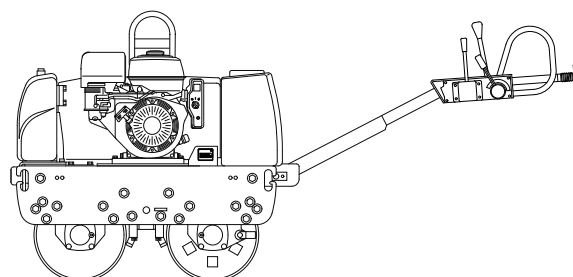




VIBRATION ROLLER

MRH-700GSB



OPERATION MANUAL

en



<http://www.mikasa.com>

502-02308



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1. PREFACE

Thank you for purchasing Mikasa MRH type vibration roller.

- This instruction manual describes the proper methods for using Mikasa vibration roller, as well as simple checks and maintenances. Be sure to read this instruction manual before operation, in order to get full use of the excellent performance of this machine, to improve your operation and to perform engineering work effectively.
- After reading this manual, store it in a handy location for easy reference.
- For details about the engine of this machine, see the separate instruction manual.
- For inquiries about repair parts, parts lists, service manuals, and repair of the machine, please contact the shop where you purchased, our sales office, or Mikasa Parts Service Center.

In addition, parts lists are available on the MIKASA website at:
<http://www.mikasas.com/english/>

The illustrations and Figures in this manual may be different from the machine you actually purchased due to design changes and other reasons for improvement.

2. MACHINERY OVERVIEW

【Applications】

Mikasa vibration roller is that powerful single axis lets vibrate both drums and compact the ground.

Compaction is more effective for most of the ground except soft ground kept much moisture. So various applications such like soil & sand, soil, gravel and asphalt compactions can be applied.

Vibration system and traveling system are both independent, and static pressure compaction and working with some degrees of inclined area can also possible.

Wide range compaction is also applicable with working efficiency.

But the machine does not comply with the area, where is already well compacted and with which hard soil more than the performance of the roller. It causes serious damage for the roller. Be sure to escape the roller from the above working conditions.

【Structure】

The upper part of the machine consists of engine, hydraulic pump, oil tank, electromagnetic clutch, water tank, handlebar. The upper part of the machine is fixed to frame to connect with lower part through shock absorbing rubber.

The machine lower part consists of a vibrator part, a drum part and a frame supporting vibrator. The machine lower part has vibrator, drum, frame. Vibrator unit generates vibration in-between both drums, each of which is traveled by each hydraulic motor. Frame is consisted of as main body.

【Power Transfer】

A air-cooled single cylinder gasoline engine is mounted on, of which power output is transferred through centrifugal clutch.

A centrifugal clutch is engaged with by the acceleration of engine speed.


Rubber Coupling with pins built-in Clutch Drum transfers the engine power to Hydraulic Pump for traveling.

Hydraulic Pump generates hydraulic pressure through out hydraulic hose calling from oil tank. Hydraulic pressure is transferred to hydraulic motor built-in Drum Bracket to move the drum. Traveling speed and Forward-Reverse motion is adjusted by the incline motion of Travel Lever. The adjustment of Control Cable can let trunnion spin of hydraulic pump, and the one of Body side can let Handle Bar move slightly.

Centrifugal Clutch Drum united with V-pulley(1), is connected through V-belt to V-pulley(2) at the counter axis end. Output Axis of Vibration Clutch is connected to V-pulley(3) to rotate, and transferred to V-pulley(4) to switch Vibration system.

The vibration generated by Vibration unit is transferred to Side Plate, Drum Bracket and Drum in order, to compact the ground with Dynamic Vibration Force.

3. WARNING LABELS

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



Warning labels indicating hazards to humans and to equipment.



DANGER: Denotes an extreme hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, is likely to result in serious injury or death.



WARNING: Denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in serious injury or death.



CAUTION: Denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury to people and may damage or destroy the product.

Precautions (without a triangular mark): Failure to follow the instructions may result in damage to property.

4. PRECAUTIONS FOR SAFETY

4-1 General Precautions WARNING



WARNING:

● **Do not work in the following conditions.**

- If you do not feel well due to overwork or illness.
- If you are taking any medicine.
- If you are under the influence of alcohol.



CAUTION:

- Read this instruction manual carefully and handle the machine as described so that you can work safely.
- For details about the engine, refer the separate instruction manual for the engine.
- Make sure you thoroughly understand the construction and operation of the machine.
- Please execute former check to operate, periodic self inspection, specification self inspection surely.
- To work safely, always wear protective clothing (helmet, safety glasses, safety shoes, ear plugs etc.) and appropriate work clothes.
- Please wear Hearing protector (noise protective equipment of ear muff or ear stoppers) by all means.
- Always check the machine to make sure that it is normal before starting operation.
- The decals on the machine body (operating methods, warning decals, etc.) are very important to ensure safety. Keep the machine body clean so that they can be read at all times. If any decal cannot be read, replace it with a new one.
- It is very dangerous if children come into contact with the machine. Take the utmost care about how and where the machine is stored.
- Before performing any maintenance, be sure to turn the engine off.
- Mikasa does not accept any liability for accidents or problems caused as a result of not using genuine Mikasa parts or if the machine has been modified.



4-2 Precautions When Adding Fuel



DANGER:

● **When adding fuel.**

- Be sure to work in a well ventilated location.
- Be sure to turn the engine off and wait until it has cooled down.
- Take the machine to a clear flat location without any combustibles nearby. Be careful not to spill any fuel. If you do spill some gasoline, wipe it all up.
- Do not allow any open flames nearby while adding fuel. (In particular, smoking while adding fuel is strictly prohibited.)
- Adding fuel until it comes too close to the top of the inlet may cause the fuel to overflow. That is dangerous. Follow the instructions in the engine manual about the specified fuel level.
- When through adding fuel, tighten the tank cap securely.



4-3 Precautions About Where To Use The Machine



DANGER:

- Do not run the engine in an unventilated location, such as indoors or in a tunnel. The exhaust gas from the engine is carbon monoxide and is deadly.
- Do not operate the machine near open fires.

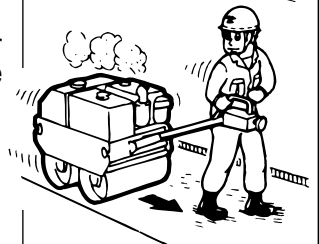
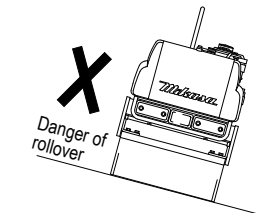
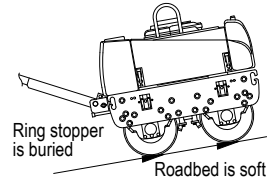
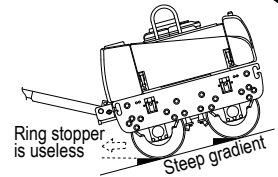


4-4 Precautions When Working



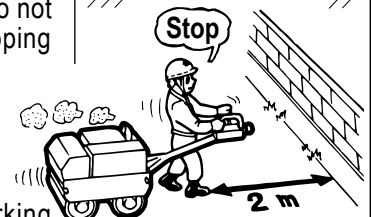
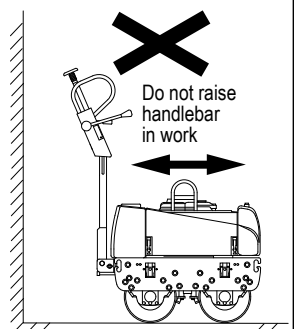
WARNING:

- Keep engine speed as specified during the work and traveling. Especially in inclined area, keep the specified speed. Otherwise, engine may stop and the roller goes down by its weight. If it happened, move Travel Lever to "Stop" position (Neutral position) promptly, which lets the drum not to roll automatically. Then use Parking Brake to lock drums, and put on the ring stopper for the safety sake.
- If the inclined angle is too big or the roadbed is too soft, the ring stopper is useless as referred to the right figure. Select the suitable ring stopper depends on working conditions.
- In the work with inclined area, the well-skilled worker is required to avoid any danger.
- Working with side slope may have danger of rollover. Do not use the machine, which becomes working with side slope, and move the machine to go vertical up & down against slope with speed at low possibly by adjusting the speed of Travel Lever. Besides, keep other workers away from the downwards of the machine.
- Keep other workers away from the roller in operation especially in case of fears of the machine fell down.
- In the work with inclined area, operator should stand at right side or left side of Handle Bar, and be sure not to go straight back of Handle Bar.
- In the work in reverse, operator also should stand at right side or left side of Handle Bar, avoiding from standing back of Handle Bar.
- Lock parking brake in parking, together with ring stopper in front and back of drums.
At the slope, avoid parking as much as possible.
But in the case of parking in inclined area, try to lock parking brake at slow speed in operation to find the locking position safely, then confirm parking lock safely. Travel Lever returns to Neutral position to stop, and raise ring stopper at each drum.
Select the suitable ring stopper especially for inclined parking.
- Do not touch with muffler when it is hot.

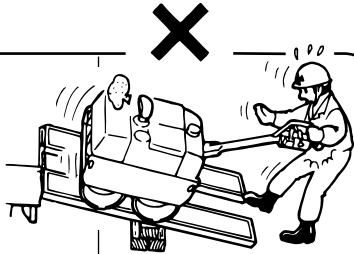
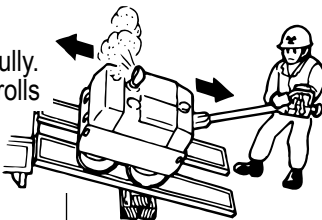


CAUTION:

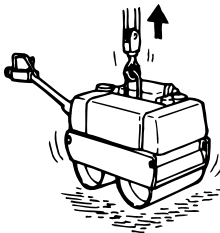
- Before starts engine, be sure to keep other people or obstacles away from the roller. Then move Travel Lever to neutral position keeping with Vibration Lever off to start engine.
- Always confirm the positions of obstacle such like telephone pole or wall, and keep safely distance from other construction equipment and workers.
- Always keep any other workers out in working range.
- Do not operate the machine with handlebar being folded, because it is not easy to keep the right position and be dangerous. Especially in reverse motion, the operator may be wedged between the one and obstacle.
- Do not look away, and do not drive aggressively. Switch Front-Reverse motion with Travel Lever slow and smoothly. Do not operate at high-speed, sudden acceleration, nor sudden stopping except emergency.
- Keep the 2m distance at minimum from a block wall, and be sure to turn always in forward traveling at safer area.
- In the night, always light up a working place good enough to illuminate.
- When fogging or in a strong wind is expected danger in working conditions, cancel the work immediately.
- If you face any trouble or abnormality of the machine, cancel the work immediately, and contact business owner to have suitable measures.



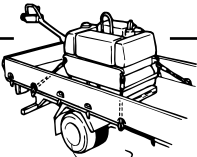
4-5 Precaution To Truck With Road Board About Unloading

<p>! WARNING:</p>	<ul style="list-style-type: none"> ● Keep engine speed as specified during the work and traveling. Especially in inclined area, keep the specified speed. Otherwise, engine may stop and the roller goes down by its weight. If it happened, move Travel Lever to "Stop" position(Neutral position) promptly, which lets the drum not to roll automatically. Operator should stand at right side or left side of Handle Bar, and be sure not to go straight back of Handle Bar. 	
<p>! CAUTION:</p>	<ul style="list-style-type: none"> ● Do unloading work under instructions of the designated leader. ● Truck, road board and rolling drum must keep away from any mud, oil, snow, ice and etc. Then start unloading work after cleaning them fully. ● Engage parking brake with Transporter, and set ring stopper at drum rolls ● Match the span of road board according to a roller width, and keep the incline angle max at 15 degree. ● Fix a course precisely before running onto a road board. Generally, do loading in forward motion, and do unloading in reverse motion. 	


