

Mikasa

REVERSIBLE COMPACTOR
MVH-R60/120/150
/306/406/502
INSTRUCTION MANUAL




We thank you for selecting Mikasa Vibration Compactor. For your safe and proper operation, please read this manual and be always sure to keep it ready for reference.



MIKASA SANGYO CO.,LTD.

402-02512

1) DECLARATION OF CONFORMITY

2) Manufacturer's name and address.		Mikasa Sangyo Co., Ltd. 1-4-3 Sarugaku-cho, Chiyoda-ku, Tokyo, Japan				
3) Name and address of the person who keeps the technical documentation.		Takao Itoh, engineer R. & D. Division, Mikasa Sangyo Co., Ltd. Shiraoka-machi, Saitama, Japan				
4) Type: Vibratory Plates						
5) model	MVH-R60	MVH-120GH	MVH-150GH	MVH-150D		
6) Equipment item number	52723 52724 52726 52729 52732 52733	52802 52803 52805 52806 52810 52811	52772 52773 52775 52776	52790 52792 52793		
7) power source cont. output	Honda GX120 2.1kW	Honda GX160 3.0kW	Honda GX200 3.75kW	Yanmar L48A 3.1kW		
8) Measured sound power level(dB)	104	107	107	106		
9) Guaranteed sound power level(dB)	105	108	108	108		
10) Max. Sound pressure level(dB)	90	94	94	93		
11) Conformity assessment according to Annex:		VIII (Full Quality Assurance procedure)				
12) Name and address of the Notified Body		Société Nationale de Certification et d'Homologation (SNCH) 11, route de Luxembourg L-5230 Sandweiler LUXEMBOURG				
13) Related Directive		Directive 2000/14/EC relating to the noise emission in the environment by equipment for use outdoors.				
14) Declaration		The equipment refer in this document, fulfills with all the requirements of the Directive 2000/14/EC				
15) Other related Community Directives		98/37/EC , 89/336/EEC, 2002/88/EC EN500-4, EN500-1				
16) EC Conformity Certificate No:		e13*2000/14*2000/14*0472*00				
17) Place and date of the declaration		Tokyo, Japan Jan, 2007 Signed by: Mikasa Sangyo Co., Ltd.  Keiichi YOSHIDA Director, General Manager R&D Division				



1) DECLARATION OF CONFORMITY

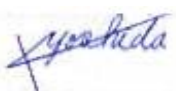
2) Manufacturer's name and address.	Mikasa Sangyo Co., Ltd. 1-4-3 Sarugaku-cho, Chiyoda-ku, Tokyo, Japan					
3) Name and address of the person who keeps the technical documentation.	Takao Itoh, engineer R. & D. Division, Mikasa Sangyo Co., Ltd. Shiraoka-machi, Saitama, Japan					
4) Type: Vibratory Plates						
5) model	MVH-200GH	MVH-306DS	MVH-306GH	MVH-406DS	MVH-406GH	MVH-502DSB
6) Equipment item number	52844, 52846, 52847	52947 52948 52949 52955	52944 52960	52916 52917 52918	52873 52876	52971 52972
7) power source cont. output	Honda GX240 4.4kW	Yanmar L70AE 4.4kW	Honda GX270 5.2kW	Yanmar L100A 6.2kW	Honda GX390 6.6kW	Hatz 1D81S 8.6kW
8) Measured sound power level(dB)	105	106	105	107	106	106
9) Guaranteed sound power level(dB)	107	108	107	108	108	109
10) Max. Sound pressure level(dB)	93	94	93	94	94	92
11) Conformity assessment according to Annex:	VIII (Full Quality Assurance procedure)					
12) Name and address of the Notified Body	Société Nationale de Certification et d'Homologation (SNCH) 11, route de Luxembourg L-5230 Sandweiler LUXEMBOURG					
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Sound Power Level Chart

Related Directive: Directive **2000/14/EC** for sound power level

98/37/EC for max. sound pressure level

Type of Equipment: Compaction machines(Engins de compactage)

model / modèle	power source / moteur	Measured sound power level(dB)(Niveau de puissance acoustique mesuré)	Guaranteed sound power level(dB)(Niveau de puissance acoustique garanti)	Max. Sound pressure level(dB)
MVH-R60	Honda GX120 2.9kw	104	105	90
MVH-120GH	Honda GX160 4kw	107	108	94
MVH-150GH	Honda GX200 4.8kw	107	108	94
MVH-150D	Robin DY23D 3.7kw	106	108	93
MVH-150D	Yanmar L48A 3.5kW	107	108	94
MVH-306DS	Yanmar L70AE 4.9kW	106	108	94

