REVERSIBLE COMPACTOR

MVH-308
MVH-408
MVH-508

INSTRUCTION MANUAL

Contents of “Declaration of Conformity”

Please refer the
EC DECLARATION OF CONFORMITY
in this manual as well.

MIKASA SANGYO CO., LTD.

402-07403
1) DECLARATION OF CONFORMITY

2) Manufacturer’s name and address. Mikasa Sangyo Co., Ltd.
4-3, Sarugaku-cho 1 chome, Chiyoda-ku, Tokyo101-0064, Japan

3) Name and address of the person who keeps the technical documentation.
Yoshiharu Nishimaki, engineer
R. & D. Division, Mikasa Sangyo Co., Ltd.
Shiraoka-city, Saitama, Japan

4) Type: Vibratory Plates

5) model
   MVH-308DSZ  MVH-408DSZ  MVH-508DSZ
   454100, 454101, 454113, 454114, 454115, 454116, 454117, 454118, 454120, 454121, 454122, 454136
   454200, 454201, 454211, 454212, 454213, 454214, 454215, 454216, 454217, 454218, 454219, 454220, 454234
   454300, 454301, 454306, 454307, 454308, 454309, 454310, 454311, 454312, 454313, 454314, 454315, 454316, 454317, 454333

6) Equipment item number

7) Serial number
   For serial number, please refer it on front page.

8) power source cont. output <max. output>
   Hatz 1B30 4.9kW <5.4kW>
   Hatz 1B50 6.7kW <7.3kW>
   Hatz 1D81S 8.9kW

9) Measured sound power level(dB)
   107 107 108

10) Guaranteed sound power level(dB)
    108 108 109

11) Operator's sound pressure level(dB)
    93 94 94

12) Conformity assessment according to Annex: VIII (Full Quality Assurance procedure)

13) Name and address of the Notified Body
    Société Nationale de Certification et d'Homologation (SNCH)
    11, route de Luxembourg
    L-5230 Sandweiler LUXEMBOURG

14) Related Directive
    Directive 2000/14/EC and, to be followed by Directive
    2005/88/EC, relating to the noise emission in the environment by
    equipment for use outdoors.

15) Declaration
    The equipment referred in this document, fulfills with all the
    requirements of Directive 2000/14/EC

16) Other related Community Directives
    EN500-1, EN500-4

17) EC Conformity Certificate No:
    SNCH*2000/14*2005/88*0472*03

18) Place and date of the declaration
    Tokyo, Japan   December, 2013
    Signed by:
    Keiichi YOSHIDA
    Director, Product Control Division
    Mikasa Sangyo Co., Ltd.
1) DECLARATION OF CONFORMITY

2) Manufacturer’s name and address.
Mikasa Sangyo Co., Ltd.
4-3, Sarugaku-cho 1 chome, Chiyoda-ku, Tokyo101-0064, Japan

3) Name and address of the person who keeps the technical documentation.
Yoshiharu Nishimaki, engineer
R. & D. Division, Mikasa Sangyo Co., Ltd.
Shiraoka-city, Saitama, Japan

4) Type: Vibratory Plates

5) model
<table>
<thead>
<tr>
<th>MVH-308GH</th>
<th>MVH-308GE</th>
<th>MVH-408GH</th>
</tr>
</thead>
</table>

6) Equipment item number
| 454102, 454105, 454108, 454123, 454124, 454125, 454126 |
| 454111, 454112, 454127, 454128 |
| 454202, 454205, 454208, 454221, 454222, 454223 |

7) Serial number
For serial number, please refer it on front page.

8) power source cont. output <max. output>
| Honda GX270 5.1kW <6.0kW> | Subaru EX27 5.1kW <6.6kW> | Honda GX390 6.6kW <8.2kW> |

9) Measured sound power level(dB)
| 105 | 106 | 106 |

10) Guaranteed sound power level(dB)
| 107 | 107 | 107 |

11) Operator’s sound pressure level(dB)
| 93 | 94 | 94 |

12) Conformity assessment according to Annex: VIII (Full Quality Assurance procedure)

13) Name and address of the Notified Body
Société Nationale de Certification et d’Homologation (SNCH)
11, route de Luxembourg
L-5230 Sandweiler
LUXEMBOURG

14) Related Directive

15) Declaration
The equipment referred in this document, fulfills with all the requirements of Directive 2000/14/EC

16) Other related Community Directives
EN500-1, EN500-4

17) EC Conformity Certificate No:
SNCH*2000/14*2005/88*0472*03

18) Place and date of the declaration
Tokyo, Japan March, 2014
Signed by:

Keiichi YOSHIDA
Director, Product Control Division
Mikasa Sangyo Co., Ltd.
1. DICHIARAZIONE “CE” DI CONFORMITÀ

