

SHIBAURA

OWNER'S MANUAL

SHIBAURA FIREFIGHTING PUMP

FT300-A

FT400-A1




Please read this operation manual carefully in order to operate the Shibauro Firefighting Pump in safe and in correct manner. If the pump is operated incorrectly, any accident may result. If this manual is missing or damaged, give an order for new one to us or our agent promptly.




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- **For safe operation**

**The operation manual is a part of machine.
Keep this manual carefully with the firefighting pump.**

- In this manual,  mark indicates particularly important instructions for safe operation. You should pay attention specifically to those marked descriptions and observe such instructions.

 Danger	If the machine is operated incorrectly, there is high possibility of death or serious injury.
 Warning	If the machine is operated incorrectly, death or serious injury may result
 Caution	If the machine is operated incorrectly, minor injury or damage of assets may result

- Quality or performance of the machine may be improved or its components may be modified for the purpose of safety. For this reason, contents of the text in this manual or photographs or illustrations may be different from actual ones.

1. Matters to be attended to for safety

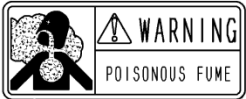
1. Warning label locations

Warning labels are attached to the positions of the firefighting pump as shown below. If the labels are peeled off or damaged, please order new ones telling the part No. as shown for each label.

Operation side

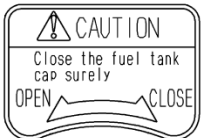


Part No.290192380



Part No.290192390

Non-operation side



Part No.290193110



Part No.290192410



Part No.290192400



1. Matters to be attended to for safety

2. Caution marks

(1) General instructions



Warning

The firefighting pump should be operated only by such a man among fire officers, firemen, volunteer disaster prevention expedition team member, and maintenance/inspection service men that has been specifically trained for safe operation.

⟨If you do not observe the instruction⟩

Serious accident including death may result due to incorrect operation.



Caution

Be sure to carry out periodical maintenance inspections.

⟨If you do not observe the instruction⟩

Accident due to damage of the machine or components may result or firefighting activities may be interfered.



Warning

Wear a helmet, shoes with creepers, and clothes without looseness.

⟨If you do not observe the instruction⟩

You may be caught by the machine, or slip and fall, and injured.



Warning

Do not operate the firefighting pump if you cannot concentrate your attention on operation as you are drunken, fatigued, sick, or under influence of drug.

⟨If you do not observe the instruction⟩

Serious accident may result.



Caution

Do not use the firefighting pump for activities other than firefighting such as civil engineering work, irrigation, water sprinkling, etc.

⟨If you do not observe the instruction⟩

You may flip some objects to injure people or damage assets around you.



Danger

Do not suck in or discharge substances other than water such as combustibles, liquid such as chemical.

⟨If you do not observe the instruction⟩

Explosion, fire, burning, or poisoning may result.



Caution

When throwing away the battery, oil, or grease, entrust a professional industrial waste disposal dealer with their disposal.

⟨If you do not observe the instruction⟩

Fire may break out, you may be burned, or environment may be polluted.

1. Matters to be attended to for safety



Warning

Use only genuine parts and designated attachments.

⟨If you do not observe the instruction⟩

Accident, injury, or machine failure may result.

(2) Cautions before starting operation



Warning

Install the pump more than 3 m apart from combustibles.

⟨If you do not observe the instruction⟩

Fire may be caused because of high temperature exhaust gas.



Warning

Remove dried grass and other objects which may catch fire easily before installing the pump.

⟨If you do not observe the instruction⟩

Fire may be caused by the heated muffler.



Danger

Do not bring fire close when supplying fuel.

⟨If you do not observe the instruction⟩

The fuel may catch fire and explode.



Danger

When supplying fuel, do not allow the fuel level to exceed the “F” mark.

If fuel spills, wipe away immediately and do not bring that cloth close to fire.

⟨If you do not observe the instruction⟩

The spilled fuel and the cloth may catch fire and explode.



Caution

After supplying fuel, close the fuel tank cap securely.

⟨If you do not observe the instruction⟩

The fuel may catch fire and explode.



Warning

Do not install the pump indoors or in the tunnel or the like where is badly ventilated.

⟨If you do not observe the instruction⟩

You may get poisoned by exhaust gas.



Caution

The firefighting pump should be carried, loaded or unloaded by two persons.

⟨If you do not observe the instruction⟩

The pump may drop on your foot and injure, or you may get a crick in the back.

1. Matters to be attended to for safety



Caution

Connect the fire hose securely and make sure that it does not fall out.

⟨If you do not observe the instruction⟩

If the hose falls out while water is being discharged, it may injure people around it.



Caution

Avoid bending, twisting or sharp turn of the fire hose when installing.

