] Circuit for stopping motion at low voltage (receiver)

If battery voltage of the crane drops below DC7V, receiver power will be interrupted for safety protection purpose.

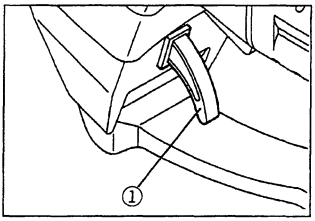
This is for preventing crane malfunctioning due to dropped battery voltage. It resets automatically, if battery voltage returns to DC7V or higher.

2. Transmitter Operation
2-1 Operation in Crane Mode

⚠ WARNING

- **Before starting to operate your crane, make sure that outriggers are securely grounded. Deficient grounding of outriggers may cause the crane to tip-over, resulting in accident of death or injury.**
- **Select Crane Mode before starting crane operation.**
- **Accelerator control lever should be operated slowly before you get used to crane operation.**
- **It is extremely dangerous to operate crane control lever with the accelerator lever remaining pulled back, as it will cause the motion to reach maximum speed. Be sure to operate the crane control lever first, before slowly pulling the accelerator lever.**
- **For stopping crane work, be sure to return the accelerator lever first, before returning the crane control lever to Neutral position.**

[1] Accelerator Control lever ①

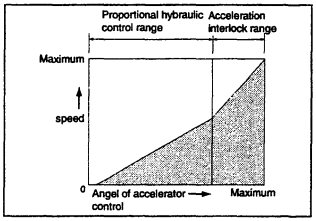


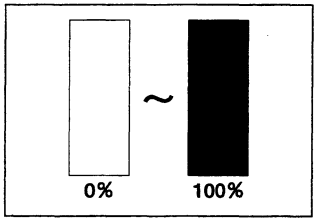
Allows you to adjust the flow in control valve and engine speed for controlling the speed of various crane motions. When released, the lever returns to original position.

Supplemental explanation

When operated independently, this lever is not effective in controlling the flow in valve or engine speed.

- With respective control lever remaining depressed, pulling up the accelerator control lever slowly causes the crane to start its motion with engine running at idling speed and as the lever is pulled further, engine speed increases, causing the crane motion to grow faster.
- Allowance for pulling the crane control lever is always indicated during crane operation.
- Accelerator control lever is useful in outrigger mode as well.





NOTES

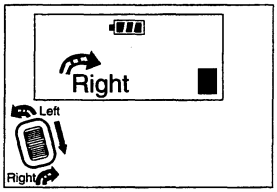
There are models wherein proportional hydraulic control does not work in outrigger mode, being interlocked with accelerator only.

[2] Swing Control lever

⚠ WARNING

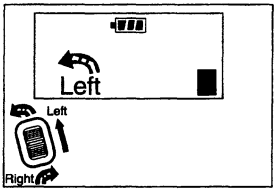
- **Operation of accelerator control lever should always be performed slowly. Particularly, its sudden operation with a load suspended will give a great shock to the crane, resulting in accident involving death or injury due to damage to or tipping-over of the crane.**
- **Swing motion should always be performed at low speed, while paying attention not to race the engine excessively.**

[Clockwise swing]
Move the swing control lever to right (down) , then pull the accelerator lever. Boom will turn clockwise, looking from top.



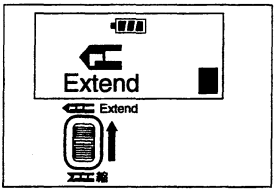
[Counterclockwise swing]
Move the swing control lever to left (up), then pull the accelerator lever.. Boom will rotate counterclockwise, looking from top.

[Stopping the motion]
After returning the accelerator lever, return the swing control lever to neutral position. The boom in swing motion will come to stop.

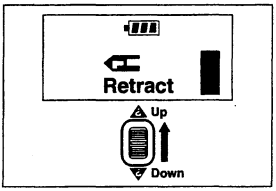


[3] Boom Telescoping Lever

[Extend]
Push the boom telescoping lever to Extend side (up), before pulling the accelerator lever. Boom will be extended.



[Retract]
Push the boom telescoping lever to Retract side (down) and pull the accelerator control lever. Boom will be retracted.



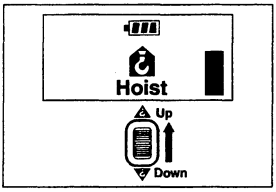
[Stopping the motion]
After returning the accelerator control lever, return the boom telescoping lever to neutral position. Boom will stop extending or retracting.