2. Nome e indirizzo Fabbricante

3. Nome e indirizzo della persona che conserva la documentazione tecnica

4. Tipo: Piastre vibranti

5. Modello

6. Codice macchina

7. Numeri di matricola

8. Potenza installata netta <resi massima>

9. Livello di potenza sonora misurato (dB)

10. Livello di potenza sonora garantito

11. Livello massimo di pressione sonora

12. Valutazione di conformità in accordo all’annesso VIII ( procedura Garanzia di Qualità totale )

13. Nome dell’organismo notificato

14. Rappresentante Autorizzato in Europa

15. Direttiva di riferimento

16. Dichiarazione

17. Altre Direttive Comunitarie di riferimento

18. Certificato di Conformità CE No:

19. Luogo e data della dichiarazione

---

Italian

---

French

1. DECLARATION « CE » DE CONFORMITE

2. Non et adresse du Fabricant

3. Nom et adresse de la personne qui détiennent les documents techniques

4. Type du matériel: Plaques vibrantes

5. Modèle

6. Número equipement

7. Numéro de série

8. Puissance reseau <rendimeto maximo>

9. Niveau sonore mesure(dB)

10. Niveau sonore garantiti(dB)

11. Niveau sonore maximum

12. Certification de conformite selon l'annexe VIII ( procédure de total garantía asegurada )

13. Nom et adresse de l'organisme notifié

14. Mandataire dans la Communauté Europeenne

15. Directive concernée

16. Déclaration

17. Autres directives communautaires concernées

18. Certificat de Conformité CE numéro:

19. Lieu et date de la declaratio

---

Spanish

1. DECLARACIÓN “CE” DE CONFORMIDAD

2. Nombre y dirección del fabricante

3. Nombre y dirección de la persona que guarda la documentación técnica.

4. Tipo: Bandejas vibrantes

5. Modelo

6. Número de referencia del equipo

7. Numeros de serie

8. Potencia neta instalada <rendimiento maximo>

9. Nivel sonoro medido del motor ( dB )

10. Nivel sonoro garantizado del motor ( dB )

11. Máximo nivel sonoro de presión ( dB )

12. Evaluación de la Conformidad de acuerdo al Anexo VIII ( Procedimiento de total garantía asegurada )

13. Nombre y dirección de la Entidad Notificada

14. Representante autorizado

15. Directiva relacionada

16. Declaración

17. Otras Directivas Comunitarias relacionadas

18. Certificado de Conformidad CE Nº

19. Lugar y fecha de la declaración
Table of contents

1. INTRODUCTION .......................................................................................... 1
2. APPLICATION, STRUCTURE AND POWER TRANSMISSION .................. 1
3. WARNING SIGNS ....................................................................................... 2
4. CAUTIONS FOR SAFETY ........................................................................... 2
   4.1 General Cautions ................................................................................. 2
   4.2 Refueling Precautions ......................................................................... 3
   4.3 Location And Ventilation Precautions ................................................ 3
   4.4 Precautions Before Starting .................................................................. 3
   4.5 Precautions During Work ..................................................................... 3
   4.6 Lifting Precautions .............................................................................. 3
   4.7 Transportation And Storage Precautions ............................................ 3
   4.8 Maintenance Precautions ....................................................................... 4
   4.9 Label Position ...................................................................................... 5
   4.10 Descriptions Of Symbols Used On Warning Labels .............................. 7
   4.11 Control Unit Positions And Names ..................................................... 8
5. SPECIFICATION .......................................................................................... 9
6. APPEARANCE ............................................................................................. 11
7. INSPECTION BEFORE OPERATION ......................................................... 12
   7.1 Engine Oil ............................................................................................. 12
   7.2 Vibration Case Oil ................................................................................ 12
   7.3 Refueling ................................................................................................ 12
   7.4 Handle ................................................................................................... 13
8. OPERATION .................................................................................................. 13
   8.1 Starting .................................................................................................. 13
   8.2 Operation ............................................................................................... 16
   8.3 Compaction Sensor (Compas) ............................................................... 16
9. STOPPING THE MACHINE ....................................................................... 18
10. TRANSPORTAION AND STORAGE ......................................................... 19
    10.1 Care .................................................................................................... 19
    10.2 Transportation Precautions ................................................................. 19
    10.3 Storage ................................................................................................. 19
11. REGULAR CHECK AND ADJUSTMENT .................................................. 20
    11.1 Inspection And Maintenance Schedule Table ...................................... 20
    11.2 Open The Front Cover ....................................................................... 21
    11.3 Changing The Engine Oil ................................................................. 22
    11.4 Cleaning The Air Cleaner .................................................................... 22
    11.5 Checking/Changing The V-belt ............................................................ 22
    11.6 Checking/Changing The vibrator Oil .................................................. 23
    11.7 Checking/Changing The Hydraulic Oil ............................................... 23
    11.8 Battery ................................................................................................. 24
12. TROUBLESHOOTING ............................................................................. 26
13. WIRING DIAGRAM .................................................................................. 29
1. INTRODUCTION

- This operation manual describes the proper operation, basic inspection and maintenance procedures of the reversible compactor. Please read this operation manual before use in order to maximize the excellent performance of this machine and make your work more efficient and effective.
- After reading the manual, please keep it in a handy location for easy reference.
- For the handling the engine, please refer to the separate engine operation manual.
- For inquiries about repair parts, parts lists, service manuals, and repairs, please contact the store where you purchased the product, our sales office, or the Mikasa Parts Service Center. For parts lists, please visit our homepage at: http://www.mikasas.com/ where you can access Mikasa WEB parts lists.

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

2. APPLICATION, STRUCTURE AND POWER TRANSMISSION

Application
This machine, weighing more than 200kg to more than 400kg, 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 exterior frame. The upper part of the machine is fixed to the vibrating plate of the lower part via an anti-vibration rubber. The lower part of this machine consists of a vibrating plate that incorporates a 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
Power is provided by an air-cooled single-cylinder 4-cycle gasoline engine or diesel engine. The engine output shaft is equipped with a centrifugal clutch. The centrifugal clutch is engaged when the engine speed increases. 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 engine 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.

<table>
<thead>
<tr>
<th>△ Warning labels indicating hazards to humans and to equipment.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DANGER</strong></td>
</tr>
<tr>
<td><strong>WARNING</strong></td>
</tr>
<tr>
<td><strong>CAUTION</strong></td>
</tr>
<tr>
<td><strong>CAUTION</strong> (without at △)</td>
</tr>
</tbody>
</table>

4. CAUTIONS FOR SAFETY

4.1 General Cautions

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

**CAUTION**
- Please read the operation manual well and work safely by using the machine properly.
- For handling of the engine, please refer to the separate engine operation manual.
- Please have a good understanding of the structure of this machine.
- Make sure to do work start inspection, regular self inspection and specified self inspection.
- To make your work safe, please use protective equipment (use specified helmet, protective shoes, etc.) and wear appropriate work clothes.
- Always use noise protection equipment such as ear muffs or ear plugs.
- Always check the machine to make sure it is in normal condition before operating the machine.
- The nameplates attached to the machine (nameplates showing operation method, warning, etc.) are very important for your safety. Clean the machine so that the nameplates can be read easily. If it is difficult to read the nameplate, please replace the old one with a new one.
- It is dangerous for young children to come near the machine. Please pay careful attention to the method of storing and the storage location for this machine. Especially the engine start key has to be taken out every time you finish your work, and keep it in a designated location.
- To do maintenance work, stop the engine and remove the battery wiring.
- We are not responsible for accidents that have occurred after the machine was refurbished without approval from the manufacturer.
4.2 Refueling Precautions

**DANGER**
- Always refuel in a well ventilated area.
- Make sure to stop the engine and wait until the engine cools down when refueling.
- Select a flat surface area with no flammable material around for refueling. Be careful not to spill the fuel. Wipe off well if there is any spill.
- Never put fire near the machine during refueling. (Especially, be careful about smoking.)
- If you fill to the top of the fuel tank inlet, fuel might spill out from the tank, and it becomes dangerous.
- After refueling, tighten the tank cap well.

4.3 Location And Ventilation Precautions

**DANGER**
- Do not run the machine in an unventilated location, such as indoors or inside a tunnel. The exhaust gas from the engine contains toxic gases such as carbon monoxide and is very hazardous.
- Do not operate the machine near open flames.

4.4 Precautions Before Starting

**CAUTION**
- Check each part to see if it is tightened properly. Vibration causes loosening of bolts, which results in unexpected serious malfunctions of the machine. Tighten the bolts securely.

4.5 Precautions During Work

**CAUTION**
- Before starting the machine, make sure it is safe to start by checking your surroundings for people and objects.
- Always pay attention to your footing. Work in an area where you can maintain a good balance of the machine and a safe comfortable posture.
- The engine and muffler become very hot. Do not touch immediately after the machine stops because they are still very hot.
- If you notice deterioration of machine operation during your work, stop your work immediately.
- Before moving away from the machine, be sure to turn the engine off. Also when the machine is transported, stop the engine and close the fuel cock.
- For a machine with cell starter specification, do not operate without the battery. If you operate without the battery, electrical system failure might occur.

4.6 Lifting Precautions

**DANGER**
- Before lifting, check the machine parts (especially the hook and anti-vibration rubber) for any damage and loosened or missing bolts.
- Stop the engine and shut the fuel cock while lifting.
- Use a sufficiently strong wire rope.
- For lifting, use only one point hoisting hook, and do not lift at any other part.
- When the machine is hoisted, never let people or animals come underneath.
- For safety reasons, do not lift to a height that is higher than necessary.

4.7 Transportation And Storage Precautions

**WARNING**
- Stop the engine during transportation.
- Transport after the engine and the machine are cooled down.
- Always drain the fuel before transporting.
- Securely fix the machine to prevent it from moving or falling during transportation.
4.8 Maintenance Precautions

**WARNING**

- Appropriate maintenance is required to ensure safe and efficient operation of the machine. Always pay attention to the machine’s condition and keep it in good condition. Pay special attention to the parts used for lifting, if they are not maintained properly, it might result in a serious accident.
- Start maintenance work after the machine has cooled down completely. The muffler, in particular, becomes very hot, and there is a danger of burn. The engine, engine oil and vibrato also become very hot. Be careful not to get burned.

**CAUTION**

- Always stop the engine before inspection and adjustment. If you are caught in a rotating part, serious injury might occur.
- After maintenance work, check the security parts to see if they are securely installed. Special attention should be paid when checking bolts and nuts.
- If disassembly is involved in maintenance, refer to the maintenance instruction manual to make your work safe.

**About The Battery**

**DANGER**

- If the battery fixing bolts have been removed, put them back and tighten securely to fix the battery.
  If used with the battery not fixed properly, contact with the battery terminal might occur, leading to electric shock and electric leak, or breakage of the battery might occur by the impact and vibration from outside, resulting in battery fluid leakage.
- The gas from the battery might cause an explosion. Do not generate sparks or bring flames near the battery.
- Never put the positive terminal and negative terminal come into contact. Sparks will be generated, and ignition might occur.