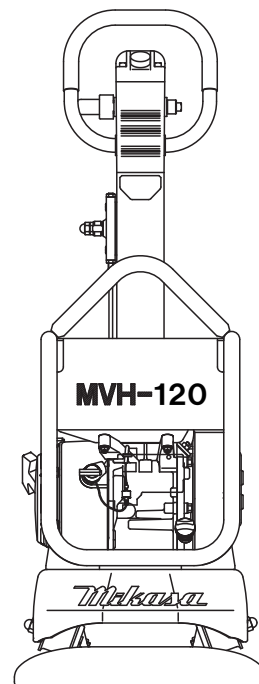
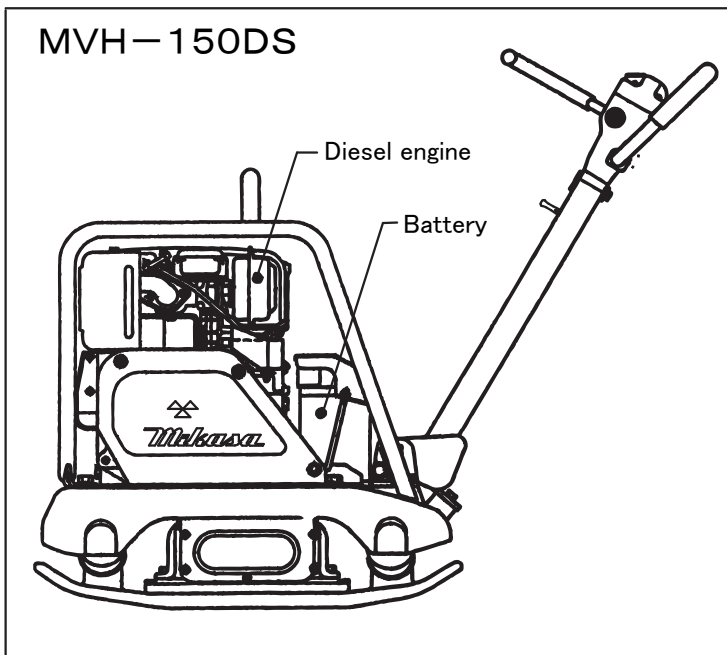
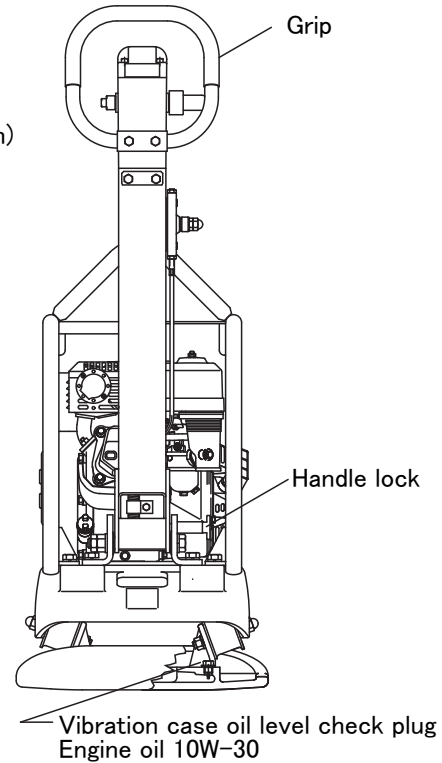
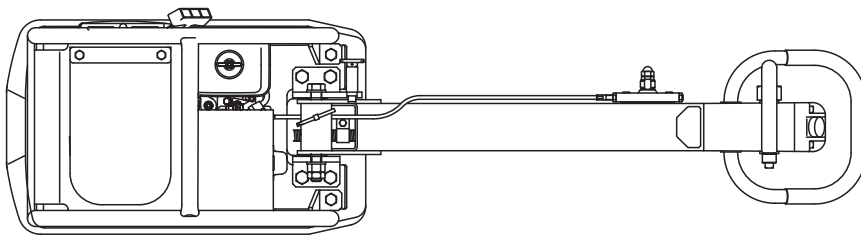
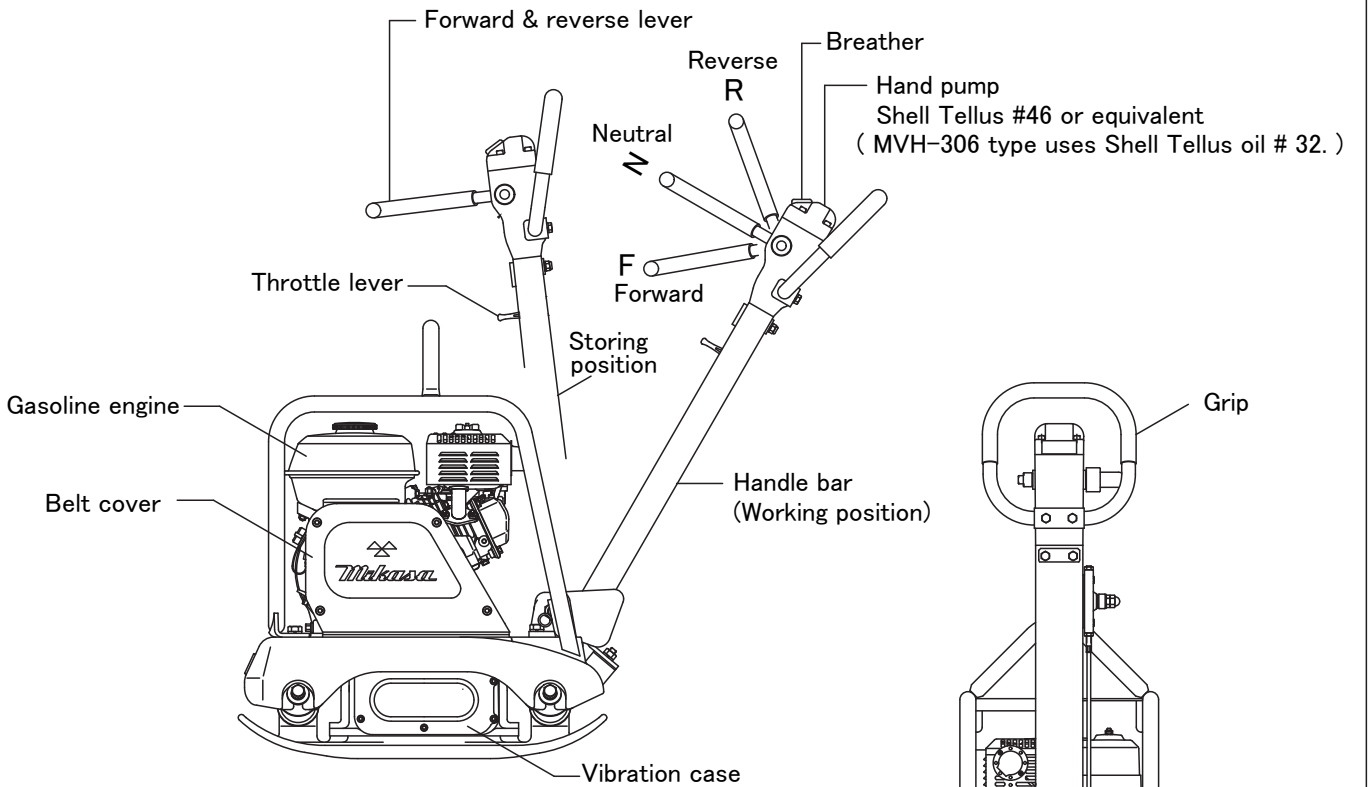
1. SPECIFICATIONS

Model	MVH-R60	MVH-120GH	MVH-120GR	MVH-150GH	MVH-150GR	MVH-150D (MVH-150DS)	MVH-150D	
Dimensions (mm)								
Overall Length	886	1030	1030	1130	1130	1130	1130	
Overall Width	350	400	400	430	430	430	430	
Overall Height	880	900	900	920	920	920	920	
Plate Size (W X L)	350 x 480	400 x 585	400 x 585	430 x 700	430 x 700	430 x 700	430 x 700	
V-Belt Size	RPF-3320	RPF-3320	RPF-3320	RPF-3350	RPF-3350	RPF-3340	RPF-3350	
Lubrication Oil in vibration case (cc)	250	350	350	350	350	350	350	
Weight								
Operating Weight (kg)	68	112	114	150	164	150 (165)	152	
Performance								
Travelling Speed (Forward)	0-25m/min	0-23m/min	0-23m/min	0-25m/min	0-25m/min	0-25m/min	0-25m/min	
Travelling Speed (Reverse)	0-25m/min	0-23m/min	0-23m/min	0-25m/min	0-25m/min	0-25m/min	0-25m/min	
Vibrating Frequency	100Hz (6,000v.p.m)	100Hz (6,000v.p.m)	100Hz (6,000v.p.m)	90Hz (5,400V.P.M)	90Hz (5,400V.P.M)	90Hz (5,400V.P.M)	90Hz (5,400V.P.M)	
Centrifugal Force	15kN (1530kgf)	22.5kN (2300kgf)	22.5kN (2300kgf)	27kN (2750kgf)	27kN (2750kgf)	27kN (2750kgf)	27kN (2750kgf)	
Power Source								
Manufacturer	Honda	Robin	Honda	Robin	Honda	Robin	Robin	Yanmar
Model	GX120 (petrol)	EX13 (petrol)	GX160 (petrol)	EH17-2D (petrol)	GX200 (petrol)	EH25-2D (petrol)	DY23-2D (diesel)	L48A (diesel)
Max. Output	2.9kW(4.0PS) /3600min ⁻¹	3.2kW(4.3PS) /4000min ⁻¹	4.0kW(5.5PS) /3600min ⁻¹	3.7kW(5.0PS) /3600min ⁻¹	4.8kW(6.5PS) /3600min ⁻¹	5.9kW(8.0PS) /3600min ⁻¹	3.7kW(5.0PS) /3600min ⁻¹	3.5kW(4.7PS) /3600min ⁻¹
Fuel Tank Capacity	2.5 L	2.7 L	3.6 L	3.6 L	3.6 L	6.0 L	3.2 L	2.5 L
Set R.P.M	3600min ⁻¹ (3600rpm)	3600min ⁻¹ (3600rpm)	3600min ⁻¹ (3600rpm)	3600min ⁻¹ (3600rpm)	3600min ⁻¹ (3600rpm)	3600min ⁻¹ (3600rpm)	3200min ⁻¹ (3200rpm)	3200min ⁻¹ (3200rpm)



