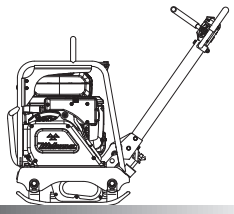
Mikasa

REVERSIBLE COMPACTOR

MVH-eR60



OPERATION MANUAL

en

http://www.mikasas.com

402-12403

EC Declaration of Conformity

1 Manufacturer's name and address	**Mikasa Sangyo Co., Ltd.** 1-4-3, Kanda-Sarugakucho, Chiyoda-ku, Tokyo, 101-0064, Japan
2 Description of the equipment	
2.1 Product	Compaction machines (Vibratory Plates : Reversible Compactors)
2.2 Type	MVH-eR60
2.3 Version(s)	—
2.4 Measured sound power level dB(A)	104
2.5 Guaranteed sound power level dB(A)	105
2.6 Motor type : Net power	DC Power Unit (Honda GXE2.0H) : 1.8 kW
3 Conformity assessment procedure	Annex VIII of 2000/14/EC as last amended by 2005/88/EC
4 Notified Body's name and address	TÜV Rheinland LGA Products GmbH Tillystraße 2, 90431, Nürnberg, Germany Notified Body number: NB 0197
5 Comply with relevant provisions and requirements of the following directives and standards	2000/14/EC , 2006/42/EC , 2014/30/EU EN 500-1:2006 +A1:2009 , EN 500-4:2011
6 Signature	2nd Jun. 2022 Keiichi Yoshida : Director, General Manager R&D Division
7 Technical documentation keeper	Engineer , R&D Division , Mikasa Sangyo Co., Ltd. 15-1,Shimoosaki,Shiraoka-city,Saitama,349-0203,Japan

Reference data	MVH-eR60
Hand-arm vibration level ※ Ahv m/s^2	4.6

※ Directive 2002/44/EC compliant. Test course (crushed gravel) is in comply with EN 500-4

Table of contents

1. INTRODUCTION

- This instruction manual describes the proper methods for using the reversible compactor, as well as simple checks and maintenance. Be sure to read this instruction manual before using the reversible compactor, in order to get full use of the excellent performance of this machine, to improve your operation and to perform work effectively.
- After reading this manual, store it in a handy location for easy reference.
- For details about the DC POWER UNIT, BATTERY PACK and BATTERY CHARGER for this machine, see the separate owner's manual for them.
- For inquiries about repair parts, parts lists, service manuals and repair of the machine, please contact the shop where you purchased it, or the Mikasa Website. In addition, parts lists are available on the MIKASA website at: http://www.mikasas.com/english/

The illustrations in this manual might slightly differ in part from the machine you actually purchased due to design changes.

2. MACHINE OVERVIEW

Application

This machine is a compactor with back and forth motion. The strong vibration from the two-axes pendulum structure inside the vibrator changes the machine' s motion into straight back and forth motion. The machine compacts through this motion. The machine has tightening and compacting effect for all ground types other than the soft soil with high water percentage. Because the machine is capable of straight back and forth movement, it works very effectively in grooved structures. Also, since the work efficiency of this machine is high, it is suitable for compacting of a large area. The machine also works well for flattening and leveling rough ground surface with irregularities created by the use of a powerful tamping rammer.
The machine can be used widely for heavy compacting works such as base work as well as finishing work for asphalt paving.

Warning about Incorrect Applications and Techniques

Do not use this machine on ground with a high water percentage and, in particular, do not use on clay because the machine will not advance. Use this machine for compacting earth and sand mixtures, soil, sand or gravel. Do not use this machine for other type of work.

Structure

The upper part of the machine consists of an engine, handle, belt cover and guard frame. The upper part of the machine is fixed to the compacting board of the lower part via an anti-vibration rubber. The lower part of the machine consists of a compacting board and a vibrator. Inside the vibrator, there are two pendulums. The phase of those pendulums is changed by hydraulic pressure.
The hydraulic cylinder for the vibrator is connected with a hydraulic hose to the hydraulic pump, which is directly connected to the drive lever.

Power Transmission

This machine is equipped with the DC power unit as power unit. The motor output shaft is equipped with a centrifugal clutch. Transmission of the power takes place by increasing the DC power unit speed to engage the centrifugal clutch. A V-pulley is incorporated to the centrifugal clutch drum, and power is transmitted via the V-belt to the V-pulley on the vibrator side. Through this process, the motor revolution is changed to the pendulum revolution suitable for compacting.
The vibrator pulley rotates the pendulum axis of the drive side. The two pendulums inside the vibrator are fixed to the two pendulum axes that are positioned in parallel and are connected with the gear. The two axes rotate in opposite directions at the same speed to generate vibration.
There is a spiral groove on the inner periphery of the gear assembled on the pendulum axis to be driven. This groove serves as a key groove to let the guide pin slide to the axis direction.
This guide pin is connecting the two pendulum axes. The phase of the two pendulums is changed by the axial sliding of the guide pin. The change in phase causes the vibration to change directions, thus changing the speed and travel direction of the machine.
Hydraulic pressure is used for the axial movement of the guide pin. At the end of the groove where the guide pin is attached, a piston is installed. When the oil level rises inside the hydraulic cylinder on the vibrator side and the pressure increases, the piston is pushed. Then the axis connected to the piston is pushed, which causes the guide pin attached to the axis to move, resulting in a change in phase.
The operator of the machine, by using the back and forth motion lever of the handle, can adjust the oil quantity and pressure by the connected hand pump to get the travel speed suitable for the work.

3. WARNING SIGNS

The triangle shaped ⚠ marks used in this manual and on the decals stuck on the main body indicate common hazards. Be sure to read and observe the cautions described.

⚠ Warning labels indicating hazards to humans and to equipment.	
⚠ **DANGER**	Denotes an extreme hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, is likely to result in serious injury or death.
⚠ **WARNING**	Denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in serious injury or death.
⚠ **CAUTION**	Denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury to people and may damage or destroy the product.
CAUTION (without at ⚠)	Failure to follow the instructions may result in damage to property.

4. CAUTIONS FOR SAFETY

4.1 General Cautions

⚠ DANGER

- Do not use the machine in the rain and machine wet with water.
- Do not use the machine near flames.
- Do not touch the machine with wet hands. It is dengerous about electric shock and electric leakage.

⚠ WARNING

- Do not work with this machine, when
  - you are tired or sick and not feeling well.
  - you have taken medicine or drug.
  - you have had a drink.

⚠ CAUTION

- Please read the operation manual well and work safely by using the machine properly.
- For handling of the DC power unit, battery pack and battery charger. Please read to the attached operation manuals for them.
- Please understand of the structure of this machine well.
- Make sure to do the inspection and check the machine conditions before starting operation.
- Please use protective equipment such as helmet, protective shoes, protective gloves, etc., and wear appropriate work clothes for making your work safe.
- Always wear noise protection equipment such as ear muffs or ear plugs and protective eyeglasses.
- The decals shown operation method, warning and etc. stuck on the machine are very important for your safety. Clean the machine so that the decals can be read easily. If it is difficult to read the decals, please replace with new ones.
- It is dangerous if children touch the machine. Please be careful about storage location and storage method for the machine.
- Stop the DC power unit before maintenance work.
- We are not responsible for any accidents occurred due to the fixing without using genuine parts (foot and etc.) and equipment modifications.