⟨If you do not observe the instruction⟩

The hose may leap up and injure people around it.

(3) Caution during operation



Caution

After draining the fuel from the carburetor, wipe away the spilt fuel immediately.

⟨If you do not observe the instruction⟩

The spilt fuel may catch the fire.



Caution

When starting the engine using a rope, do not allow people to be within 2 m around the pump.

⟨If you do not observe the instruction⟩

They may be beaten by your elbow or the rope and injured.



Danger

Before replenishing the fuel during operation, wait until the engine cools down enough.

⟨If you do not observe the instruction⟩

The fuel may catch fire and explode.



Caution

Open and close the water discharge valve always after returning the engine speed to slow.

Hold the play hose positively and wear the back band before discharging the water.

⟨If you do not observe the instruction⟩

You may lose control of the play hose and be injured when water discharging is started.



Caution

Do not direct the nozzle to other people or do not peep into it.

⟨If you do not observe the instruction⟩

You may be sent flying by high pressure and injured.



Caution

Do not touch the ignition plug or high-tension cord during operation.

⟨If you do not observe the instruction⟩

You may receive an electric shock.

1. Matters to be attended to for safety



Caution

Never touch the muffler and exhaust pipe during operation since they become very hot.

⟨If you do not observe the instruction⟩

You may be burned.

(4) Caution for inspections and services



Warning

When the battery cap is removed, do not bring fire close to it.

⟨If you do not observe the instruction⟩

The electrolyte in the battery may catch fire and explode.



Warning

The electrolyte of the battery is strong acid. Do not allow it to touch your body or clothes.

If the electrolyte remains, dilute it with water to more than 10 times and then discard.

⟨If you do not observe the instruction⟩

You may be burned or clothes or assets may be damaged.



Caution

Before starting inspections or service, stop the engine and wait until it cools down sufficiently.

⟨If you do not observe the instruction⟩

You may be hurt or burned and fire may occur.



Caution

When disconnecting the battery cord, remove the (-) cord first and when installing, install the (+) cord first.

⟨If you do not observe the instruction⟩

Short circuit may occur and burn you.



Warning

Remove the packing materials from the charger when charging with it.

⟨If you do not observe the instruction⟩

Fire may break out.



Caution

Install the charger at a dry and well-ventilated place where it does not get wet.

⟨If you do not observe the instruction⟩

Electric shock or fire may result.



Caution

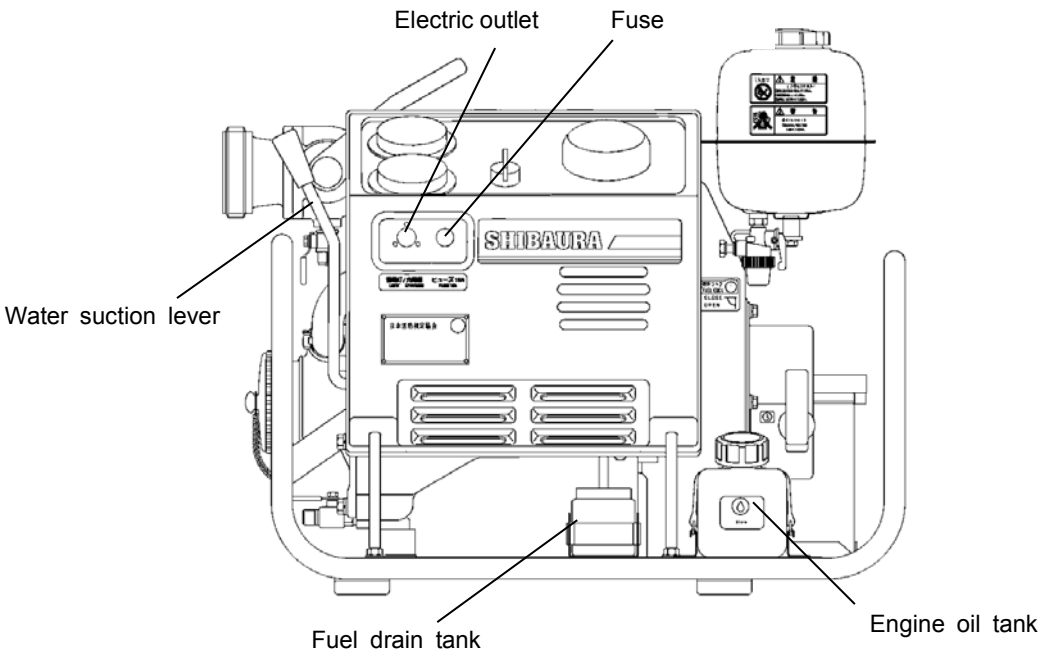
Only use a designated charger.