Model	MVH-306GH	MVH-306GE	MVH-306D (MVH-306DS)	MVH-406DS/ MVH-406DSN	MVH-406DZN	MVH-406DS (Lower Noise)	MVH-502DSB [for EU]
Dimensions (mm)							
Overall Length	1570	1570	1570	1610	1610	1610	1680
Overall Width	445	445	445	500	500	500	550
Overall Height	970	970	970	930	1020	930	950
Plate Size (W X L)	445 x 860	445 x 860	445 x 860	500 x 900	500 x 900	500 x 900	550 x 900
V-Belt Size	RPF-5360	RPF-5360	RPF-5370	HDPF-5370	HDPF-5370	HDPF-5390	HDPF-5450
Lubrication Oil in vibration case (cc)	600	600	600	600	600	600	1000
Weight							
Operating Weight (kg)	315	305	310 (350)	410	410	430	550 [560]
Performance							
Travelling Speed (Forward)	0-23m/min	0-23m/min	0-23m/min	0-23m/min	0-24m/min	0-23m/min	0-23m/min
Travelling Speed (Reverse)	0-23m/min	0-23m/min	0-23m/min	0-23m/min	0-24m/min	0-23m/min	0-23m/min
Vibrating Frequency	73Hz (4,400V.P.M)	73Hz (4,400V.P.M)	73Hz (4,400V.P.M)	73Hz (4,400v.p.m)	77Hz (4,600v.p.m)	73Hz (4,400v.p.m)	67Hz (4,000v.p.m)
Centrifugal Force	45kN (4600kgf)	45kN (4600kgf)	45kN (4600kgf)	50kN (5100kgf)	55kN (5600kgf)	50kN (5100kgf)	61.7kN (6300kgf)
Power Source							
Manufacturer	Honda	Robin	Yanmar	Yanmar	HATZ	Yanmar	HATZ
Model	GX270 (petrol)	EX27 (petrol)	L70AE (diesel)	L100AD (diesel)	1B40 (diesel)	L100AD (diesel)	1D81S (diesel)
Max. Output	6.6kW(9.0PS) /3600min ⁻¹	6.6kW(9.0PS) /4000min ⁻¹	4.9kW(6.7PS) /3600min ⁻¹	7.4kW(10PS) /3600min ⁻¹	7.3kW(9.9PS) /3600min ⁻¹	7.4kW(10PS) /3600min ⁻¹	10.3kW(14.1PS) /2900min ⁻¹
Fuel Tank Capacity	6.0 L	6.1 L	3.5 L	5.5 L	5.0 L	5.5 L	7.0 L
Set R.P.M	3600min ⁻¹ (3600rpm)	3600min ⁻¹ (3600rpm)	3600min ⁻¹ (3600rpm)	3200min ⁻¹ (3200rpm)	3400min ⁻¹ (3400rpm)	2500min ⁻¹ (2500rpm)	2850min ⁻¹ (2850rpm)

2. PARTS AND COMPONENT



3. FOR YOUR WORKING SAFETY

This manual elaborates how to operate and service our MVH series reversible compactor. For your working safety, Please read and understand this manual thoroughly before you start working.

⚠ mark appears in this manual or on label affixed to your machine is warning sign.

For your safety, be sure to observe the direction contained.

⚠ **Danger:** Used when there is an extremely high possibility for an accident that may cause death or serious injury, unless the direction is observed.

⚠ **Warning:** Used when there is a possibility for an accident that may cause death or serious injury, unless the direction is observed.

⚠ **Caution:** Used when there is a possibility for accident that may cause bodily injury.

General Rules to observe

- ⚠ **Warning**
- Refrain from working in such cases as below:
 - When not feeling well due to fatigue or disease.
 - When taking medicine.
 - Under the influence of alcohol.
- ⚠ **Caution**
- Read the instruction manual carefully and operate the machine properly to work safely.
 - With respect to engine, read the separate engine manual.
 - Understand the mechanism of the machine sufficiently.
 - Wear protectors (hard hat, Safety shoes, ear plugs, etc.) and proper clothing for working safety.
 - Always check the machine for loosened threads or any other abnormality before starting your work.
 - Whenever affixed name plate (such as operating directions and warnings) become difficult to read, replace it with new one.
 - Machine is hazardous for children to tamper with. Pay enough caution for how and where to store it. Particularly in case of the machine equipped with starting motor, remove starting key to store at designated location.
 - Be sure to shutdown engine for servicing. If equipped with starter motor, disconnect battery wiring.
 - Manufacturer does not assume responsibility for any accident arising from modification.



For refueling

- ⚠ **Warning**
- Before refueling, be sure to shutdown engine and wait for it to cool.
 - Select location where there is no inflammable matter and be careful not to spill fuel. When spilled, wipe thoroughly it off thoroughly.
 - Never use fire in the vicinity while refueling, (Definitely no smoking!).
 - Topping up to filler port is dangerous as it tends to spill fuel.



General Rules to observe during operation

- ⚠ **Caution**
- Before starting and operating your machine, check for safety of personnel or obstacle around.
 - Always pay attention to ground so you can work in stable position with your machine remaining balanced.
 - Whenever machine fails to work properly or any abnormality is noticed during work, suspend your work immediately.
 - Do not touch engine body or muffler as they are hot in operation.
 - Be sure to stop engine whenever you leave the machine. Also, do not forget to stop the engine when you shift the machine as well.



Loading and unloading with crane in use

- ⚠ **Caution**
- Before lifting make sure that machine parts (hook and shock absorber in particular) are not damaged and screws are not loosened or lost.
 - Stop the engine before lifting your machine.

- Use wire rope which has sufficient strength.
- Use one point suspension hook and lift straight upward without giving any shock.
- Be sure not to allow any person or animal to enter underneath the lifted machine.
- For safety, try not to lift to unnecessary height.

For Transport

- ⚠ Caution ● Shutdown the engine during transport.
- Tighten fuel tank cap securely and close fuel cock to prevent fuel from spilling..
- Drain fuel before transporting over long distance or on poor road.
- Lock the machine securely so the machine does not move or topple over.

About Reversible Compactor

Application

Mikasa Reversible Compactor is a machine to compact ground with going forward and reverse motion, which is achieved by strong twin rotors' vibration in vibrator unit enables base plate to reciprocate linearly and to change the travel direction. The operation of Reversible Compactor is effective to compact most type of soil conditions excluding waterbed. This machine is suitable for trench work because of its forward and reverse motion. Its working efficiency also makes it suitable for compacting large area.

Lightweight machines (MVH-R60,120,150) can be applied for widespread compacting work, such as leveling and compacting soil, and finishing the asphalt paving.

Heavyweight machines (MVH-200, 304, 306, 402, 502, 702) make large compacting ability possible and they are applied for compacting the base of load, embankment, building, backfill of gas piping works, water pipes, and cable works.

Warnings for incorrect application and abuse

These machines are not suitable for compacting waterbed ground especially like clay soils. They are to be used for compacting cohesive clay, gravels, and patching work on asphalt, etc. Do not use machines for the other applications.

Structure

The upper part of main body consists of engine, handle, belt cover and guard hook, which are fixed on vibrating plate (base plate) through shock absorbing rubber. Oil tank and battery are equipped with some models. The lower part consists of vibrating plate and vibrator unit. It is the mechanism that the phase of two eccentric rotary shafts in vibrator unit is to be changed by oil pressure. Hydraulic cylinder at vibrator unit is connected to hydraulic pump or /and valves that are directly inked to travel lever through hydraulic hoses.

Hydraulic valve is supplied with oil from hydraulic pump on vibrator unit.

Power Transfer

Air-cooled single cylinder engine is mounted as power source and centrifugal clutch is fixed on engine output shaft. petrol 4 stroke engine and diesel gasoline engine are mounted according to models.

Centrifugal clutch engages by running up the engine and the suitable frequency for compaction is achieved through the translation process from clutch pulley to vibration pulley (at vibrator unit) linked by v-belt. Rotation of vibrator pulley turns round 2 sets of eccentric weights (connected by gears) in the opposite direction, which are installed in vibrator unit combined with base plate. It eventually generates vibrations on base plate. There is spiral groove inside gear connected to the one of Eccentric rotary shafts and the key groove that can slide to the shaft direction is attached in the shaft. Both groove is connected each other by guide pin. Letting guide pin move to side direction enables the phase of shaft and gear to change. It also changes the phase of both eccentric rotary shafts. The vibrating direction changes in response to the variation of phase of eccentric weights. It also transforms speed and traveling direction. Guide pin is sided by hydraulic pressure, which amount of oil is adjusted by traveling lever for suitable speed and direction at the spot.

Hand pump is used to generate oil pressure for lightweight machines (MVH-R60, 120, 150, 200) and hydraulic pump is used as auxiliary power for heavyweight machines (MVH-304, 402, 502, 702). Latest MVH-306 type to be similar to a heavyweight class machine uses hand pump as auxiliary power.

4. BEFORE STARTING YOUR OPERATION

1. Clean the machine, removing dirt and dust. Particularly, the bottom of plate, engine cooling air inlet, around carburetor and air cleaner should be carefully cleaned.