**WARNING**

- Be careful when handling the battery fluid because it is very toxic. If the battery fluid gets on your skin, eye, or clothes, rinse it off with plenty of water and consult with a doctor.
4.9 Label Position

※ The illustration is shown for model, "MVH-308"
<table>
<thead>
<tr>
<th>REF No.</th>
<th>PART No.</th>
<th>PART NAME</th>
<th>Q'TY</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9202-10100</td>
<td>DECAL, EC NOISE REQ. LWA108</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9202-03330</td>
<td>EAR PROTECTION LABEL</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9201-08800</td>
<td>DECAL, KEY SWITCH</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>9202-14960</td>
<td>DECAL, KEY OPERATION</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>9202-01950</td>
<td>DECAL, OIL SAE 10W-30</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>9202-14950</td>
<td>DECAL, REMOVE KEY</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>9202-14730</td>
<td>DECAL, DO NOT LIFTING</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>9202-14740</td>
<td>DECAL, LIFTING POSITION</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>9202-17640</td>
<td>DECAL COMPASS MARK 94MM</td>
<td>1</td>
<td>Diesel Only</td>
</tr>
<tr>
<td>10</td>
<td>9202-17650</td>
<td>DECAL COMPASS MARK 110MM</td>
<td>2</td>
<td>Diesel Only</td>
</tr>
<tr>
<td>11</td>
<td>9202-14750</td>
<td>DEAL, CAUTION ICONS/V-TYPE</td>
<td>1</td>
<td>Diesel Only</td>
</tr>
<tr>
<td>12</td>
<td>9202-17130</td>
<td>DECAL, MIKASA MARK (W)200L</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>9202-17110</td>
<td>DECAL, MIKASA MARK 35X70</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>9202-18140</td>
<td>DECAL, E/G RPM 3400</td>
<td>1</td>
<td>308D</td>
</tr>
<tr>
<td>15</td>
<td>9202-18130</td>
<td>DECAL, E/G RPM 3600</td>
<td>1</td>
<td>308G</td>
</tr>
<tr>
<td>16</td>
<td>9202-18150</td>
<td>DECAL, E/G RPM 2400</td>
<td>1</td>
<td>408D, 508D</td>
</tr>
<tr>
<td>17</td>
<td>9202-18160</td>
<td>DECAL, E/G RPM 3200</td>
<td>1</td>
<td>408G</td>
</tr>
<tr>
<td>18</td>
<td>9202-17870</td>
<td>DECAL, MODEL MVH-308</td>
<td>1</td>
<td>308</td>
</tr>
<tr>
<td>19</td>
<td>9202-17880</td>
<td>DECAL, MODEL MVH-408</td>
<td>1</td>
<td>408</td>
</tr>
<tr>
<td>20</td>
<td>9202-17890</td>
<td>DECAL, MODEL MVH-508</td>
<td>1</td>
<td>508</td>
</tr>
<tr>
<td>21</td>
<td>9202-17730</td>
<td>DECAL, MODEL MVH-308 R-OR</td>
<td>2</td>
<td>308</td>
</tr>
<tr>
<td>22</td>
<td>9202-17770</td>
<td>DECAL, MODEL MVH-408 R-OR</td>
<td>2</td>
<td>408</td>
</tr>
<tr>
<td>23</td>
<td>9202-17810</td>
<td>DECAL, MODEL MVH-508 R-OR</td>
<td>2</td>
<td>508</td>
</tr>
<tr>
<td>24</td>
<td>9202-17740</td>
<td>DECAL, MODEL MVH-308 L-OR</td>
<td>1</td>
<td>308</td>
</tr>
<tr>
<td>25</td>
<td>9202-17780</td>
<td>DECAL, MODEL MVH-408 L-OR</td>
<td>1</td>
<td>408</td>
</tr>
<tr>
<td>26</td>
<td>9202-17820</td>
<td>DECAL, MODEL MVH-508 L-OR</td>
<td>1</td>
<td>508</td>
</tr>
<tr>
<td>27</td>
<td>9202-17820</td>
<td>PLATE, SERIAL NO.</td>
<td>1</td>
<td>Not For Sale</td>
</tr>
</tbody>
</table>
4.10 Descriptions Of Symbols Used On Warning Labels

- **Do not use. (For rollers)**
- **NPA-1473**
- **NPA-1475 NPA-1474**

**Starting, and stopping** (Refer to engine instruction manual for Diesel engine type)

**START**
1. Open Fuel Cock to start
2. Turn Stop Switch to “I”(ON) position
3. Close Choke Lever
4. Pull Recoil Starter to start
5. Return Choke Lever to open

**STOP**
1. Return Throttle Lever fully until “O”(OFF) position to stop work
2. After cooling down enough, stop the engine to move Stop Switch to “O”(OFF) position
3. Close Fuel Cock at the end

---

**Read the manual carefully.**
Always read the operation manual and have good understanding of operation before your work.

**Danger: poisonous exhaust gas**
Carbon monoxide poisoning may occur if the exhaust gas is inhaled. Do not operate the machine in a poorly ventilated area.

**Be careful not to be caught in rotating parts.**
Make sure the engine is stopped when removing the belt cover during a belt change.

**Be careful not to get burned.**
Accidental burn may occur if you touch the hot parts (engine, muffler, etc.) during operation or immediately after the machine stops.

**Be careful not to approach danger source.**
During operation, be careful not to approach hot parts and rotating parts.

**Refueling Hazard.**
Don’t fill the fuel tank while the engine is running or hot.

**Danger of hearing damage caused by noise**
Always use ear plugs while operating the machine.

**Fire hazard**
Stop the engine when refueling. Fire may occur if a flame is near the tank fuel port.

**Do not lift the machine at this point.**
Lifting by the handle is prohibited.

**Lifting position.**
For lifting, use only one point hoisting hook, and do not lift at any other part.

---

**P/N 9209-00110 DECAL, SET /MVH, MRH /EXP, EU**

**(NPA-1476 : “Diesel engine type” is excluded.)**
4.11 Control Unit Positions And Names

- Oil filler for vibration case (with oil gauge)
- Oil filler for engine (without oil gauge)
- Rubber cover
- Fuel tank cap (Fuel inlet)
- Hour / tacho meter
- Handle lock (Stored position)
- Breather plug (with plug cap)
- Key switch
- Hand pump
- Grip
- Cyclone cleaner
- Compaction sensor (COMPASS)
- Extension plate (option)
- Vibrating plate
- Hook
- Stopper for rear cover
- Handle (Stored position)
- Throttle lever
- Forward
- Neutral
- Reverse
- Direction control lever (variable speed adjustable)
- Grip for adjusting handle height
- Handle (Working position)
- Battery
- MVH-308GH
- MVH-408GH
- Engine switch (ON-OFF)
- Engine
- Front cover
- Center cover
- Rear cover

※ The illustration is shown for model, "MVH-308"
## 5. SPECIFICATION

<table>
<thead>
<tr>
<th>MODEL</th>
<th>MVH–308DSZ</th>
<th>MVH–308DSY</th>
<th>MVH–408DSZ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MVH–308DSZ–PAS</td>
<td>MVH–308DSY–PAS</td>
<td>MVH–408DSZ–PAS</td>
</tr>
</tbody>
</table>

### Main Dimensions

<table>
<thead>
<tr>
<th></th>
<th>MVH–308DSZ</th>
<th>MVH–308DSY</th>
<th>MVH–408DSZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Length</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>Overall Height (Handle)</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>Overall Width</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
</tbody>
</table>

### Compacting Board

<table>
<thead>
<tr>
<th></th>
<th>MVH–308DSZ</th>
<th>MVH–308DSY</th>
<th>MVH–408DSZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>Length</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
</tbody>
</table>

### Weight

<table>
<thead>
<tr>
<th></th>
<th>kg</th>
<th>kg</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Weight</td>
<td>345(360,375)</td>
<td>341(356,371)</td>
<td>408(423,438)</td>
</tr>
</tbody>
</table>