[4] Hook Hoisting and Lowering Lever

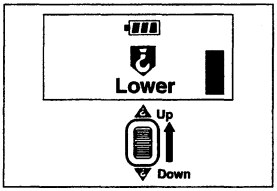
⚠ WARNING

- **While hoisting the hook, if the over-hoist preventive device or over-hoist alarm system is actuated, stop hoisting immediately.**
  Crane will be damaged or wire rope will be broken, causing hook or suspended load to fall down to result in accident involving death or injury.
- **While lowering the hook, continuing to lower even after the load (hook) has reached the ground, will result in disorderly take up of wire rope, which shortens the useful life of rope substantially. Or, by catching wire rope, the winch may become inoperable. Use sufficient care to avoid disorderly take up.**
- **Hook will rise up even with boom extension or its hoisting. Same as in hook hoisting operation, if the buzzer of over-hoist preventive device or over-hoist alarm starts to sound, stop you operation immediately.**

[Hoisting]
Pull the hook hoist and lowering lever to Hoist side (up) before pulling the accelerator control lever. Hook will be hoisted.



[Lowering]
Push the hook hoisting and lowering lever to Lower side (down) and pull the accelerator control lever. Hook will be lowered.



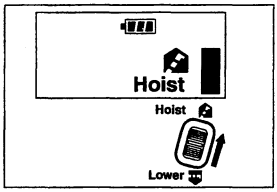
[Stopping the motion]
After returning the accelerator control lever, return the hook hoisting and lowering control lever to Neutral. Hoisting or lowering of the hoist will come to stop.

[5] Boom Hoisting and Lowering Lever

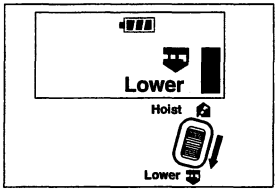
⚠ WARNING

- **Always operate the accelerator lever slowly.**
- **Particularly, sudden operation with a load suspended will give a great shock to the crane, causing a damage to or tip-over of the crane to result in accident with death or injury involved.**
- **Lifting a load off the ground by means of boom hoisting motion should be prohibited. Damage to or tip-over of crane may be caused, resulting in accident with death or injury involved.**

[Boom Hoist]
Pull the boom hoist control lever to Hoist side (up), then pull the accelerator control lever slowly. Boom will be hoisted.



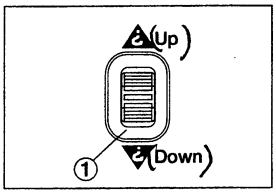
[Boom Lower]
Push the boom hoist control lever to Lower side (down). then pull the accelerator control lever slowly. Boom will be lowered slowly.



[Stopping the work]
After returning the accelerator control lever slowly, return the boom hoist control lever to its neutral position. Boom will stop hoisting or lowering.

2-2 Automatic Hook Stowing

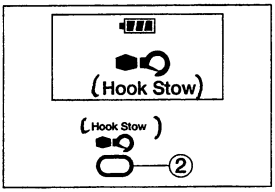
* Not applicable to any crane which is not of automatic stowing type specifications.



(1)After placing the boom in travel position, operate the Hook hoist and lower control lever ① to hoist the hook. As soon as the hook comes in contact with the over-hoist detecting weight, the motion of hook hoisting will stop. Any motion of boom extension and boom hoisting will stop automatically as well.

Supplementary explanation:

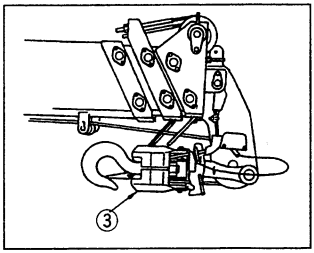
Simultaneously with stopping, a voice message to the effect that hook is being over-hoisted will be heard (Applicable only to the crane with voice function.)



(2)After the hook has become stationary, push the Hook Stow button ②. Message "Hook Stowed" will be displayed in LCD.

Supplementary explanation:

Pushing the Hook Stow button, causes a voice message, "Place the boom in travel position. The hook will be stowed." will sound. (Applicable only to the crane with voice function.)



(3)With the Hook Stow button remaining depressed, pull the accel-eration control lever slowly to hoist the hook.

Supplementary explanation:

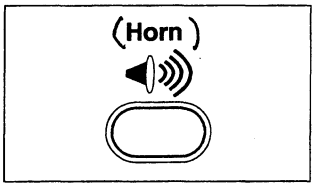
During this hook stowing operation, engine will remain at idling speed.