4-6 Precaution In Lifting

<p>! CAUTION:</p>	<ul style="list-style-type: none"> ● Before lifting work, be sure to confirm security. Check any breakage of body parts(Lifting hook, Shock absorbing rubber, Safety guard, etc) or looseness/falling off of screws. ● When lifting, stop the engine first. ● Use wire rope good enough with strength. ● Manage to use one-point lifting hook, to be straight and avoid shock. ● Avoid any sudden lifting up and down work, especially done by crane device with hydraulic excavator. ● Keep any person or animal away from under the lifted machine. ● For security, do not lift the machine up more than it required. 	
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4-7 Precaution In Transportation

<p>! WARNING:</p>	<ul style="list-style-type: none"> ● When transporting, stop the engine for security. ● Drain fuel completely before transporting the machine. ● Engage Parking Brake, and put ring stopper in front & rear of drums to roll on, then use wire rope with tow catches for security. 	
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4-8 Precaution In Maintenance

<p>! WARNING:</p>	<ul style="list-style-type: none"> ● Appropriate maintenance is always required for safety operation. Improper maintenance on traveling device may lead serious accident especially. Pay full attention to maintain the machine in good condition. 	
<p>! CAUTION:</p>	<ul style="list-style-type: none"> ● Be sure to stop engine always before checking the machine. ● Do not touch with muffler when it is hot. 	
<p>! WARNING:</p>	<ul style="list-style-type: none"> ● Battery liquid is dangerous drug, and pay special attention to handle. When added battery liquid to skin, eye, clothes, wash it completely with much quantity of water, and medical check by medical specialist is recommended. 	
<p>! CAUTION:</p>	<ul style="list-style-type: none"> ● In case of hydraulic distribution pipes removed, release hydraulic pressure in piping by all means. High pressure in hydraulic circuit may give a worker danger. ● Lubrication oil and engine oil may be very hot, and bring burn injury, and do not start maintenance while oil remains hot. ● After performing any maintenance, check the conditions of safety components and general safety of the machine. In particular, check bolts and nuts thoroughly. ● Electromagnetic clutch system consists of soft materials a lot. Slapping, dropping, added force may cause bruise and transformation, and in the event, it leads malfunction and a lack of torque. 	

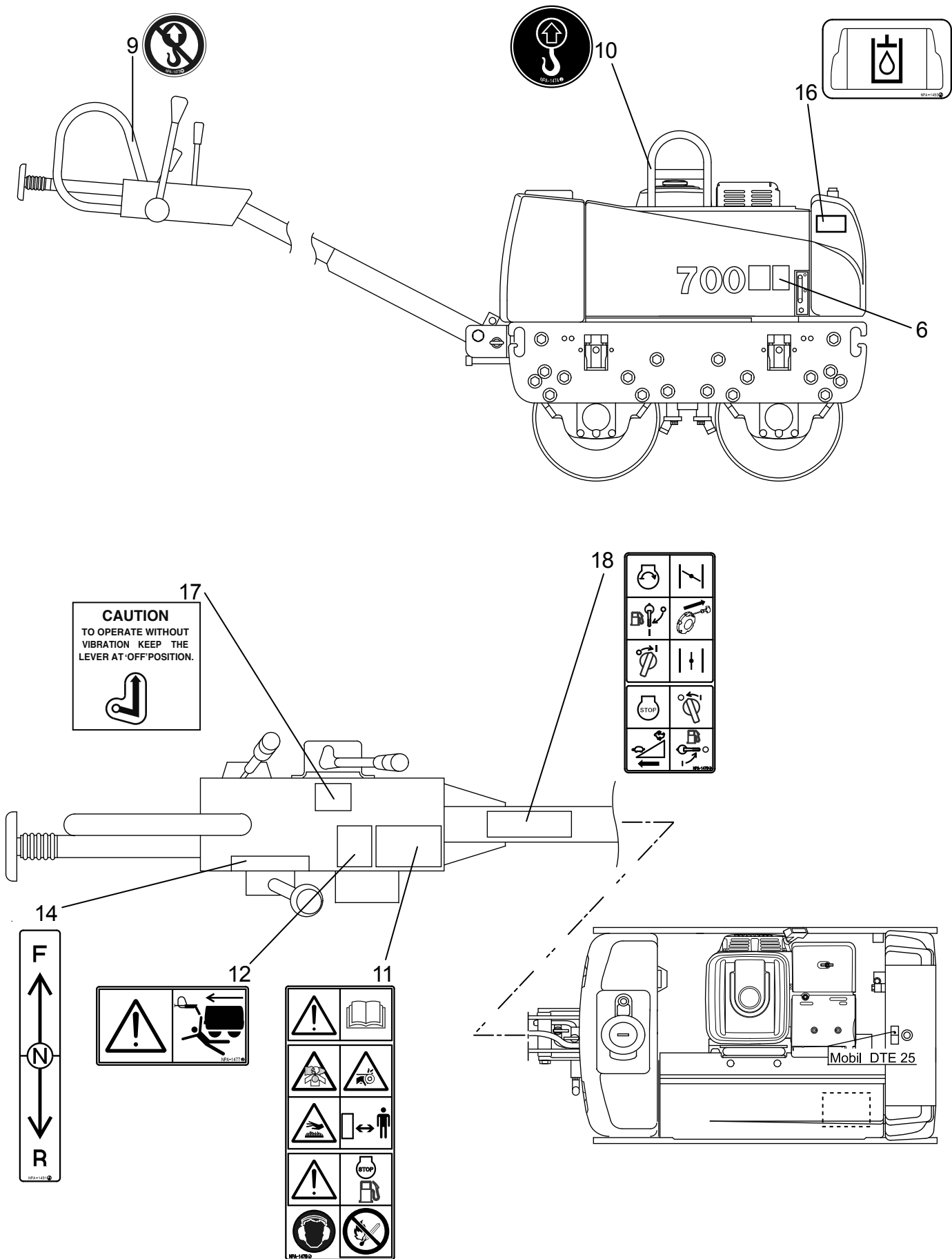
4-9 Precaution In Working With Folded Handlebar

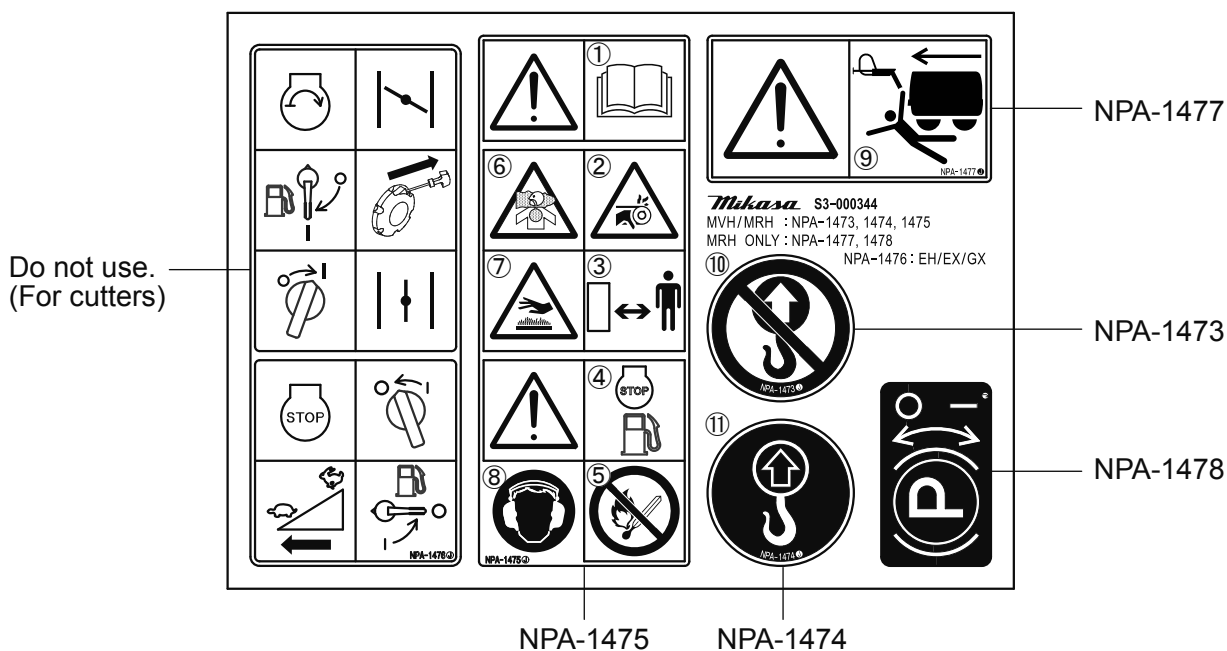


WARNING:

- Confirm a function and presence of any damage of a handlebar and locking device.
When it was damaged and lifted up, serious accident may happen.
- When lifting handlebar, pay enough attention not to damage waists.
- While lifting handlebar, do not release hands. There is a danger to suffer serious injury by attacking human body by any chance. Also it may happen to damage machine itself.
- Confirm handlebar was securely locked. Incomplete lock may lead handlebar falls, and get damage to owe serious casualty.





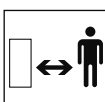

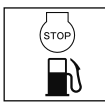





4.10 Installation Position Figure Of NAME PLATE





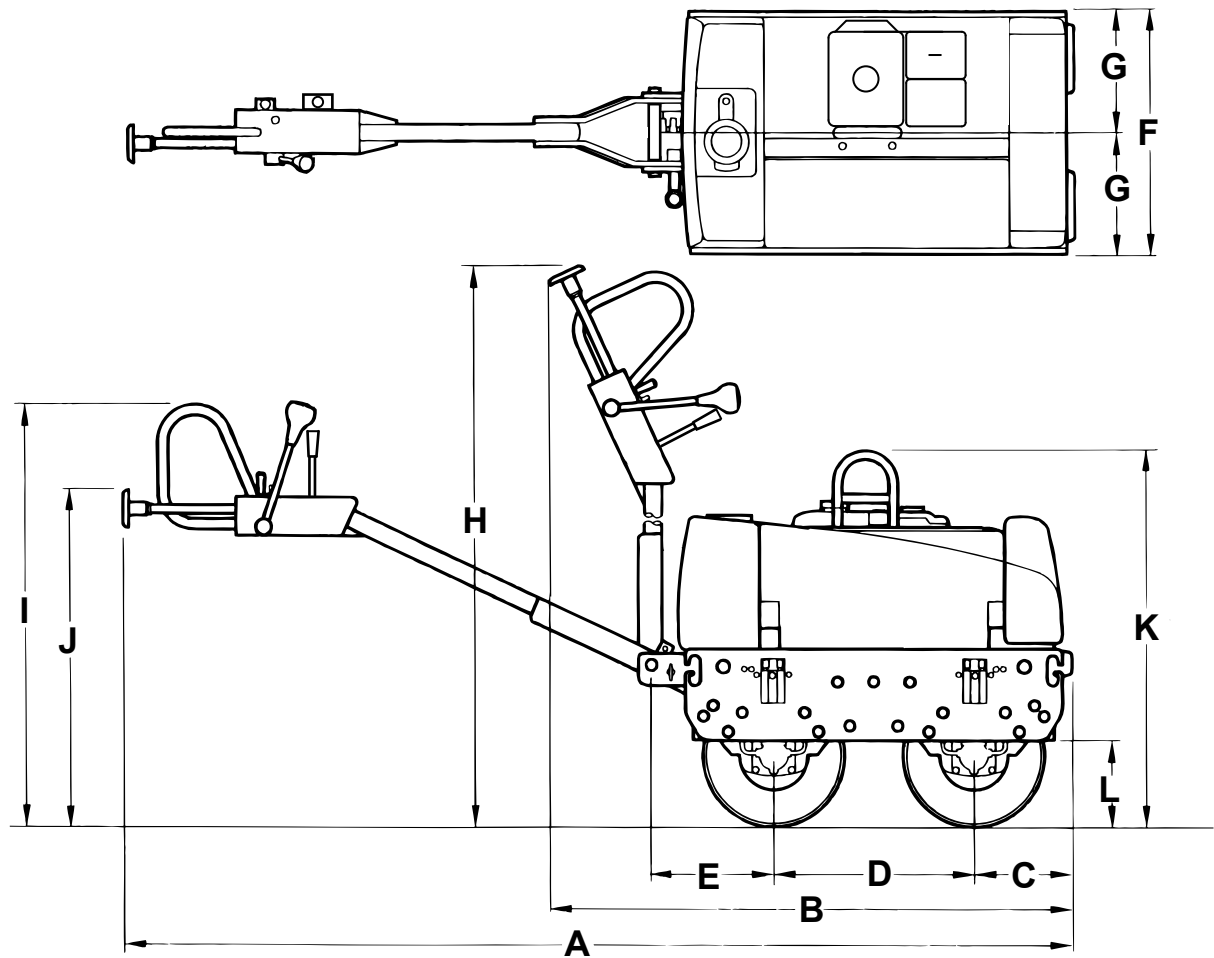
4.10 Descriptions Of Symbols Used On Warning Labels