4.2 Cautions for Attaching and Removing the Battery Pack

⚠ DANGER

- Be sure to press STOP on the START/STOP switch.
- Be sure to work in a clear and flat location without any combustibles nearby.
- After attaching the battery pack, make sure the battery hook and fastener are securely attached.

⚠ CAUTION

- Close the battery fastener lever while removing the battery pack.

4.3 Precautions before Starting Work

⚠ CAUTION

- Always preform a pre-operation inspection before each operation and correct any problems.
- Always check the equipment for loosened threads or bolts before starting.
- Before attaching the Battery Pack, make sure that:
  - ○ Exterior cover is not damaged.
  - ○ Switches are not damaged.
  - ○ Rubber support is not damaged.
  - ○ Battery hook is not loose or damaged.
  - ○ Battery fastener is not damaged.
  - ○ Battery connector is not damaged.
  - ○ Motor wire harness is not damaged. (For GXE2.0S only)
  - ○ There are no debris or excessive dirt on the DC Power Unit or the Battery Pack.
- During the test run:
  - ○ Check that all switches work (start and stop) properly.
  - ○ Check that all indicators light when the DC Power Unit is turned on.

4.4 Precautions during Work

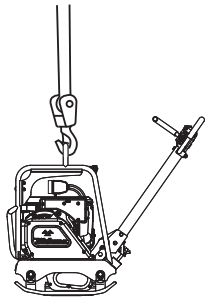
⚠ CAUTION

- If you use the machine for a long time, be careful to watch for signs of vibration syndrome. Since this machine vibrates, work for a long time may have a negative effect on your body. Take sufficient brakes while working.
- Before starting to operate the machine, check the safety for people around and obstacles nearby.
- Always be careful around ground condition at job site. Operate the reversible compactor in stable position and balance.
- Do not touch the DC power unit during work or soon after work, because it is very hot.
- If you find trouble or damage of the machine during work, stop work immediately.
- Before leaving or moving the machine, be sure to stop the DC power unit.

4.5 Precautions while Lifting

⚠ CAUTION

- Before lifting the machine, make sure that there is no damage to parts on the machine (especially the shock absorber and the hook), loosening or missing of the bolt, and the machine must be in a safe condition.
- Stop the DC power unit before lifting the machine.
- Use adequate lifting cable (wire or rope) of sufficient strength for support to the machine.
- Do not lift it higher than necessary for safety.
- Do not use a damaged lifting cable.
- Use one point lifting hook for lifting the machine and lift straight upwards. Do not use any other points (such as the handle) for lifting.
- Never lift or suspend the machine rapidly with hydraulic excavator.
- Never allow any person or animal to stand underneath the machine while lifting.
- Be careful not to an accident when using any lifting equipment. Before using the lifting equipment, make sure that there is no trouble or damage.



4.6 Precautions for Transportation and Storage

⚠ DANGER

- Stop the DC power unit before transporting or storing the machine.
- After the DC power unit and main body has cooled down enough, transport or store the machine.
- Remove the battery pack before transporting or storing the machine.
- Maintain upright position of this reversible compactor on a level ground during transporting or storing.
- Tie down the reversible compactor with cable (wire or rope) so that it cannot move or fall over.
- When lifting the reversible compactor with the handle, be careful not to pinch your fingers between the handle and main body.
- When transporting the reversible compactor, use MC-1B of Mikasa Carry or similar product.
- Avoid storage areas with high temperature and high humidity, or environments with severe temperature changes. Keep away from direct sunlight and rain.

4.7 Precautions for Maintenance

⚠ WARNING

- Ensure safety for maintenance. It needs appropriate maintenance for keeping the machine performance. Keep the machine in good condition with attention to the machine's condition always.

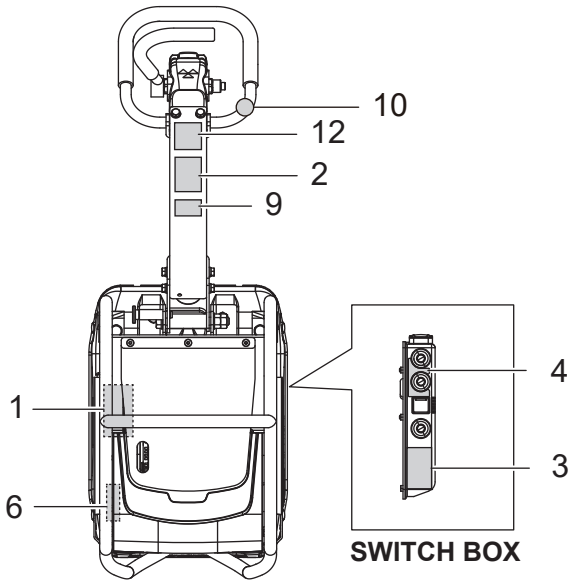
⚠ CAUTION

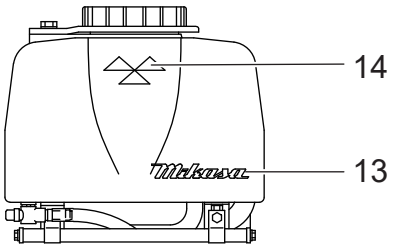
- Be sure to stop the DC power unit before maintenance of the machine.
- Do not touch the parts that became hot until they have cooled down enough to prevent burn.
- Do not touch the lubrication oil and engine oil until they have cooled down enough to prevent burn.
- When maintenance of the machine with disassembling, be sure to refer the service manual and always work safely.
- After maintenance of the machine, check that the parts are assembled properly and machine conditions are safe.

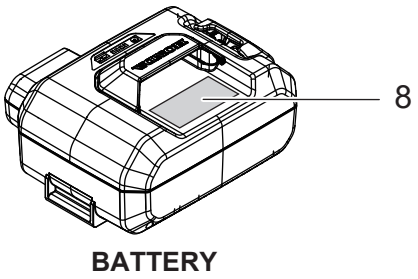
4.8 Precautions for Battery Pack and Battery Charger

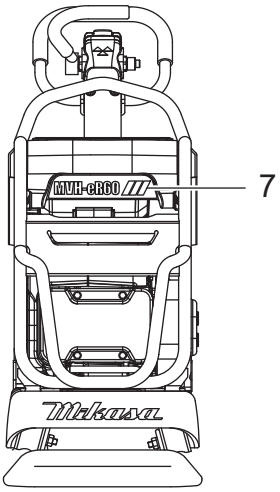
The battery pack and battery charger are provided with each owner's manual. Follow them when you operate the battery pack and battery charger.