### Engine

<table>
<thead>
<tr>
<th></th>
<th>MVH–308DSZ</th>
<th>MVH–308DSY</th>
<th>MVH–408DSZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer/Type</td>
<td>HATZ,1B30</td>
<td>YANMAR, L70N6</td>
<td>HATZ, 1B50</td>
</tr>
<tr>
<td>Type Of Engine</td>
<td>Air-cooled 4-cycle diesel engine</td>
<td>Air-cooled 4-cycle diesel engine</td>
<td>Air-cooled 4-cycle diesel engine</td>
</tr>
<tr>
<td>Maximum Power</td>
<td>kw/min¹</td>
<td>kw/min¹</td>
<td>kw/min¹</td>
</tr>
<tr>
<td></td>
<td>4.9/3300</td>
<td>4.9/3600</td>
<td>6.7/3600</td>
</tr>
<tr>
<td></td>
<td>6.7/3300</td>
<td>6.7/3600</td>
<td>9.1/3600</td>
</tr>
<tr>
<td>Set Engine Revolution</td>
<td>r.p.m</td>
<td>r.p.m</td>
<td>r.p.m</td>
</tr>
<tr>
<td></td>
<td>3350</td>
<td>3600</td>
<td>2350</td>
</tr>
<tr>
<td>Electric Start</td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
</tr>
</tbody>
</table>

### Performance

<table>
<thead>
<tr>
<th></th>
<th>MVH–308DSZ</th>
<th>MVH–308DSY</th>
<th>MVH–408DSZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibrating Frequency</td>
<td>Hz/VPM</td>
<td>Hz/VPM</td>
<td>Hz/VPM</td>
</tr>
<tr>
<td></td>
<td>73/4400</td>
<td>73/4400</td>
<td>73/4400</td>
</tr>
<tr>
<td>Centrifugal Force</td>
<td>kN/kgf</td>
<td>kN/kgf</td>
<td>kN/kgf</td>
</tr>
<tr>
<td></td>
<td>45/4000</td>
<td>45/4000</td>
<td>55/5000</td>
</tr>
<tr>
<td>Max. Traveling Speed</td>
<td>m/min</td>
<td>m/min</td>
<td>m/min</td>
</tr>
<tr>
<td></td>
<td>0~27</td>
<td>0~27</td>
<td>0~28</td>
</tr>
<tr>
<td>Hand Arm Vibration (Ahv)</td>
<td>m/sec²</td>
<td>m/sec²</td>
<td>m/sec²</td>
</tr>
<tr>
<td></td>
<td>6.1</td>
<td></td>
<td>4.7</td>
</tr>
</tbody>
</table>

### MVH–408DSY

<table>
<thead>
<tr>
<th></th>
<th>MVH–408DSY</th>
<th>MVH–508DSZ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MVH–408DSY–PAS</td>
<td>MVH–508DSZ–PAS</td>
</tr>
</tbody>
</table>

### Main Dimensions

<table>
<thead>
<tr>
<th></th>
<th>MVH–408DSY</th>
<th>MVH–508DSZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Length</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>Overall Height (Handle)</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>Overall Width</td>
<td>mm</td>
<td>mm</td>
</tr>
</tbody>
</table>

### Compacting Board

<table>
<thead>
<tr>
<th></th>
<th>MVH–408DSY</th>
<th>MVH–508DSZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>Length</td>
<td>mm</td>
<td>mm</td>
</tr>
</tbody>
</table>

### Weight

<table>
<thead>
<tr>
<th></th>
<th>kg</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Weight</td>
<td>407(422,437)</td>
<td>525(540)</td>
</tr>
</tbody>
</table>

### Engine

<table>
<thead>
<tr>
<th></th>
<th>MVH–508DSZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer/Type</td>
<td>YANMAR, L100N2</td>
</tr>
<tr>
<td>Type Of Engine</td>
<td>Air-cooled 4-cycle diesel engine</td>
</tr>
<tr>
<td>Maximum Power</td>
<td>kw/min¹</td>
</tr>
<tr>
<td></td>
<td>7.0/3200</td>
</tr>
<tr>
<td></td>
<td>9.5/3200</td>
</tr>
<tr>
<td>Set Engine Revolution</td>
<td>r.p.m</td>
</tr>
<tr>
<td></td>
<td>3200</td>
</tr>
<tr>
<td>Electric Start</td>
<td>☑️</td>
</tr>
</tbody>
</table>

### Performance

<table>
<thead>
<tr>
<th></th>
<th>MVH–508DSZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibrating Frequency</td>
<td>Hz/VPM</td>
</tr>
<tr>
<td></td>
<td>73/4400</td>
</tr>
<tr>
<td>Centrifugal Force</td>
<td>kN/kgf</td>
</tr>
<tr>
<td></td>
<td>50/5100</td>
</tr>
<tr>
<td>Max. Traveling Speed</td>
<td>m/min</td>
</tr>
<tr>
<td></td>
<td>0~27</td>
</tr>
<tr>
<td>Hand Arm Vibration (Ahv)</td>
<td>m/sec²</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

※ The number in parentheses is the dimension of the “extension plate(option)” with. “( )” : MVH–308, 408: (standard type, wide type) MVH–508: (wide type)
<table>
<thead>
<tr>
<th></th>
<th>MVH-308GH</th>
<th>MVH-308GE</th>
<th>MVH-408GH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Dimensions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall Length</td>
<td>mm</td>
<td>1540</td>
<td>1540</td>
</tr>
<tr>
<td>Overall Height (Handle)</td>
<td>mm</td>
<td>1030</td>
<td>1030</td>
</tr>
<tr>
<td>Overall Width</td>
<td>mm</td>
<td>445(595,745)</td>
<td>445(595,745)</td>
</tr>
<tr>
<td><strong>Compacting Board</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>mm</td>
<td>445(595,745)</td>
<td>445(595,745)</td>
</tr>
<tr>
<td>Length</td>
<td>mm</td>
<td>860</td>
<td>860</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Weight</td>
<td>kg</td>
<td>310(325,340)</td>
<td>307(322,337)</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturer/Type</td>
<td></td>
<td>HONDA, GX270</td>
<td>ROBIN, EX27</td>
</tr>
<tr>
<td>Type Of Engine</td>
<td></td>
<td>Air-cooled 4-cycle petrol engine</td>
<td>Air-cooled 4-cycle petrol engine</td>
</tr>
<tr>
<td>Maximum Power</td>
<td>kw/min⁻¹</td>
<td>6.3/3600</td>
<td>6.6/4000</td>
</tr>
<tr>
<td></td>
<td>PS/min⁻¹</td>
<td>8.6/3600</td>
<td>9.0/4000</td>
</tr>
<tr>
<td>Set Engine Revolution</td>
<td>r.p.m</td>
<td>3600</td>
<td>3600</td>
</tr>
<tr>
<td>Electric Start</td>
<td></td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibrating Frequency</td>
<td>Hz/VPM</td>
<td>73/4400</td>
<td>73/4400</td>
</tr>
<tr>
<td>Centrifugal Force</td>
<td>kN/kgf</td>
<td>45/4600</td>
<td>45/4600</td>
</tr>
<tr>
<td>Max. Traveling Speed</td>
<td>m/min</td>
<td>0~27</td>
<td>0~27</td>
</tr>
<tr>
<td>Hand Arm Vibration (Ahv)</td>
<td>m/sec²</td>
<td>2.8</td>
<td>3.8</td>
</tr>
</tbody>
</table>

**Remarks:**
Vibration Level is in comply with EU Directive 2002/44/EC and the value is shown as 3 axix min vibration level.
Test course (Crushed gravel) is in comply with EN500-4.
The above values are subject to change in case that the machine is modified or/and the required regulations change.