P/N 9209-00110 DECAL, SET /MVH, MRH /EXP,EU (NPA-1474, 1475, 1477, 1478)

- | | |
|---|---|
| <p>①  Read the manual carefully.
Always read the operation manual and have good understanding of operation before your work.</p> | <p>⑦  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.</p> |
| <p>②  Be careful not to get caught in the rotating parts.
During operation, be careful not to have your fingers, body, clothes, etc. come in contact with the rotating parts such as the V-belt and clutch.</p> | <p>⑧  Danger of hearing damage caused by noise
Always use ear plugs while operating the machine.</p> |
| <p>③  Be careful not to approach danger source.
During operation, Be careful not to approach hot parts and rotating parts.</p> | <p>⑨  Danger: in the work in reverse
Stand at right side or left side of Handle Bar, avoiding from standing back of</p> |
| <p>④  Refueling Hazard.
Don't fill the fuel tank while the engine is running or hot.</p> | <p>⑩  Lifting by the handle is prohibited.
Due to a falling risk, do not lift the machine by the handle.</p> |
| <p>⑤  Fire hazard
Stop the engine when refueling. Fire may occur if a flame is near the tank fuel port.</p> | <p>⑪  Lifting position.
For lifting, use only one point hoisting hook, and do not lift at any other part.</p> |
| <p>⑥  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.</p> | <p>⑫  Operation of the parking brake.
Display a cancellation and lock position</p> |

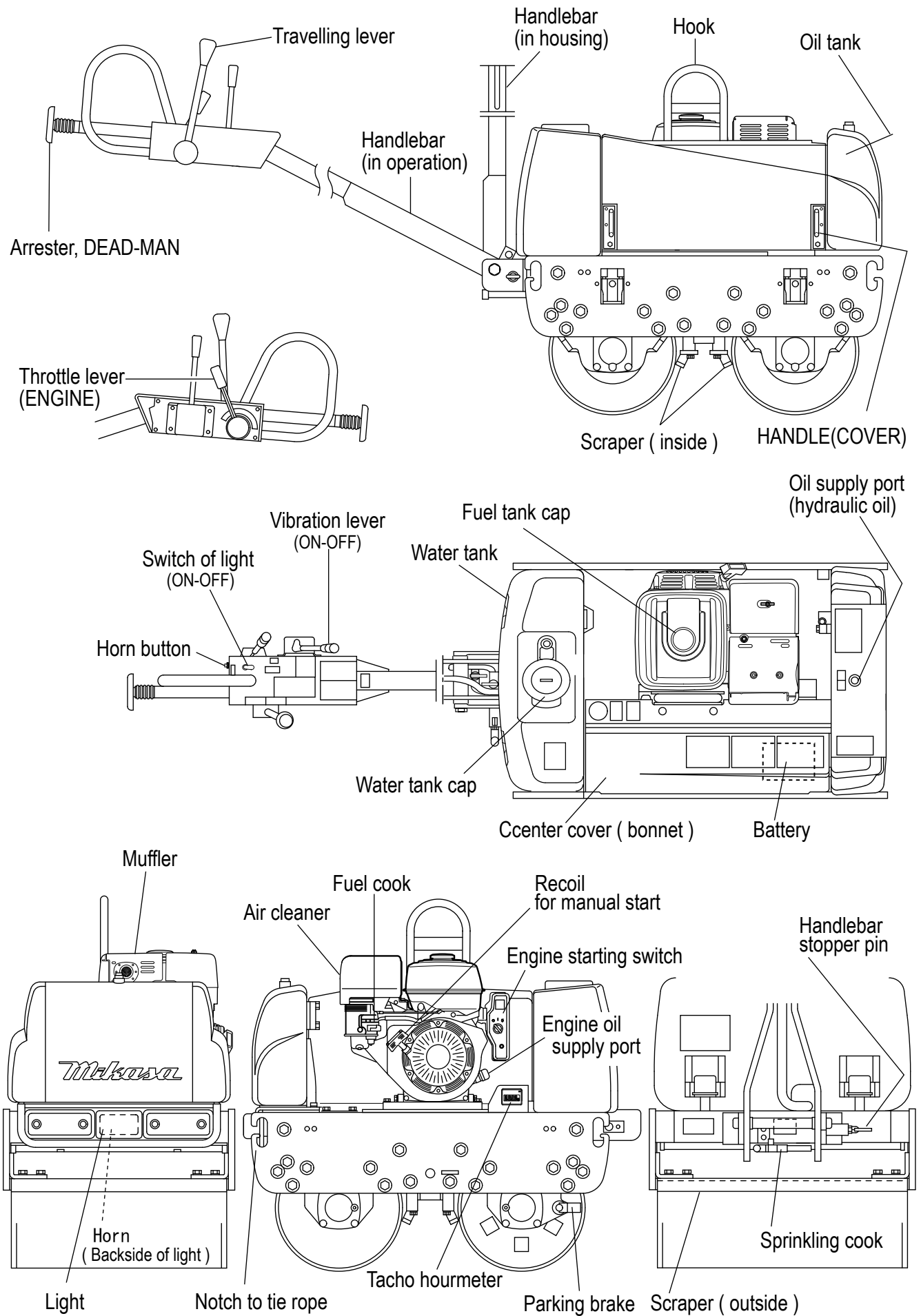
5. GENERAL VIEW

5.1 Dimensions



		MRH-700
Length	A	2,670mm
	B	1,420mm
	C	280mm
	D	580mm
	E	350mm
Width	F	692mm
	G	346mm
Height	H	1,985mm
	I	1,170mm
	J	980mm
	K	1,120mm
	L	238mm

5.2 Part names and positions of device



6. SPECIFICATION

6.1 Roller (body)

MODEL	MRH-700GSB
Body Dimension (mm)	
Overall Length (in operation)	2670
(in housing)	1420
Overall Height (in operation)	1170
(in housing)	1985
Overall Width	692
Distance between axes	580
Drum Width	650
Curb Clearance	238
Side Overhang	21
Drum Dimension (mm)	
Drum Dia	406
Drum Width	650
Weight (kg)	
With Water (Half quantity)	680
Dry Weight	635
Performance	
Working Speed (km/h)	0~3
Gradeability (%)	35
Vibration Frequency Hz (C.P.M.)	55(3300)
Centrifugal Force (kgf)	23.5(2400)
Water Tank Capacity (L)	40
Lubricating Oil (L)	25

※ Features and specifications are subject to change without notification.

6.2 Engine (motor)

M O T O R	Maker	Honda
	Engine Model	GX-390
	Maximum output kw/min ⁻¹ (PS/r.p.m.)	8.7/3600 (11.9/3600)
	Starting System	Electric / Recoil Start
	Max. set speed of rotation min ⁻¹	2,500
	Oil pump maker Model	DAIKIN PV10

7. BEFORE OPERATING THE ROLLER

⚠ CAUTION Check your roller with engine stopped. Open center cover and support it with strut by inserting its end to the hole in the base. See Figs.1 and 2.

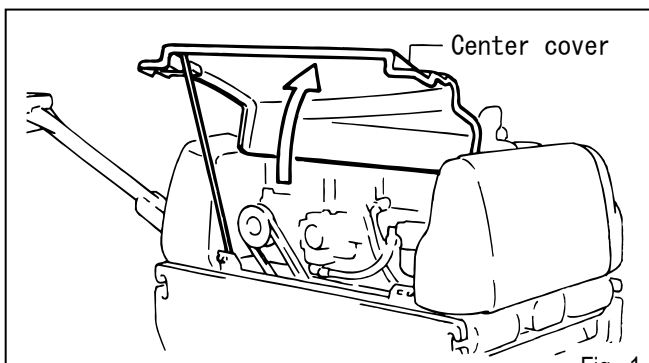


Fig. 1

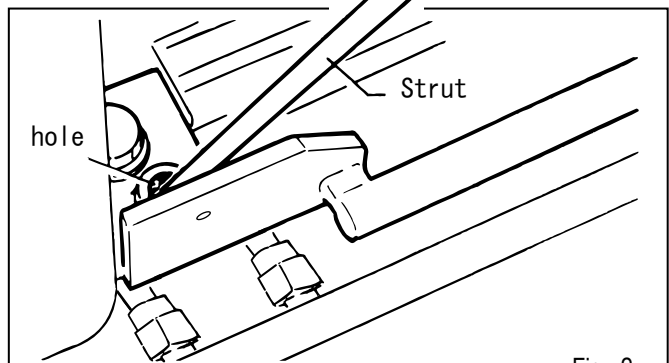


Fig. 2

Check each part before work

Check point	Check item
Visual inspection	Crack, Skewness
Hook	Falling off, Breakage, Crack, Looseness and falling off of bolt & nuts
Fuel tank	Leak, Quantity of oil, Dirt
Fuel system	Leak
Engine oil	Leak, Quantity of oil, Dirt
Oil tank	Leak, Quantity of oil, Dirt
V-belt for vibrator	Crack, Tension
Fan belt	Crack, Tension
Oil pressure pipe line system	Leak, Looseness, Crack, Abrasion
Horn	Operation check
Head light	Lighting check
Traveling lever & part of rink system	Falling off, Breakage, Crack, Looseness and falling off of bolt & nuts
Operation of traveling lever, rink origin	Operation check, Permissible error
Arrester, DEAD-MAN	Operation check
Scraper	Curve, Damage, Adjustment
Bolt, nuts	Looseness, Falling off

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

7-1 Hydraulic System (Fig.3)

- Check oil tank level gauge and make sure that oil is up to specified level (middle of the gauge). At the time of shipment, it is filled with Idemitsu Duffny Super Hydro 46ST (25 liters).
- Check oil tank, oil pump, oil motor and hose joints for any leakage.

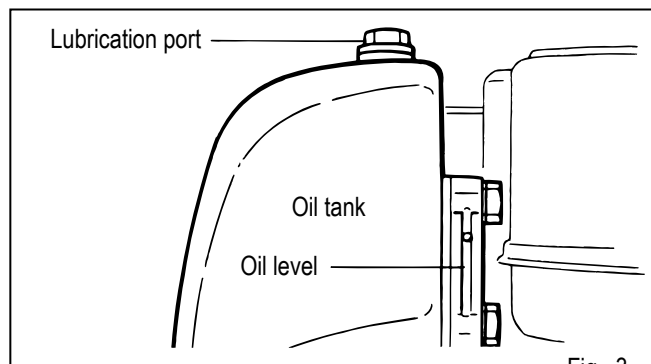


Fig. 3

7-2 Engine (Fig.4)

- Check engine oil for proper level (See separate Engine Instruction Manual for details.)

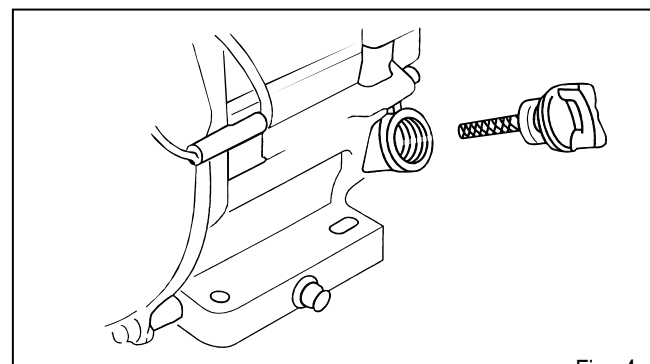


Fig. 4

7-3 Vibrator Unit

- With center cover opened, check V-belt for proper tension. With insufficient tension, vibration does not transfer sufficiently. (Fig.5)
- Check vibrator casing for any oil leakage. If any leakage is noticed, check the oil level with level plug removed off the side plate. (Fig.6)

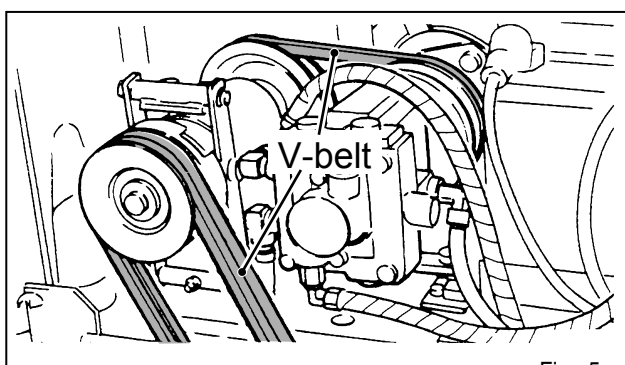


Fig. 5

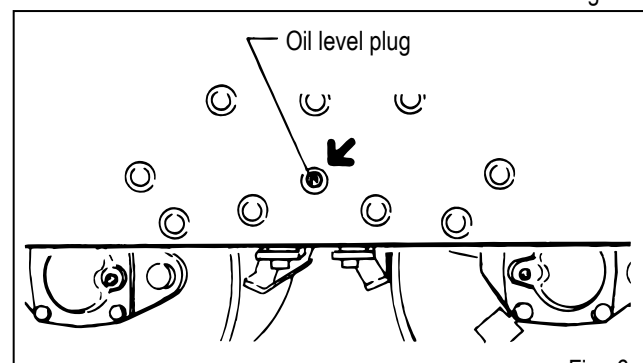


Fig. 6

⚠ Warning Please do check the belt after stopping engine by all means. Keep hand and clothes away from rotating part (belt, pulley, etc.).