⟨If you do not observe the instruction⟩

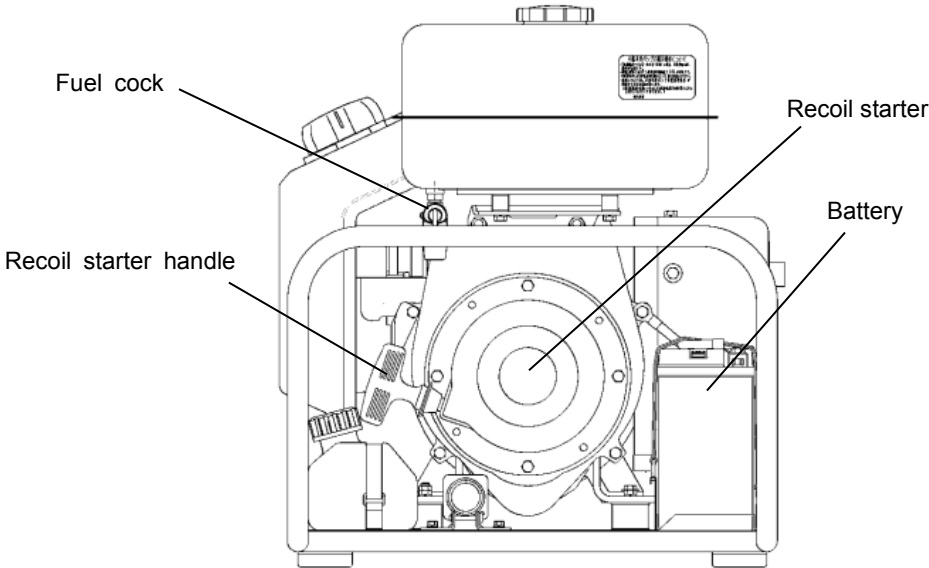
Fire may occur due to overheat or damage of the wiring by a fire.