※ The number in parentheses is the dimension of the “extension plate(option)” with.
“( )” : MVH-308,408: (standard type, wide type)
        MVH-508: (wide type)
6. APPEARANCE

MVH-308
MVH-408

※ The illustration is shown for model, "MVH-308"

MVH-308: 860mm
MVH-408: 900mm

MVH-308: 880mm
MVH-408: 950mm

MVH-308: 1540mm
MVH-408: 1575mm

※ The illustration is shown for model, "MVH-308"

Extension plate (option)
MVH-308 (Standard:595mm, Wide:745mm)
MVH-408 (Standard:650mm, Wide:800mm)

MVH-508

Extension plate (OPTION)

900mm

1600mm
7. INSPECTION BEFORE OPERATION

Part inspection sheet before work start

<table>
<thead>
<tr>
<th>Check point</th>
<th>Check item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual inspection</td>
<td>Crack, Skewness</td>
</tr>
<tr>
<td>Front cover &amp; center cover</td>
<td>Falling off, Breakage, Crack, Looseness and falling off of bolt &amp; nuts</td>
</tr>
<tr>
<td>Fuel tank</td>
<td>Leak, Quantity of oil, Dirt</td>
</tr>
<tr>
<td>Fuel system</td>
<td>Leak</td>
</tr>
<tr>
<td>Fuel filter</td>
<td>Dirt</td>
</tr>
<tr>
<td>Engine oil</td>
<td>Leak, Quantity of oil, Dirt</td>
</tr>
<tr>
<td>Vibration case oil</td>
<td>Leak, Quantity of oil, Dirt</td>
</tr>
<tr>
<td>V-belt for vibrator</td>
<td>Crack, Tension</td>
</tr>
<tr>
<td>Oil pressure pipe line system</td>
<td>Leak, Looseness, Crack, Abrasion</td>
</tr>
<tr>
<td>Traveling lever &amp; part of system</td>
<td>Falling off, Breakage, Crack, Looseness and falling off of bolt &amp; nuts</td>
</tr>
<tr>
<td>Operation of traveling lever, rink origin</td>
<td>Operation check, Permissible error</td>
</tr>
<tr>
<td>Bolt, nuts</td>
<td>Looseness, Falling off</td>
</tr>
</tbody>
</table>

The check is details of engine is referred to engine instruction manual independently.

Always stop the engine before inspection

7.1 Engine Oil

- Set the engine on a level surface to check the oil level. If the oil level is low, add oil. (Fig.1)
- Only lubrication can be done from the top for HATZ engine (1B and 1D). (There is no oil gauge.) (Fig.2)
- Use the following engine oil.

**Quality:** Diesel engine oil, Grade CC or above
Gasoline engine oil, Grade SE or above
Viscosity: SAE No. 30 at 20°C and above (summer)
SAE10W-30

※ When pouring oil from the top (for 1B and 1D), oil might overflow if large amount of oil is poured at one time. So, pour slowly.

7.2 Vibration Case Oil

- Set the machine on a level surface, then remove the oil gauge of the vibrator. Check the oil gauge to see if the oil is at the specified level. Use engine oil SAE10W-30 as lubrication oil.
- Recommended oil quantity is 600cc. (Fig. 3)

7.3 Refueling

**DANGER**

- Stop the engine when refueling.
- Do not expose to open flames while refueling.
- Do not fill to the rim because the fuel might spill.
- Wipe off well if a spill occurs.

- Use clean automotive gasoline or automotive light oil appropriate for the engine. Let the fuel run through a filter when refueling.
- Fuel inlet is located under the rubber cover at the front cover top portion.
- The fuel tank cap is equipped with a lock lever. Unlock this lever before opening the cap. (Only for HATZ engine) (Fig.4)
8. OPERATION

8.1 Starting

Gasoline Engine

1. Set the fuel cock lever to the “ON” position to let the fuel flow. (Fig. 6)

2. In cold weather or when the engine does not start easily, set the choke lever to the “Start” position. This is not necessary when the engine is already warmed up. (Fig. 7)
3. Move the throttle lever to the idle position. (Fig. 8)

4. When the engine is stopped, the hour tachometer is always showing "Cumulative time". (Fig. 9)

5. Turn on the engine switch on the rear cover. (Fig. 10)

6. Hold the recoil starter grip, and pull it a little. You will feel a slight resistance. Then, pull it hard to run the engine. Be careful not to pull too hard, or the rope might break or come off. Allow the starter rope to slowly move back into the case while keeping the grip grabbed. (Fig. 11)

7. After the engine has started, while you hear some explosion loud noise, gradually move back the choke lever until it is wide open. (Fig. 12)

*When the choke lever is set to “Start”, gradually move it back toward the “Operation” direction while making sure the engine revolution stabilizes.*

8. After the engine has started, warm up the engine at low speed for 2 to 3 minutes. This is especially important in cold weather.

9. “Rotation number” is displayed during operation. (Fig. 13)
Set the fuel cock lever to the “ON” position to let the fuel flow. (Fig. 14) (Only for YANMAR engine)

**YANMAR (L70N,L100N)**

1. Insert the key to the key switch.
2. Open the throttle lever to the idling position. (Fig. 15)
3. Turn the key to "Run" position. (Fig. 16) The buzzer starts. After "HA" is displayed on hour tachometer, the display will change immediately to "Cumulative time". (Fig. 17)

---

**STarter motor**

1. Insert the key to the key switch.
2. Open the throttle lever to the idling position. (Fig. 15)
3. Turn the key to "Run" position. (Fig. 16) The buzzer starts. After "HA" is displayed on hour tachometer, the display will change immediately to "Cumulative time". (Fig. 17)

---

**Diesel Engine**

4. Turn the key further to the “START” position to start the engine. After the engine is started, take your hand off the key. (Fig. 16) After the engine revolution rises, the buzzer stops.

5. “Rotation number” is displayed during operation. (Fig. 18)

6. After the engine has started, warm up the engine at low speed for 2 to 3 minutes. This is especially important in cold weather.

---

**CAUTION**

- When the engine does not start, do not run the cell motor continuously for more than five seconds. Move the key back to the “RUN” position, then wait for about 10 seconds to restart.
- While the engine is running, never turn the key switch to the “START” position.

---

**Recoil motor**

1. Insert the key to the key switch.
2. Open the throttle lever to the idling position. (Fig. 15)
3. Turn the key to "Run" position. (Fig. 16) The buzzer starts. After "HA" is displayed on hour tachometer, the display will change immediately to "Cumulative time". (Fig. 17)

4. Hold the recoil starter grip, and pull it a little. You will feel a slight resistance. Then, pull it hard to run the engine. Be careful not to pull too hard, or the rope might break or come off. Allow the starter rope to slowly move back into the case while keeping the grip grabbed. (Fig. 19)
5 When the machine is used on ground that contains clay, the ground surface tends to stick to the vibrating board, and the machine travel speed becomes slower. In this case, check the bottom of the vibrating board to see if there is any clay adhered to the board. This machine cannot perform well on clay and other type of ground with a high water percentage. Drying the ground is recommended to make the ground water percentage appropriate for the machine to get good compacting performance.

4 If you want to suspend the work, to return quickly to the idle position the throttle lever. (Fig. 22)

8.2 Operation

**CAUTION**

- Do not pull the starter knob all the length of the rope.
- After engine start, do not let the starter knob off your hand, but return it slowly by holding it.
- While the engine is running, never turn the key switch to the "START" position.

1 If the throttle lever is opened suddenly, the machine starts to operate. When you operate the throttle lever slowly, it may cause failure of the clutch lever causing the bad connection. (Fig.20)

2 Use the back and forth movement direction control lever to make the machine move backward and forward. When the direction control 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. (Fig.21)

3 When this machine is used on ground that contains clay, the ground surface tends to stick to the vibrating board, and the machine travel speed becomes slower. In this case, check the bottom of the vibrating board to see if there is any clay adhered to the board. This machine cannot perform well on clay and other type of ground with a high water percentage. Drying the ground is recommended to make the ground water percentage appropriate for the machine to get good compacting performance.

