Rabbit PORTABLE FIRE FIGHTING PUMP

P455$^{S}_{M}$ P476$^{S}_{M}$ P555$^{S}_{M}$ P572S

INSTRUCTION MANUAL

WARNING

BE SURE TO READ THIS MANUAL BEFORE OPERATION.

IHI Shibaura Machinery Corporation

PREFACE

We wish to express our great thanks for your purchase of RABBIT PORTABLE FIRE FIGHTING PUMP.
For safety operation of RABBIT PORTABLE FIRE FIGHTING PUMP, pay attention to:

☆ The operation of this pump is limited to fire fighting.

☆ Reference : In Japan, the use of this pump is authorized only to the qualified persons who have received a special training for safety operation, selected from the official fire fighting staff, voluntary disasters-preventing personnel, voluntary fire fighting personnel and qualified maintenance personnel for portable fire fighting pump.

For inspection and maintenance of the pump, please contact the maintenance shops or special dealers who have been qualified for maintenance of the portable fire fighting pumps.
This instruction manual is intended to offer the information necessary for safe and effective operation of RABBIT PORTABLE FIRE FIGHTING PUMP. It is recommended to thoroughly read this manual for the best and safest use of RABBIT PORTABLE FIRE FIGHTING PUMP.
For any matters remaining unclear on your side, please contact our authorized agents.

CONTENTS

FOR SAFETY OPERATION

The classification and meanings of the warning signs are as follows:

"DANGER" : Any mistakes in operation may lead to imminent fear of death or serious injury.

"WARNING" : Any mistakes in operation may lead to possible fear of death or serious injury.

"ATTENTION" : Any mistakes in operation may lead to light injury or material damages.

The following attention labels are attached to RABBIT FIRE FIGHTING PUMP. In operation, please be sure to be well informed of and to follow the attention.

L82900900

For possible dangerous matters and points, never fail to observe the following:

Type of danger	Rank	Dangerous points	Points of attention
Fire	Danger	Fuel tank (In refill of gasoline) Air cleaner element (in cleaning)	(1) Never place near fire. (2) After stopping the engine, be sure to confirm the engine is cooled down prior to refill gasoline. (3) Be careful not to spill gasoline and kerosene for cleaning of air cleaner element.
	Warning	Muffler (exhaust gas) Muffler (dry grass) Battery (get fire)	(1) Perform operation at a place 3 m or more off any inflammables. (2) Never perform operation on dry grass. If it is inevitable, remove dry grass under the muffler. (3) When you take off battery cap, keep good ventilation. (4) When you take off battery cap, do not put the battery close to flame.
	Attention	Fuel tank (In refill of gasoline) Carburetor (Overflow)	(1) Pay full attention to waste cloth which has been used to wipe out spilt fuel. (2) Be sure to confirm that the fuel tank cap is securely tightened. (3) When you supply fuel, keep good ventilation. (4) Set the fuel cock lever to "Close", except when you drive. (5) Dispose of drained fuel in overflow bottle without keeping it intact.
Burn	Attention	Muffler Exhaust pipe Exhaust port Battery liquid	(1) Never touch while it is still hot. (2) Be careful, keep your skin away from battery liquid.
Rotating parts	Attention	Recoil pulley	(1) When starting by the rope, be careful that your clothing or gloves will not be caught in. (2) When starting by the rope, confirm that there is not any person or any things within the radius of 2 m.
Toxicity	Warning	Muffler (exhaust gas)	(1) Never operate where ventilation is not enough. (Pump house, inside of a tunnel, etc)

High-pressure water	Attention 	Nozzle, discharge port	(1) Never direct the nozzle to any people, which may cause injury. (2) Never peep into the discharge port or nozzle during preparation for water discharge. (3) Set the engine at low speed when opening or closing the discharge valve. (4) Never start the engine while the discharge valve is still open.
Electric shock	Warning 	Ignition plug High-pressure cord Battery	(1) Never touch during operation. (2) When replacing the battery, remove (-) terminal side first, and attach (+) side first.
Injury (cut, etc)	Attention 	Carrying handle discharge valve (ball cock)	(1) Do not touch hinge parts when you operate handle. (2) Never place the hand or the finger in the discharge port during operation of the discharge valve.
Scattering of stones and explosion, etc.	Attention 		(1) Pay full attention to stones or other foreign matters which may cause physical risk during water discharge. (2) Never suck or discharge inflammable or chemicals, which may cause fire or explosion.
Disposal	Attention 		(1) When disposing of a battery or resin, contact a special agent.
Slip	Attention 		(1) Be careful not to spill oil. Be sure to wipe up spilt oil.

CONVERSION TABLE OF UNITS

Designation	Conventional	New	
Rotation speed	Number of rotation rpm	Rotating speed	rpm
Pressure	kgf/cm^2	MPa	Megapascal
Mass	Weight kgf	Mass kg	Kilogram
Volume	ℓ	l	Liter
Consumption	cc/min	ml/min	Milliliter per minute
Vacuum	mmHg	-MPa	Megapascal
Displacement	cc	ml	Milliliter
Output	PS	kW	Kilowatt

- 1kgf/cm^2 ≒ 0.098MPa
- 760mmHg ≒ -0.1013MPa
- 1PS ≒ 0.735kW
- 1cc = 1ml

Pay attention to the unit of pressure in which new unit is about 1/10 as compared with the existing one.

SPECIFICATIONS

P455 S/M

Brand name	RABBIT P455
Type	Portable fire fighting pump

ENGINE

Model	EP555	
Classification	S	M
Type	Water-cooled, 2-cycle, Horizontal 2-cylinder gasoline engine	
No of cylinders – bore x stroke mm	2-76x70	
Total displacement ml(cc)	635	
Rated output kW/rpm (PS/rpm)	28 (38) / 5100	
Fuel consumption l/h	13	
Carburetor	Float, with auto-choke unit	
Cooling system	Forced water cooling	
Ignition system	Non-contact (CDI) magnet ignition	
Ignition plug	NGK B8HS	
Fuel tank capacity l	12	
Fuel	Unleaded gasoline	
Oil tank capacity l	1.2	
Lubricating oil	2-cycle engine oil (separate lubrication 50:1)	
Startup system	Self-starting motor type, recoil type	Recoil type
Charging capacity V-A	12-1.0	—
Speed regulating system	Centrifugal weight	
Rotation	Left (viewed from output side)	
Lighting V-W	12-25 (Search light) 12-3 x 2 (Meter lamp)	
Battery	28A19R (12V30AH)	—

PUMP

Model		P455	
Classification		S	M
Type		High-pressure one-stage turbine pump	
Suction port dia. mm		Nominal 75 (fire-fighting screw-type fitting JIS-B-9912)	
Discharge port dia. mm		Nominal 65 (fire-fighting screw-type fitting JIS-B-9912)	
Performance	Rated pressure MPa(kg/cm^2)	0.55 (5.5)	
	Rated discharge m^3/min	1.22	
	Rated discharge nozzle mm	ϕ 28.0	
	Rated rotation speed rpm	Approx. 4300	
	High pressure MPa(kg/cm^2)	0.8 (8.0)	
	High-pressure discharge m^3/min	0.91	
	High-pressure nozzle mm	ϕ 22.0	
	High-pressure rpm	Approx. 4500	
	Rated rpm rpm	5100 (Governor set)	
Pump chamber sealing		Mechanical unit seal	
Vacuum pump		4-blade eccentric rotary type with strainer	
Vacuum MPa		Suction head Approx. 9 m (–0.085 or more)	
Lubrication		Oilless system	
Dimension (overall L x W x H) mm		657 x 584 x 720	
Dry weight kg		Approx. 88	Approx. 78