2. Name of components

Operating side

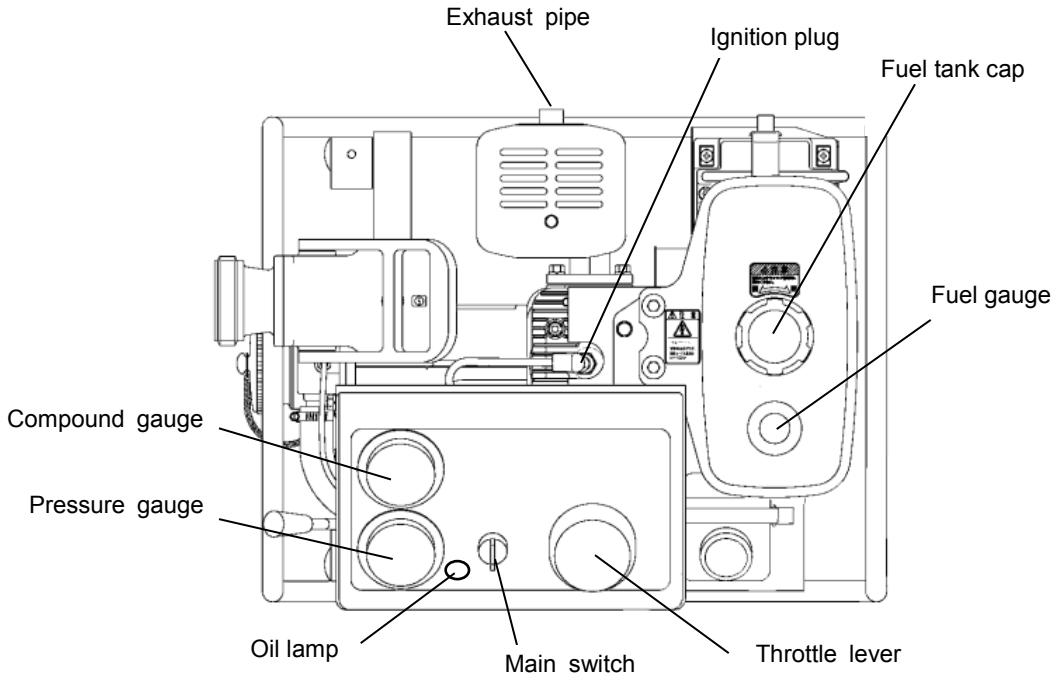


Recoil starter side

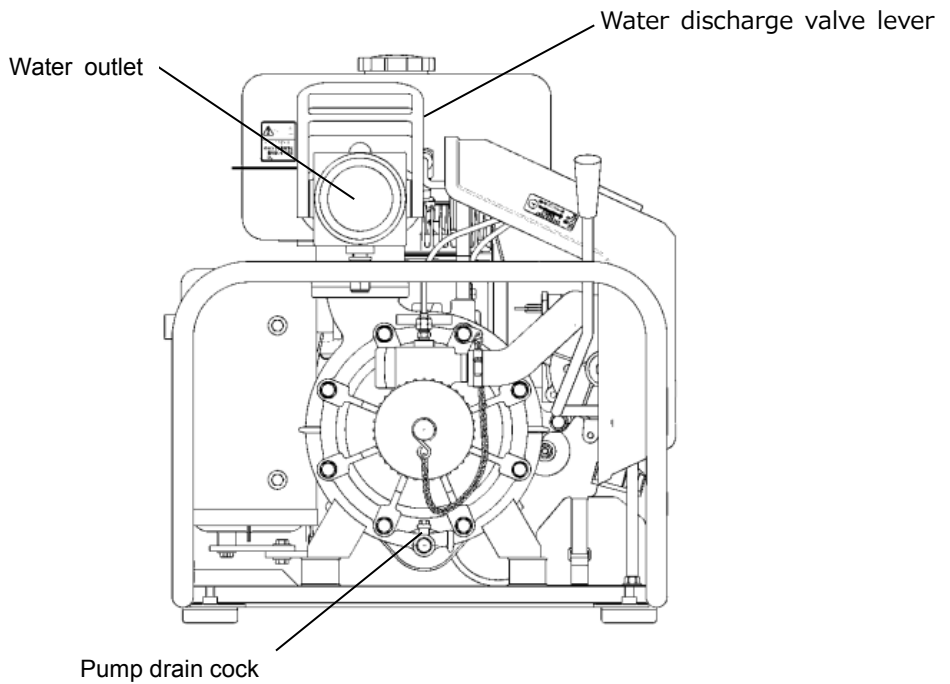


2. Name of components

Top side



Pump side



3. Handling of pump (Before starting operation)

1. Unpacking


- (1) Check the name of the machine shown on the box surface to see whether it is what you ordered.
- (2) Cut the band bound on the box.
- (3) Pull up the box; the main unit of the machine and accessories will come out.
- (4) Check that the following components are included.

A. Main machine unit (One as ordered? Not damaged?)	1
B. Battery	1
C. Charger	1
D. Tool bag	1
E. Pump cover	1

The main unit is covered with a thin vinyl cover. Be sure to remove it before operating the machine.

2. Mounting the battery

- (1) Fix the battery with the supplied rubber band to the battery box.
- (2) Connect the two (+) battery cords (red) and then (-) cord (black) with the attached hexagon bolts and nuts.

 **Caution**

- When disconnecting the battery cords, disconnect the (-) cord first and connecting, connect the (+) cord first.
- If not, short circuit may result leading to a fire or you may get burnt.

- (3) Charge the battery for 2 to 3 hours.

This battery is sealed type requiring no water replenishment. See the operation manual for the battery for details.



3. Handling of pump (Before starting operation)

3. Replenishing the fuel

- (1) Supply the fuel into the tank (tank capacity 4.0L).
The engine of this firefighting pump is fueled independently of the lubricating tank. Supply automobile regular gasoline up to the “F” mark of the fuel gauge. Do not use mixed gasoline and Bio-gasoline.



! Danger

- Do not bring a fire close to the engine when supplying fuel.
- Do not allow the fuel to exceed the “F” mark of the gauge.
- If the fuel spills, wipe it away immediately. Do not bring that cloth to a fire
- It may catch fire and explode.

! Caution

- After supplying fuel, close the fuel tank cap securely.
- If not, the fuel may catch fire and explode.

- (2) Supply 2-cycle engine oil (tank capacity 0.4L).
The fire pump is a separate filling type. Supply the 2-cycle engine oil to the engine oil tank provided on the lower part of the pump.



Caution
Lights when the oil tank level is too low thereby stopping the engine.

! Caution

- If you want to supply the 2-cycle oil, please put the oil of same brand and same grade.
- At the time of 2 cycle oil supply, please prevent water and dirt from the oil inlet.
- Cause of the malfunction or equipment failure of the engine.

! Caution

- Oil spills, please wipe completely with a cloth or the like.
- There is a risk of injury by falling slipped.

3. Handling of pump (Before starting operation)

4. Installation

- (1) Place the pump on a flat place close to a water source.



Warning

- Install the pump more than 3 m from combustibles.
- Remove dried grass and other objects which may catch fire easily before installing the pump.
- If not, fire may be caused by the heated muffler.



Warning

- Do not install the pump indoors or in the tunnel or the like where is badly ventilated.
- If not, you may get poisoned by exhaust gas.