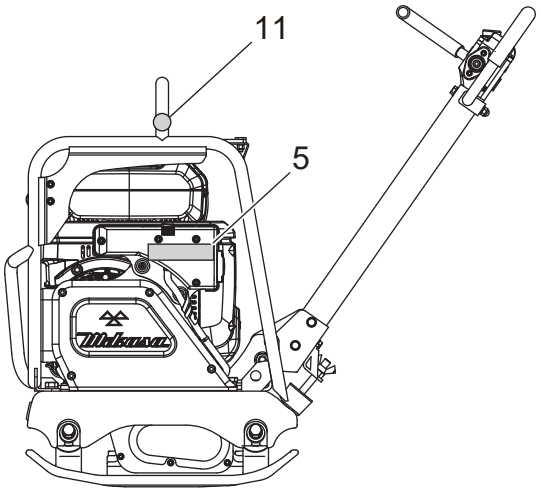
4.9 Decals Position





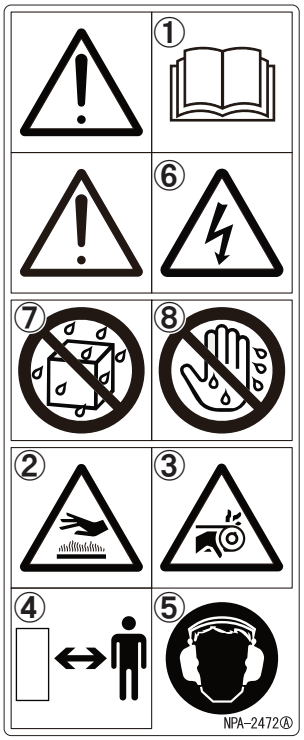






REF No.	PART No.	PART NAME	Q' TY	REMARK
1	9202-24380	DECAL,NAMEPLATE /eR60/ 5CE	1	NPA-2438
2	9202-24720	DECAL,COMBI CAUTION /eR60	1	NPA-2472
3	9202-24360	DECAL,START-STOP/eGX	1	NPA-2436
4	9202-24390	DECAL,LED/e60	1	NPA-2439
5	9202-24690	DECAL,EARTH SMART	1	NPA-2469
6	9202-24760	DECAL,CAUTION RAINY&WASH	1	NPA-2476
7	9202-24430	DECAL /MVH-eR60 /ORANGE	1	NPA-2443,ORANGE
7	9202-24420	DECAL /MVH-eR60 /GREEN	1	NPA-2442,GREEN
8	1D143-8B0-E01	LABEL,CAUTION(E)EXP/eGX	1	
9	9202-24780	DECAL,NEUTRAL OPERATION/EN	1	NPA-2478
10	9202-14730	DECAL,DO NOT LIFTING	1	NPA-1473
11	9202-14740	DECAL,LIFTING POSITION	1	NPA-1474
12	9202-10330	DECAL,EC NOISE REQ.LWA105	1	NPA-1033
13	9201-13430	DECAL,MIKASA MARK 125MM	1	NP-1343
14	9201-08850	DECAL,M-MARK Y-40X80	1	NP-885

4.10 Descriptions of the Warning Decals



9202-24720 DECAL,COMBI CAUTION /eR60

① **Read the manual carefully.**
Read and fully understand the operation manual before operating the machine.

② **Burn hazard.**
Never touch the hot parts. Allow these parts to cool before servicing the machine.

③ **Rotating parts hazard.**
Keep hands clear from all moving parts (such as inside the belt cover) to prevent injury.

④ **Keep safe distance.**
Be careful not to approach danger source during operation.

⑤ **Noise hazard.**
Always wear ear protection while operating the machine.

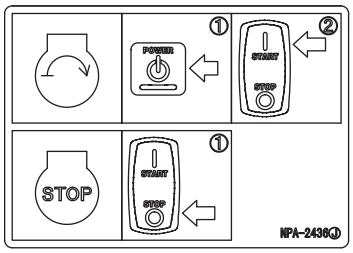
⑥ **Electric shock hazard.**
Be careful about electric shock. Stop the power unit before maintenance.

⑦ Do not use the machine in the rain and wet machine.

⑧ Do not use the machine with wet hands.

No lifting position.
Do not use any other points (such as the handle) except one point lifting hook for lifting the machine.

Lifting position.
Use one point lifting hook for lifting the machine.



START
① Press the POWER button.
② Press the START/STOP switch to the START position.

STOP
① Press the START/STOP switch to the STOP position.

① Do not use high pressure washer.
② Keep dry.

Do not operate continuously in neutral position.
Do not operate continuously when the travel lever is in neutral position, operate at the travel lever is forward or backward.

Caution decal put on the battery.
① **Read the manual carefully.**
Read and fully understand the operation manual before operating the machine.
② **Fire hazard.**
Keep away any flames and sparks from the machine.

5. SPECIFICATIONS

5.1 Reversible Compactor

Model			**MVH-eR60**
Dimensions	Length	mm (inch)	945(37.2)
	Width		350(13.8)
	Height (with handle)		940(37.0)
Plate Size	Length	mm (inch)	480(18.9)
	Width		350(13.8)
Performance			
Vibrating Frequency		Hz (V.P.M.)	108(6500)
Centrifugal Force		kN(kgf)	12(1225)
Max. Traveling Speed		m/min	0 - 24
Vibrator Oil Capacity		liter (qt.)	200(211)
Lubrication Oil			API Service Categories SE or higher SAE 10W-30
Operating Weight		kg (lbs.)	81(179)
V-belt Size			RPF3310
Water Tank Capacity		liter (qt.)	8.5(8.98)
Reted Operating time			About 25 - 35min/1.6kW

5.2 DC power unit

Model		**Honda GXE2.0H**
Type		Three-phase brushless DC motor
Weight without Battery	kg (lbs.)	18.5 (40.8)
Cooling System		Forced Air
Max. Output		1.8kW (2.1HP, 2.2PS)/3600rpm
Voltage	V	72

5.3 Battery

Model			**Honda DP72104Z**
Type			Rechargeable Lithium Ion Battery
Dimensions	Length	mm (inch)	233 (9.2)
	Width		268 (10.6)
	Height		150 (5.9)
Weight		kg (lbs.)	6.4 (14.1)
Voltage		V	72
Power Capacity		Wh	720
Charging temperature range		°C (°F)	5 - 30 (41 - 86) Battery Packs cannot be charged at temperatures of 5C (41F) or colder
Operating temperature range		°C (°F)	5 - 40 (41 - 104)
Storage temperature range		°C (°F)	-5 - 30 (23 - 86)

∗ Specifications are subject to change without notice.