**NOTE**

What is shown by the compaction sensor (Compas) is not the absolute value of the soil stiffness. When using the sensor, always calculate appropriate soil stiffness by conducting plate load test and dynamic load test (FWD), etc. to calibrate the LED lighting level with the actual measurement value.
If that happens, because you cannot expect sufficient compaction, do ground improvement work before proceeding with the compaction process. (Fig. 26)

Detection of vibration abnormality
During operation when appropriate vibration frequency cannot be achieved because of the specified engine revolution or the loosened drive belt, or when the vibration frequency is too high, it is indicated by the flashing light. (Fig. 27)

Sensor wire disconnection
(Between acceleration sensor and sensor panel)
If flashing of red LED and green LED alternates as shown in the figure, please check the sensor wire because there is a possibility that it is disconnected. (Fig. 28)

Power cable disconnection
(Between battery and sensor panel)
If there is no power even when the key switch is turned on, please check because there is a possibility that the power cable is disconnected.

Function to detect electric system abnormality
4-2 Power cable disconnection
(Between battery and sensor panel)
If there is no power even when the key switch is turned on, please check because there is a possibility that the power cable is disconnected.

3-2 Detection of vibration abnormality
During operation when appropriate vibration frequency cannot be achieved because of the specified engine revolution or the loosened drive belt, or when the vibration frequency is too high, it is indicated by the flashing light. (Fig. 27)

Function to detect abnormality
3 Function to detect abnormality
3-1 Detection of ground trouble and soft ground
For a case of unstable ground or soft ground (soil containing clay) for which the use of this machine is not suitable, only the red LED lights up, with no yellow LED illuminated.
9. STOPPING THE MACHINE

Gasoline Engine

1. Move the throttle lever to idle position. Run the engine for 3 to 5 minutes at low speeds to cool it down before stopping.

2. Turn the engine switch to the OFF position, then the engine stops. (Fig. 29)

3. Shut the fuel cock. (Fig. 30)

HONDA (GX270, GX390)

ROBIN (EX27)

Diesel Engine

1. Move the throttle lever to idle position. Run the engine for 3 to 5 minutes at low speeds to cool it down before stopping.

2. Move the throttle lever to the stop position to stop the engine. In case of a diesel engine, when the engine stops, the buzzer sounds. (Fig. 31)

3. When the key switch is moved from "ON (Operation)" to "OFF (Stop)", the buzzer stops. (Fig. 32)

4. Shut the fuel cock. (Fig. 33)

(Only for YANMAR engine)

CAUTION

If the throttle lever is moved from the idling position to the stop position, the engine revolution decreases. Before the engine stops completely, do not move the throttle lever suddenly.

YANMAR (L70N, L100N)
10. TRANSPORTATION AND STORAGE

10.1 Loading And Unloading

**WARNING**
- Make sure there is no breakage of guard frame and anti-vibration rubber nor loosened or missing bolts.
- Always stop the engine when lifting.
- Use an intact wire rope without any deformation with sufficient strength.
- Slowly lift upward without applying any impact. Never let people or animals go under the lifted machine.
- For safety reasons, do not lift to a height that is higher than necessary.

1. Use a crane for loading and unloading the machine.
2. Designate a person to guide the loading and unloading, and always work under the instruction of that person.
3. When lifting, always use a hook. (Fig. 34) Never lift by using the hook on the handle.

![Hook](Fig.34)

10.2 Transportation Precautions

**WARNING**
- Stop the engine when the machine is transported.
- Always drain the fuel before transportation.
- Fix the machine securely to prevent the machine from moving or falling.

- When putting the handle into the stored condition (vertical condition), make sure it is properly locked.
- When transporting, remove the starter key.

10.3 Storage

- Wash off dirt and soil from every part with water. While washing, be careful not to let the water splashed on the electric components such as the battery and the engine muffler part.

- Store in a dry area away from direct sunlight after putting the cover over the machine to prevent dust and dirt buildup.
- Do not leave the machine outdoors. Keep it indoors.
- When not used for a long period of time, drain the fuel from the fuel tank, and either disconnect the battery terminal or remove the battery itself.
- When the machine is used after a long storage period, check the level of engine oil and battery capacity.
## 11. REGULAR CHECK AND ADJUSTMENT

### 11.1 Inspection And Maintenance Schedule Table

<table>
<thead>
<tr>
<th>Check frequency</th>
<th>Check parts</th>
<th>Check items</th>
<th>Oils</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Daily</strong></td>
<td>Appearance</td>
<td>Flaw, deformation</td>
<td>Light oil, gasoline</td>
</tr>
<tr>
<td></td>
<td>Fuel tank</td>
<td>Leakage, oil level, dirt</td>
<td>Light oil, gasoline</td>
</tr>
<tr>
<td></td>
<td>Fuel system</td>
<td>Leakage, oil level, dirt</td>
<td>Light oil, gasoline</td>
</tr>
<tr>
<td></td>
<td>Engine oil</td>
<td>Leakage, oil level, dirt</td>
<td>Engine oil</td>
</tr>
<tr>
<td></td>
<td>Shock absorber</td>
<td>Crack, damage, wear</td>
<td>Lightweight oil</td>
</tr>
<tr>
<td></td>
<td>Hand pump</td>
<td>Leakage</td>
<td>Hydraulic oil</td>
</tr>
<tr>
<td></td>
<td>Vibrator oil</td>
<td>Leakage</td>
<td>Engine oil</td>
</tr>
<tr>
<td></td>
<td>Hydraulic pipe system</td>
<td>Leakage, looseness, flaw,</td>
<td>Hydraulic oil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wear</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air cleaner</td>
<td>Dust on sponge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Guard frame</td>
<td>Breakage, flaw, looseness,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>missing bolts and nuts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Back and forth motion</td>
<td>Missing, breakage, flaw,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>looseness, missing-bolts and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>lever, linking parts</td>
<td>nuts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Back and forth motion</td>
<td>Operation check, play</td>
<td></td>
</tr>
<tr>
<td></td>
<td>lever operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bolts and nuts</td>
<td>Looseness, missing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Duct hose</td>
<td>Crack, damage</td>
<td></td>
</tr>
<tr>
<td><strong>Every 20 hours</strong></td>
<td>Engine oil</td>
<td>Replace only after the first</td>
<td>Engine oil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 hours</td>
<td>Engine oil filter</td>
</tr>
<tr>
<td></td>
<td>Engine oil filter</td>
<td>Replace only after the first</td>
<td>Engine oil filter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 hours</td>
<td>Engine oil filter</td>
</tr>
<tr>
<td><strong>Every 100 hours</strong></td>
<td>Engine oil</td>
<td>Change</td>
<td>Engine oil</td>
</tr>
<tr>
<td></td>
<td>Engine oil filter</td>
<td>Washing</td>
<td>Engine oil</td>
</tr>
<tr>
<td></td>
<td>Vibrator oil</td>
<td>Leakage, oil level, dirt</td>
<td>Engine oil</td>
</tr>
<tr>
<td></td>
<td>Hydraulic oil</td>
<td>Leakage, oil level, dirt</td>
<td>Hydraulic oil</td>
</tr>
<tr>
<td></td>
<td>Battery terminal</td>
<td>Cleaning</td>
<td></td>
</tr>
<tr>
<td><strong>Every 200 hours</strong></td>
<td>V-belt for vibrator</td>
<td>Flaw, tension</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dirt, flaw, wear</td>
<td></td>
</tr>
<tr>
<td><strong>Every 300 hours</strong></td>
<td>Vibrator oil</td>
<td>Change</td>
<td>Engine oil</td>
</tr>
<tr>
<td></td>
<td>Hydraulic oil</td>
<td>Change</td>
<td>Hydraulic oil</td>
</tr>
<tr>
<td></td>
<td>Fuel filter</td>
<td>Change</td>
<td>Engine oil</td>
</tr>
<tr>
<td></td>
<td>Engine oil filter</td>
<td>Change</td>
<td>Engine oil filter</td>
</tr>
<tr>
<td><strong>Every 2 years</strong></td>
<td>Fuel pipes</td>
<td>Change</td>
<td>Engine oil</td>
</tr>
<tr>
<td><strong>Irregular</strong></td>
<td>Air cleaner element</td>
<td>Change</td>
<td>Engine oil</td>
</tr>
<tr>
<td></td>
<td>Hydraulic hose</td>
<td>Change</td>
<td>Engine oil</td>
</tr>
<tr>
<td></td>
<td>Cyclone cleaner</td>
<td>Cleaning</td>
<td>Engine oil</td>
</tr>
</tbody>
</table>

For details about the check and maintenance of the engine, please refer to the attached engine operation manual. 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. For check of bolt and nut looseness and tightening, please see the following tightening torque list.