- (2) Be sure to attach the strainer and a rattan basket to the water suction port of the water suction hose and position it more than 30 cm below the water level. If it is positioned above the specified level, air may be sucked preventing water discharging.
- (3) Arrange the pump so that the water suction height is 3 m or less as low as possible. When it is too high, the pumping capacity may deteriorate or water may fall.
- (4) Arrange the water suction hose to go up toward the pump and tighten it positively to the water suction port of the pump. If the hose goes up or down unevenly, water may not be discharged smoothly.



Caution

- Connect the fire hose securely and make sure it does not fall out.
- If the hose falls out while water is being discharged, it may injure people around it.




Caution

- Avoid bending, twisting or sharp turn of the fire hose when installing.
- The hose may leap up and injure people around it.

3. Handling of pump (Before starting operation)


5. Operator

- (1) Though the firefighting pump is small-sized, it is a high performance machine generating strong power. If it is operated in a wrong way, serious accident including death may be caused.

 **Warning**


- The firefighting pump should be operated by such a man among fire officers, firemen, volunteer fire prevention expedition team member, or maintenance/inspection service man that has been specifically trained for safe operation.

- (2) Clothing should be suited to work.

 **Warning**

- Wear a helmet, shoes with creepers, and clothes without looseness.
- You may be caught by the machine, or slip and fall, and get injured.


- (3) Do not operate the firefighting pump when you are sick.

 **Warning**

- Do not operate the firefighting pump if you cannot concentrate your attention on operation as you are drunken, fatigued, sick, or under influence of drug.
- If you do not follow the instruction, serious accident may result.

6. Transportation

- (1) Transport the firefighting pump holding at the frame.

 **Caution**

- The firefighting pump should be carried, loaded or unloaded by two persons.
- The pump may drop on your foot and injure, or you may get a crick in the back.

3. Handling of pump (Operating method)

1. Starting the engine

Before starting the engine, close the water discharge valve and pump drain cock.



Water discharge valve

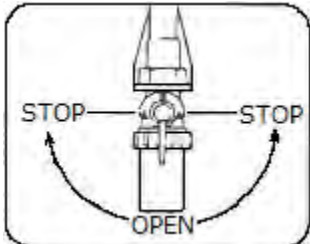


Drain cock



Pump drain cock

- (1) Open the fuel cock ①
Pull down the fuel cock lever to the lowest point to open it.



- (2) Set the throttle lever ② to the "START" position.



- (3) Turn the main switch ③ fully clockwise to the "START" position.
After the engine is started, leave your hand from the switch.




- (4) When using the rope to start the engine, pull the recoil starter handle ④ forcibly.



3. Handling of pump (Operating method)

- In case an engine does not start so well due to an excessive fuel like after running for warm-up, turn off the fuel cock, drain all of gasoline in carburetor, then start the engine again.
After the engine starts, turn on the fuel cock. When it stops, just take the starting operation again.

 **Caution**

- When you drain the fuel of the carburetor, please wipe the immediately flowed out fuel.
- It may catch fire and explode.

- To alleviate the power of pulling the recoil starter handle, a decompression valve is equipped. It is OK with the roar of the air leakage when the recoil starter handle draw out. If there is not the roar of the air leakage, please push a clear button located at the upper of the decompression valve.



2. Sucking up the water

- (1) Set the throttle lever ② to the "SUCTION" position.
- (2) Pull the water suction lever ⑤ toward you and operate the vacuum pump to suck up the water.
 - When the pointer on the pressure gauge starts to move, return the water suction lever promptly.



3. Discharging the water

- (1) Open the water discharge valve lever ⑥ gradually to "→O" position until it stops.



3. Handling of pump (Operating method)

- Communicate with the person at the snout and discharge water adjusting the pressure with the throttle lever ② depending on the situation of the fire site.
 - Keep the pointer on the pressure gauge and compound gauge in the green range when discharging the water.
- (2) By inserting the search light plug into the receptacle, the lamp lights up.



Caution

- Open and close the water discharge valve lever always after returning the engine speed to low speed.
- Hold the nozzle at the end positively and wear the back band before charging the water.
- If not, you may lose control of the nozzle at the end and be injured when water charging is started.



Caution

- Do not direct the nozzle to other people or do not peep into it.
- You may be sent flying by high pressure and injured.



Caution

- Do not touch the ignition plug or high-tension cord during operation.
- You may receive an electric shock.



Caution

- During operation or immediately after operation, the exhaust pipe becomes very hot. Never touch them
- You may be burnt.

3. Handling of pump (Operating method)

4. Stopping the engine

- (1) Set the throttle lever ② to the “SLOW” position.
 - If the engine is hot, cool it down by continuing low speed operation for about 1 minute.
- (2) Turn the water discharge valve lever in the “→ Close” direction and close the water discharge valve.
- (3) Set the main switch ③ to the “Stop” position.