2. Check fastening threads for tightness. Loosened screw due to vibration, could lead to unexpected accident.

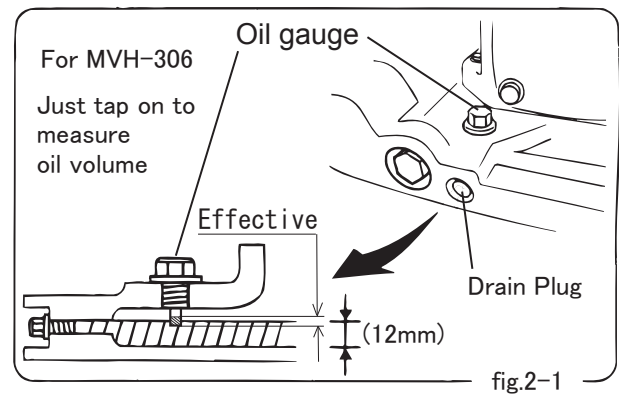
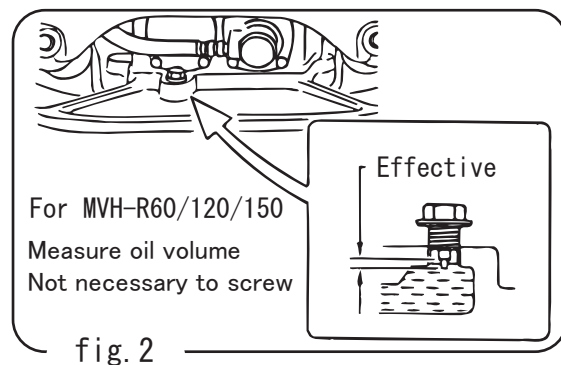
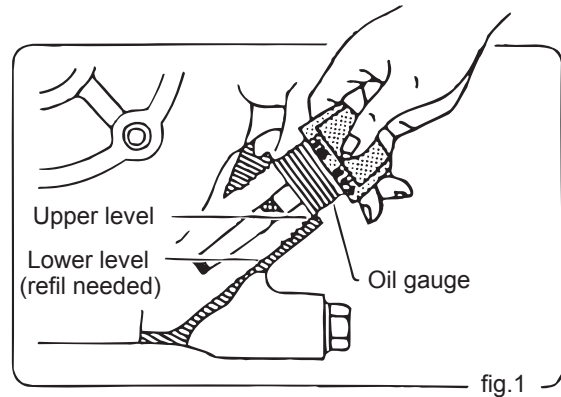
3. Check V-belt tension (See Page 11). Tension is proper if it bends 10 to 15 mm when depressed with finger at midway between the shafts. When V-belt is slackened, power transmission will be deficient, causing reduced compaction and premature wear of the belt.
Refer to the V-belt Size mentioned on the previous page.

4. Position the engine horizontally to check oil level and replenish as necessary. Use engine oil in accordance with the chart below (fig.1):

	Temperature	Oil to be used
Summer	25°C or higher	SAE#30
Spring/fall	25°C ~ 10°C	SAE#30,#20
Winter	0°C or lower	SAE#10

5. With the machine positioned horizontally, remove oil gauge of vibrator to check for proper oil level. (Fig-2, Fig-2-1)
Use engine oil SAE 10W-30 for lubrication. Capacity of the Lubrication oil shall be referred to the SPECIFICATIONS mentioned previous page.

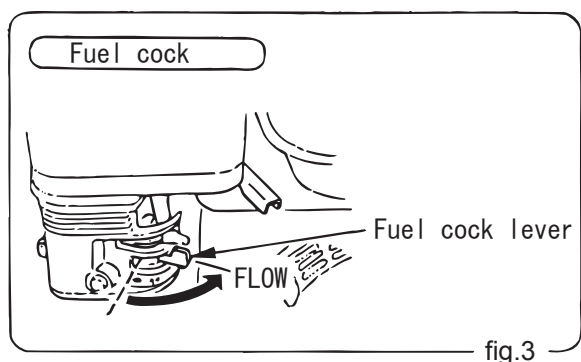
6. Fuel is normal automobile gasoline. When refueling, be sure to use strainer for filtration.



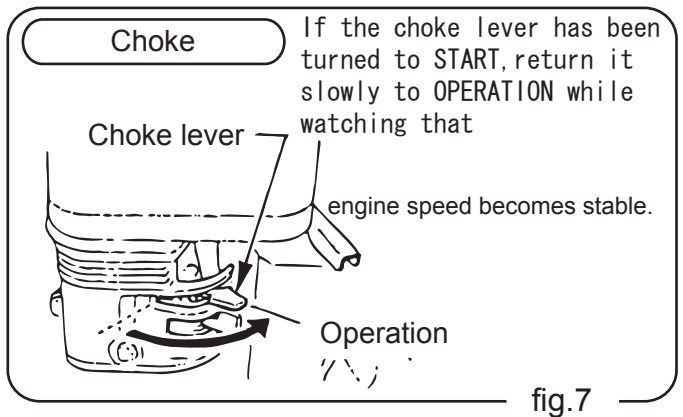
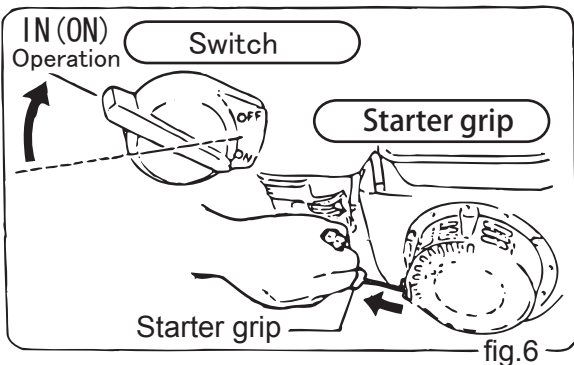
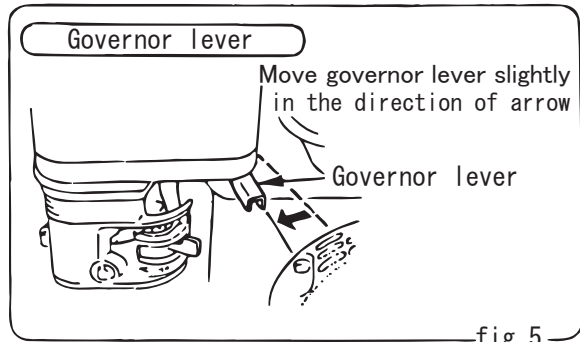
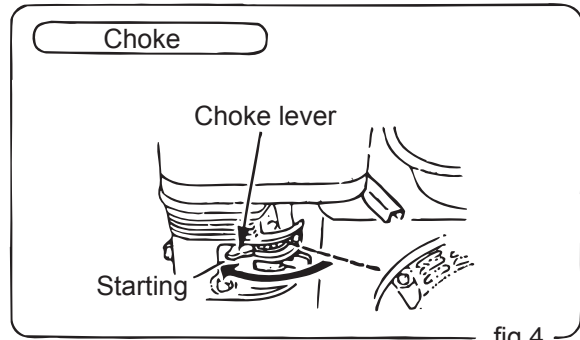
5. STARTING-UP

Gasoline Engine

1. Align fuel cock lever with FLOW position. (Fig.3)



2. When cold or somehow starting is difficult, turn choke lever to START position. This is not necessary when engine is warm. (Fig.4)
3. Turn governor lever slightly to high speed side. (Fig.5)
4. Turn engine start switch to ON position. (Fig.6)
5. Hold recoil starter grip and pull it slightly until you feel light resistance. Pull it strongly there. Be careful not to pull it too hard however because it may come off. Do not release the grip from the pulled position but return it to starter case before releasing. (Fig.6)
6. If engine has started, while listening to explosion sound, slowly return the choke lever to OPERATION position. (Fig.7)
After started, be sure to run the engine at low speed for a few minutes.
It must be done in cold weather in particular.
Check for abnormal noise of gas leak in the meantime.