(4)The hook ③ will go up along the hook guide to be stowed in prescribed place. After returning accelerator control lever, return the Hook Stow button.

3. Nomenclature

3.1 Alarm System

Pushing the Horn button causes vehicle horn to sound, which is to be used at the start of work or alarming any personnel around for a danger.

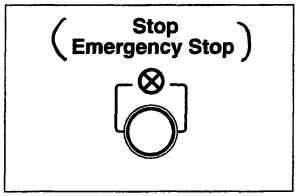


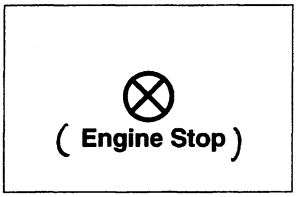
3.2 Engine Stop/Emergency Stop

- **Engine Stop:**
  If you want to stop engine with transmitter, push the Stop/Emergency Stop button.

- **Emergency Stop:**
  If releasing the control lever or accelerator control lever on the transmitter fails to stop the crane in action, or if crane is actuated without lever being operated, push this Stop/Emergency Stop button. With the engine being shutdown, crane motion will come to stop.

★After making an emergency stop, turn OFF the power button on the transmitter.

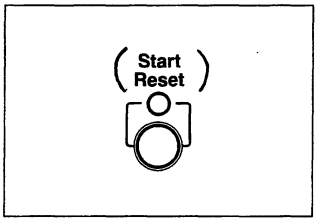




3.3 Starting and Resetting the Engine

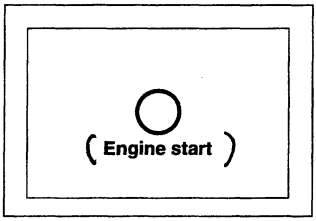
- **Starting the engine:**

For starting the engine by means of transmitter, push the Start/Reset button.



Supplementary explanation:

For starting your engine with the Start/Reset button, have the engine key on the crane turned to ON position. If it remains at OFF position, engine will not start even with the Start/Reset button pressed.



- **Resetting:**

For canceling emergency stop system or trouble signal detector, push the Start/Reset button. Power to the receiver will be reset. If the radio controlled motion has been stopped, the radio control start up circuit will be energized and radio control will be actuated.

Supplementary explanation:

- While engine is running, pushing the Start/Reset button does not cause the engine starter to be actuated.
- Before pushing the Reset button, turn-on the power button on transmitter.
- When the Reset button is pressed, the trouble signal detector will automatically be actuated. Therefore, wait for 3-4 seconds before operating the transmitter.

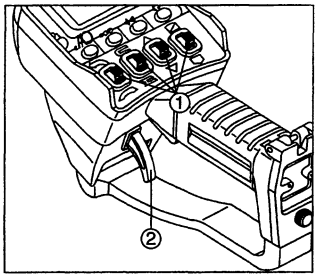
4. Operation

⚠ WARNING

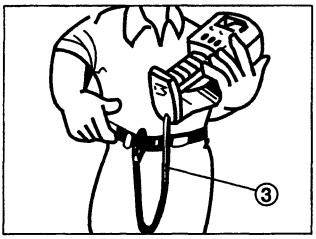
- **Never disassemble or modify the transmitter or receiver. Electrification or fire may result in.**
- **Do not drop, hit or give strong shock to the transmitter. Due to broken casing or trouble or malfunction of electronic parts, electrification or other injury may result in.**
- **If the transmitter should be damaged by dropping it or the like, remove all the batteries first and contact your dealer for repair.**
- **Cleaning the transmitter or receiver with water is strictly prohibited. Ingress of water will cause trouble or malfunction, resulting in electrification or other injury.**
- **Crane should not be operated simultaneously with radio and manual controls. Unexpected motion of the crane may cause accident with injury involved. Crane operation should always be conducted with only one of the two systems in use.**
- **Loose tightening of battery cover locking screw on the transmitter deteriorates water proof performance. Tighten them securely.**

4.1 Matters to be checked before starting operation

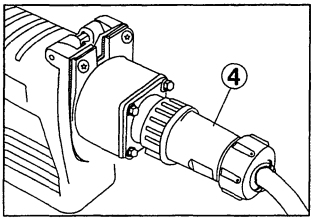
(1) That the main switch of receiver is turned OFF.
(2) That control levers ① on transmitter moves smoothly and when released they return to Neutral.
(3) That accelerator control lever ② has been returned all the way.
(4) Now, start the crane engine.