5. Draining the water

After the firefighting pump was operated, much water remains inside. If the water is left in the pump, rust may be generated or the pump may be damaged due to frozen water in the cold season. Be sure to drain water before storing the firefighting pump.

- (1) After sea water or dirty water is used, be sure to keep clear water discharged for more than 5 minutes.
- (2) Open the pump drain cock.
- (3) Open the drain cock of water discharge valve then open and close the water discharge valve lever.
- (4) Close the pump drain cock and the drain cock of water discharge valve.
- (5) Screw in the cap of the water inlet.
- (6) Start the engine and pull the water suction lever for about 5 seconds.
- (7) Stop the engine.
- (8) Open the pump drain cock, release the vacuum and close the drain cock again.

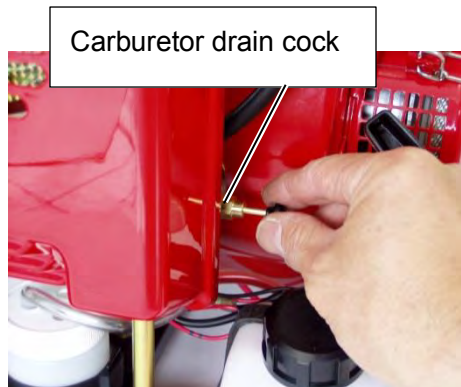
If the vacuum is not released, rubber of valves may be deformed shortening its service life.

6. Storing the pump

The firefighting pump is such a machine that is usually out of operation after being operated for a short time. Therefore, storing it under proper condition is essential in order that the pump operates satisfactorily when required next time or to secure its long life.

3. Handling of pump (Operating method)

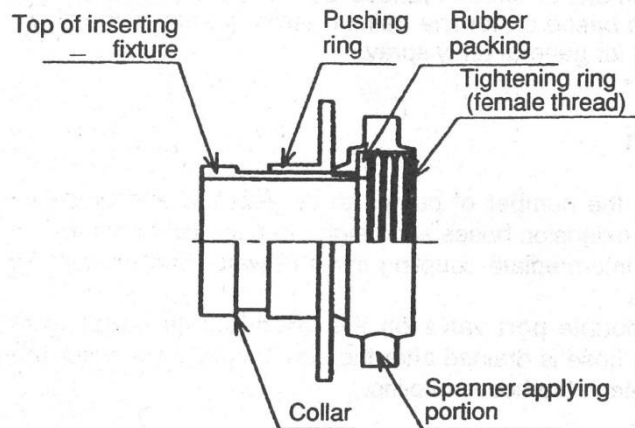
- (1) Environment
Place the pump at a dry and cool place avoiding dust or direct sun beams.
- (2) Supply fuel and lubricating oil respectively to the specified levels.
- (3) After close the fuel cock, drain the fuel in the carburetor from the carburetor drain cock on the recoil starter side.
- (4) Cover the pump with the pump cover.



Caution

- When you drain the fuel of the carburetor, please wipe the immediately flowed out fuel.
- It may catch fire and explode.

7. Connecting a hose



Warning

- Insert the plug-in intermediate fixture until clicking. Hold the receiving fixture and pull the plug-in fixture to check that the claw is hitched on the collar and joined firmly.
- In case of a screw type intermediate fixture, tighten positively until the packing of the receiving fixture (female screw) touches the plug-in fixture (male screw).
- While the plug-in type intermediate fixture is used (while water is being discharged), never touch the pushing ring. If the pushing ring is pushed in while the water is being sent, the fixture may be disconnected, causing an accident resulting in injury or death.

3. Handling of pump (Discharging with multiple pumps)


In the mountains and forests or in urban areas which are inconvenient for water transportation, multiple pumps will be required in order for the water to reach the fire by relaying the pumps. In this case, pumps are separated far from each other and firemen are required judgment based on the existing state and systematic activities based on training. General method of relay operation is described below.

1. Installation

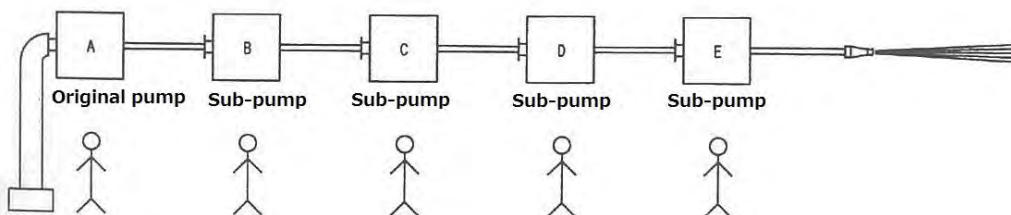
- (1) Determine the number of pumps and places of their installation depending on the number of extension hoses and height from the water source.
- (2) Screw in the coupler to the water suction port to connect the fire hose.
- (3) Fit a two-way valve to the coupler of the water discharge valve beforehand.
The hose coupler may not be removed until the water in the hose is drained after the water is discharged.