### Tightening torque list (unit: kgf-cm, 1kgf-cm=9.80665N-cm)

<table>
<thead>
<tr>
<th>Material 4T(SS41)</th>
<th>6mm</th>
<th>8mm</th>
<th>10mm</th>
<th>12mm</th>
<th>14mm</th>
<th>16mm</th>
<th>18mm</th>
<th>20mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>70</td>
<td>150</td>
<td>300</td>
<td>500</td>
<td>750</td>
<td>1,100</td>
<td>1,400</td>
<td>2,000</td>
</tr>
<tr>
<td>6-8T(S45C)</td>
<td>100</td>
<td>250</td>
<td>500</td>
<td>800</td>
<td>1,300</td>
<td>2,000</td>
<td>2,700</td>
<td>3,800</td>
</tr>
<tr>
<td>11T(SCM3)</td>
<td>150</td>
<td>400</td>
<td>800</td>
<td>1,200</td>
<td>2,000</td>
<td>2,900</td>
<td>4,200</td>
<td>5,600</td>
</tr>
</tbody>
</table>

When the mating material is aluminum, 100 ~ 350N·cm (Bolts used on the machine are all right-hand thread.)
1.2 Opening The Front Cover

For a comfortable maintenance work.

**CAUTION**

- Do maintenance work in a place with a flat and hard surface to keep the machine stable.
- Start your work after the machine and engine cool down completely.
- Be careful to catch the finger when opening and closing the front cover.
- Do not touch the hot part because the engine and muffler become very hot.

1. Remove the bolts (M14x35) on the front cover. Loosen the bolts (M14x35) on the side of front cover. (Do not remove.) (Fig.35)

   ![Fig.35](image)

   - Top of front cover bolts (M14x45)
   - Side of front cover bolts (M14x45)

2. Hold the side of front cover, and pull up to open position. (Fig.36)

   ![Fig.36](image)

   - Open position

3. Open the front cover slowly. (Fig.37)

   ![Fig.37](image)

   - OPEN

4. Return the front cover to original position slowly. Tighten the bolts in the specified torque. (Fig.40)

   ![Fig.40](image)

   - Bolt M14X45 (176.6N·m (130.2ft·lb))

**Diesel Engine**

2. Hold the hook and the front side of front cover, and pull up to open position. (Fig.38)

   ![Fig.38](image)

   - Pull up

3. Open the front cover slowly. (Fig.39)

   ![Fig.39](image)

   - OPEN

4. Return the front cover to original position slowly. Tighten the bolts in the specified torque. (Fig.40)

   ![Fig.40](image)

   - Bolt M14X45 (176.6N·m (130.2ft·lb))

**Gasoline Engine**

2. Hold the side of front cover, and pull up to open position. (Fig.36)

   ![Fig.36](image)

   - Open position

3. Open the front cover slowly. (Fig.37)

   ![Fig.37](image)

   - OPEN

**CAUTION**

- Do not return the front cover in its open position.
- Do not start the engine when opening the front cover.
- Tighten the bolts firmly.
11.3 Changing The Engine Oil

- Perform the first engine oil change after 20 hours of operation, then change at every 100 hours. (Fig. 41)

![Engine oil drain (Drain bolt)](image)

**CAUTION**

Be careful to avoid pinched fingers.

11.4 Cleaning The Air Cleaner

**The Engine Air Cleaner**

When the air cleaner element becomes dirty, the engine does not start smoothly, and sufficient output cannot be obtained. Machine operation will be affected and the engine life will be shortened greatly. Do not forget to clean the element. (For details, please see the separate engine operation manual.) If the element cannot be cleaned, replace it with a new one. (Fig. 42)

![Engine air cleaner](image)

**CAUTION**

Do not use organic solvent like paint thinner, which may cause damage or deformation of Dust Pot.

11.5 Checking/Changing The V-belt and Clutch

1. **Check of V-belt** (Fig. 45)

   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.

![Check of V-belt](image)

2. **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.

![Removing the V-belt](image)
11.6 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.46)

Change the vibrator oil at every 300 hour 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.

Use engine oil SAE 10W-30 as lubrication oil. The quantity used is 600cc.

11.7 Checking/Changing 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. 47)

Changing the hydraulic oil

1. Remove the plug cap of the hand pump. Then remove the breather plug (with 24mm wrench) before removing the hydraulic hose connected to the cylinder on the vibrator side. Set the run lever to reverse, then drain the hydraulic oil from the pump. (Fig.47, 48)

2. After the oil is drained, attach the hydraulic hose again to the cylinder on the vibrator side. With the direction control lever at the forward-most position, fix to the hook with a rope to immobilize. (Fig.48, 49)

CAUTION

- Appropriate maintenance is required to ensure safe and efficient operation of the machine. Pay special attention to the parts used for lifting, if they are not maintained properly, it might result in a serious accident.
- 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.
- In case that oil is drained from Drain Plug, some oil still remains in Oil Pan. So be sure to check oil level correctly by Oil Gauge after filling oil.
- Do not fill oil with excessive volume (600cc). It may cause the terrible fuel consumption and lower machine performance as the result of engine overload.
3 Pour hydraulic oil (550 cc) from the hand pump breather plug attachment hole. (Fig.47)

4 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. (Fig.48)

5 Then release the direction control lever and move the lever forward and reverse several dozen times (until air bubble not be found). Stay the lever at the forward position for 10 seconds every time. (Because the check valve is opened at the maximum forward position and air bubble will come out from the oil tank of the hand pump). (Fig.49)

   In case the air bleeding is insufficient, repeat the procedure of above “4” and “5”.

6 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.

   **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.

   **Hydraulic oil:**
   
   Shell Terrace Oil #32 or equivalent

11.8 Battery

   **Checking the battery**

   The standard battery installed is a maintenance free battery. It is not necessary to supply battery fluid. In case of a sudden voltage drop, the battery cannot be charged quickly, so it has to be replaced with a new one.

   **Check of battery capacity by battery checker**

   When the battery charging level gets low, the battery checker of the hour tachometer lights up in red. (Fig.50)

   **CAUTION**

   If an old battery is used, even when the battery checker is not lighted (indicating charging level low), the cell starter might not operate because of low charging level. If that happens, change the battery with the new one.

   **How to remove the battery**

   1 Remove the stopper at the two locations on the top portion of the rear cover to open the rear cover. (Fig.51)

   2 Loosen, but not remove, the M8 bolts (2 bolts) used for cyclone cleaner attachment. Take out the cyclone cleaner downward. (Fig.52)

   3 Take off the nuts and remove the battery holder. After tilting the battery backward, disconnect the battery terminal. When doing so, always disconnect the black terminal on the minus side first.

   4 By holding the top surface handle, pull upward to remove the battery from the machine. (Fig.53)

   **CAUTION**

   Pay sufficient attention so that the battery terminal will not touch the frame.
5 For assembly, take the reverse steps described above, but when attaching the battery terminal, start with the red terminal of the plus side. Also, attach securely so that it will not get loosened by vibration.

**CAUTION**

When charging the battery, always remove it from the machine.