7-4 Operation Device

- Check each lever and wire (travel, vibration, throttle) for proper function. (Fig.7)
- With travel lever placed in reverse, push Arrestor, DEAD-MAN to verify that travel lever returns to neutral position. (Fig.8)
- Travel Lever returns to neutral position automatically if lever is released. (CE type)
- Press horn button to check for proper function. (Fig.7)

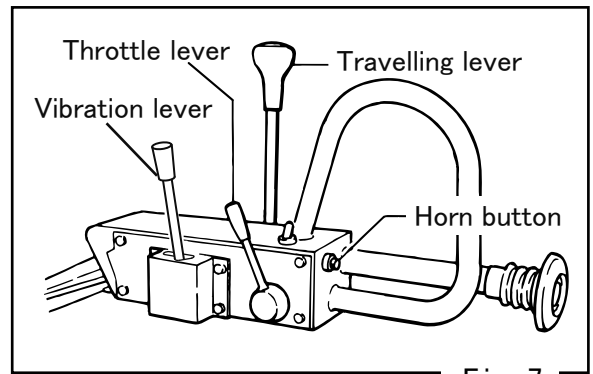


Fig. 7

7-5 Water Sprinkler System

- For watering work, fill water tank in the back with water. Its capacity is 40 liters. (Fig.9)

CAUTION: Be careful not be confused with oil tank.

- Open the cock of front & rear drums, and please confirm the water flow.

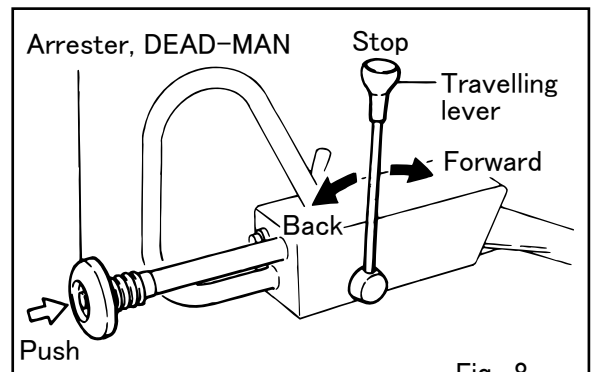


Fig. 8

7-6 Scraper on Each Drum (Fig.10)

- Check to see if it is not clogged with mud, bent or damaged in any other way.
- Adjust clearance between drums and scrapers as necessary.

7-7 Others

- Check bolts, nuts and screws on each part of machine (including engine) for proper tightness.

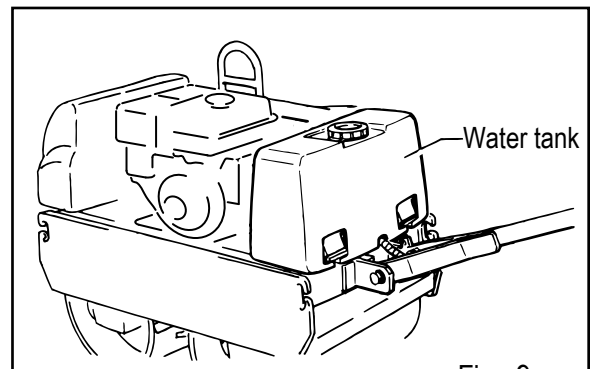


Fig. 9

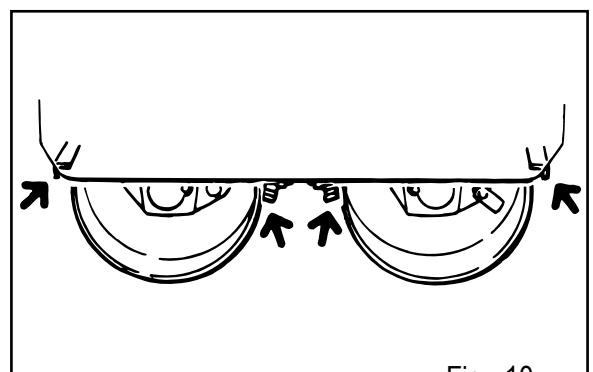


Fig. 10

8. OPERATION

8-1 Starting up

- Align throttle lever with the position for Operation.
- Travel lever should be in neutral and vibration lever in OFF positions.

○ TACHO HOURMETER (Fig.11)

When the engine is stopped, the tacho hourmeter is always showing "Cumulative time".

○ CIRCUIT PROTECTOR (Fig.12)

The circuit protector protects the battery charging circuit. A short circuit, or a battery connected with reverse polarity, will trip the circuit breaker.

The green indicator inside the circuit protector will pop out to show that the circuit protector has switched off. If this occurs, determine the cause of the problem, and correct it before resetting the circuit protector.

Push the circuit protector button to reset.

WARNING: Carbon monoxide gas is toxic. Breathing it can cause unconsciousness and even kill you. Avoid any areas or actions that expose you to carbon monoxide.

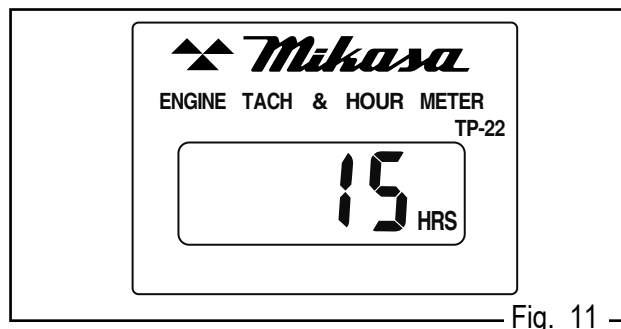


Fig. 11

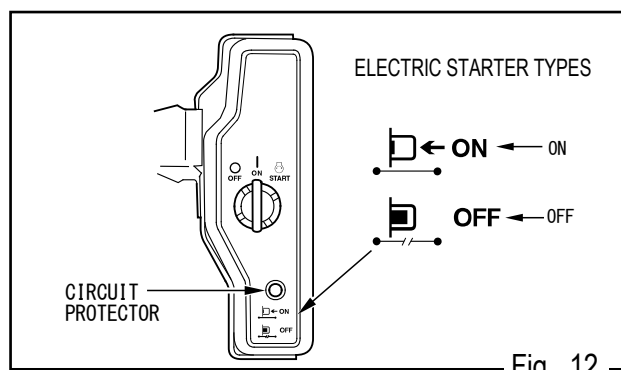


Fig. 12

STARTING THE ENGINE

1. Move the fuel valve lever to the ON position. (Fig.13)
2. To start a cold engine, move the choke lever to the CLOSED position. (Fig.14)
3. Turn the engine switch to the ON position. (Fig.15)
4. Operate the starter.

● RECOIL STARTER (Fig.16)

Pull the starter grip lightly until you feel resistance, then pull briskly in the direction of the arrow as shown below. Return the starter gently.

CAUTION: Do not allow the starter grip to snap back against the engine. Return it gently to prevent damage to the starter.

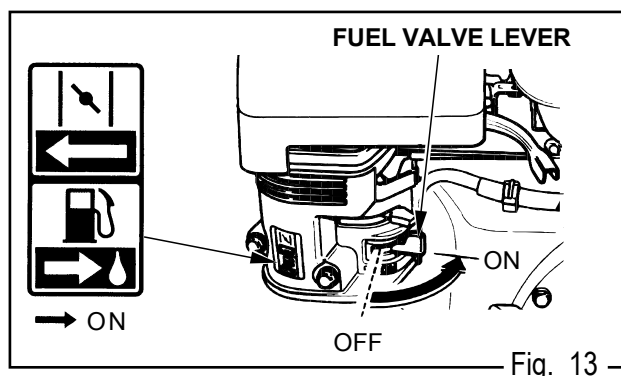


Fig. 13

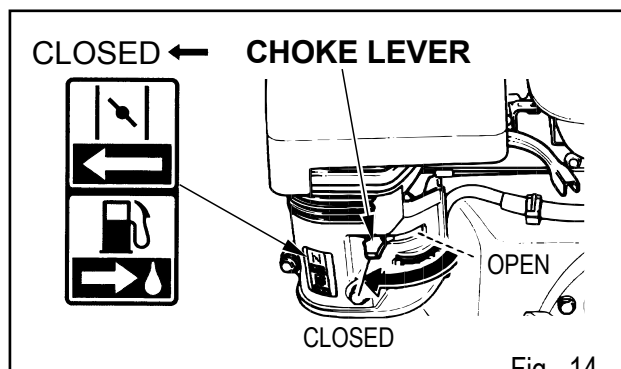


Fig. 14

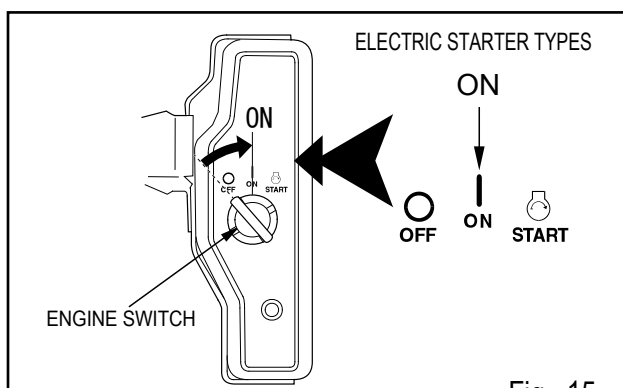


Fig. 15

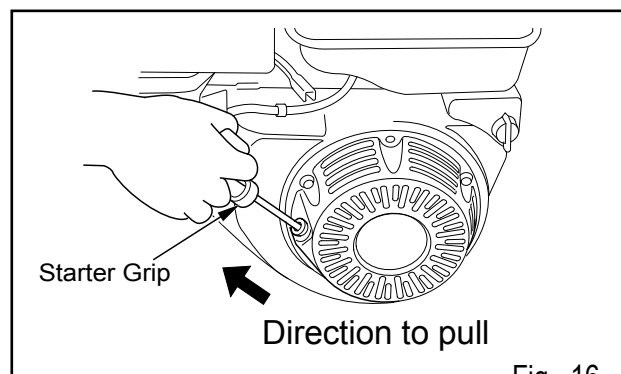


Fig. 16

ELECTRIC STARTER (Fig.17)

Turn the key to the START position, and hold it there until the engine starts.

If the engine fails to start within 5 seconds, release the key, and wait at least 10 seconds before operating the starter again.

CAUTION: Using the electric starter for more than 5 seconds at a time will overheat the starter motor and can damage it.

When the engine starts, release the key, allowing it to return to the ON position.

6. If the choke lever or choke rod (applicable types) has been moved to the CLOSED position to start the engine, gradually move it to the OPEN position as the engine warms up. (Fig.18)
 7. "Rotation number" is displayed during operation. (Fig.19)
- After starting, continue warm-up run for about 3 to 10 minutes. In cold weather particularly this warm up is essential. Check for gas leakage or any abnormal noise during this interval.
 - If buzzer does not cease to sound after engine has started, shutdown engine immediately and check engine oil level. This buzzer has the function of engine oil warning as well.
 - Please confirm that horn sounds.
 - Please confirm that a headlight lights.

8-2 Traveling

- With throttle lever fully opened, increase the engine rotation. (Fig.7)
- Pushing travel lever slightly forward, causes the roller to travel forward at micro speed. Pushing it further, increases the travel speed. Depending on how you move the travel lever, travel speed can be varied steplessly between 0 and 3 km/h (for both forward and reverse). Pulling the lever back causes the roller to travel backward. (Fig.8)

CAUTION: Before starting to travel, be sure to disengage parking brake system. When the lever is tight, moving the roller back and forth will make it easier. (Fig.20)

- During work, do not reduce engine speed.
- When shifting travel lever from forward to reverse, be sure to stop the lever at neutral position once. Do not shift it all the way in one motion.