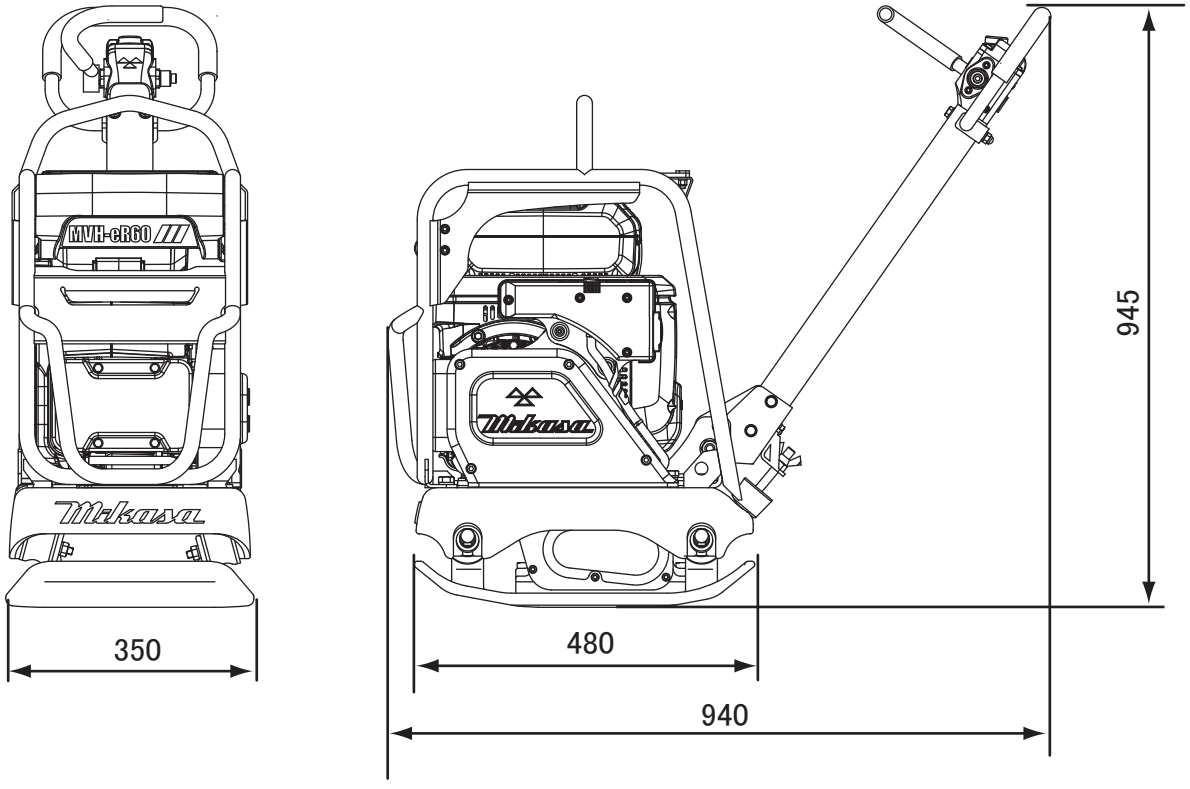
5.4 Charger

Model			**Honda CV7285Z**
Dimensions	Length	mm (inch)	266 (10.5)
	Width		352 (13.9)
	Height		247 (9.7)
Weight		kg (lbs.)	11.0 (24.2)
Cable Length		mm (inch)	2000 (78.7)
Input Voltage		V	AC100 - 240
Input Frequency		Hz	50/60
Output Voltage		V	DC82.8
Charging Temperature		°C (°F)	5 - 30 (41 - 86)
Range			
Charging Time	80%	hour	1
	100%		1.5

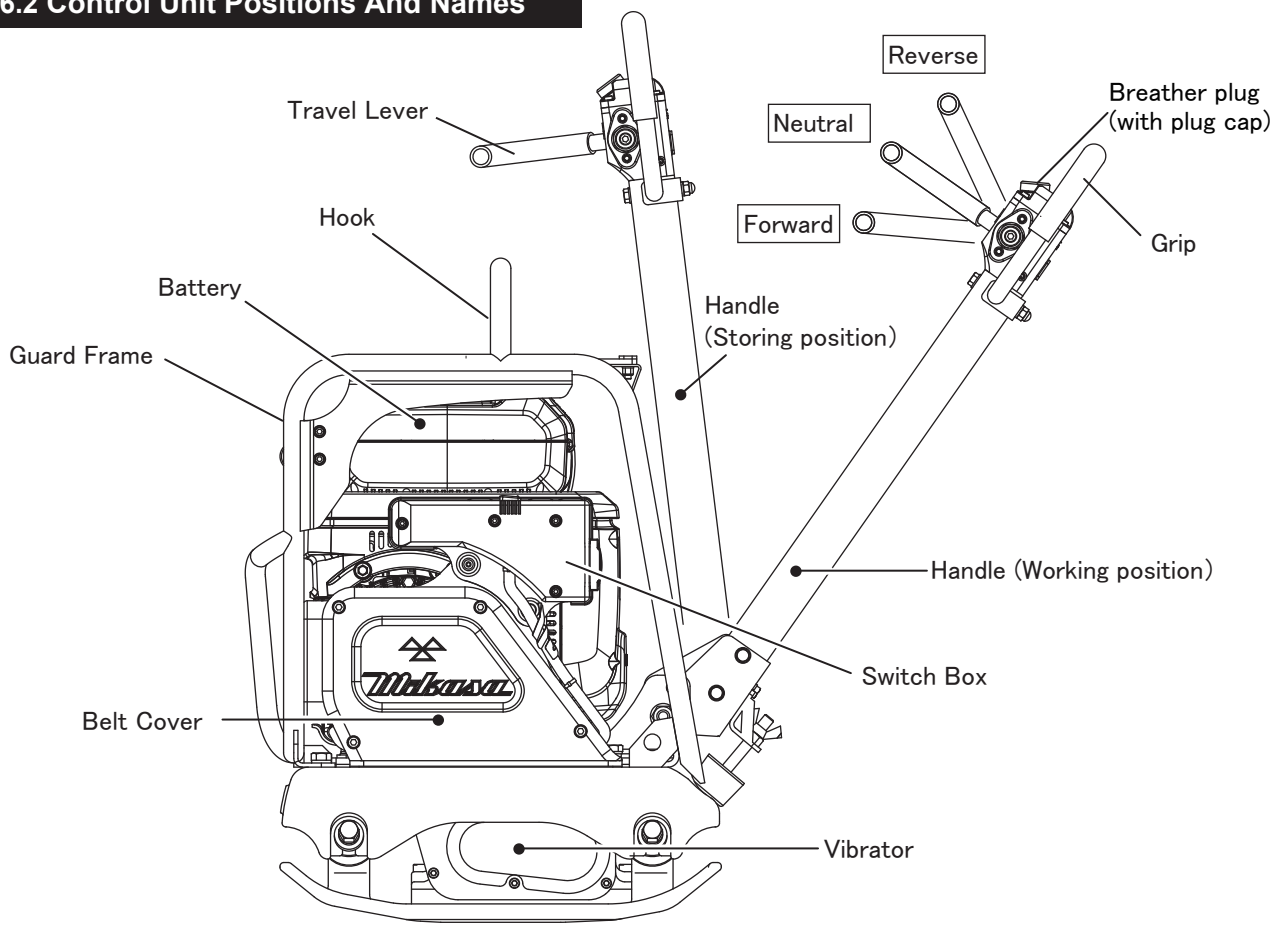
∗ Specifications are subject to change without notice.

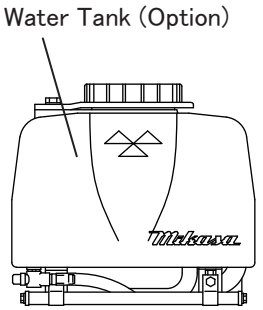
6. APPEARANCE

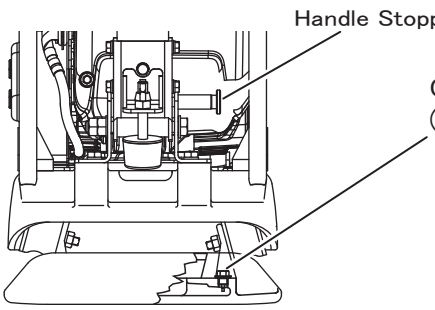
6.1 Dimensions (mm)