STANDARD UNITS

Designation	No. of units	Designation	No. of units	Designation	No. of units
Root joint	1	Battery(S)	1		

ACCESSORIES

Designation	No. of units	Designation	No. of units	Designation	No. of units	Designation	No. of units
Disassembly tool set	1	Suction port strainer	1	Safety nozzle	1	Instruction manual	1
Pump cover	1	Ignition plug	1	Fuse(S)	1	Automatic battery charger	1

SPECIFICATIONS

P476 S/M

Brand name	RABBIT P476
Type	Portable fire fighting pump

ENGINE

Model	EP555	
Classification	S	M
Type	Water-cooled, 2-cycle, Horizontal 2-cylinder gasoline engine	
No of cylinders – bore x stroke mm	2-76x70	
Total displacement ml(cc)	635	
Rated output kW/rpm (PS/rpm)	28 (38) / 5100	
Fuel consumption l/h	13	
Carburetor	Float, with auto-choke unit	
Cooling system	Forced water cooling	
Ignition system	Non-contact (CDI) magnet ignition	
Ignition plug	NGK B8HS	
Fuel tank capacity l	12	
Fuel	Unleaded gasoline	
Oil tank capacity l	1.2	
Lubricating oil	2-cycle engine oil (separate lubrication 50:1)	
Startup system	Self-starting motor type, recoil type	Recoil type
Charging capacity V-A	12-1.0	—
Speed regulating system	Centrifugal weight	
Rotation	Left (viewed from output side)	
Lighting V-W	12-25 (Search light) 12-3 x 2 (Meter lamp)	
Battery	28A19R (12V30AH)	—

PUMP

Model		P476	
Classification		S	M
Type		High-pressure one-stage turbine pump	
Suction port dia. mm		Nominal 75 (fire-fighting screw-type fitting JIS-B-9912)	
Discharge port dia. mm		Nominal 65 (fire-fighting screw-type fitting JIS-B-9912)	
Performance	Rated pressure MPa(kg/cm^2)	0.55 (5.5)	
	Rated discharge m^3/min	1.40	
	Rated discharge nozzle mm	ϕ 30.0	
	Rated rotation speed rpm	Approx. 4500	
	High pressure MPa(kg/cm^2)	0.8 (8.0)	
	High-pressure discharge m^3/min	1.13	
	High-pressure nozzle mm	ϕ 24.5	
	High-pressure rpm	Approx. 4700	
	Rated rpm rpm	5100 (Governor set)	
Pump chamber sealing		Mechanical unit seal	
Vacuum pump		4-blade eccentric rotary type with strainer	
Vacuum MPa		Suction head Approx. 9 m (–0.085 or more)	
Lubrication		Oilless system	
Dimension (overall L x W x H) mm		657 x 584 x 720	
Dry weight kg		Approx. 88	Approx. 78

STANDARD UNITS

Designation	No. of units	Designation	No. of units	Designation	No. of units
Root joint	1	Battery(S)	1		

ACCESSORIES

Designation	No. of units	Designation	No. of units	Designation	No. of units	Designation	No. of units
Disassembly tool set	1	Suction port strainer	1	Safety nozzle	1	Instruction manual	1
Pump cover	1	Ignition plug	1	Fuse(S)	1	Automatic battery charger	1

SPECIFICATIONS

P555 S/M

Brand name	RABBIT P555
Type	Portable fire fighting pump

ENGINE

Model	EP555	
Classification	S	M
Type	Water-cooled, 2-cycle, Horizontal 2-cylinder gasoline engine	
No of cylinders – bore x stroke mm	2-76x70	
Total displacement ml(cc)	635	
Rated output kW/rpm (PS/rpm)	28 (38) / 5100	
Fuel consumption l/h	14	
Carburetor	Float, with auto-choke unit	
Cooling system	Forced water cooling	
Ignition system	Non-contact (CDI) magnet ignition	
Ignition plug	NGK B8HS	
Fuel tank capacity l	12	
Fuel	Unleaded gasoline	
Oil tank capacity l	1.2	
Lubricating oil	2-cycle engine oil (separate lubrication 50:1)	
Startup system	Self-starting motor type, recoil type	Recoil type
Charging capacity V-A	12-1.0	—
Speed regulating system	Centrifugal weight	
Rotation	Left (viewed from output side)	
Lighting V-W	12-25 (Search light) 12-3 x 2 (Meter lamp)	
Battery	28A19R (12V30AH)	—

PUMP

Model		P555	
Classification		S	M
Type		High-pressure one-stage turbine pump	
Suction port dia. mm		Nominal 75 (fire-fighting screw-type fitting JIS-B-9912)	
Discharge port dia. mm		Nominal 65 (fire-fighting screw-type fitting JIS-B-9912)	
Performance	Rated pressure MPa(kg/cm^2)	0.70 (7.0)	
	Rated discharge m^3/min	1.28	
	Rated discharge nozzle mm	ϕ 27.0	
	Rated rotation speed rpm	Approx. 4600	
	High pressure MPa(kg/cm^2)	1.00 (10.0)	
	High-pressure discharge m^3/min	0.88	
	High-pressure nozzle mm	ϕ 20.5	
	High-pressure rpm	Approx. 4900	
	Rated rpm rpm	5100 (Governor set)	
Pump chamber sealing		Mechanical unit seal	
Vacuum pump		4-blade eccentric rotary type with strainer	
Vacuum MPa		Suction head Approx. 9 m (–0.085 or more)	
Lubrication		Oilless system	
Dimension (overall L x W x H) mm		657 x 584 x 720	
Dry weight kg		Approx. 88	Approx. 78

STANDARD UNITS

Designation	No. of units	Designation	No. of units	Designation	No. of units
Root joint	1	Battery(S)	1		

ACCESSORIES

Designation	No. of units	Designation	No. of units	Designation	No. of units	Designation	No. of units
Disassembly tool set	1	Suction port strainer	1	Safety nozzle	1	Instruction manual	1
Pump cover	1	Ignition plug	1	Fuse(S)	1	Automatic battery charger	1

SPECIFICATIONS

P572 S

Brand name	RABBIT P572
Type	Portable fire fighting pump

ENGINE

Model	EP572
Classification	S
Type	Water-cooled, 2-cycle, Horizontal 2-cylinder gasoline engine
No of cylinders – bore x stroke mm	2-80x72
Total displacement ml(cc)	723
Rated output kW/rpm (PS/rpm)	34.2 (46.5) / 5200
Fuel consumption l/h	17.5
Carburetor	Float, with auto-choke unit
Cooling system	Forced water cooling
Ignition system	Non-contact (CDI) magnet ignition
Ignition plug	NGK B7HS
Fuel tank capacity l	12
Fuel	Unleaded gasoline
Oil tank capacity l	1.2
Lubricating oil	2-cycle engine oil (separate lubrication 50:1)
Startup system	Self-starting motor type, recoil type
Charging capacity V-A	12-1.0
Speed regulating system	Centrifugal weight
Rotation	Left (viewed from output side)
Lighting V-W	12-25 (Search light) 12-3 x 2 (Meter lamp)
Battery	28A19R (12V30AH)