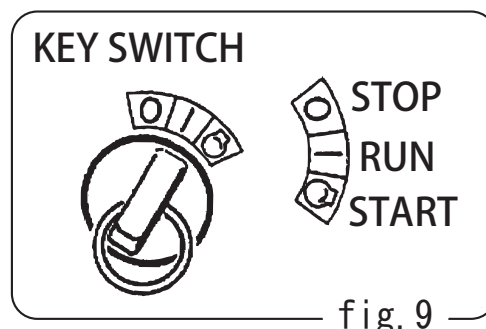
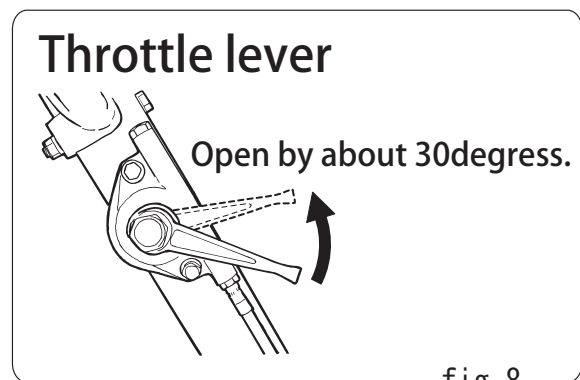


Diesel Engine

1. Turn the throttle lever to START position (open by about 30 degrees)(fig.8)
2. Operate Starter
 - In case of self starter
 - a. Insert the key into starter switch.
 - b. Turn the key to I (Run) mark.
 - c. Turn the key further clockwise to 𠄎 (Start) mark and the engine will start. (Fig.9)

⚠ CAUTION

If your engine fails to start, do not rotate starter motor for more than 5 seconds continuously, but return the key to (Run) mark and wait for 10 seconds or so, before attempting again.



⚠ CAUTION

While your engine is running, never turn the key switch to (Start) mark.

⚠ CAUTION

In case you start with recoil starter or cranking, the key should be placed in I (Run) position as well.

In case of recoil starter

By pulling the starter knob slowly, you will reach such point where resistance becomes strong (compression point). By pulling it further, you will find a point where resistance is reduced.

Return the knob but slowly return it original position.(fig.10)

⚠ CAUTION

Do not pull the rope all the way and do not take your hand off the pulled knob but slowly return it original position.

3. After starting up the engine, be sure to perform a warm up run for 2 to 3 minutes. This should be performed without fail, particularly during winter season. While doing this, check for abnormal sound of gas leaking.

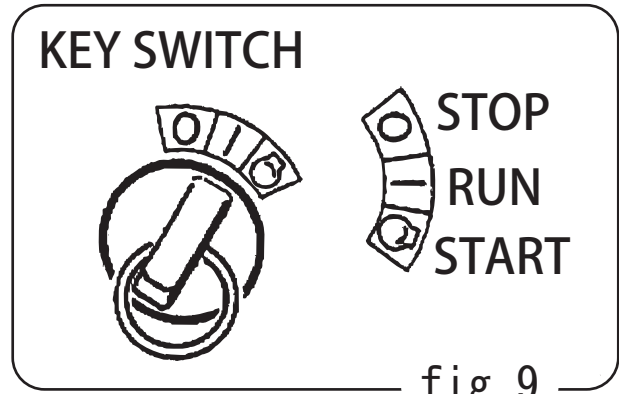


fig. 9

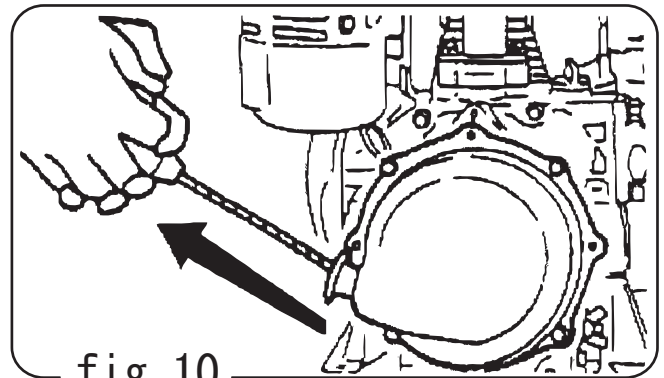


fig. 10

6. OPERATION

1. Opening the governor lever sharply causes the compactor to start working. (fig.5)
When the engine speed reaches around 2,300rpm, centrifugal clutch will be engaged. The lever should be operated quickly without hesitation, because increasing the engine speed slowly causes the clutch to slip and fail.
2. Operate travel lever to have compactor travel forward or reverse. Push the lever forward for forward travel, pull it back for reverse and place it in neutral for vibration in place. (fig.11)

3. When you work on soil which contains clay, there may be cases where traveling speed drops because compaction plate does not leave ground surface as easily. Check the bottom of plate to see if clay has not stuck there. Incidentally, because compactor can not be as efficient on clayey or high moisture containing soil, dry such soil to appropriate moisture content level or carry out compaction twice.
4. To discontinue your work, contrary to the starting time, return the governor lever quickly to LOW position. Do not move it slowly.(Fig.5)

⚠ Caution

While engine is stopped, operating travel lever back and forth a few times causes the lever to be locked at forward position. This does not mean it is in trouble but the check valve within hand pump is actuated. Do not try to operate the machine forcibly. The travel lever will operate normally when the engine is started and vibrator is in action.

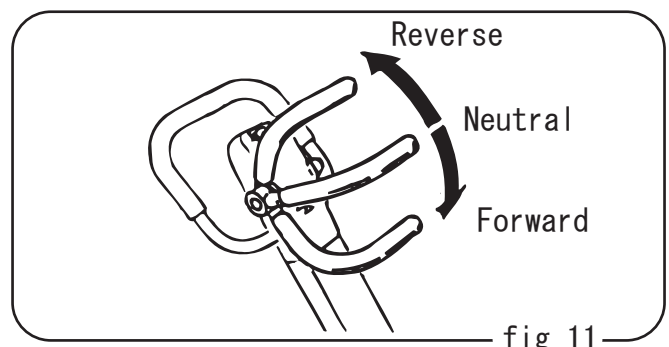


fig. 11

7. STOPPING

1. For stopping the engine with your work discontinued, return the throttle lever to low position to be in idle state for 2-3 minutes. After cooling down engine, stop the engine completely.

Diesel engine

- a. Return the throttle lever forward original position to stop.
- b. For electric start, turn around the key switch to off (0) position to stop.

Gasoline engine

- a. Turn the engine switch to off (0) position to stop.

⚠ Caution

If the engine is stopped while it is still hot, it may hasten wear such as burn out of oil slick in cylinder.

- b. After stopping the engine, align the fuel cock lever to off (0) position. No fuel cock is installed with the machine with Robin DY23.

8. TRANSPORTATION

1. Loading and unloading

- a. Load or unload the machine with crane or the like in use.
- b. For loading or unloading work, be sure to designate a leader and follow this instruction.
- c. Engage lifting device to the hook of guard frame.

⚠ Caution

Confirm the safety by checking that there is no damage on guard frame or insulation rubber and no screw has been loosened or missing.

⚠ Caution

Stop the engine before starting to lift.

⚠ Caution

Use wire rope with sufficient strength and without kink or deformation.

⚠ Caution

Lift straight upward without giving any shock. Do not allow any person or animal to enter underneath the lifted machine.

⚠ Caution

For your safety, try not to lift to unnecessary height.

2. Rules for transport

- a. Shutdown engine for transport.
- b. Tighten fuel tank cap securely and close fuel cock to prevent fuel from spilling.
- c. Drain fuel for transport over long distance or on poor road.
- d. Use guard frame and rope or the like to lock the machine during transport.

9. PERIODICAL INSPECTION AND MAINTENANCE SERVICE

⚠ Caution

Inspection and other service should be carried out on hard and level ground with engine shutdown.

1. Inspection and maintenance service chart

In order to use your machine always in good condition, Carry out maintenance inspection in accordance with following chart:

Machine Inspection

Item	Hours of operation	Remark
(Starting check)		
Loosened or lost screws	Every 8 hours (every day)	
Damage of any part	- ditto -	
Function of controlling system part	- ditto -	
Leak of hydraulic system	- ditto -	

Machine Inspection

Item	Hours of operation	Remark
Vibrator oil check	Every 100 hours	See page12
Vibrator oil replacement	Every 300 hours	See page12
Hydraulic oil check	Every 100 hours	See page12
Hydraulic oil replacement	At first 200 hours, then in every 1000 hrs.	See page12,13
V-belt (clutch) check	Every 200 hours	See page11

Engine check (For details, see separate Engine Manual.)