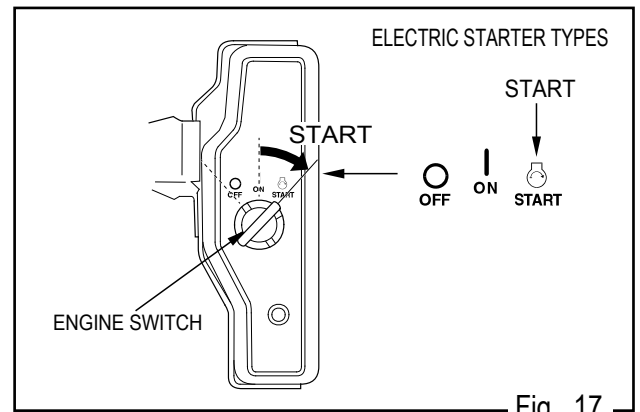


Fig. 17

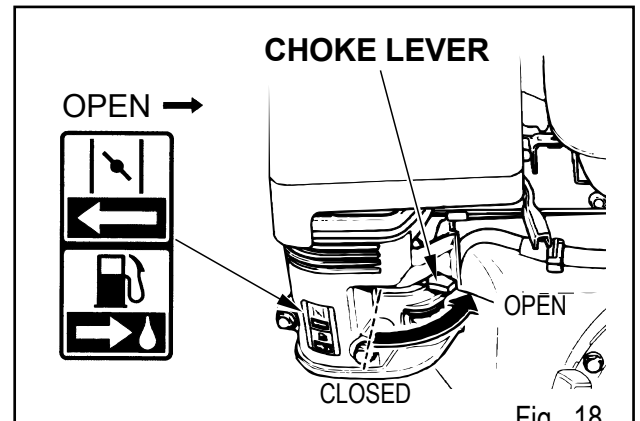


Fig. 18

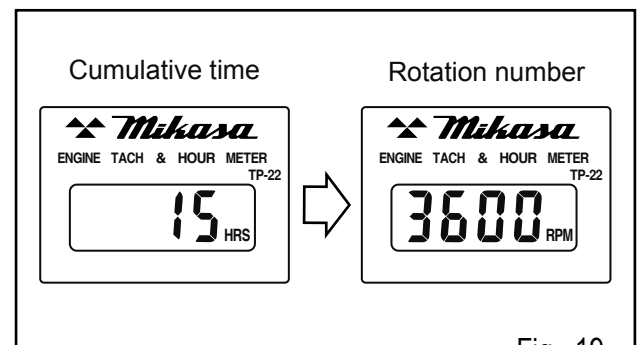


Fig. 19

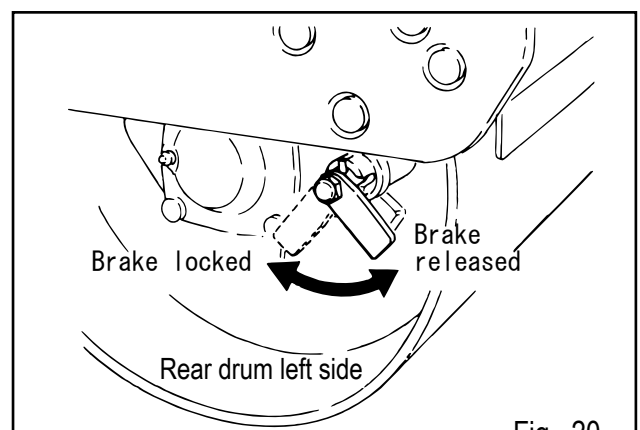


Fig. 20

WARNING:

After test travel, shutdown engine to check for any abnormality including oil leakage. If any trouble should be found, do not operate the roller before it is completely corrected.

8-3 Vibration (Fig.21)

- The roller begins vibration when I put a vibration lever in ON from OFF.

CAUTION: Using the vibration with clutch slipping, causes the clutch to burn. Also, vibration should not be used over completely compacted area, paved road surface or with the roller standing still.

In the case of next, please do not vibrate.

- When do not travel
 - The place that fully hardened
 - In road surface after paving work
- Machine or the road surface is damaged.

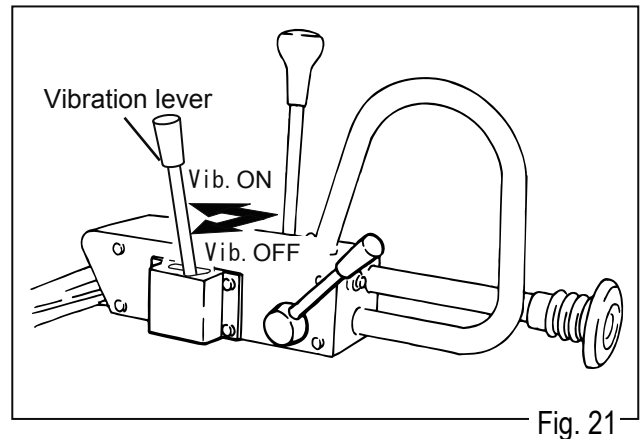


Fig. 21

8-4 Watering work (Fig.22)

- For sprinkler work, open the cock at the rear of the body.

8-5 Safety system

- Klaxon (horn) is provided.
- Pressing Arrester, DEAD-MAN provided while traveling in reverse, causes travel lever to return to neutral position to bring the machine to stop. (Fig.23)

! DANGER: When operator be sandwiched in between DEAD-MAN Arrester and obstacle, do not continue grasping the traveling lever in back position. Roller continues reversing, and it will hurt operator.

When operator is wedged between, release your hand from traveling lever. Or move traveling lever to "STOP" position (or "FORWARD" position).

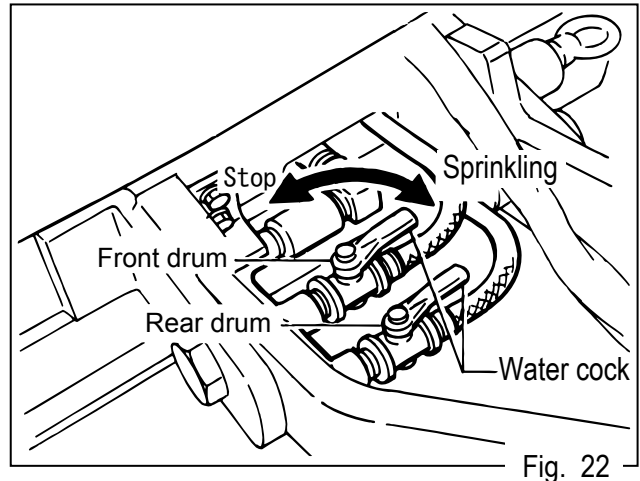


Fig. 22

8-6 Others

- Using the roller in combination with plate compactor (MIKASA MVC-Series) allows you to finish asphalt surface in high efficiency.

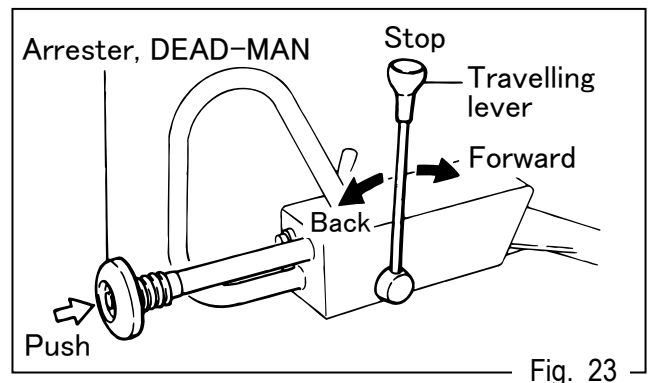


Fig. 23

9. STOPPING THE OPERATION

- With travel lever and vibration lever placed in neutral and OFF position respectively, return throttle lever to START position before conducting cool down run for 3 to 5 minutes. (Fig. 7, 8 and 21)
- Returning the throttle lever to the MIN. position.
- Turn the key switch to OFF position. (Fig.24)
- Before leaving the machine, remove the key and keep it to designated place.

CAUTION: Neglecting to return the key switch to OFF position causes the battery to discharge, making impossible to start-up next time. (When does not turn the key into "off" position, it gives the sound of buzzer.)

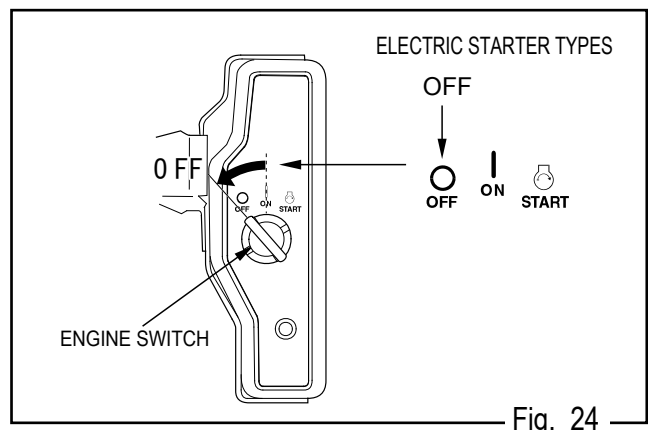


Fig. 24

- After having stopped, close the fuel cock. (Fig. 25)
- Lock the parking brake by pulling the brake knob and rotating it 90 degrees counter clockwise. (Fig. 20)

⚠ Parking brake system should always be kept clean avoiding from mud depositing.

⚠ **DANGER:** When parking in the slope, turn the traveling lever into "STOP" position, and also move calmly to the position that parking brake locks. (Parking brake is in the rear wheel drum left side.) After having confirmed lock of parking brake, turn traveling lever into stop, stop the engine, and use the ring stopper. Select suitable ring stopper from slope condition. There is fear to run uncontrollably when does not follow process.

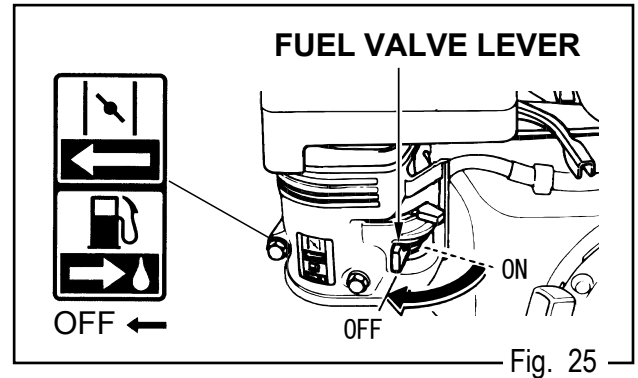


Fig. 25

10. MACHINE TRANSFER AFTER ENGINE STOPS

⚠ **WARNING:** Besides emergency, do not take the next operation. There is fear to cause serious obstacle or death accident when takes the wrong handling.

Unloading procedure (Fig.26 and 27)

- After stopping engine, if you have to move the roller by pushing it manually, loosen bolt of by-pass valve on oil pump by one rotation, which will cause hydraulic brake to be disengaged so that you can move it with less effort.
- After moving, do not forget to tighten the bolt back again. Tightening torque is 55 to 70 kgf-cm.

⚠ **WARNING:** Be careful with the handling of tightening torque. Do not tighten much, because it damage needle-valve, and leak a hydraulic oil. When a hydraulic oil does leak, there is danger to run by itself even loose slope. In addition, performance deteriorates in driving, and there is the fear that operator becomes dangerous.

⚠ **WARNING:** Never conduct this unloading procedure on slope. It may cause the roller to roll down with its own weight if parking brake or blocking is deficient.