2. Operation (Necessary an operator for all of pump each)

- (1) Open the water discharge valve or all sub-pump in advance.
- (2) Send water to the original pump first and then to others sequentially.
- (3) Check the pressure scale in the sub pumps and increase the engine speed regulate the discharging water.
The sub pump: Should be more than 0.05MPa in a scale of compound gauge pressure, be less than 1.2MPa in a scale of power.
- (4) If there is not enough the power of water discharge at the tip of hose, increase the engine speed of the original pump, then the second of one which is closer from the original, sequentially.
- (5) When stopping water discharging, decrease the engine speed of the last pump first and stop gradually.

 **Caution**

○ If the nozzle at the end of the hose or water discharge valve is closed while water is being discharged, the pressure in the pump may increase extraordinarily, and the pump or hose may be broken.



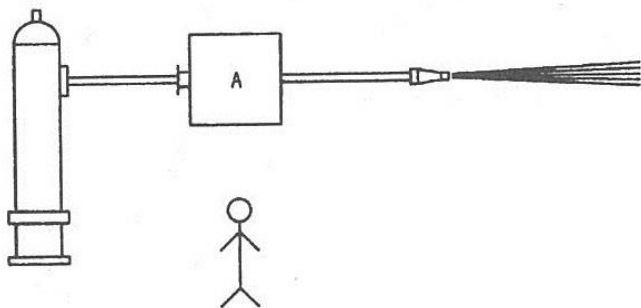
3. Handling of pump (Suction and discharge of water from Fire hydrant)

1. Suction and discharging of water from Fire hydrant

- (1) Capacity for supply water of the fire hydrant
It is necessary to check an enough volume for discharging water from the fire hydrant in advance.
It would be impacted by some factors, diameter of the hydrant, the condition of piping, an initial water pressure and so on.
The capacity of supply water would be less if the diameter was so small although the initial water pressure is high.
In the other hand, it can be high capacity for water supply with wider diameter in spite of low water pressure.
- (2) Method of water supply
 - ① Avoiding from any damage of the suction hose with the higher water pressure, choose a fire hose only with a coupler for hose connected.
 - ② Before connection with the hose, discharge some water from the hydrant for removing contamination.
 - ③ Basically, the discharge valve of the hydrant should open completely, except too much high water pressure.

2. Discharge

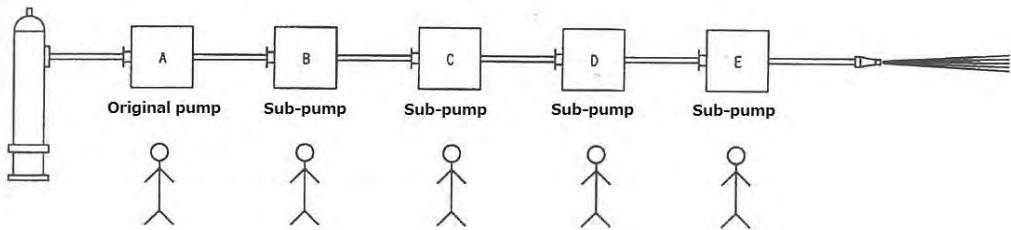
- (1) One pump
 - ① Open the water discharge valve of the pump, including a nozzle of installed.
 - ② Open the valve of the hydrant before an engine start, and check the pressure scale of the pump.
 - ③ Start the engine and discharge water.
 - ④ Adjust the engine speed for enough pressure of water at the discharge.
 - ⑤ In case of less water pressure, change the number of hose.
 - ⑥ When stopping water discharging, close the valve of the hydrant at first, and then decrease the engine speed. Finally stop the engine.



3. Handling of pump (suction and discharge of water from Fire hydrant)

(2) Plural pumps

- ① Open the water discharge valve for ALL of pumps at first.
- ② Open the valve of the hydrant before an engine start, check the pressure scale of the original pump.
- ③ Start the engine for the original pump at first, then it can send water sucked from the hydrant to the next pump.
- ④ Start the engines for the next following pumps.
- ⑤ Check the pressure scale of the last pump and increase the engine speed for the proper pressure and discharge of water.
- ⑥ In case of less water pressure at the nozzle, change the pump location and the number of the pump.
- ⑦ When the water discharge stop, decrease the engine speed for the pump which is closer from the nozzle for water discharge, then the engine stop. Finally the valve of the hydrant may close.