Item	Hours of operation
Leakage of oil or fuel	Every 8 hours (every day)
Tightness of fastening threads	Every 8 hours (every day)
Engine oil check and replenishment	Every 8 hours (every day) (Replenish to specified max level)
Engine oil replacement	At first 200 hours, then in every 100 hrs.
Air cleaner cleaning	Every 50 hours

⚠ Caution

These are inspection interval for operation under normal conditions. Optimize the number of hours depending on particular working conditions.

⚠ Caution

Fuel piping should be replaced in every 2 years.

2. Daily service

- a. Check for leakage of oil or fuel.
- b. Check screws including bolt and nut for tightness. See the torque chart below for retightening:

Tightening Torque (in kg/cm) Diameter ↓

Material	6mm	8mm	10mm	12mm	14mm	16mm	18mm	20mm	Material for quality of Material. Marked on each bolt, screw.
4T	70	150	300	500	750	1,100	1,400	2,000	
6-8T	100	250	500	800	1,300	2,000	2,700	3,800	
11T	150	400	800	1,200	1,200	2,900	4,200	5,600	
※1	100 (6mm) 300 ~ 350 (8mm) 650 ~ 700 (10mm)								In case counter-part is of aluminum

(Threads in use with this machine are all right handed)

- ※1. Materials of a supporting case are aluminum.
- ※2. All bolts which is used in these models are right-hand thread.
- ※3. Quality of material is marked to each bolt and a screw.

- c. Remove soil and clean the bottom of compaction plate.
- d. Check hydraulic pump, piping and hose for any leakage. Loosened hose can be a cause for leakage. Check hose joint with wrench applied for tightness.
- e. Check engine oil. (For detail, See Page 6.)

3. Engine oil replacement

Replace engine oil, first in 20 hours of operation and every 100 hours afterwards.
Oil may be drained more easily when it is warm after operation (For detail, See separate Engine Manual).

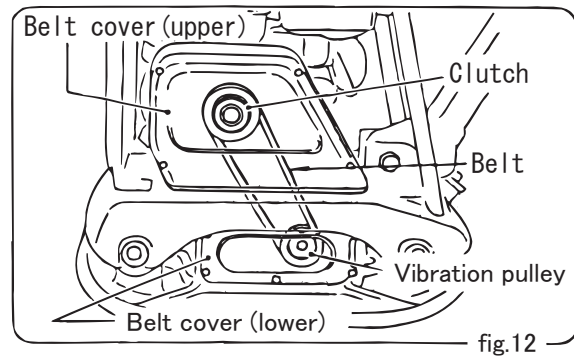
4. Cleaning the air cleaner:

Element should be cleaned because clogged cleaner element can not only be a cause for poor engine starting performance, lack of power or other trouble but shorten the life of engine substantially (See separately provided Engine Manual for detail).

5 Checking and replacing the V-belt and clutch:

a. Checking the V-belt (fig. 12)

In every 200 hours of operation remove belt cover (upper) to check the belt tension. Tension is proper if the belt bends about 10mm when depressed strongly with finger between the shafts. Loosened V-belt reduces power transmission efficiency causing weak compaction on and shortened useful life of the belt itself.



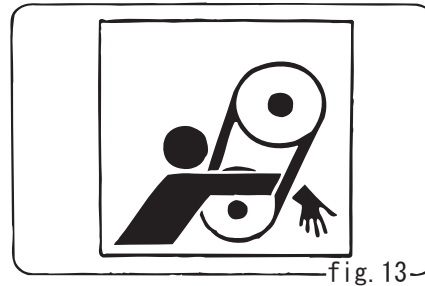
b. Replacing the V-belt

Removing the V-belt:

Remove upper and lower belt covers. Engage an offset wrench (13mm) or the like to vibrator pulley (lower) fastening bolt. Engage waste cloth or the like at midway of V-belt on the left side and while pulling it act strongly, rotate the offset wrench clockwise so that the V-belt will come off.

Reinstalling the V-belt

Engage V-belt to lower vibrator pulley and push the V-belt to left side of upper clutch and, in the same manner as in removal, rotate offset wrench clockwise so that the V-belt goes back on.



⚠ Caution

There is danger for injury. Be careful for your hand not be caught between belt and clutch. Use safety gloves without fail.

c. Checking the clutch

Check the clutch simultaneously with V-belt checking. With belt cover removed, check outer drum of the clutch for seizure and V groove for wear or damage with your eyes. Clean the V groove as necessary. Wear of lining or shoe should be checked with running check. If the shoe is worn, power transmission becomes deficient and slipping will result in.

d. Replacing the clutch

- Remove V-belt. (See above)
- Remove bolt at engine power output end by tapping on an engaged wrench (with hammer or the like). (Rotate counterclockwise)
- Remove the clutch by means of pulley puller.
- Reinstall with the procedure reversed. For tightening the bolt securely, tap on an engaged wrench.

⚠ Caution

When vibration is weakened or lost while engine is in rotation during operation, regardless of 200 hours service, check the V-belt and clutch immediately.

6. Vibrator oil level check (Fig.14)

In every 100 hours of operation, with the machine positioned horizontally, remove oil level check plug off vibrator (14mm wrench) and see if oil is up to filler port.

In every 300 hours of operation, replace oil. For draining oil through level check hole, have the machine inclined with a sleeper or the like placed under the compaction plate on opposite side.

- Use engine oil of 110W-30 for this lubrication.

Oil level: Please refer to SPECIFICATIONS mentioned in previous page.

⚠ Caution:

Before checking, clean around the check hole to prevent any dust from entering.

⚠ Caution

If any oil leakage from vibrator has been noticed, check the oil level at any time.

7. Checking the hydraulic oil.

(fig.15 :For MVH-R60, 120, 150)

- Check hydraulic oil in every 100 hours of operation. With handle bar positioned vertically (storage position), remove breather plug off the top of hydraulic pump and check for proper oil level.

- Replacing the hydraulic oil
(For MVH-R60, 120, 150)

Replace after first 200 hours and in every 1000 hours of operation thereafter.

⚠ Caution

Use care not to allow any dust to enter the hand pump.

- After removing plug cap of hand pump, remove plug of breather (24mm wrench) and disconnect vibrator side of hydraulic hose at vibrator cylinder. With travel lever placed at FORWARD, drain hydraulic oil in the pump.
- After draining, re-connect the hydraulic hose to vibrator.
- Feed oil through breather hole of hand pump. (Capacity About 300cc)
- Removing breather plug at vibrator cylinder causes oil to flow out of breather hole in a while. When aeration disappears, reinstall the plug and tighten securely.
- Replace breather plug of hand pump and fit the plug cap. After making sure that oil in pump is at proper level, replace the breather plug.

⚠ Caution

Make sure that oil in hand pump is correctly up to proper level, because excessive oil will blow out of breather plug.

- Type of oil is Shell Tellus oil #46 or equivalent.