(5) To prevent transmitter from falling down, engage the hook of belt ③ at the bottom of grip and fasten its other end through Operator's belt or the like.

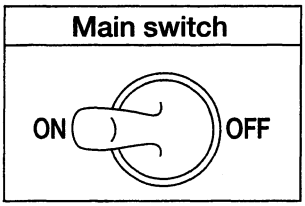


(6) If remote control system is provided, make sure that cable receptacle ④ has been securely installed to each of the transmitter and receiver.



4.2 Starting the Radio Remote Control System

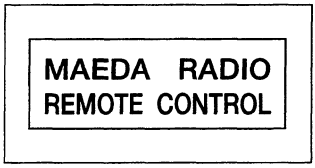
(1) Turn ON the main switch of the receiver.



Supplementary explanation:

Because the trouble signal detector will work for the 3-4 seconds after the main switch is turned ON, the crane is not operable during such period.

(2) Turn ON the power button of the transmitter to see the mark shown to the right appears on LCD. Simultaneously, a voice message to the effect that radio control is now operable will sound, in case your crane has the voice function.



Supplementary explanation:

When an instruction on LCD requesting for replacement of battery appears, replace the battery in accordance with Battery Replacement.

- In the event that establishment of initial values for LCD temperature, light, off-timer or the like on the LCD is necessary, select the Initial Mode to set them up.
- Due to jamming or reflection in surroundings, there will be cases where radio wave does not reach even in short distance. If a voice function is available, a voice message to the effect that wave can not be received will be issued. Operate your crane in as close location as possible to the receiving antenna. If the wave still does not reach, "E2" will appear on the monitor display of During crane operation, when preset time for off-timer has elapsed, auto power-off system will be actuated and power to the transmitter will go OFF. When you want to resume radio control again, turn ON the transmitter power and set up the required operation mode.

4.3 Crane Operation

⚠ WARNING

- **Make sure that outriggers of crane has been all extended and positively grounded. If grounding is deficient, an accident resulting in injury or death can be incurred due to damage to or tipping-over of the crane.**
- **During work, be sure to always carry Portable Total Rated Load Chart with you and use care to prevent over-loading or tipping over.**
- **In case of radio control operation, operator stays away from the crane. Sufficient attention should be paid to conditions surrounding the crane and its stability, particularly to avoid tipping over of the crane.**
- **Control lever of the transmitter should be operated slowly. Sudden lever control particularly with a load suspended, will give a great shock to the crane, causing damage to or tipping over of the crane and resulting in accident with death or injury involved.**
- **Simultaneous operation of hook hoisting and boom lowering with a load suspended should never be executed as it is extremely dangerous.**

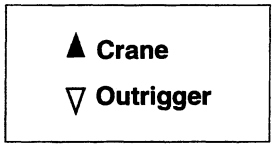
(1) Select the Crane Mode for operation.
- See Retrieving the Crane Mode (P3-13) for detail.

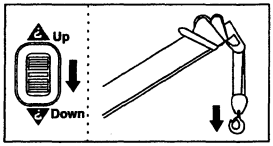
Make sure that the Crane Mode has been selected.

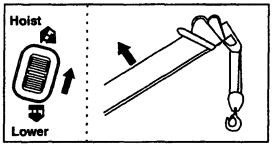
(2) Push down the Hook Hoist and Lower Control lever to Lower side and have the stowed status of hook cancelled.

(3) Pull up the Boom Hoist and Lower Control lever to Hoist side and hoist the boom sufficiently.

(4) Operate respective control switch for desired crane operation.
See Operation in Crane Mode for detail, Instruction Manual of the crane should also be referred to.







OUR ADVICE

- In case of emergency during radio controlled operation, such as that releasing the transmitter lever does not cause the crane to stop its motion, or despite that you have not touched the lever, the crane starts its motion all by itself, push the Emergency Stop button on the transmitter. Engine will stop and so does the crane motion.
- In the Micro Speed mode, swinging speed may be different between clockwise and counterclockwise slewings. Slight variation in the speed may take place due to hydraulic oil temperature as well.