PUMP

Model		P572
Classification		S
Type		High-pressure one-stage turbine pump
Suction port dia. mm		Nominal 75 (fire-fighting screw-type fitting JIS-B-9912)
Discharge port dia. mm		Nominal 65 (fire-fighting screw-type fitting JIS-B-9912)
Performance	Rated pressure MPa(kg/cm^2)	0.70 (7.0)
	Rated discharge m^3/min	1.53
	Rated discharge nozzle mm	ϕ 29.5
	Rated rotation speed rpm	Approx. 4900
	High pressure MPa(kg/cm^2)	1.0 (10.0)
	High-pressure discharge m^3/min	1.06
	High-pressure nozzle mm	ϕ 22.5
	High-pressure rpm	Approx. 5000
	Rated rpm rpm	5200 (Governor set)
Pump chamber sealing		Mechanical unit seal
Vacuum pump		4-blade eccentric rotary type with strainer
Vacuum MPa		Suction head Approx. 9 m (–0.085 or more)
Lubrication		Oilless system
Dimension (overall L x W x H) mm		657 x 584 x 720
Dry weight kg		Approx. 88

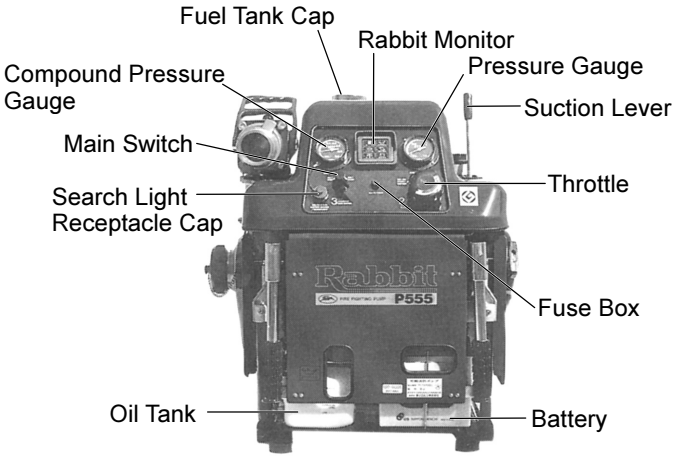
STANDARD UNITS

Designation	No. of units	Designation	No. of units	Designation	No. of units
Root joint	1	Battery	1		

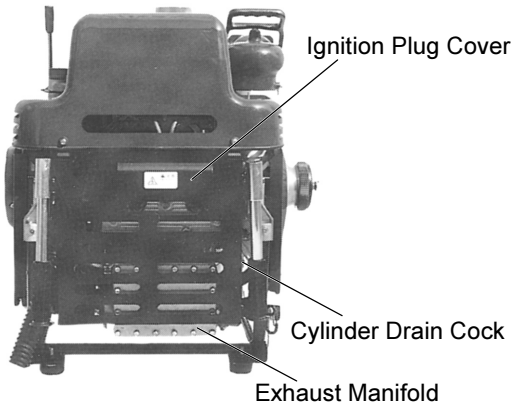
ACCESSORIES

Designation	No. of units	Designation	No. of units	Designation	No. of units	Designation	No. of units
Disassembly tool set	1	Suction port strainer	1	Safety nozzle	1	Instruction manual	1
Pump cover	1	Ignition plug	1	Fuse	1	Automatic battery charger	1

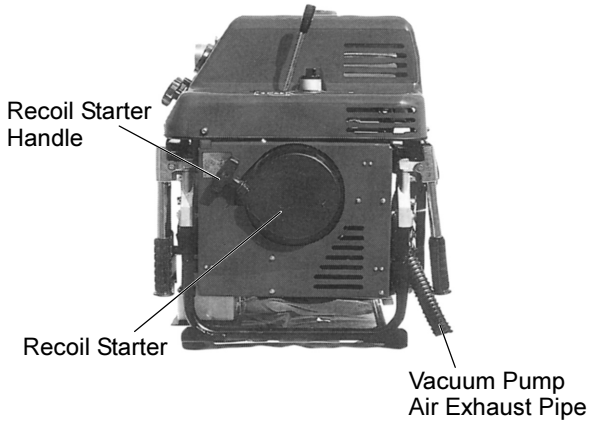
DESIGNATION OF PARTS



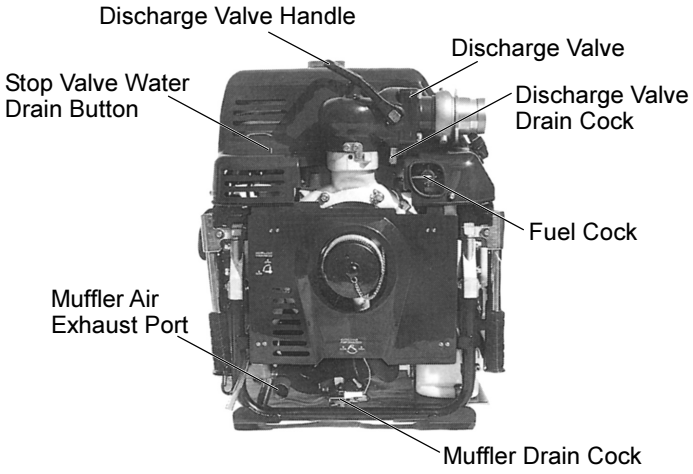
OPERATING SIDE



BACK SIDE



RECOIL STARTER SIDE



PUMP SIDE

BEFORE OPERATION

(1) Confirm that a complete set of the standard equipment and accessories in the package.

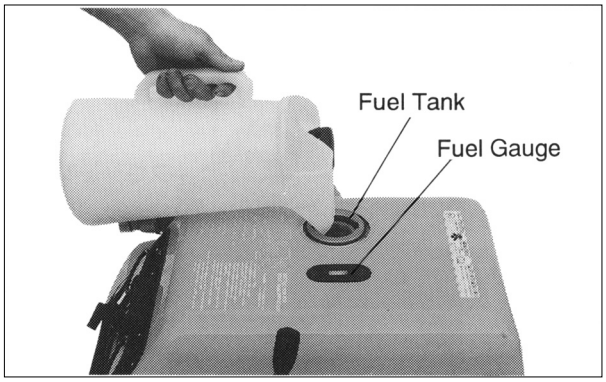
WARNING (2) For (S) Specification, it is necessary to connect the battery with the terminals. First, detach the cover on the operation side, and connect the battery with (+) terminal and (-) terminal. Detach the liquid port plug nearest to the (+) terminal of the battery, and mount the battery liquid level sensor.

PREPARATIONS BEFORE OPERATION

1. Fill the fuel.

DANGER

Fill the fuel tank with automobile gasoline. (Separate lubricating system used: It is not necessary to mix with 2-cycle oil.)
The level of the fuel in the tank can be checked by the fuel gauge on the tank top.



Notes:
1. Never feed fuel full up to the tank feeding port.
2. If fuel stored for a long time emits irritating odor or appears turbid, replace it immediately.
3. If water or dust remains in the fuel cock cup, remove and clean the cup.

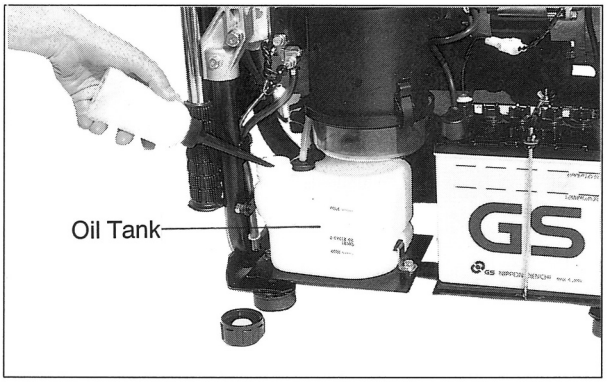
FLAMMABLE **DANGER**

INFLAMMABLE
*Don't close flame.
*Stop engine when supply fuel
*Don't split fuel.

2. Fill the oil.

ATTENTION

Fill the oil tank with 2-cycle engine oil.



Note: Never fill oil fully up to the tank fill port.

3. Set the pump

Pay attention to the following.