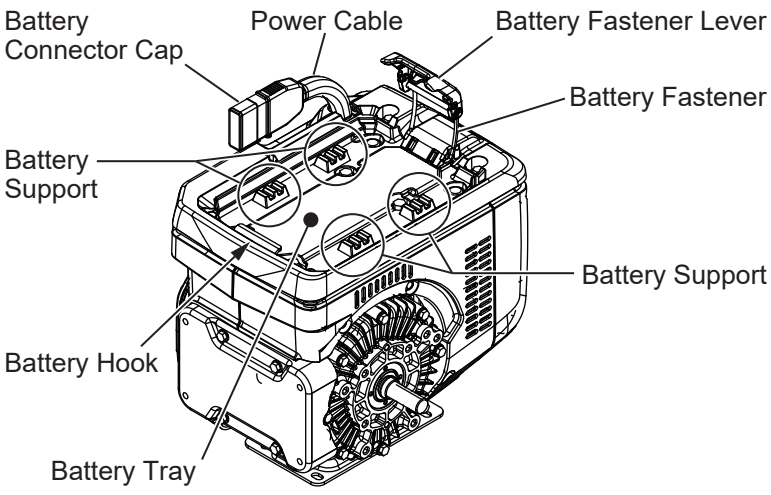
6.2 Control Unit Positions And Names



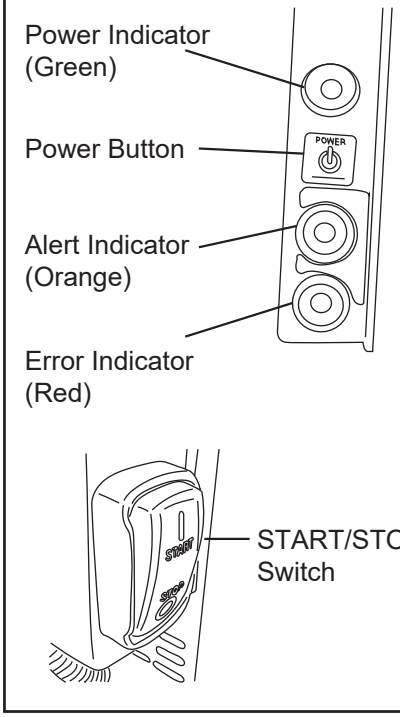




POWER UNIT



Switch Box



7. INSPECTION BEFORE OPERATION

⚠ WARNING

- Always stop the DC power unit before inspection. You may be caught in a rotating part and be seriously injured.
- Check the machine after it ties down on level ground to avoid falls.
- Check the machine after it has cooled down to avoid burns.

⚠ CAUTION

- It is extremely important that this section be read carefully before attempting to operate the reversible compactor.
- Do not use your reversible compactor until this section is thoroughly understood.
- The DC power unit, battery pack and battery charger are provided with each owner's manual. Follow them when you operate the DC power unit, battery pack and battery charger.

Check parts	Check items	Check parts	Check items
Appearance	Flaws, deformation, dirt	Shock absorber	Flaws, deformity, cracks, breaks
Vibrating plate	Wears, deformity, breaks	Vibrator oil	Dirt, oil level
Bolts, nuts	Loose, missing	V-belt for vibrator	Flaws, tension
Handle	Flaws, deformity, cracks, breaks	Hydraulic pipe system	Leaks, loose, flaws, wears
Guard frame	Breaks, flaws, loose or missing bolts and nuts	Travel lever	Operation check, play

7.1 Inspection

1. Clean each parts of the machine. Thoroughly remove dirt and oil from the machine.

2. Make sure that all bolts and nuts are not loosened. If they are loosened, retighten them to prevent an accident and trouble.

3. Make sure that the guard hook, belt cover and shock absorbers are not damaged. If they are damaged, replace new ones.

4. Replace any missing or damaged safety and operation decals.

5. Check the V-belt tension. The V-belt tension is proper if the V-belt bents about 10 - 15mm when depressed with finger at midway between the clutch and vibrator pulley. If V-belt tension is loosened, power is not transmitted well, so reduces compacting force and shortens the life of V-belt.

6. Place the reversible compactor on the level surface. Check the vibrator oil level by removing the oil plug. (Fig.1)
   The oil level should be up to the level of oil plug hole.

- **Vibrator oil:**
  API Service Categories SE or higher SAE 10W-30
- **Oil capacity: 200cc**

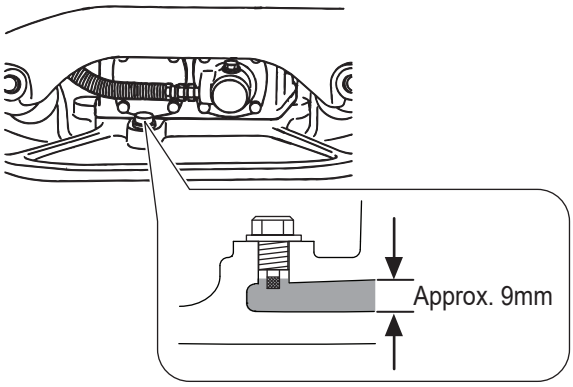


Fig.1

7. If your unit is equipped with the water tank and your application requires sprinkling work, fill water into the water tank.

   Note: Fill water only. If you should fill liquids other than water, the resin, tank cap and other parts of water tank may cause deterioration, expansion, leakage or damage.

8. The water tank can be removed by pulling it upward. When mounting the water tank again, insert the hook into the groove of the water tank securely. The amount of sprinkling water can be adjusted by the cock.

7.2 Battery Pack and Battery Charger

The battery pack and battery charger are provided with each owner's manual. Follow them when you operate the following operations of battery pack and battery charger.

- Charging and Charge Level
- Cleaning
- Storage
- Disposal

7.3 Attaching and Removing the Battery Pack

Follow the owner's manual for the DC power unit when attaching and removing the battery pack.

● Attaching the battery pack

Make sure to use a genuine Battery Pack.

1. Open the rubber cover and the top cover. (Fig.2)

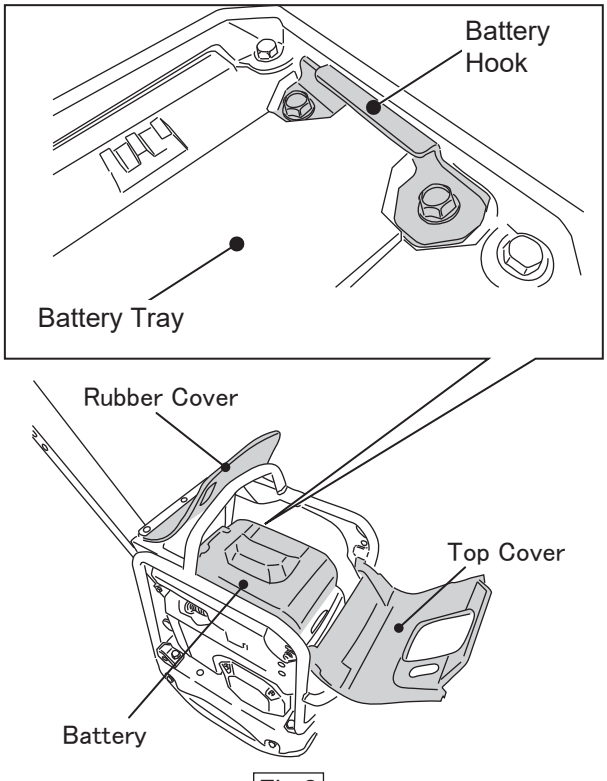


Fig.2

2. Make sure there are no debris or dirt on the battery tray.(Fig.2)
3. Tilt the Battery Pack and insert its claw into the battery hook.(Fig.2)
4. Push down the Battery Pack and hook the battery fastener to it.(Fig.3)
5. Push the battery fastener lever up and lock the Battery Pack.(Fig.3)
   Be careful not to catch your fingers.