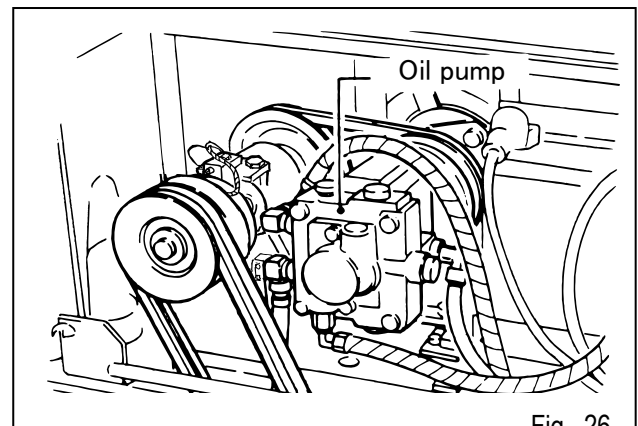


Fig. 26

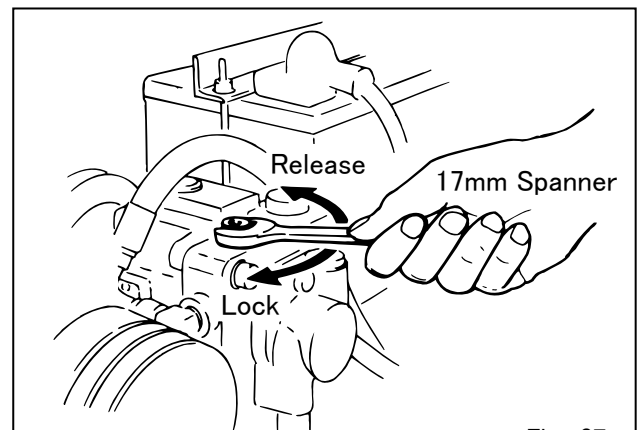


Fig. 27

⚠ **CAUTION:** Never tow this roller by means of vehicle or the like. It will damage hydraulic system.

11. SERVICE AND STORAGE

- 11-1 Wash down dust and dirt off the machine. Area around drums and scrapers should be cleaned with particular care, as lodged mud will present resistance.
- 11-2 Drain water tank completely using outlet.
- 11-3 Cover the machine to prevent dust and store it in dry place, not exposed to sun.
- 11-4 **Long term storage**
- Conduct lubrication and oil change thoroughly.
 - For battery, disconnect terminals or dismount it from the roller for storage.
 - Where ambient temperature may drop below freezing point, add anti-freeze solution to coolant.
 - Cover the inlet and outlet of air cleaner and muffler securely.
 - Store it inside building, not leaving it outdoor.

12. PERIODIC CHECK AND COORDINATION

12-1 Each part check schedule list

Check schedule	Check point	Ccheck item	Type of oils and fats
Daily (before work)	Visual inspection	Crack、Skewness	
	Fuel tank	Leak、Quantity of oil、 Dirt	Light oil
	Hook	Falling off、Breakage、Crack Looseness & falling off of bolt & nuts	
	Fuel system	Leak	
	Fuel filter	Dirt	
	Engine oil	Leak、Quantity of oil、 Dirt	Engine oil
	Oil tank	Leak、Quantity of oil、 Dirt	Hydraulic oil
	V-belt for vibrator	Crack、Tension	
	Fan belt	Crack、Tension	
	Oil pressure pipe line system	Leak、Looseness、Crack、Abrasion	Hydraulic oil
	Horn	Operation check	
	Head light	Lighting check	
	Traveling lever & part of rink system	Falling off、Breakage、Crack Looseness & falling off of bolt & nuts	
	Operation of traveling lever, rink origin	Operation check、Permissible error	
	Arrester, DEAD-MAN	Operation check	
	Scraper	Curve、Damage、Adjustment	
	Bolt, nuts	Looseness、Falling off	
10 hours	Fan belt	Check, adjustment	
20 hours	Engine oil	Only first time	Engine oil
	Engine oil filter	Only first time	
Every 50 hours	Bearing of drum	Supply of oils and fats	Grease
	Traveling lever corollary part	Supply of oils and fats	
	Lever for hydraulic pumps	Supply of oils and fats	
	Auto. stop device (DEAD-MAN Arrester)	Supply of oils and fats	
	Handle stopper	Supply of oils and fats	
	Parking brake	Supply of oils and fats	
	Filter for hydraulic oils	Exchange only first time in 50 h	
Every 100 hours	Engine oil	Exchange	Engine oil
	Battery terminal	Cleaning	
300 hours	Vibrator oil	Exchange	Engine oil
500 hours	Filter for hydraulic oils	Exchange	
1000 hours	Hydraulic oil	Exchange	Hydraulic oil
Irregular time	Air-cleaner element	Exchange	
	Hydraulic hose	Exchange	

Refer the attached engine instruction manual about the details of check & maintenance for engine.

12-2 Engine

Please follow attached engine instruction manual about daily inspection & periodic check and simple adjustment & maintenance for engine.

12-3 Main Body

Do check and maintenance in accordance with an each part check schedule list of 18 pages.
Each refueling port refer to 22-23 pages.

12-4 Neutral Adjustment of Travel Lever (Fig.28)

CAUTION: Be sure to shutdown engine before proceeding with any adjustment.

- If neutral position for forward and reverse travel has been displaced, conduct the neutral adjustment.
(When have traveled in engine starting)
- If roller travels forward with the ball of ball plunger remaining in V slot of the guide, loosen M8 bolt and slide the slide plate slightly toward engine (away). If it travels backward, slide the slide plate toward side plate (back).
- With M8 bolt tightened, start engine and check the neutral for forward and reverse. If still displaced, repeat the procedure.
- In case neutral position of forward/reverse lever has been displaced, use the turn buckle located on the oil pump side of forward/reverse cable.

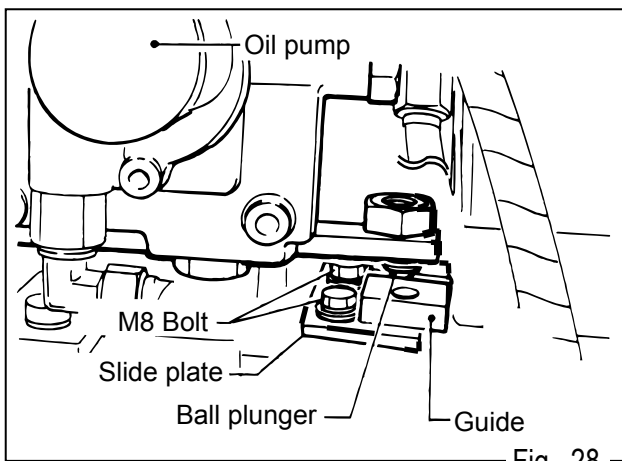


Fig. 28

WARNING The grease lack or rust outbreak or damage of ball plunger is means heavy movement of the traveling lever, and produce malfunction of a traveling cable, and there is fear to cause a serious accident.
Always check so that malfunction of ball plunger does not happen. And do maintenance of grease-up etc.

CAUTION: Be sure to shutdown engine before proceeding with any adjustment.

12-5 Check of Battery Power

CAUTION: Fire is absolutely prohibited during battery inspection as Inflammable gas generated from battery may catch fire to explode.

● Servicing the battery

Looseness or corrosion of terminal leads to deficient contact.

When white powder is noticed at terminal, clean it with lukewarm water before coating with grease.

If corrosion is substantial, polish with wire brush or sand paper and tighten securely not to allow

● Dismounting and remounting of battery (Fig.29)

For dismounting, disconnect with negative terminal first. For mounting, connect positive terminal first, followed by negative terminal.

CAUTION: When connecting the cables, definitely do not cause positive and negative terminals to short circuit.
Connecting positive and negative oppositely, may expose electric component to damage.

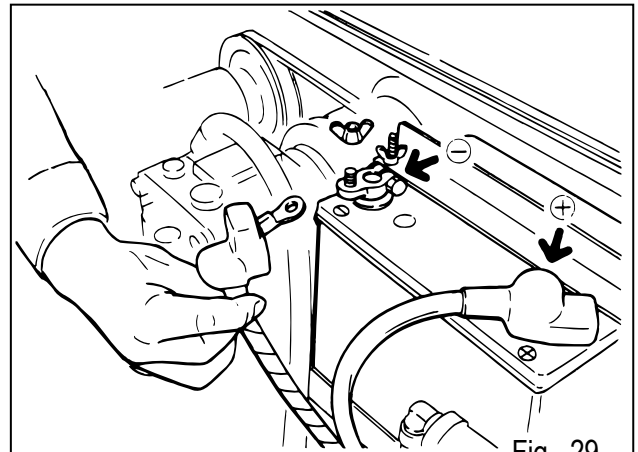


Fig. 29

● Battery inspection:

(External appearance check only for maintenance free type battery)

Check battery for crack or any other damage, If white pattern appears (sulfation) inside the battery or paste has accumulated at bottom, replace the battery with new one.

SPECIFIC GRAVITY: Use hydrometer to measure specific gravity of electrolyte and if it is below 1.230, charging is required.

Completely charged: 1.270 -1.290

Lack of charging : 1.260 or lower

CAUTION: Electrolyte being a strong chemical, care should be taken for its handling.
If it has gotten on skin, eyes, or clothing, wash down with plenty of water and see doctor.

12-6 Check & Maintenance of Hydraulic System

Inspection (Figs.26 and 30)

- a) Check motor and pump for any damage.
- b) Check hoses and pipings for proper tightness and make sure that there is no leakage.
- c) Checking Nylon tubes for hydraulic oil intake and drain:
Retighten brass nut if it is loosened and leakage is noticed around. If the leakage continues after retightening, replace the Nylon tube, nut and sleeve with a set of new ones.
- d) Check oil tank for proper oil level and see if the hydraulic oil has not been whitened or emulsified.
Its whitish color means aeration in pump.
Re-tighten piping and correct the level of oil.
Emulsification means water in the hydraulic oil. Replace the oil.

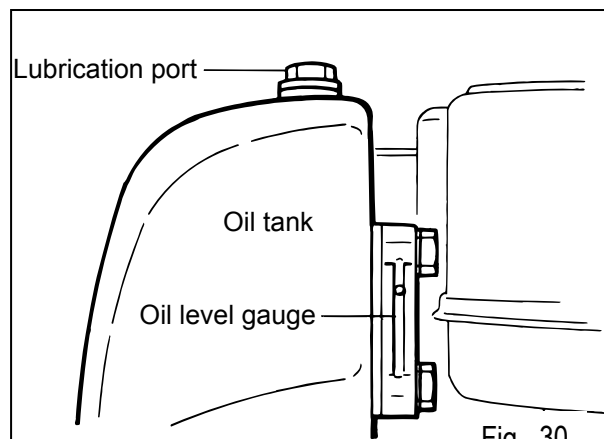


Fig. 30

Maintenance

a) Oil filter replacement (Fig.31)

Initial replacement: After 25 hours of operation
Thereafter: In every 500 hours of operation

CAUTION: Use genuine Mikasa filter paper with 10 microns only. Replace it if suction resistance has exceeded 254mmHg. (at operating temperature of 60 degrees C)

b) Hydraulic oil replacement

Though it depends on load, normally it should be replaced in every 1,000 to 1,500 hours of operation. Remove drain plug off oil tank and hose joint to drain old oil before refilling it with 25 liters of recommended oil. Use care not to allow dust, foreign matter or water to enter.

CAUTION: Dispose of the oil which pulled out as the appropriate waste done regulations of.

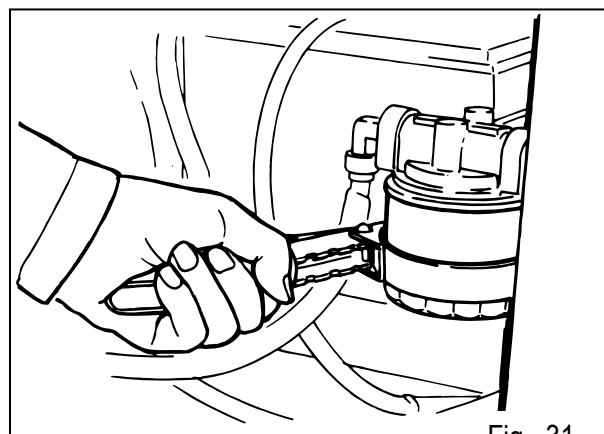


Fig. 31

Recommended wear resistant hydraulic oil:

Viscosity: ISO VG32 equivalent, for cold region
ISO VG46 or 56 equivalent, for general and warm region
(At the factory shipment, machine is filled with Idemitsu Duffny Super Hydro 46ST.)