WARNING

(1) The muffler is mounted at the bottom part. Never operate on dry grass.

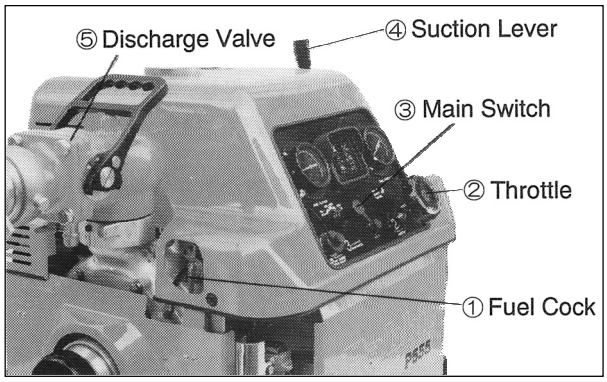
ATTENTION

(2) When carrying the pump, be sure to hold it correctly with the carrying handle.
(3) Set the pump as near as possible to a water suction level so as to minimize suction height. Place the pump as level as possible.
(4) To prevent air bubbles in the suction pipe, place the suction pipe in an up-grade manner.
(5) Attach a strainer or a rattan basket to the port of the suction pipe. If there is fear of sand or dirt suction, place a mat under the rattan basket.
(6) Set the rattan basket at a level about 30 cm under water so that air will not be introduced.
(7) Place the water discharge hose so that it will not be bent halfway.

4. Shut the discharge valve and muffler drain cock.

Note: Keep the cylinder drain cock always "CLOSE" other than in operation described later in "6. For longer no-load operation".

OPERATION

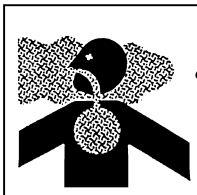


1. Start

(1) Set the fuel cock lever ① to "OPEN" .
(2) Set the throttle ② to "START/SUCTION".
(3) Set the main switch ③ to "RUN". In self-starting, turn it to "START". In start by recoil starter, tread on the step, and pull the recoil starter handle as shown on the right figure.
(4) The engine starts.

Notes:

1. The engine will sometimes start with difficulty due to excess of fuel in re-start after warm-up operation. Then, return the throttle fully toward "SLOW", and start the engine. If the engine does not start yet, set the fuel cock once to "CLOSE" and start the engine. After the engine starts, reset the fuel cock to "OPEN".
2. This fire-fighting pump is equipped with a decompressor to reduce pulling force of the recoil starter handle. The decompressor runs regularly when a leak noise can be confirmed when pulling the recoil starter handle lightly. If there is no leak noise from the decompressor, push the clear button on the top of the decompressor.
3. Be careful not to pull the recoil starter rope excessively to the full.
4. Never start and stop the engine repeatedly without water suction. Fuel mixture remaining unburnt may cause explosion (after-fire).

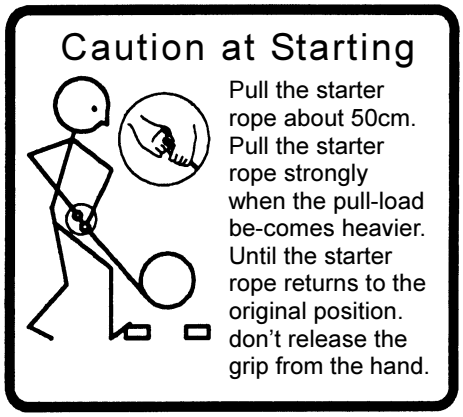


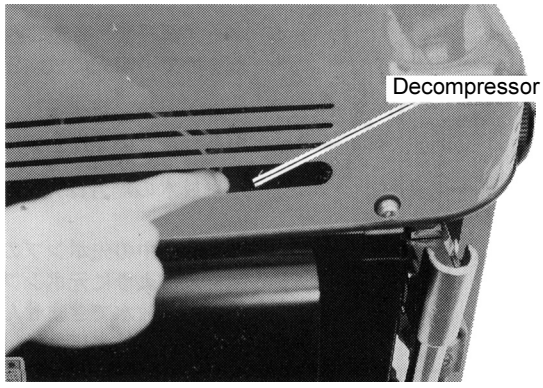
⚠ WARNING

Exhaust gas is poisonous
*Don't operate in bad ventilation room.

⚠ ATTENTION

ELECTRIC SHOCK
*Don't touch Spark Plug or Electric Wires on running.





2. Water discharge

(1) After engine startup, set the water suction lever ④ to "SUCTION" (until the lever come in contact with the stopper), and run the vacuum pump.

(2) When water is discharged continuously from the exhaust pipe of the vacuum pump, reset the water suction lever to "DISCHARGE" securely and smoothly. If there is any bend halfway on the water suction pipe, air may remain there. To prevent this, keep the water suction lever running 3 to 5 seconds longer than actually required.

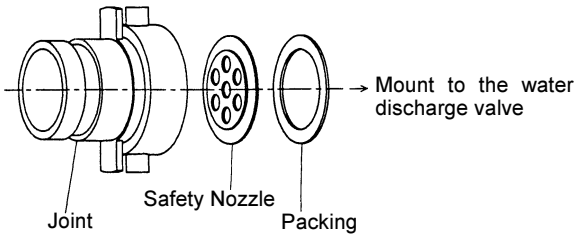
(3) After confirming safety of the pipe end, slowly open the water discharge valve ⑤ keeping the throttle set to "START/SUCTION". After starting water discharge, adjust the throttle to attain adequate discharge pressure.

Notes:

1. If suction height is high, never open the water discharge valve acutely. Water sucked halfway drops and water cannot be discharged sometimes. If cavitation occurs because of too high water suction level, set the throttle to a speed as low as possible.
2. When running the vacuum pump with the water suction lever kept running, set the operating time for 30 seconds or less.
3. The engine is cooled down by water introduced. If the engine is operated without water suction (no-load operation), set the throttle to low speed and never operate the engine more than 2 minutes. This fire-fighting pump is equipped with a safety device designed to stop the engine by detecting temperature rise in cooling water. This safety device sometimes may not function regularly when the throttle is set to medium- or high-speed in no-load operation without cooling water. Be sure to observe the instruction. (Refer to P. 12 "For Longer No-load Operation".)
4. The pump pressure required depends on the number of extended hoses, nozzle diameter, water feeding height, two-line water discharge, etc. Set the pump pressure in response to the water discharge pressure at the nozzle.

ATTENTION

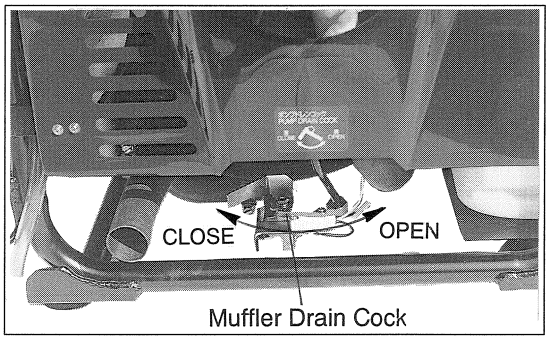
5. Pay attention to a sudden swing of the nozzle, which may occur when water discharge pressure is too high or when the water discharge valve is opened or closed acutely.
6. In relayed water discharge, start the master pump first, and stop the slave pump first.
   Set the water feeding pressure of the master pump so that the compound pressure gauge of the slave pump in operation will read 0.05 to 0.1 MPa (max. 0.6 MPa). The slave pump will not run if the compound pressure gauge read 0 or below.
   The water discharge pressure of the slave pump must be 1.5 MPa or less. If this limit is surpassed, the pressure gauge or pump unit may be damaged.
7. As illustrated, mount a safety nozzle between joint and water discharge valve in operation without pipe-end nozzle (for example, suction from the water tank or water feeding to a relay tank).