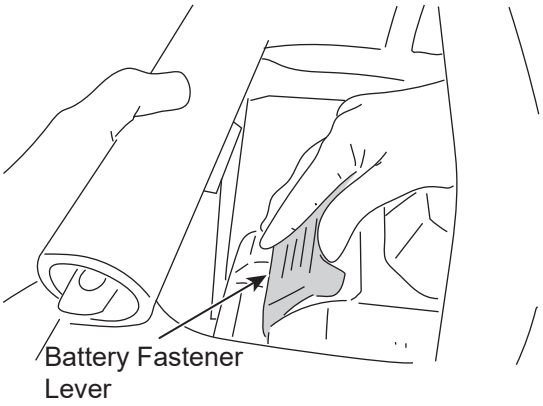


Fig.3

6. Remove the battery connector cap from the power cable.(Fig.4)
   Connect the power cable to the battery connector of the Battery Pack.(Fig.5)

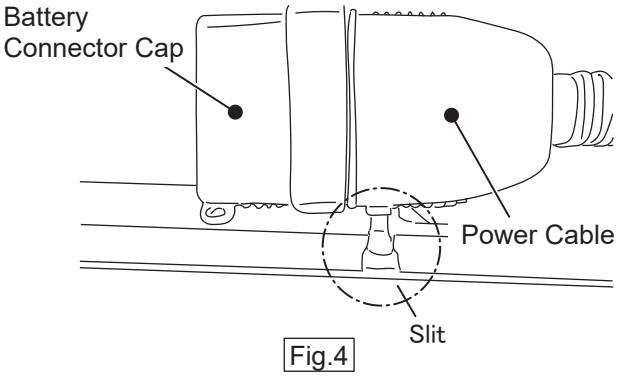


Fig.4

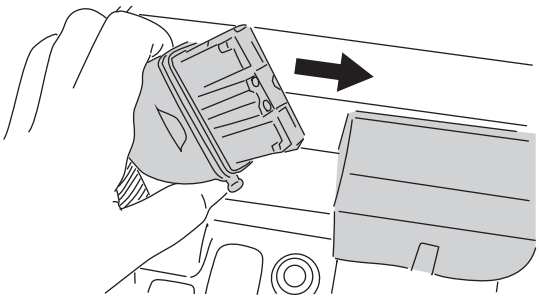


Fig.5

After attaching the Battery Pack, make sure the battery hook and fastener are securely attached.

● Removing the battery pack

1. Remove the power cable from the Battery Pack.(Fig.5)
2. Pull the battery fastener down to unlock, tilt the Battery Pack up and pull the Battery Pack claw out from the battery hook, and remove the Battery Pack. (Fig.2,3)
3. Attach the battery connector cap to the power cable.(Fig.4)

8. OPERATION

1. Press STOP on the START/STOP switch.

2. Press the POWER button.
   All the indicators should illuminate for a few seconds, and then only the POWER indicator remains illuminated.

3. Hold the handle firmly. Then, Press the START/STOP switch to the START position to start moving forward by starting the DC Power Unit.

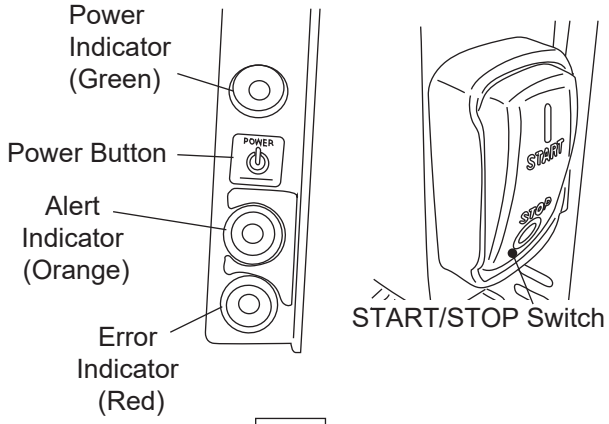


Fig.6

⚠ CAUTION

- If the POWER button is pressed when the START/STOP switch is in the START position, the POWER indicator remains off and the ALERT indicator flashes. In this case, the DC Power Unit cannot start. Press the START/STOP switch to the STOP position and then press the POWER button.
- It may take some time for the indicators to light after the POWER button is pressed. If the indicators do not light, press the POWER button again.
- If the DC Power Unit is not operated for about one minute after the POWER button is pressed, the POWER indicator turns off. Press the POWER button again to start the DC Power Unit.
- DO NOT use this machine on ground that is harder than the machine can handle, or for driving pilings or tamping rock beds. Furthermore, use of the machine on sloping ground, such as the side of an embankment, may make the machine unstable and can cause an accident. It can also result in premature machine wear due to uneven loads on the machine.

⚠ CAUTION

- Use the machine with confidence for tamping earth and sand, soil, gravel, and asphalt.
- DO NOT use the machine for other types of jobs.
- In cold weather, the reversible compactor can be warmed up by Pressing the START/STOP switch START and STOP several times until the reversible compactor operates smoothly.

4. Use the back and forth travel lever to make the machine move backward and forward. When the lever is pushed forward, the machine moves forward, when pulled backward, the machine moves backward. At neutral, the machine vibrates staying at the same location.

⚠ CAUTION

Do not operate continuously when the travel lever is in neutral position, operate at the travel lever is forward or backward.

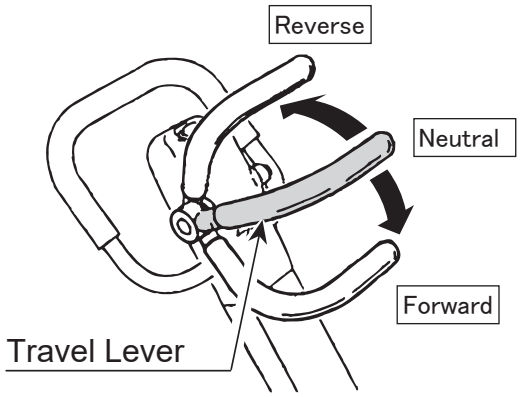


Fig.7

5. If your unit is equipped with the water tank and your application requires sprinkling work, open the cock of water tank.

9. STOPPING THE DC POWER UNIT

1. Press the START/STOP switch to the STOP position.
   The DC Power Unit stops and the POWER indicator turns off.

> **⚠ CAUTION**
>
> You can also stop the DC Power unit by pressing the POWER button, but it may take some time to stop.

2. When stopping sprinkling work, close the cock of water tank. (Fig. 8)

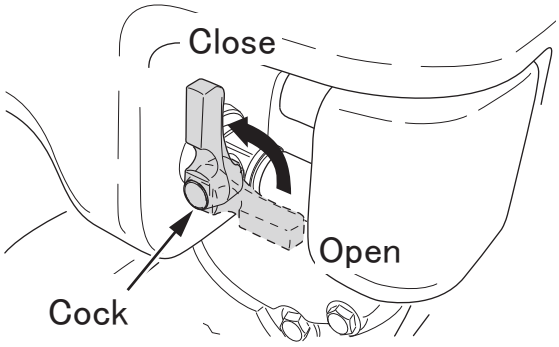


Fig. 8

10. TRANSPORTATION

1. Stop the DC Power unit before transporting the machine.
2. Do not move the machine until the DC Power Unit and main body have cooled down enough.
3. Remove the Battery Pack.
4. Maintain upright position of the plate compactor on a level ground during transporting.
5. Tie down the plate compactor with cable (wire or rope) so that it cannot move or fall over during transporting.