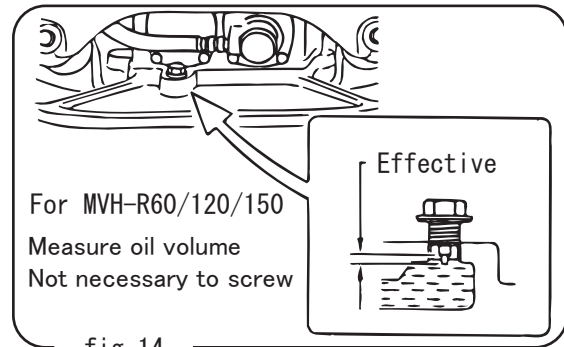


fig.14

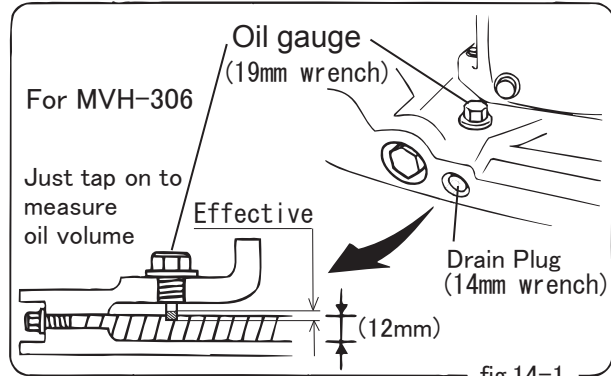


fig.14-1

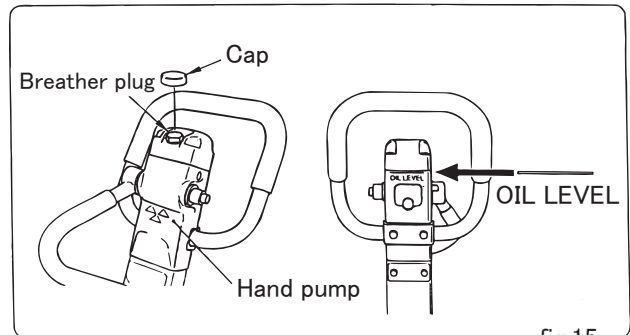


fig.15

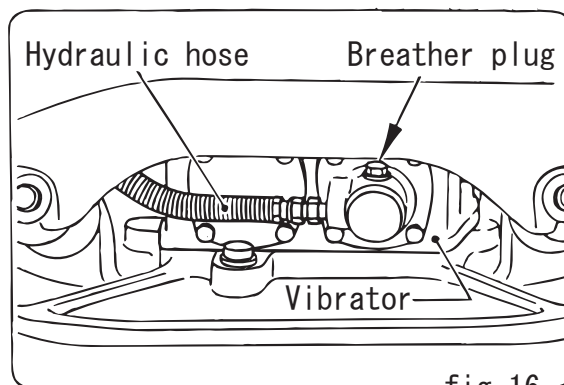


fig.16

- c. Replacing the hydraulic oil for MVH-306
 Replace after first 200 hours and in every 1,000 hours of operation thereafter.

⚠ Caution: Use care not to allow any dust to enter the hand pump.

1. After removing plug cap of hand pump, remove plug of breather (24mm wrench) and disconnect vibrator side of hydraulic hose at vibrator cylinder. With travel lever placed at REVERSE, drain hydraulic oil in the pump.
2. After draining, re-connect the hydraulic hose to Vibrator and lock the travel lever to the sub-handle at reverse side (at "maximum" position) using rope or the like.
3. Feed oil through breather hole of hand pump. (Capacity: About 550cc)
4. Removing breather plug at vibrator cylinder causes of to flow out of the breather hole in a while.

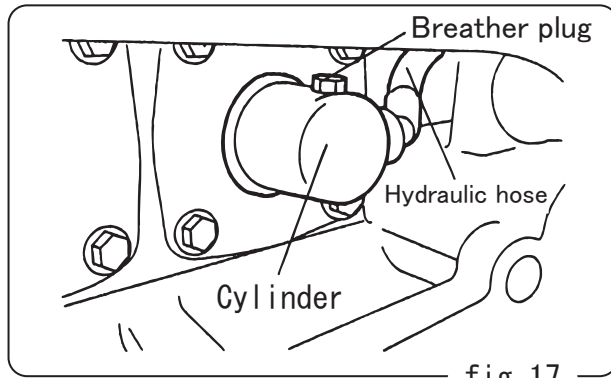


fig. 17

When aeration disappears, reinstall the plug and tightening security. (fig. 17)

5. Then release the rope from the travel lever and move the lever forward and reverse several dozen times (until air bubble not be found). Stay the lever at the reverse position for 10 seconds every time. (Because the check valve is opened at the maximum reverse position and air bubble will come out from the oil tank of the hand pump). If the accumulator moves 2 - 3cm when move the lever to forward side, air bleeding is finished. In case the air bleeding is insufficient, repeat the procedure of above 4 and 5.
6. Reinstall breather plug of hand pump and fit the plug cap. After making sure that oil in pump is at proper level, install the breather plug.

⚠ Caution: Make sure that oil in hand pump is correctly up to proper level, because excessive oil will blow out of breather plug.

7. Type of oil: Shell Tellus oil #32 or equivalent

8. Checking the battery

The battery provided as a standard supply is of maintenance-free type, requiring no electrode replenishment, If the voltage has dropped, rapid charging is impossible.

Replace with new battery.

a. How to remove the battery : (fig. 18/19)

- ① With M8 nuts (x4) removed, take the cover off.
- ② Disconnect battery terminals. Disconnect negative terminal first and, for re-connection, connect positive terminal first, before finally connecting the negative terminal.

⚠ WARNING: When removing or connecting battery cables, use care not to short-circuit the positive and negative terminals.

- ③ Take out the battery from the machine.

b. Checking and cleaning the battery

- ① Check the battery for crack or any other damage.
- ② Check for terminals for corrosion. If corroded, polish it with wire brush or emery paper before coating it with electrode grease.
- ③ Clean the battery externals.
- ④ Check and clean the battery housing of the machine.

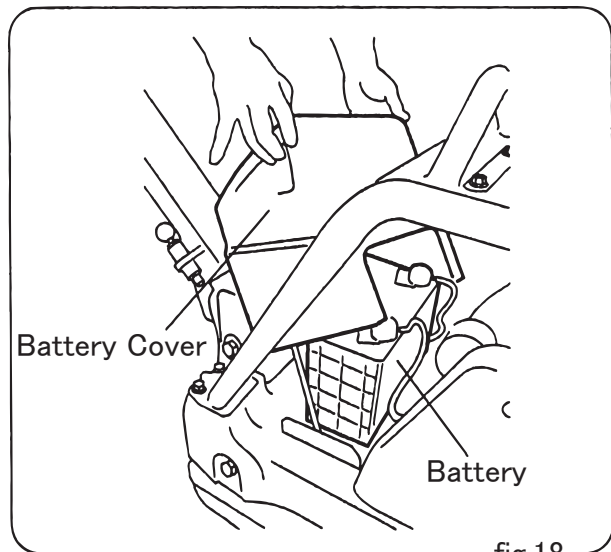


fig.18

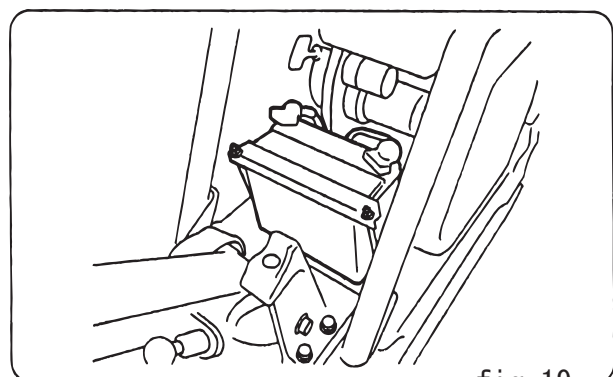
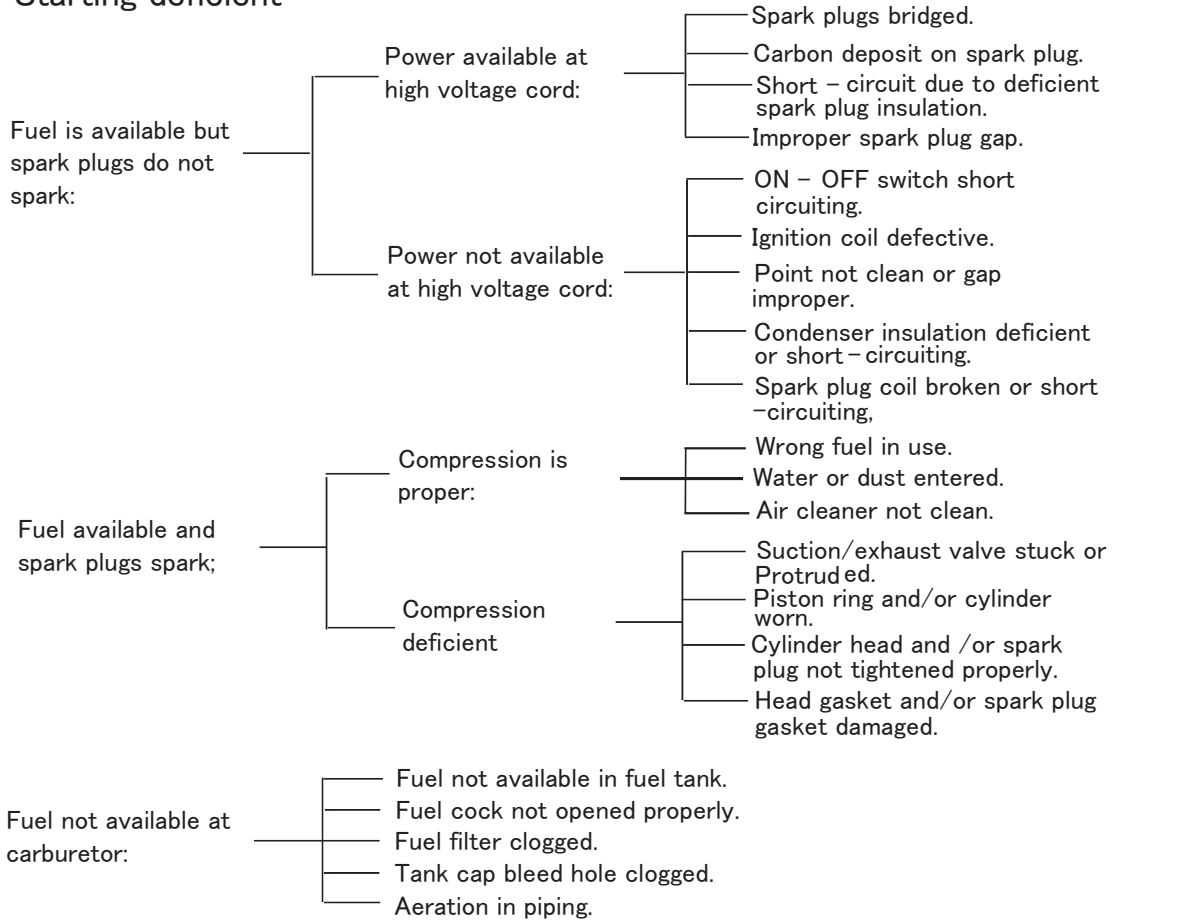