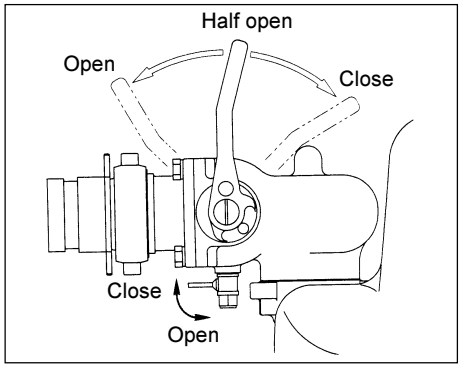


3. Temporary stop of water discharge

(1) When it is necessary to stop the pump provisionally for replacement of a nozzle in water discharge or connection of hoses, turn the throttle to "SLOW", and set the water discharge valve to "CLOSE".

(2) When stopping operation provisionally, with the water suction pipe kept in operation, set the throttle to "SLOW", and stop the engine keeping the water suction lever set to water discharge position. In this case, water will not drop because of the check valve. Start up the engine and open the water discharge valve. Then, water will be discharged. (Re-start the engine within 3 minutes.)





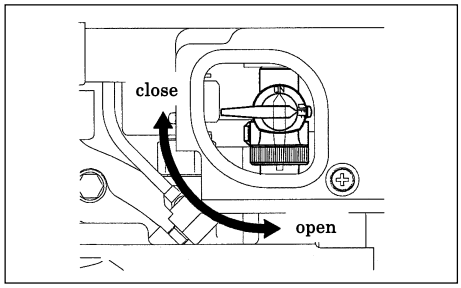
4. Stop

(1) Turn the throttle fully to "SLOW" direction, and set the water discharge valve to "CLOSE".

(2) Reset the main switch to "STOP" after a while, and the engine will stop.

(3) Set the fuel cock lever to "Close".

Note: Never stop the engine at medium- or high-speed operation without setting the throttle to "SLOW". There is a risk of after fire.



5. For longer no-load operation

Keep cooling water in the cylinder, and it will be possible to perform no-load operation at idling for about 10 minutes. In this mode of operation, close the cylinder drain cock. In this operation in cold weather, put anti-freezing solution in the cylinder.
(Refer to P. 17 "CAUTIONS IN COLD WEATHER.)

STORAGE

(1) Set the water discharge valve to “HALF OPEN”, and open the water discharge valve and muffler drain cock. Push the water stop valve drain button and drain water completely. After water drain, be sure to close each drain cock.

(2) After detaching the water suction pipe, re-start the engine. Run the vacuum pump 2 to 3 seconds. After discharging water in the vacuum pump, stop the engine again.

(3) Set the fuel cock lever to "CLOSE".

(4) Dispose of drained fuel in overflow bottle. (Refer to the photo of the next page for overflow bottle.)

(5) Attach the suction port cap and cover the pump before storage.

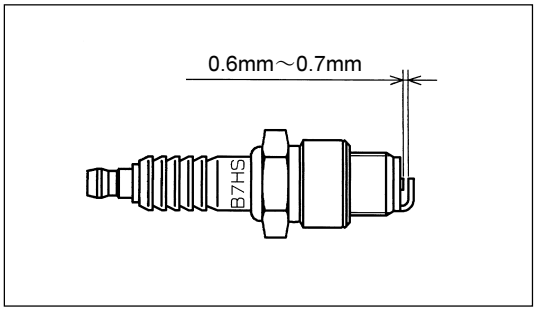
Notes:

1. Incomplete water drain may cause damage due to freezing or corrosion.
2. After using muddy water or sea water, clean the pump with fresh water. Then, never fail to drain remaining water of all the parts.
3. Keep a storage house off moisture.
4. Check the battery charging level and electrolyte level once a month. Charge the battery during storage. (Refer to P. 16 "HANDLING OF BATTERY AND BATTERY CHARGER".)
5. Perform water discharge operation once a month for 5 to 10 minutes with the throttle set at high speed.
6. For long storage, open the carburetor drain cock and drain fuel in the float chamber. (Refer to P. 13 “Carburetor”.) Use completely fuel in the fuel tank or replace it within 3 months.
7. Before storage, confirm that water is completely drained. In operation in cold weather, put an antifreeze mixture in the pump. (Refer to P. 17 "CAUTIONS IN COLD WEATHER".)

MAINTENANCE

ENGINE

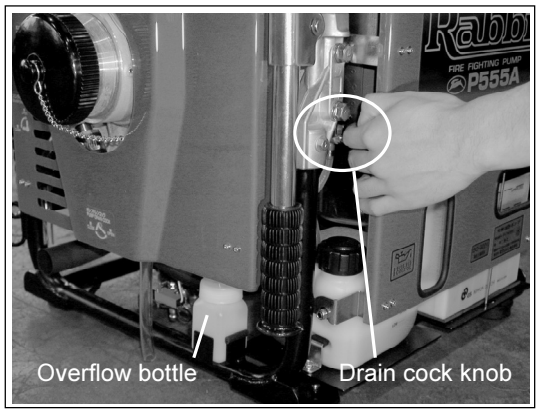
1. Ignition Plug



Clean the electrode contaminated with exhaust gas or carbon.

Ignition plug used : NGK B7HS (P572)
NGK B8HS (P455/P476/P555)
Gap : 0.6-0.7 mm

2. Throttle



The operating force of the throttle can be fine-controlled by the adjusting nut on the throttle body side.

3. Carburetor

In long-time storage of the pump, drain fuel in the carburetor float chamber, as below:

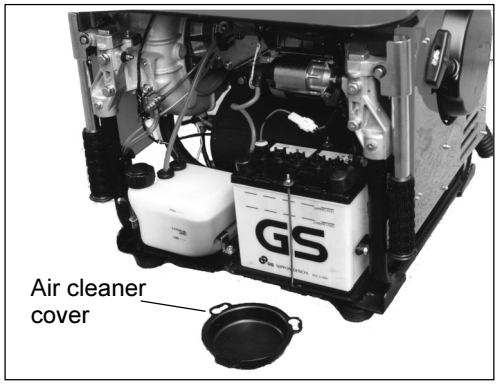
(1) Close the fuel cock.
(2) Pull the drain cock knob and drain fuel. Drained fuel is received by Overflow bottle.
(3) When fuel is drained completely, release your hand from the knob.
(4) Dispose of drained fuel in the bottle. Wipe out spilt fuel, if any, with waste cloth. Enough care should be taken of disposal of the waste cloth.
(5) Replace the bottle and insert the tubes in it again.

4. Air Cleaner Element (Except for P572)

DANGER

Detach the element from the air cleaner, and confirm that it is free of contamination.
If the element is contaminated, clean it with kerosene. After it is cleaned, immerse it in oil mixture (kerosene 2-4: automobile Mobil oil 1), swing off drops completely and attach it to the cleaner main unit.

P455/P476/P555

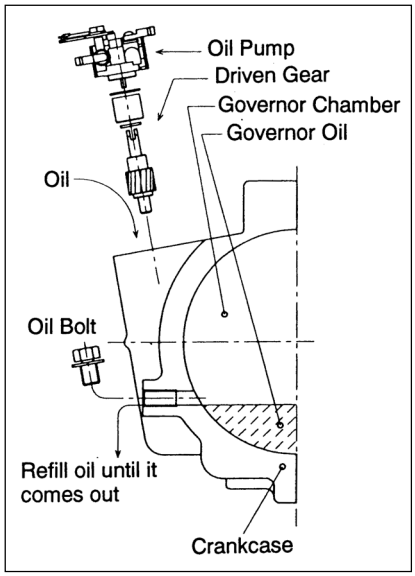


P572

5. Governor Oil

Detach the oil pump, and continue to refill oil until oil comes out from the bolt hole, as illustrated on the right (once a year).