11. CLEANING

- Do not use a hose or pressure washer to spray water to the DC Power Unit and Battery Pack.
- Water entering the electrical components may cause a malfunction.
- Only use dry and clean cloths.

12. STORAGE

1. Store the machine the same procedure as 10. TRANSPORTATION.
2. Avoid storage areas with high temperature and high humidity, or environments with severe temperature changes. Keep away from direct sunlight and rain.
3. Put a cover on the machine to avoid depositing dirt.

13. INSPECTION AND MAINTENANCE

Proper maintenance is essential for safe, economical, reliable, and environmentally friendly operation.

⚠ WARNING

- Always stop the DC power unit before inspaction and maintenance. You may be caught in a rotating part and be seriously injured.
- Check the machine after it ties down on level ground to avoid falls.
- Check the machine after it has cooled down to avoid burns.

Regarding the inspection and maintenance of the DC Power unit, Battery Pack and Battery Charger, always follow each owner's manuals.

13.1 Maintenance Schedule

Check frequency	Check parts	Check items	Oils
Daily (before starting)	Appearance	Flaw, deformation	
	Shock absorber, and other rubbers	Crack, damage, wear	
	Hand pump	Leakage	Hydraulic oil
	Travel lever	Leakage	Engine oil
	Battery fastener	Crack, damage, wear	
	Bolts, nuts	Looseness, missing	
Every 100 hours	Vibrator oil	Leakage, oil level, dirt	
	Hydraulic oil	Leakage, oil level, dirt	Engine oil
Every 200 hours	V-belt	Flaws, tension	Hydraulic oil
	Clutch	Dirt, flaw, wear	
Every 300 hours	Vibrator oil	Replace	
	Hydraulic oil	Replace	Engine oil
Irregular	Hydraulic Hose	Replace	Hydraulic oil
	Switch box	Looseness	

⚠ CAUTION

- The above table shows the check frequency for standard condition.
- The check frequency may vary depending on the condition in which the machine is used.

13.2 Checking/Changing the V-belt

⚠ CAUTION

Be careful not to have your hand or clothes get caught between the V belt and the clutch. Always wear work gloves.

● **Check of V-belt (Fig.9)**

At every 200 hours, remove the belt cover (top) to check the tension of the V-belt.
The flexibility of the belt should be about 10 mm when pushed strongly with your finger at the mid-point between the axes.
When the V-belt is loose, the engine power is not transmitted well, resulting in poor compacting force and shortening the life of the V-belt.

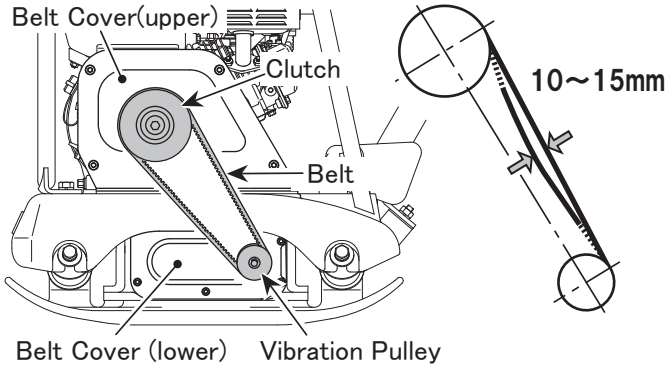


Fig.9

● **Changing the V-belt**
Removing the V-belt
Remove the top and bottom belt covers.
Put a wrench (19mm) on the tightening bolt of the vibrator pulley (lower side). Put a piece of cloth at the center of the left side of the V-belt, and pull the belt strongly towards you. While pulling, turn the wrench clockwise, then remove the V-belt.

Installing the V-belt
Set the V-belt on the lower side of the vibrator pulley. Push the V-belt to the left side of the upper clutch. Similar to removing the V-belt, turn the wrench clockwise to install.

13.3 Checking/Changing the Vibrator Oil

● At every 100 hours of operation, set the machine on a level surface and remove the oil gauge of the vibrator. Check the oil level to see if it is within the allowable range. (Fig.10)
Change the vibrator oil at every 300 hours operation. Drain the oil from the drain plug. For draining, put a beam under the compacting board at the other side of the drain plug to tilt the machine.

∗ **Vibrator oil:**
API Service Categories SE or higher SAE 10W-30

∗ **Oil capacity: 200cc**

⚠ CAUTION

When checking the vibrator oil, clean the oil port beforehand to prevent dust and other foreign materials from falling into the oil. Whenever there is an oil leakage from the vibrator, check the oil level.

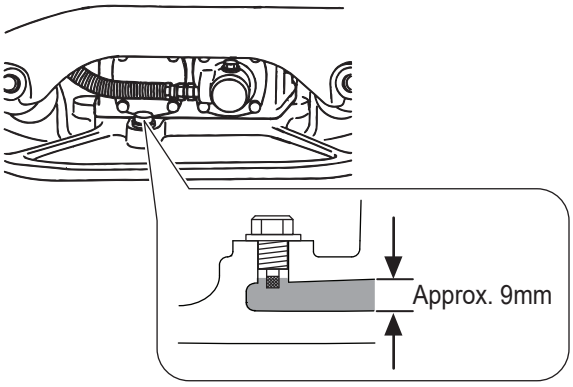


Fig.10

13.4 Checking/Changing the Hydraulic Oil

● **Check the Hydraulic Oil**
Check the hydraulic oil at every 100 hours' operation. By making the handle bar vertical (done at the time of storage), remove the breather plug at the top of the hydraulic hand pump to see if the hydraulic oil is at the specified level (OIL LEVEL). (Fig. 11)

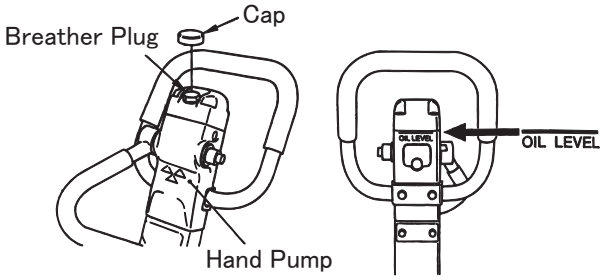


Fig.11

● **Changing the Hydraulic Oil (Fig. 12)**

⚠ CAUTION

- The level of the hydraulic oil in the hand pump should always be at OIL LEVEL. If the level is higher, the oil bursts out from the breather plug.
- Be careful not to let dust enter inside the hand pump.