4.4 Completing Your Crane Operation

⚠ WARNING

- **Upon completion of your radio controlled operation, be sure to turn OFF the power to the transmitter and receiver.**
- **Never power up the transmitter except for the purposes of crane operation. Crane may be actuated against operator' s intention and cause accident of tipping over or collision, resulting in personal injury or other accident.**
- **For the purpose of inspection or the like, if you are inevitably to power up the transmitter, make sure that the receiver is turned OFF and the crane engine is not running.**

(1) After making sure that Crane Mode has been selected and the boom has been totally retracted and lowered to be stowed in prescribed location, stow the hook.
(2) Select Outrigger Mode and stow all the outriggers to assume travel position.
(3) After completion of crane work, make sure that the accelerator control lever of transmitter has returned to Idling position.
(4) Turn OFF the transmitter power.
(5) Stow the transmitter in the provided storage case to avoid rain water and store in the cool, dry shade.
(6) Turn OFF the receiver main switch.

5. Trouble Shooting

5.1 Matters to be checked when crane does not operate despite that the engine running:

- Does the crane operate under manual control?
- Has the transmitter power been turned ON?
- Has the LCD on transmitter been lighted?
  Battery has to be replaced if an instruction to that effect is displayed.
- Hasn' t the fuse been blown?
- Hasn' t the transmitter been deformed or damaged?
- Are all the transmitter levers in Neutral position?
- Aren' t you operating the lever immediately after pushing ON the transmitter power button?
- Isn' t any Error message displayed on transmitter LCD or receiver monitor display? If yes, push reset the button on transmitter to see if it goes off. If the Error message still persists, turn OFF the power of transmitter once, before turning it ON again.

If the crane still does not operate after above checking having been conducted, contact your dealer. In case the trouble is based on electric system, operation can be performed manually with the main switch of receiver turned OFF.

5.2 Trouble in radio controller (When Crane is displayed, in case of manual operation.)

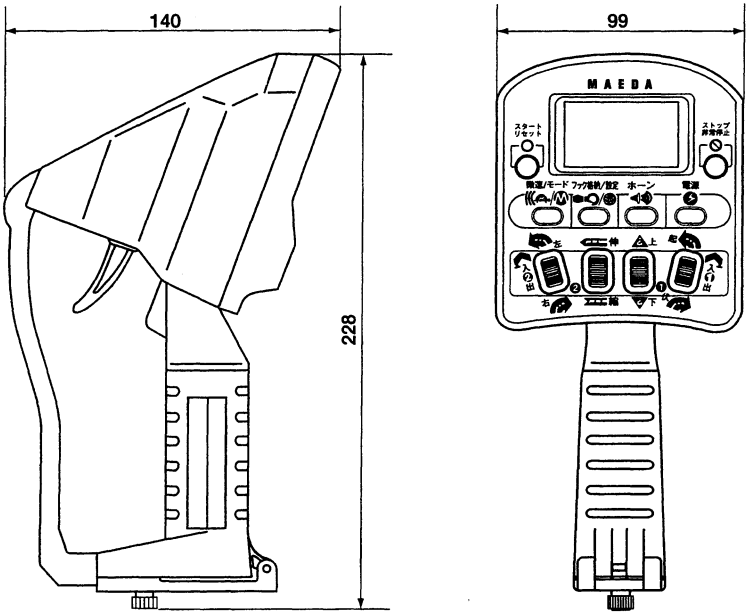
	Error display		Main Cause	Remedy	
	Transmitter	Receiver		Remedy 1	Remedy 2
While crane operates perfectly under manual control, it does not at all under radio control.	———	Nothing displayed	Receiver printedcircuit(PC) input voltage dropped ● Relay PC defective ● Power line wire harness defective between relay PC and receiver PC.	● Check the relay PC. ● Check, repair or replace between the relay PC and receiver PC.	
			● Receiver PC defective.	● Check, repair or replace the receiver PC.	
	(Emergency stop)	E1	Emergency stop being applied to transmitter.	● Push reset button and cancel the emergency stop.	● Replace or repair the transmitter assembly.
	———	E2	Receiving error has occurred. ● ID code inconsistent. ● Noise and jamming wave occurring in the neighborhood for disturbance. ● Radio wave interrupted during operation. Transmitter defective ● Transmitter not powered up. ● PC within the transmitter defective. Receiver defective ● Receiver antenna damaged. ● PC within the receiver defective.	● Check the type of transmitter and receiver and ID code consistency. ● Check the neighborhood, or work manually. ● Move the transmitter into the area from where radio wave reaches. (Returning control lever on receiver to Neutral causes the Error to be cancelled.) ● Check that the transmitter has been powered up. ● Check, repair or replace the transmitter. ● Replace the antenna. ● Check, repair or replace the receiver.	● Check, repair or replace the transmitter.
	(Wiring failure within the transmitter) E1	E3	Receiver defective ● PC within the transmitter defect ● Transmitter power supply voltage drop ● Battery contact deficient	● Check, repair or replace the transmitter. ● Check the battery mark on LCD or replace the battery. ● Check and repair the battery case or replace the transmitter.	