Installation

- 1/4 (pipe thread) hydraulic hose tightening torque:250kg-cm
- 1/4 (pipe thread) hydraulic hose tightening torque:380kg-cm
- Installing the Nylon tube (Fig.32)

- Insert nut and sleeve to the Nylon tube.
- Nylon tube should extend from sleeve end by about 10mm.
- Insert the Nylon tube straight all the way into connection of the joint.
- With the Nylon tube thus inserted, tighten nut fully with fingers. Then, tighten it further with wrench to leave 1 -1.5cm of thread of joint remaining.
(Tightening torque: 100 -140kg-cm)

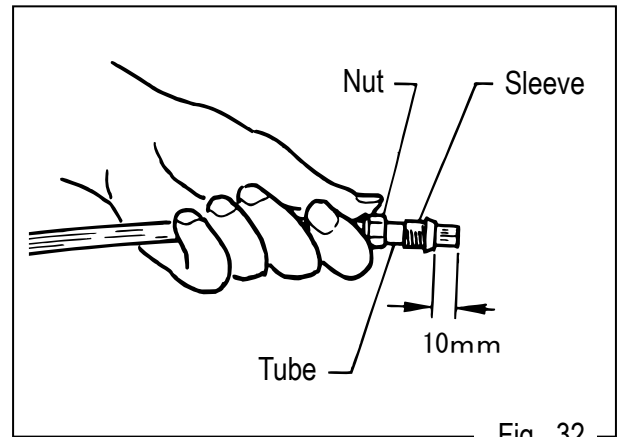


Fig. 32

CAUTION:

- Watch for insufficient depth of insertion for sleeve and Nylon tube into joint.
 - Watch for insufficient tightening of nut.
- These are the two points to be carefully watched during replacement work.

12-7 Vibration Clutch Adjustment Lever (Fig.33,34)

For adjusting vibration clutch,with vibration lever on handle side placed in OFF position, loosen the nuts (front and back) at the end of vibration clutch cable. Then turn-in the nut on front side again and from such positon where release fork starts to move, turn-in the nut by one or two threads and lock it right there together with the nut on back side.

Turning-in the front side nut excessively may cause the sliding engagement of clutch to take place or no vibration to take place even when vibration lever is engaged.

If on the contrary, its insufficient turning-in may cause sliding engagement of clutch even when vibration lever is placed in OFF position or vibration to remain engaged.

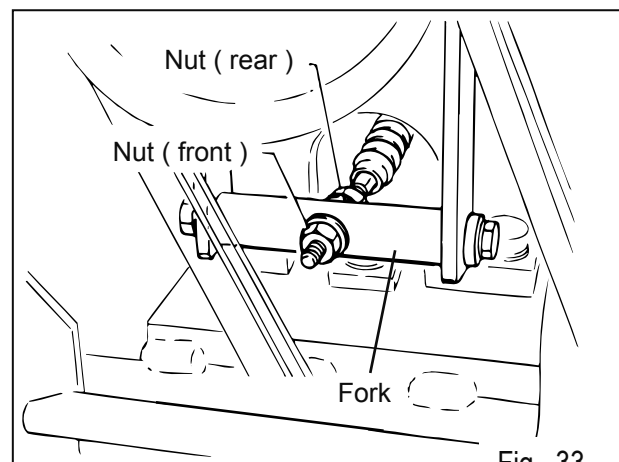


Fig. 33

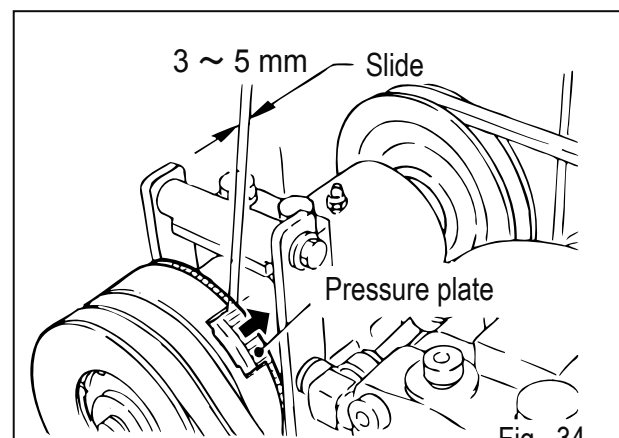
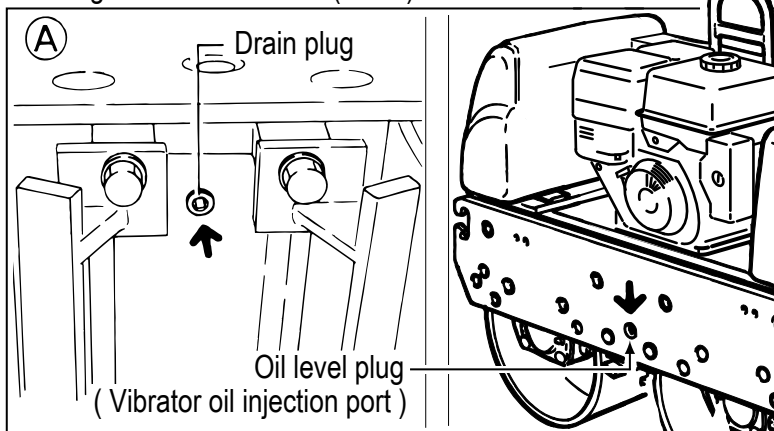


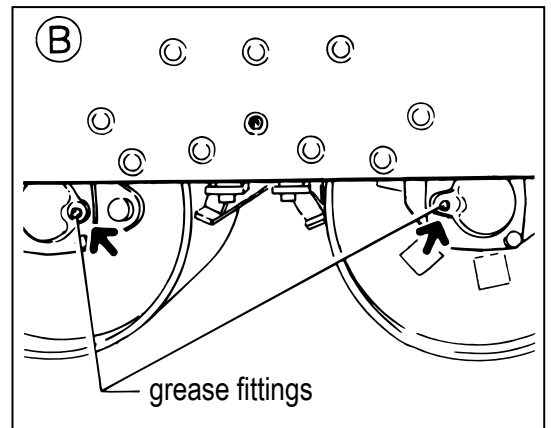
Fig. 34

13. LUBRICATION CHART

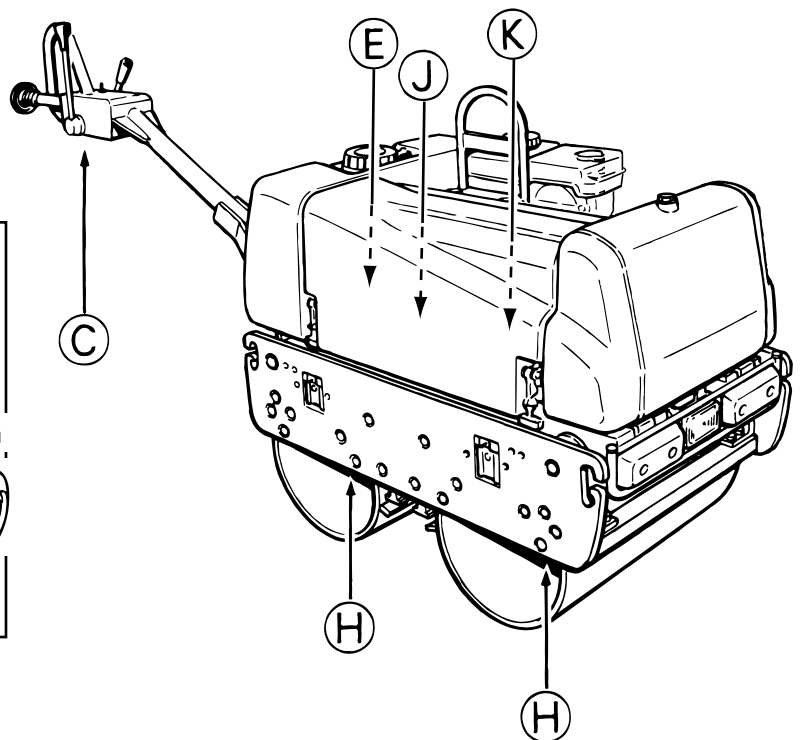
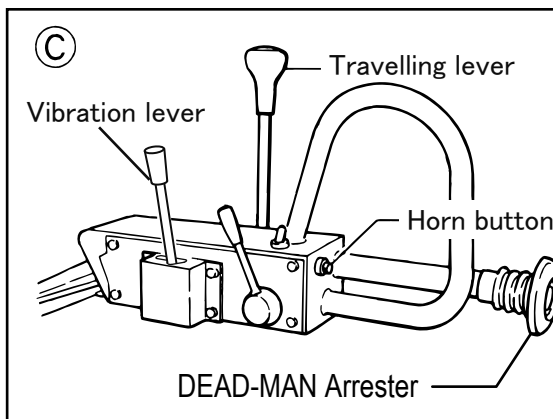
- **VIBRATOR OIL**
every 300 hours
Engine oil SAE10W-30 (0.9L)



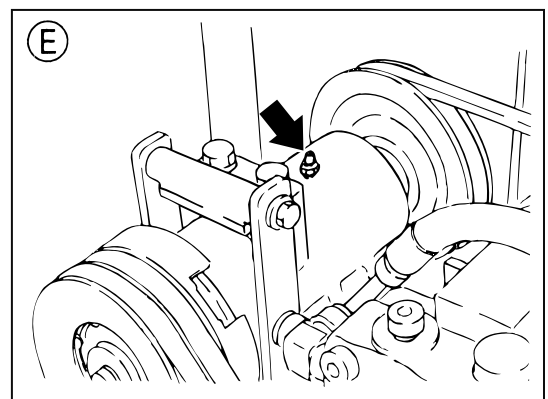
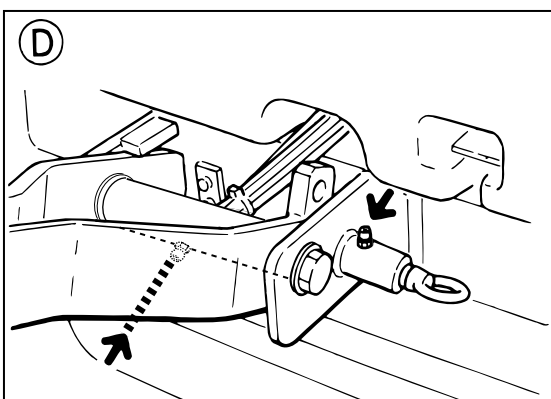
- **Bearing cover**
every 50 hours onto grease fittings



- **Traveling lever, Throttle lever**
every 50 hours
(Supply sliding part with lubricating oil)
- **DEAD-MAN Arrester**
every 50 hours onto grease fittings

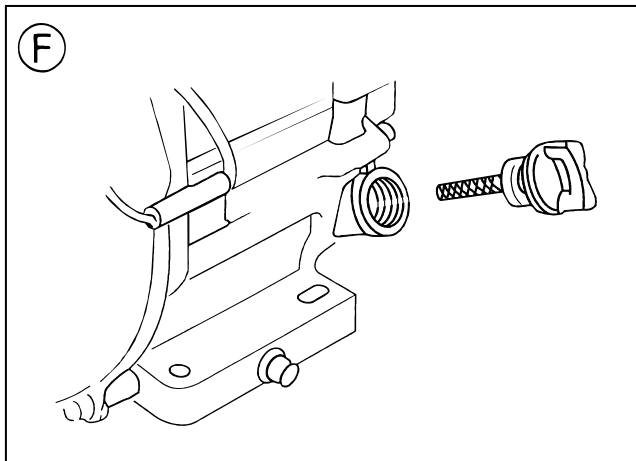


- **Handle stopper**
every 50 hours onto grease fittings



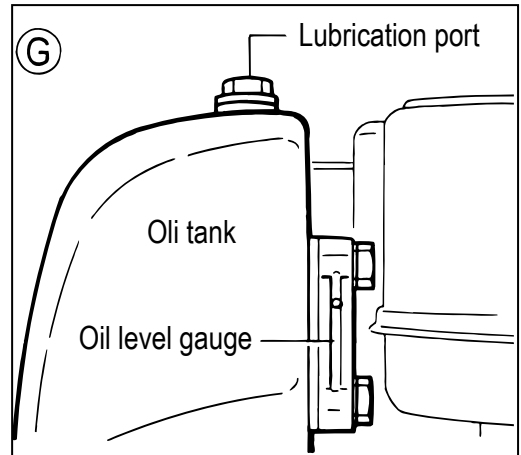
● **Replacement of engine oil**

First time: 20 hours Afterward : every :100 hours
 Engine oil for Gasoline SJ class : SAE10W-30
 Extreme cold region (Less than -10 degrees) : SAE5W-30