Automobile Mobil Oil : SAE#30, #20 (in winter)
Specified level 50 ml



Note: Under cold weather in winter, it is recommended to use SAE5W30 or SAE10W30 or other types of lubricating oil adapted for operation under cold weather.

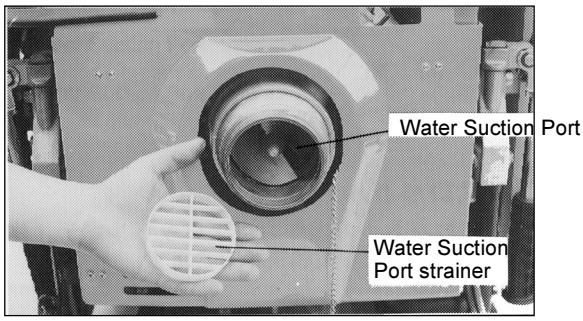
6. Search Light (Option)

When using the search light during engine stop, it is possible to operate it by battery. In this case, change the connection of one line on the back of the receptacle according to the wiring diagram in P. 20. In this connection, the battery discharges much. Be sure to check the battery level.

PUMP

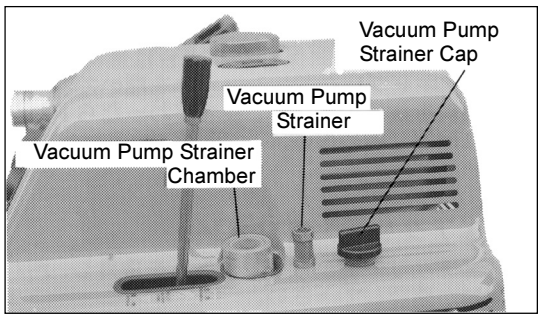
1. Water Suction Port Strainer

After the pump is operated for water containing alga, clear the alga of the water suction strainer.



2. Vacuum Pump Strainer

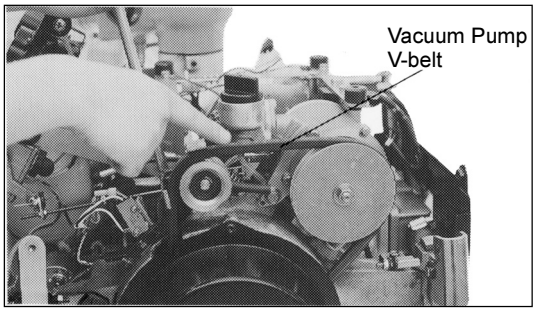
After the pump is operated for water containing dirt, sand or alga, detach the strainer cap, and clean the strainer.



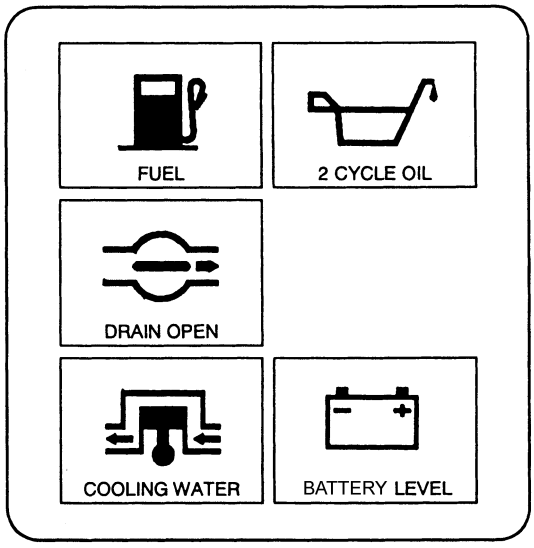
3. Adjustment and Replacement of Vacuum Pump Driving V-belt

(1) If the belt does not run regularly, adjust the belt retainer.

(2) If the belt is extended, the belt tension can be adjusted to some degree by shifting the tension pulley. If the belt tension cannot be controlled or the belt is damaged, replace it with a new one. (Belt used: A-29 V-belt)



RABBIT MONITOR



The pump operating condition control can be centralized on Rabbit Monitor on the operation panel. The monitor displays an alarm in abnormality or stops the engine in an emergency, enabling safety operation of the pump.

1. Operation Check of Monitor

Set the main switch to "RUN", and all LEDs will go on for about 3 seconds (only in (S) specification).
If the LEDs do not go on, there may be some abnormality. Contact the maintenance shop or dealer.

2. Monitor Indication and Remedy

Indication		Monitor Operation		Remedy
	Fuel	If fuel becomes in small quantity, LED goes on.		Refill tank with gasoline.
	2 cycle oil	If oil level become low enough, engine stops to prevent seizure, and LED goes on.		Set main switch to "STOP", refill oil tank with oil, and re-start engine.
	Drain cock	If muffler drain cock opens, LED goes on.		Close drain cock except in drain.
	Cooling water	ON	LED goes on if cooling water pressure is low.	Insufficient engine cooling water may cause over-heating. Increase water pressure by setting throttle at high speed.
		FLICKER	If cooling water temperature becomes too high, engine stops and LED goes on to prevent engine from overheating. (Note 1)	Cooling water temperature rises. Check up causes and remove them.
	Battery Level	ON	If battery voltage lowers, LED goes on (only in (S) specification; in (M) specification, LED goes on in low-speed operation, which does not mean a failure).	Refer to P.16 "HANDLING OF BATTERY AND BATTERY CHARGER".
		FLICKER	LED goes on when electrolyte level is too low (only in (S) specification).	

Notes:

(1) In no-load operation without cooling water, it may not function regularly. Be sure to observe the instructions for no-load operation (refer to P.11, Note: 3).

(2) In addition to checkup by Rabbit monitor, be sure to check up every part at the time of periodical inspection.

BATTERY AND BATTERY CHARGE

1. Battery

Charge the equipped battery before using it, although it has already charged and can be used.

Notes : 1. Be sure to make correct connection with the battery terminals (⊕red, ⊖black).
2. To connect the battery, start with the ⊕terminal, to disconnect it, start with the ⊖terminal.

2. Battery Care

WARNING

(1) The battery electrolyte is diluted sulfuric acid and is very harmful to the skin. Never unscrew the electrolyte cap except when required to refill. When refilling, pay enough attention to keep the electrolyte off the skin. Also, never to spill the electrolyte.

(2) The battery discharges continuously even not in use, so the supplementary charging is required.

* Be sure to recharge the battery using the attached charger, because unlike automobile batteries, this battery cannot be charged during the operation.

(3) The attached charger is an automatic charger, which can automatically switch from the normal charging to the supplementary charging (charging to cover the self-discharged electricity).

WARNING

(4) Check the electrolyte level from time to time. Put distilled water into the battery up to the maximum liquid level, if the electrolyte level is below the level.

3. Battery Charging

WARNING

(1) Clean the battery terminals, by removing dust and dirt from the battery. If the electrolyte level is below the maximum liquid level, put distilled water into the battery up to the maximum liquid level.

(2) Connect the output plug of the battery charger to the socket of this fire fighting pump. If the power switch is tuned on, the power lamp(red) is lit and the charging starts.

(3) The charging is complete when the completion lamp(green) is lit and the power lamp(red) is turned off. The charger goes into the supplementary battery charging.