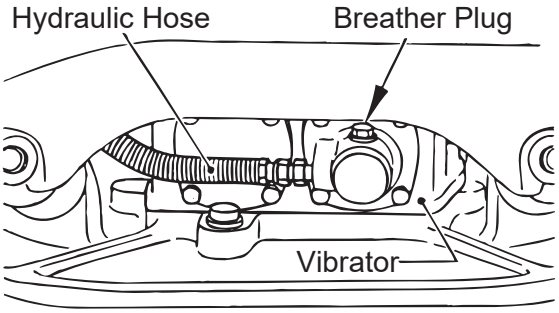


Fig.12

a. Remove the hand pump plug cap, then remove the breather plug (with a 24 mm wrench). Remove the hydraulic hose that is in the vibrator cylinder. Set the lever to the forward motion to drain the hydraulic oil in the pump.

b. After the hydraulic oil is drained, install the hydraulic hose to the vibrator.

c. Pour hydraulic oil from the hand pump breather plug attachment hole.
(MVH-eR60: 0.12L)

d. Remove the air releasing plug of vibrator cylinder. Then oil will come out from the air releasing plug. After air bubbles stop coming out, attach the plug. Tighten securely.

e. Attach the hand pump breather plug, put on the plug cap. After making sure the hydraulic oil in the pump is at OIL LEVEL, attach the breather plug.

■ **Hydraulic oil (MVH-eR60):**
Shell Terrace Oil #32 or equivalent

13.5 Checking the switch box

a. Check that the assembling of switch box is not looseness.
b. If the assembling of switch box is looseness, it may be damaged or fallen.
c. Remove the switch box, then replace the grommet installed to switch box panel to new one. (Fig.13)

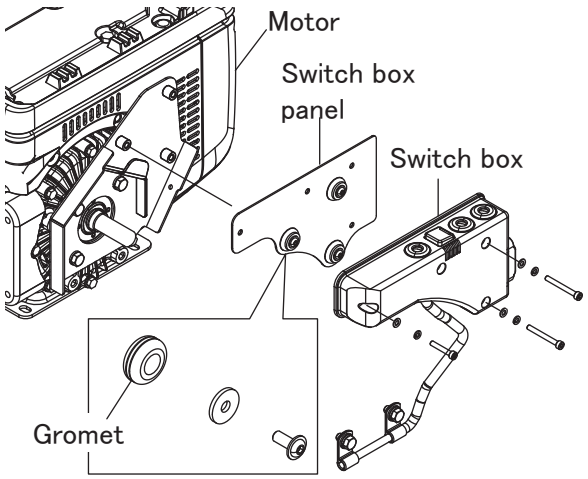


Fig.13

14. TROUBLESHOOTING

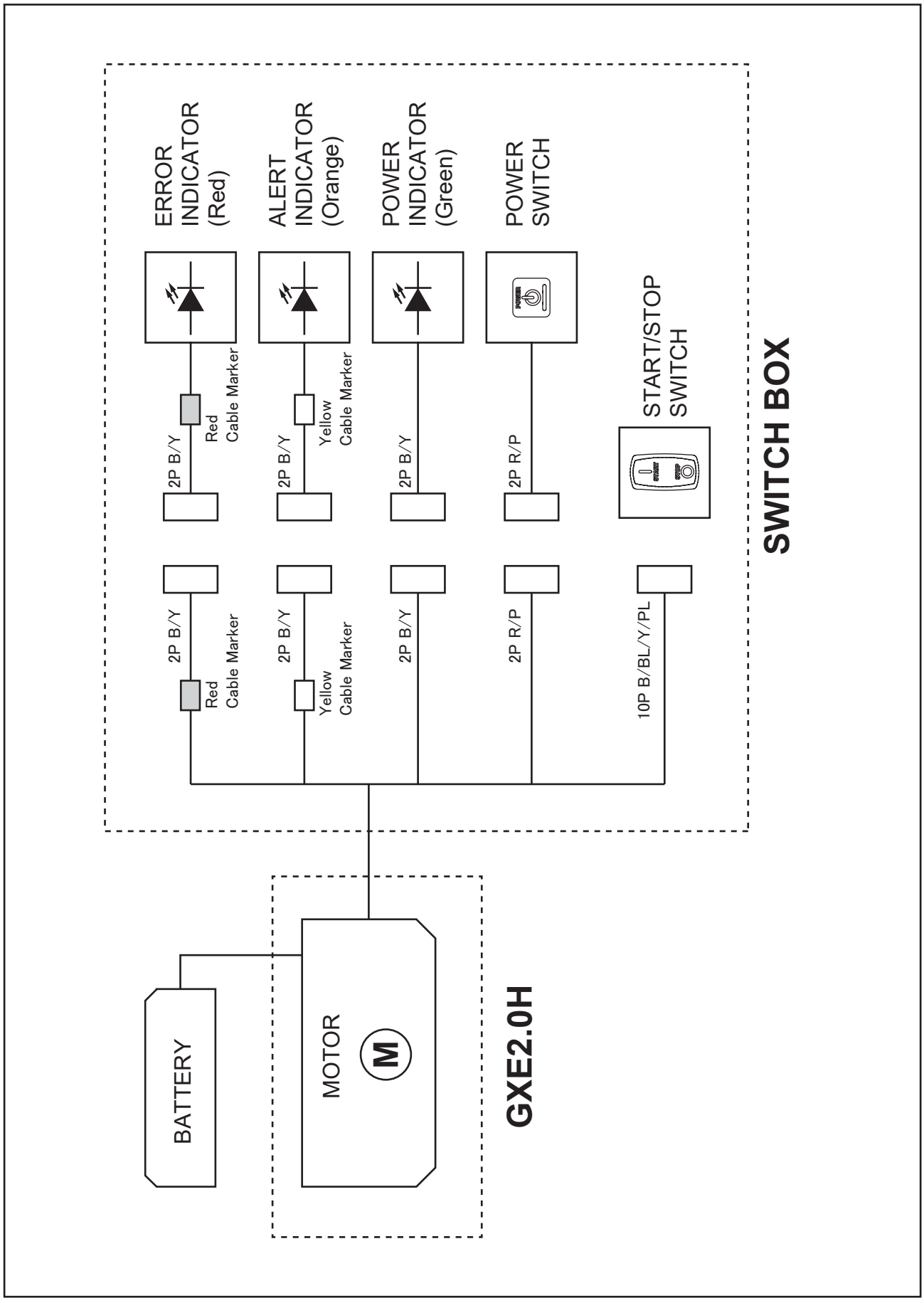
14.1 DC Power Unit, Battery Pack and Battery Charger

Regarding the troubleshooting of the DC Power Unit, Battery Pack and Battery Charger, please refer to each owner's manual.

14.2 Reversible compactor

- Low travel speed and vibration weak
  - Insufficient engine output and inappropriate high speed set revolution
  - Slipping of clutch
  - Slipping of V-belt
  - Too much vibrator oil
  - Failure inside vibrator
- Move forward or backwards, but unable to switch between back and forth motion
  - Hand pump problems
  - Inappropriately installed forward/backward motion lever
  - Breakage of the oil hose
  - Mixing of air in the hydraulic oil
  - Clogging of foreign materials in the check valve inside the hand pump
  - Breakage of the piston bearing in cylinder
- No forward, backward motion
  - V-belt coming off, slipping and breakage
  - Slipping of the clutch
  - Locking of the vibrator
  - Breakage of the piston bearing in cylinder
- Movement of lever heavy
  - Piston inside the hand pump not moving smoothly
  - Vibrator cylinder piston does not move smoothly

15. WIRING DIAGRAM



MIKASA SANGYO CO., LTD.
1-4-3,Kanda-Sarugakucho,Chiyoda-ku,Tokyo,101-0064,Japan