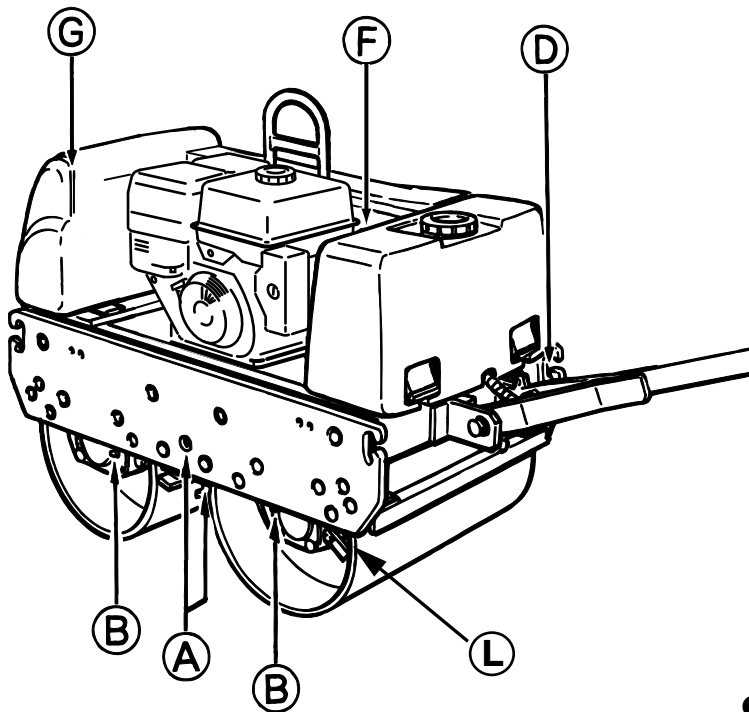
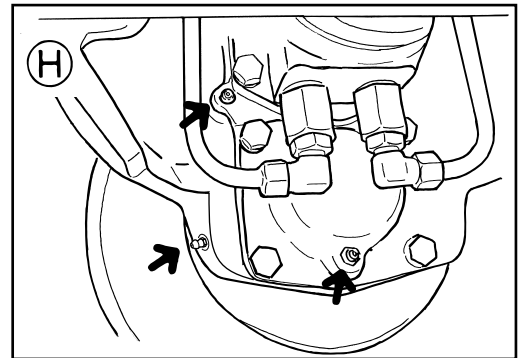
● **Hydraulic oil**

every 1,000-1,500 hours (25 liters)



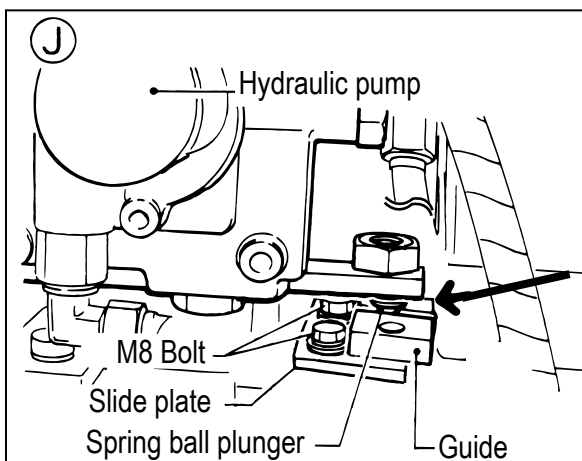
● **Bearing cover & drum bracket**

every 50 hours onto grease fittings



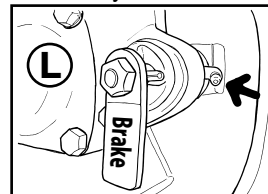
● **Spring ball plunger of LEVER (P V 10)**

every 50 hours onto sliding part



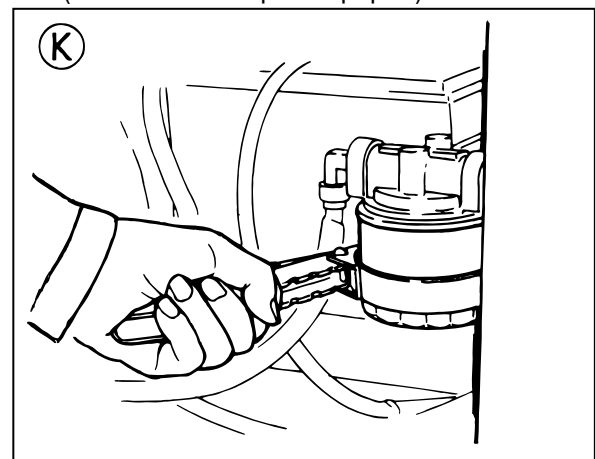
● **Parking brake**

every 50 hours onto grease fittings

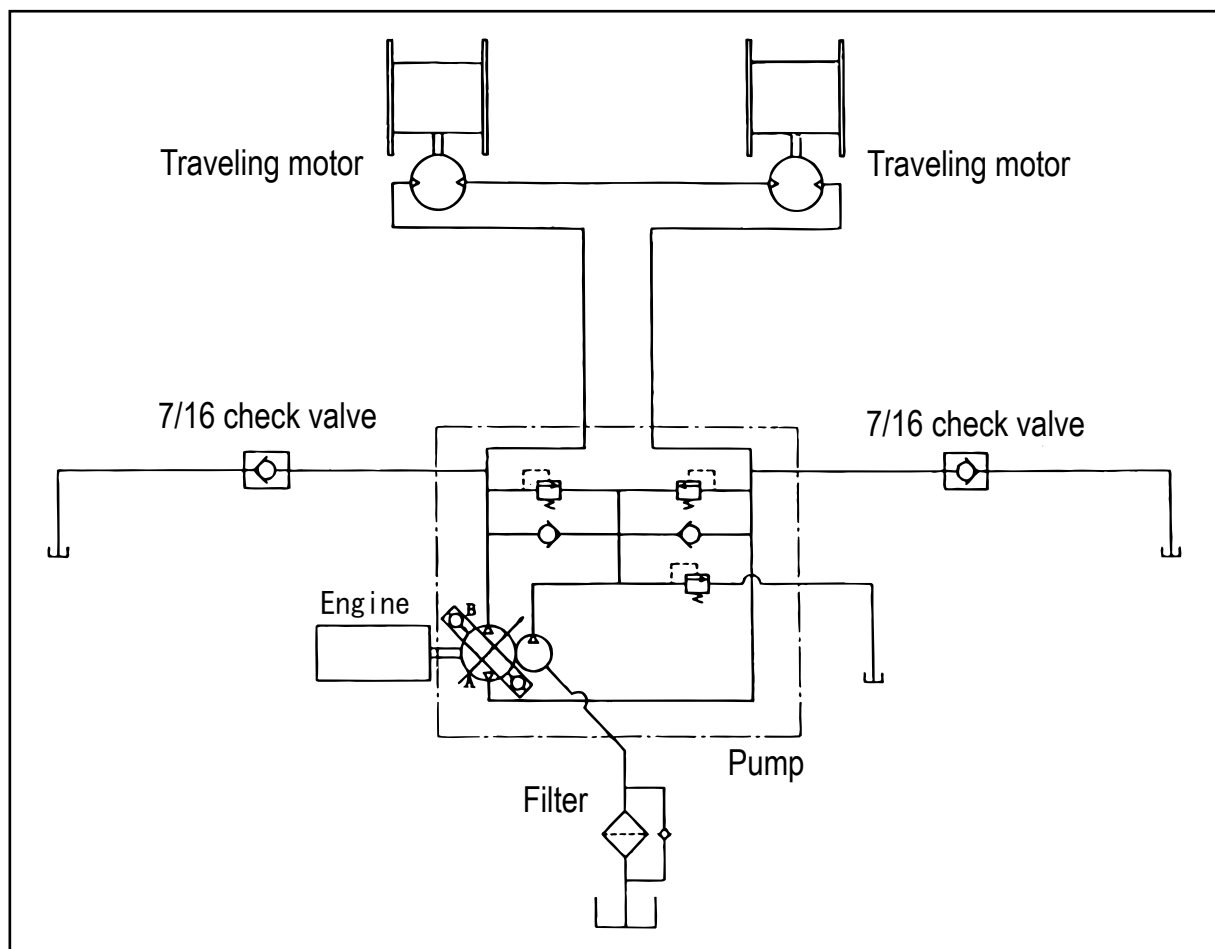


● **Replacement of oil filter**

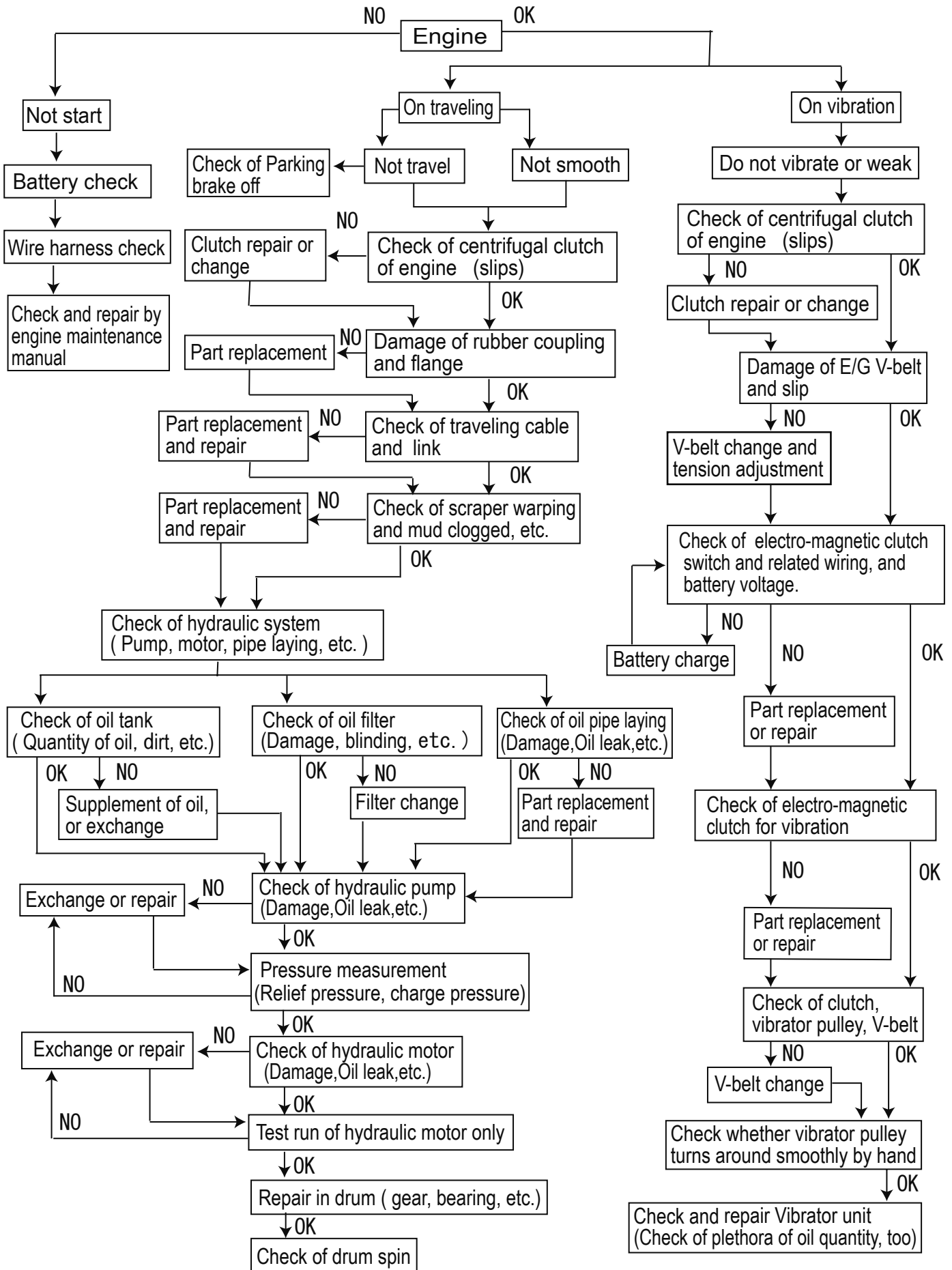
First time 25 hours
 Afterward every 500 hours
 (Oil filter use 10 μ filter-paper)



14. FIGURE OF HYDRAULIC CIRCUIT



15. Troubleshooting



[illegible]

Mikasa

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