6 **Mountable battery size table**

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>W</th>
<th>H</th>
<th>SIZE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MVH-308</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>238</td>
<td>129</td>
<td>203</td>
<td>55B24L(JIS) No.51R(BCI)</td>
<td>STD</td>
</tr>
<tr>
<td></td>
<td>245</td>
<td>175</td>
<td>175</td>
<td>DIN 55Ah or equivalent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>245</td>
<td>175</td>
<td>190</td>
<td></td>
<td>Replacement</td>
</tr>
<tr>
<td></td>
<td>245</td>
<td>129</td>
<td>203</td>
<td>JIS/BCI TYPE Maximum capacity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>245</td>
<td>175</td>
<td>190</td>
<td>DIN TYPE Maximum capacity</td>
<td></td>
</tr>
<tr>
<td><strong>MVH-408</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>238</td>
<td>129</td>
<td>203</td>
<td>55B24L(JIS) No.51R(BCI)</td>
<td>STD</td>
</tr>
<tr>
<td></td>
<td>232</td>
<td>175</td>
<td>203</td>
<td>※ 75D23L(JIS) No.35(BCI)</td>
<td>Replacement</td>
</tr>
<tr>
<td></td>
<td>245</td>
<td>175</td>
<td>175</td>
<td>DIN 55Ah or equivalent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>245</td>
<td>175</td>
<td>190</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>245</td>
<td>175</td>
<td>203</td>
<td>Maximum capacity</td>
<td></td>
</tr>
<tr>
<td><strong>MVH-508</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>232</td>
<td>175</td>
<td>203</td>
<td>75D23L(JIS) No.35(BCI)</td>
<td>STD</td>
</tr>
<tr>
<td></td>
<td>245</td>
<td>175</td>
<td>175</td>
<td>DIN 75Ah or equivalent</td>
<td>Replacement</td>
</tr>
<tr>
<td></td>
<td>245</td>
<td>175</td>
<td>190</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>245</td>
<td>175</td>
<td>203</td>
<td>Maximum capacity</td>
<td></td>
</tr>
</tbody>
</table>
12. TROUBLESHOOTING

12.1 Gasoline Engine

(1) Starting problems

Fuel is supplied, but the igniter plug does not ignite.

- Electricity reaches the high voltage cable.
  - Bridging the igniter plug.
  - Carbon accumulated on the igniter plug.
  - Short circuit due to insulation problems of the igniter plug.
  - Inappropriate spark gap
- Electricity does not reach the high voltage cable.
  - Short circuit of the ON-OFF switch
  - Ignition coil problems
  - Dirt of the point or inappropriate gap.
  - Breakage of ignition coil or short circuit

Fuel supplied, and the igniter plug ignites.

- Compression is good,
  - The wrong fuel is used.
  - Mixing of water or foreign materials
  - The air cleaner not working
- Compression is not good,
  - Intake/exhaust valve is stuck or pushed up
  - Piston ring, cylinder wear
  - Cylinder head, igniter plug tightening problem
  - Head gasket, igniter plug gasket breakage

Fuel does not reach the carburetor.

- No fuel in the fuel tank.
- Fuel cock does not open properly.
- Clogging of fuel filter.
- Clogging of tank cap air hole
- Air trapped in the fuel pipe.

(2) Operation problems

Lowered power.

- Compression is good and no firing problem.
  - Dirt of air cleaner.
  - Carbon accumulated in the cylinder.
  - Carburetor oil level inappropriate.
- Insufficient compression (see the item “compression is not good.” )
  - Water mixed in fuel
  - Dirt of the igniter plug.
  - Ignition coil problem
  - Occasional short circuit of the ignition coil

Engine overheating

- Carbon accumulated inside combustion chamber and exhaust hole.
- Spark plug thermal value inappropriate
- Dirt and breakage of the cooling fin.

Revolution fluctuation

- Governor adjustment inappropriate
- Governor spring problems
- Fuel does not flow properly.
- Air taken from intake pipe system

(3) Recoil starter problems

Recoil starter operation not good

- Clogging of foreign materials at the rotating part.
- Weakening of the spiral spring
(1) Starting problems

(A) In case of compression problems

No compression at all
- Intake/exhaust valve upthrust
- Decompressor adjustment problems

Almost no compression
- Contact with seat not close enough.
- Piston ring wear
- Cylinder wear
- Cylinder, cylinder head mating surface problems
- Nozzle seat looseness

(B) In case of inappropriate fuel injection inside the combustion chamber

Fuel flow low or no flow
- Clogging of the tank cap air hole.
- Clogging of the fuel filter
- Fuel cock not open
- Air inside the fuel pipe

Fuel not injected inside the combustion chamber
- Injection pump barrel, plunger stuck
- Nozzle hole clogging
- Nozzle needle stuck

No fuel in the fuel tank

Mixing of water or foreign materials

(C) Fuel and compression pressure appropriate, but the engine does not start.

Does not reach the starting revolution.
- Inappropriate starting operations
- Engine oil viscosity high, engine oil is very dirty.
- Air trapped inside the fuel pipe.

(2) Insufficient output and operation problems

Insufficient compression
- See the comment for insufficient compression.

Engine overheating with black smoke
- Dirt and breakage of cooling fin
- Mixing of water inside the fuel filter
- Carbon accumulated in the combustion chamber or exhaust hole.
- Smoke set inappropriate
- Overload
- Inappropriate injecting timing
- Nozzle clogging

Revolution fluctuation
- Governor fork and sleeve mating surface problems
- Governor spring problems
- Fly plate and sliding part wear and operation problems
<table>
<thead>
<tr>
<th>Engine revolution does not increase.</th>
<th>Valve open/close timing inappropriate</th>
<th>Clogged exhaust hole, muffler</th>
<th>Overload</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firing problem with white smoke (when unloaded)</td>
<td>Piston, cylinder ring wear</td>
<td>Nozzle hole clogging</td>
<td>Piston ring stuck</td>
</tr>
<tr>
<td></td>
<td>Wrong assembly (upside down) of piston ring</td>
<td>Inappropriate injection timing</td>
<td>Inappropriate valve open/close timing</td>
</tr>
<tr>
<td></td>
<td>Looseness of injection pump joint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel consumption too high (black smoke)</td>
<td>Leakage from fuel passage</td>
<td>Clogging of the air cleaner element</td>
<td>Inappropriate fuel due to mixing of impurities</td>
</tr>
<tr>
<td>Extensive wear on sliding parts or stuck piston rings</td>
<td>Use of wrong oil</td>
<td>Failure to change oil</td>
<td>Breakage of the air cleaner element or failure to clean the air cleaner</td>
</tr>
<tr>
<td>Stopped suddenly with abnormal noise</td>
<td>Searing or damage of the piston, rod, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication oil diluted and increased.</td>
<td>Wear on the injection pump barrel or plunger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine does not stop even though the fuel supply is cut (or over-running)</td>
<td>Too much oil</td>
<td>Wrong assembly of the governor system</td>
<td>Detached injection pump rack</td>
</tr>
</tbody>
</table>

**12.3 Main Body**

| Low travel speed and vibration weak | Insufficient engine output and inappropriate high speed set revolution | Slipping of clutch | Slipping of V-belt |
| Move forward or backwards, but unable to switch between back and forth motion | Too much vibrator oil | Failure inside vibrator | |
| | 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 | |
13. WIRING DIAGRAM

MVH-308DSY

MVH-408DSY

Dynamo
114399-78260

CB104

CA104

(Green/White)

Regulator

Starter switch

Starter
DC12V 0.8kW

Battery
55B24L

Oil pressure switch
121252-39450

Hour/tacho meter
DC12V

AV20

AV1.25 Red

AV1.25 Black

AV1.25 White

MVH-308DSY-PAS

MVH-408DSY-PAS

Dynamo
114399-78260

CB104

CA104

(Green/White)

Regulator

Starter switch

Starter
DC12V 0.8kW

Battery
55B24L

Oil pressure switch
121252-39450

Hour/tacho meter
DC12V

ISO 8820-3
TYPE,F
2A
(SAE J2077)

Compaction sensor panel

Compaction sensor

AV20

AV1.25 Red

AV1.25 Black

AV1.25 White

(Black/Green)