fig. 19

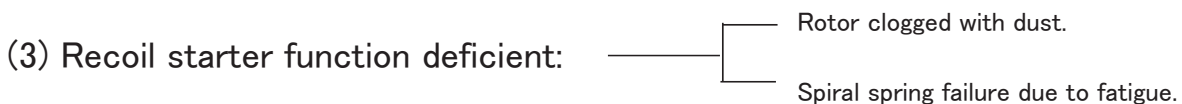
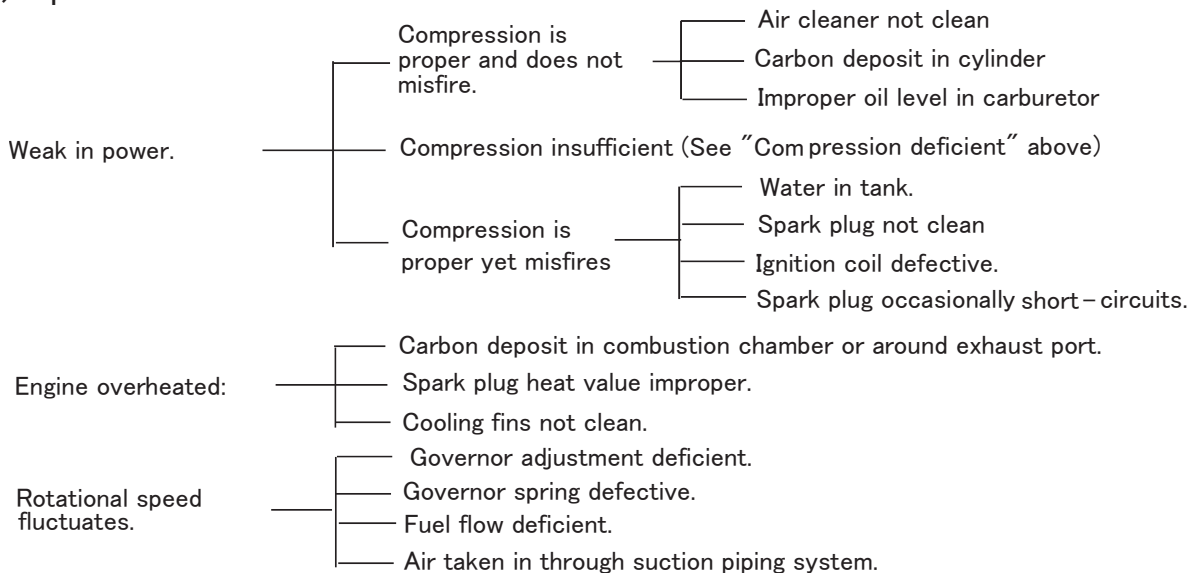
10. TROUBLE SHOOTING

1. Gasoline Engine

(1) Starting deficient



(2) Operation deficient



2. Diesel Engine

(1) Starting deficient

(A) Due to deficient compression

No compression available at all ——— Suction/exhaust valve protruded

Hardly any compression or very little compression available. ———

- Seat contact deficient.
- Piston cylinder worn.
- Cylinder worn.
- Improper setting between cylinder and cylinder head.

(B) Improper fuel injection into combustion ——— Nozzle seat loosend.

Fuel flow is too low or not available. ———

- Bleeder hole in tank cap clogged.
- Fuel strainer passage blocked or strainer clogge
- Fuel strainer cook closed.
- Aeration in the piping.(Occurs particularly when tank is emptied)

Fuel not injected into chamber. ———

- Injection pump barrel or plunger.
- Nozzle hole clogged.
- Nozzle needle clogged.

No fuel available in fuel tank.
Water or trash in the fuel.

(C) Fuel and compression are normal yet engine does not start.

Does not reach starting rotational speed. ———

- Starting procedure improper.
- Engine oil viscosity too high or deterioration excessive.
- Aeration in piping.

(2) Insufficient output and deficient operation

Insufficient compression. ——— See” compression deficient”

Engine overheated and black smoke exhausted. ———

- Cooling fins deficient.
- Water entered fuel filter.
- Carbon deposit inside combustion chamber or exhaust hole.
- Smoke setting improper.
- Over loading.
- Injection timing improper.
- Nozzle blocked.

Rotational speed fluctuates. ———

- Contact between governor fork and improper.
- Governor spring deficient.
- Fly plate or sliding part worm and malfunction.

Engine speed does not increase. ———

- Valve open /close timing improper.
- Exhaust hole or muffler clogged.
- Over loading.

Misfire accompanying white smoke.(at no-load) ———

- Piston,cylinder or ring worn.
- Nozzle hole blocked.
- Piston cylinder stuck.
- Piston ring installation reversed.(Upper and lower.)
- Injection timing deficient.
- Valve open/close timing deficient.
- Injection pump joint loosened.

Fuel consumption too high.
(Black smoke exhausted) ————

- Leakage from fuel route.
- Air cleaner element clogged.
- Fuel improper with foreign matter entered or the like.
- Over loading.

Sliding part extremely worn or piston ring stuck. ————

- Improper oil in use.
- Oil replacement neglected.
- Air cleaner element damaged or its cleaning neglected.

Suddenly stopped
accompanying abnormal sound. ————

- Piston or rod seizure or damage.

Lubricant diluted with
volume increasing. ————

- Injection pump plunger barrel worn.

Engine does not stop
even with fuel supply
discontinued.(or overruns) ————

- Excessive oil.
- Governor system installation improper.
- Injection pump rack came off.

3.Machine

Travel speed slow
and vibration weak. ————

- Engine output deficient and high speed revolution setting improper
- Clutch slips.
- V-belts slips.
- Excessive oil in vibrator.
- Defect in vibrator internals.

Travels forward or
reverse but
impossible to
switch direction. ————

- Reversing parts defective.
- Reversing lever installation deficient
- Oil hose broken.
- Aeration in hydraulic oil for reversing system.
- Check valve in hand pump clogged with dust.
- Piston bearing in cylinder defective.

Dows not travel
either forward or
reverse. ————

- V-belt disengaged or slips.
- Clutch slips.
- Vibrator locked.
- Piston bearing in cylinder defective.

Travel lever
operating
resistance great. ————

- Gall of hand pump piston.
- Gall of vibrator cylinder piston.



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