Charge status ○ : Lit

		Power lamp (Red)	Completion lamp (Green)
Not charged			
Normal charging	< 80%	○	
	≧ 80%	○	○
Compensation charging			○

Notes : 1. The breaker is activated if excessive current is supplied because of a reverse connected battery. Also, the breaker may be activated if the Main Switch is turn to the "CELL" during the charging. Eliminate the causes of the problem, and reset the breaker to the normal position.
2. The useful life of the battery is about 2 years.

CAUTIONS IN COLD WEATHER

1. Cautions in Storage

(1) Use high-grade fuel. (The higher the gasoline quality is, the more gasoline becomes volatile and the easier the startup is.)

(2) Prevent the pump main unit, water discharge valve, vacuum pump and muffler from freezing. After the pump operation is over, discharge water and use anti-freezing solution or alcohol. In some cases, it is advisable to keep the parts warm.

(3) Always keep a required amount of anti-freezing solution.

(4) Confirm that the vacuum pump rotates regularly. If it is frozen and cannot run, heat it with hot water.

(5) Keep the battery always well maintained.

Anti-freezing solution

Mixture ratio		Freezing temperature (℃)
Anti-freezing solution (%)	Water (%)	
10	90	-4.7
20	80	-10.7
30	70	-17.7
40	60	-27.7
50	50	-39.8

2. Feeding of Anti-freezing Solution

(1) After draining water completely from the drain cock of each part, tighten the suction port cap, and close the discharge valve drain cock, muffler drain cock and discharge valve. Attach a tube to the port of muffler drain cock, and place the other end of the tube in the anti-freezing solution.

(2) After engine startup, set the water suction lever to the suction position, and operate the vacuum pump for about 5 seconds. When confirming that the compound pressure gauge indicates a negative pressure, set the water suction lever to the water discharge position and stop the engine. If the pressure does not become negative, confirm that the suction port cap, drain cock, etc. are tightly closed, and repeat the procedure mentioned before.

(3) Cover the cooling water discharge port with your palm and open the muffler drain cock. So the anti-freezing solution will be sucked in. If the solution suction reaches by about 2.5 lit. and dose not proceed further, close the drain cock.

(4) Re-start the engine, keep it in operation for about 5 seconds so the solution will spread totally. Set the water suction lever to the water suction position, return it to the water discharge position when the anti-freezing solution comes out from the vacuum pump exhaust pipe, and stop the engine.

(5) Open each drain cock, and drain the anti-freezing solution. (For longer no-load operation, never discharge the anti-freezing solution from the cylinder drain cock. Refer to P. 12 “For longer no-load operation”.

Notes :

1. In cold weather, the vacuum pump may freeze even in operation. In such a case, detach the vacuum pump strainer cap, and pour 10 ml of the anti-freezing solution. Start the engine, pull the water suction lever, and spread the anti-freezing solution well in the vacuum pump.

3. Cautions in Handling of Accessories

(1) Be sure to dry up a cloth hose or metal pieces.

(2) Pour hot water on a frozen cloth hose.

TROUBLE-SHOOTING

Note: The services of inspection and maintenance for the items in parens in "Countermeasures" shall be submitted to the official staff qualified for the portable fire fighting pumps or to our special agents.

ENGINE

Condition			Cause / Remedy
Difficult startup	Fuel system	Excessive suction of fuel	Possibility of auto choke irregularity. Turn the throttle fully to the "SLOW" side, and perform startup operation again. 《 Possibility of irregularity in the carburetor float and needle valve. 》
		Irregular fuel	Confirm that gasoline becomes old or is mixed with water. If necessary, replace it with new one.
	Electric system	Ignition plug	Confirm that the ignition plug is loosened, the electrode becomes dirty or that the gap is 0.7 mm or more. If necessary, clean the plug, adjust the gap, and retighten securely.
		Irregular magnet	《 Possibility of irregularity in the flywheel magneto coil, CDI coil unit and ignition coil. 》
		Others	Confirm that there in no disconnection. If necessary, perform correct connection according to the wiring diagram.
			Open the fuse box on the operation panel, and confirm that the fuse blows out or not. If it blows out, replace it with a new one.
			Set the main switch to "RUN", and confirm that LED of Rabbit monitor battery voltage display goes on. If it is on, charge the battery (only in (S) specification).
	Decompressor		Confirm that the decompressor is not loosened. If loosened, tighten it securely. If the recoil starter is hard to pull, push the decompressor.
Irregular rotation	Excessive or irregular fuel		Refer to "Difficult startup, Electric system".
	Insufficient fuel suction		Confirm that the fuel tank cap air orifice and fuel passage is not clogged. If clogged, clean it.
	Ignition plug		Refer to "Difficult startup, Electric system".
Abnormal noise	Worn-out parts		《 Possibility of wear in the cylinder, piston and piston ring. 》
	Knocking		《 Possibility of cylinder overheating and knocking because of irregularity in the cooling system. 》
	Partial operation		Partial operation may occur because of irregular explosion if gasoline is old and the ignition plug is irregular. Refer to "Difficult startup, Fuel system, Electric system".
Abnormal overheating of cylinder head			《 Possibility of excessive carbon accumulation on the cylinder head and piston head. 》
			《 Possibility of clogging in the muffler inside and exhaust port. 》
			《 Possibility of clogging in the cooling water passage. 》
			《 Possibility of irregular ignition period of the ignition plug. 》