	Error display		Main Cause	Remedy	
	Transmitter	Receiver		Remedy 1	Remedy 2
While crane operates perfectly under manual control, it does not at all under radio control.	(Position of VOL inappropriate) E3	E4	Transmitter defective ● Transmitter accelerator control lever position inappropriate.	● With the accelerator control lever returned, power up the transmitter again and see.	● Check, repair or replace the transmitter.
	———	E5	Transmitter defective ● When the transmitter was powered up, accelerator control lever had been pulled up.	● With the accelerator control valve returned, push the reset button.	● Check, repair or replace the transmitter.
	———	E6	Receiver PC defective ● Memory content deficient.	● Power up again and see.	● Check, repair or replace the receiver PC.
	(CPU defective) E4	E7	Receiver PC defective ● CPU deficient.	● Power up again and see.	● Check, repair or replace the receiver PC.
	(EPROM defective) E2	———	Receiver PC defective ● Memory content deficient.	● Power up again and see.	● Check, repair or replace the transmitter.
	(SW location inappropriate) E5	E9	Defect within the transmitter ● At power up, the transmitter control lever was no in Neutral.	● With the control lever returned, push the reset button.	● Check, repair or replace the transmitter.
Crane operates perfectly under manual control but partially inoperable under radio control.			● Receiver PC defective ● Receiver PC defective ? Wire harness defective between control solenoid valves. ● Solenoid proportional reducing valve of control valve defective.	● Check, repair or replace the receiver PC. ● Check, repair or replace the wire harness between receiver PC and control valve solenoid. ● Check, repair or replace the solenoid proportional reducing valve.	

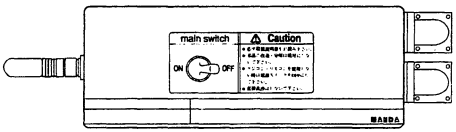
Conduct the Remedy 2 in case trouble is not corrected with Remedy 1.

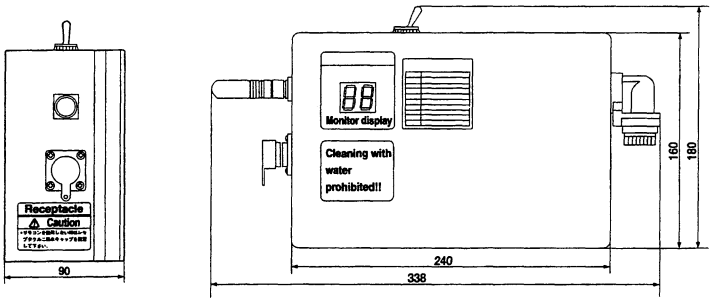
6 Outer Dimensions

● Controller

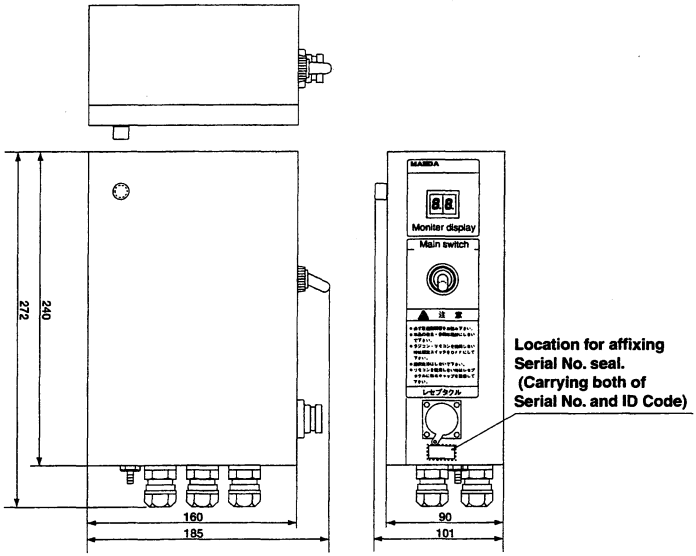


● Receiver (MC104C)





● Controller (MC305C)



● Receiver (MC305C)