PUMP

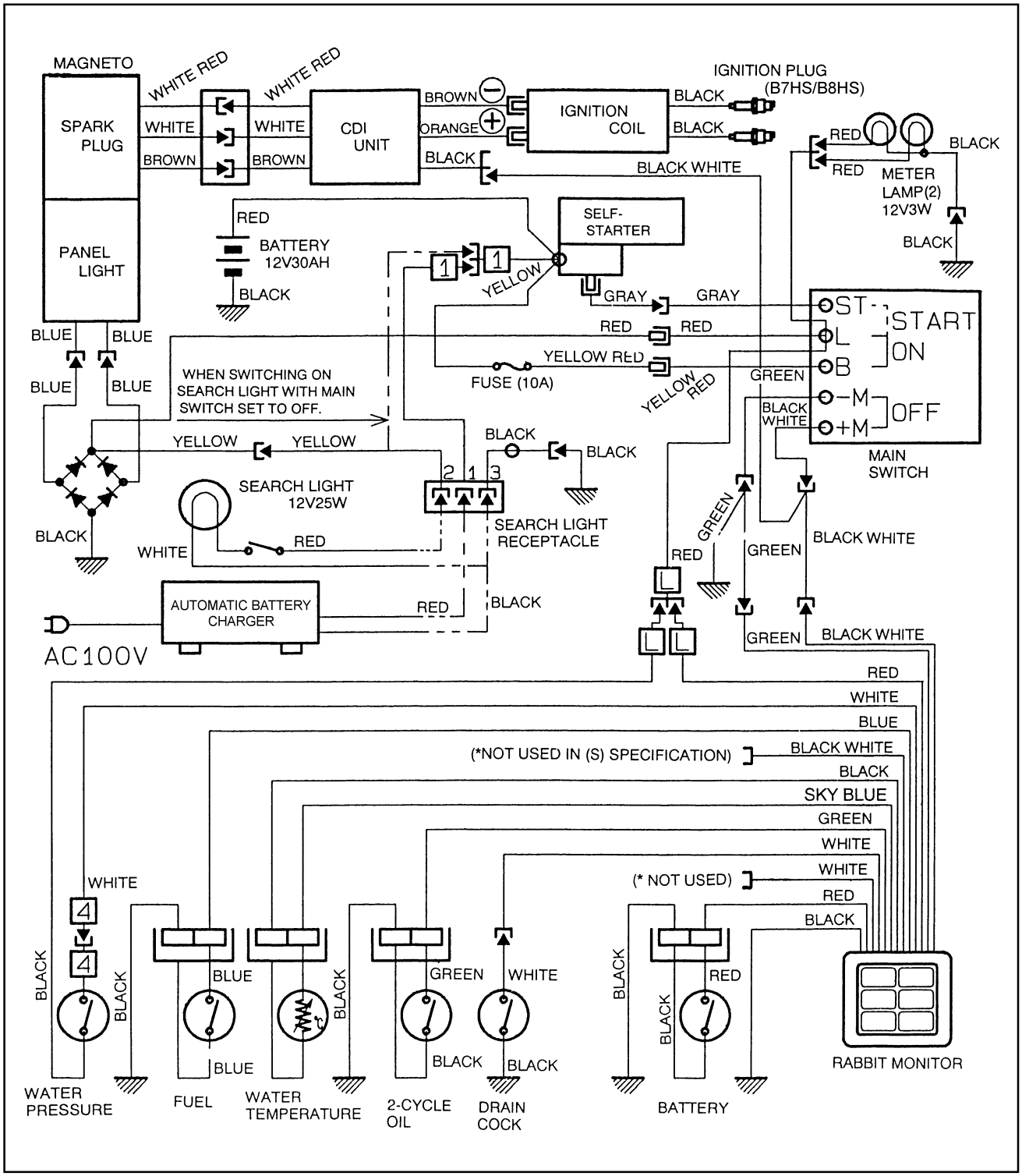
Condition		Cause/Remedy
Impossibility of water suction	Compound pressure Gauge indicates Negative pressure.	Water suction becomes impossible when difference in height between pump and suction level exceeds 9 m. Place the pump so as to minimize the difference.
		Confirm that there is no clogging in the water suction pipe strainer, rattan basket, water suction pipe inside and water suction port strainer. If clogged, remove foreign materials.
		Water suction may be impossible if there is an air pocket in the water suction pipe. Confirm that the water suction pipe is arranged regularly.
	Compound pressure gauge does not indicate negative pressure.	Confirm that the water discharge valve and muffler drain cock are closed. If not, close.
		Confirm that the vacuum pump strainer cap is regularly closed and that the strainer is not clogged. If clogged, clean and tighten the cap securely.
		Confirm that the V-belt is extended or broken. Refer to P. 14 "MAINTENANCE, Adjustment and Replacement of Vacuum Pump Driving V-belt".
		Confirm that the water suction pipe is regularly tightened, and that the water suction portion is regularly placed in water. If not, tighten the water suction pipe regularly, and immerse the water suction part completely in water.
		《 Possibility of leakage in the pump sealing and piping. 》
		《 Possibility of failure in the vacuum pump. 》
Insufficient water discharge pressure	Pump	If the nozzle diameter is too large, water discharge pressure cannot reach a specified level. Check the specification of the nozzle. Replace it with a new one, if necessary.
		Confirm that the water suction pipe strainer, rattan basket, water suction pipe inside, and water suction port strainer are not clogged. --- Refer to "Impossibility of water suction".
	Engine	Confirm that the engine operates regularly. --- Refer to "Irregular rotation".
Impossibility of pump rotation	Pump	Confirm that there are foreign materials in the labyrinth. If there are, remove them.
		Confirm that the pump does not freeze. --- Refer to "Cautions in Cold Weather".
	Engine	《 Possibility of Engine Seizure 》

WIRING DIAGRAM

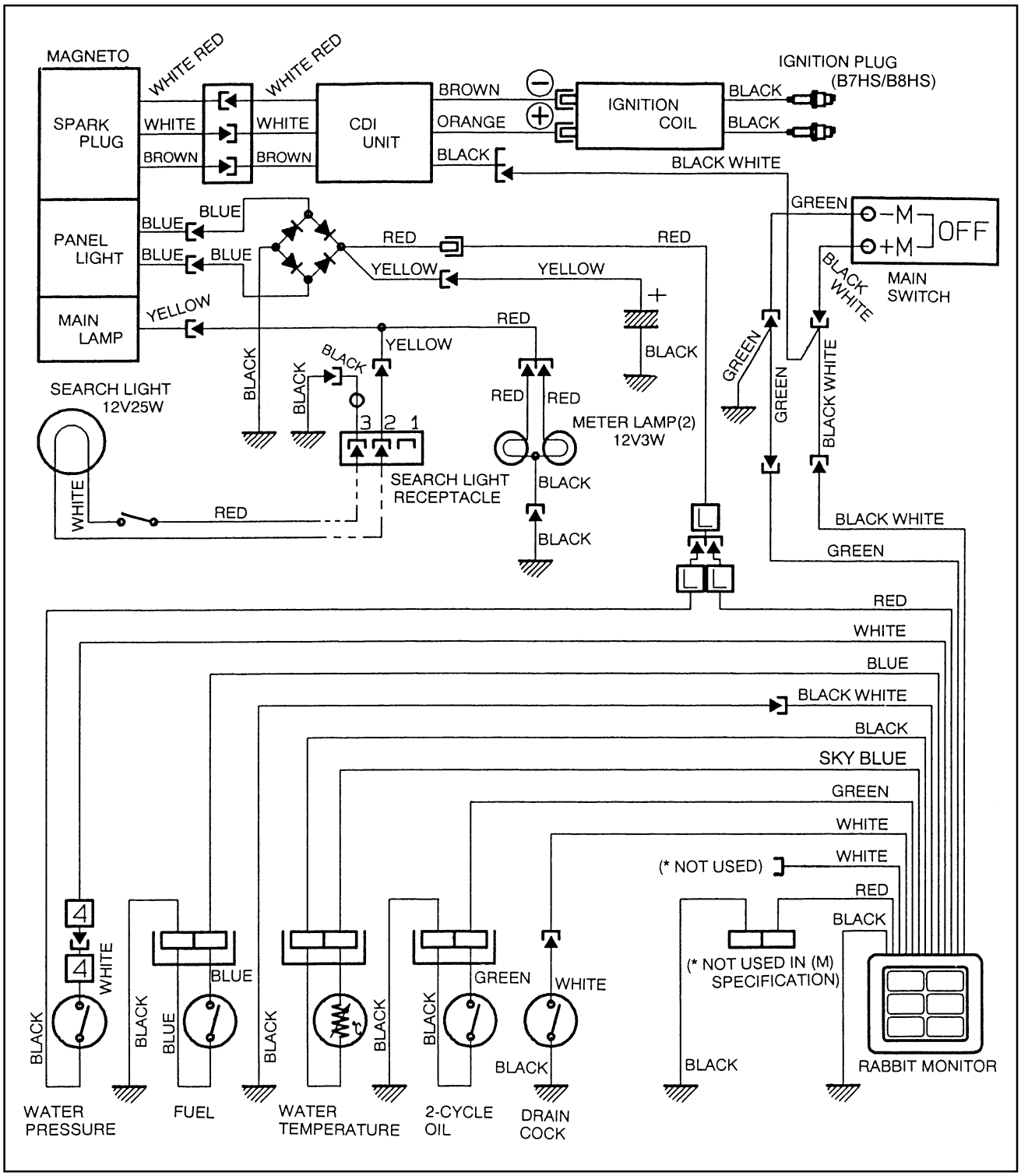
(S) WIRING DIAGRAM

Notes : 1. This pump is equipped the fuse, but pay attention to correct connection with (+) and (-) terminals of battery.

2. In connection with the battery, start with (+). In disconnection, start with (-) terminal.



(M) WIRING DIAGRAM



IHI Shibaura Machinery Corporation

L82900940-1 2013.03 50K