3. Handling of pump (Operation in cold districts in winter)

1. Before starting the engine

- (1) In cold seasons, battery performance deteriorates remarkably. Charge the battery periodically as such as possible.
- (2) Pull the rope of the recoil starter gently to check that the pump is operated. If the pump does not operate, the pump is freezing. To melt the frozen pump, supply hot water from suction port or place the pump in a warm room.
- (3) Turn the belt of the vacuum pump by hand to check the vacuum pump operates. If not, the vacuum pump is freezing. To melt the frozen vacuum pump, blow warm air to the outside of the vacuum pump or place the pump in a warm room.



Danger

- Do not use fire to melt the frozen water.
- The fuel may catch the fire and explode.

2. Starting the engine

- (1) Immediately after the engine is started, the operation may not be smooth. Idle the engine for several minutes at a low speed until the engine is warmed.

3. Treatment after discharging water

- (1) Drain water from the pump (see page 16).
- (2) Attach the suction port cap.
- (3) Start the engine.
- (4) Connect the drain cock of the pump and the vessel of the anti-freezing solution with a hose, open the pump drain cock pulling up the suction lever to suck up the anti-freeze mixture. (Concentration of the anti-freeze mixture is about 40%.)
- (5) When the anti-freeze mixture comes out of the discharge pipe of the vacuum pump, return the suction lever and close the pump drain cock.



Caution: Do not use alcohol since it damages the rubber seal.

4. Periodical inspections

1. Periodical inspection schedule

Item	Every running	Every month	Every 6 months	Every year
Replenishment of fuel	●			
Replenishment of 2 cycle engine oil	●			
Cleaning of dust, etc. from outside	●			
Battery charging		●		
Cleaning of fuel filter			●	
Changing fuel in tank			●	
Cleaning of ignition plug			●	
Inspection of V belt			●	
Starting and vacuum test		●		
Water suction and discharge test		●		

Caution:

Above table indicates inspection timing under general operating condition. If the pump is operated under special condition, inspect it without regard to the above schedule.



Caution

- Be sure to carry out the periodical inspections.
- If not, accidents due to failure may occur or the firefighting activities may be interfered.

4. Periodical inspections

2. Inspection method

To keep the safety of the firefighting pump and make use of every possible function, periodical inspections are essential. Inspect the firefighting pump correctly and in safe following the procedure below.



Caution

- Start the inspections and services after the engine is stopped and has cooled down sufficiently.
- If not, injury, burnt, or fire may result.

- (1) Check and charging of battery
 - A) Installation and removal of battery.



Caution

- When disconnecting the battery cord, remove the (-) cord first and when connecting, connect the (+) cord first.
- If not, short circuit may occur and cause a fire or burn you.

- B) Auxiliary charge
Battery charging level decreases day by day due to self-discharge even if the battery is not used. Consumption by the self-charge, starting motor, lamps, etc. should be supplemented by charging.



Caution

- Be sure to use the specified charger.
- If not, fire may arise due to overheat, burning of wiring, etc.




Caution

- When the battery cap is removed, do not bring a fire close to the battery.
- The electrolyte may catch the fire and explode.

- C) Replacing timing
Battery performance is rapidly deteriorated in about 2 years even if the battery is correctly handled. It is recommendable to replace the battery earlier.

4. Periodical inspections


 **Caution**

- Entrust a professional industrial waste disposal dealer with disposal of the battery, oil, grease, etc.
- If not, fire, burnt or environmental pollution may result.

(2) Handling of Shibaura full-automatic charger


- A) Unpacking
Take out the charger from the box.



 **Warning**

- Remove packaging materials from the charger when charging with it.
- If not, a fire may be caused.

- B) Place of installation

 **Caution**

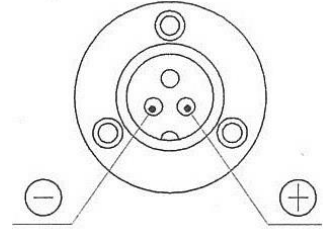
- Install the charger at a dry and well ventilated place where the battery does not get well.
- If not, electric shock or fire may result.

- C) Battery charger Operating Manual
- ① Turn off every current consumer which is connected to the Battery and Pump.
 - ② Make sure power switch on the Battery Charger is OFF.
 - ③ Plug the connector of Battery Charger into AC outlet.
Applied AC voltage is due to the following.

Model	Applied AC voltage
FT300-A	220V
FT400-A1	100V

4. Periodical inspections

- ④ Plug the Battery Charger cord into the pump socket.



- ⑤ Turn on the power of the Battery Charger. POWER LED (RED) will turn on, and will start charging automatically.
- ⑥ CHARGE UP LED (GREEN) will turn on if the battery has reached more than 80 percent charge level. Once the battery has reached full charge, it will maintain the battery at full charge (GREEN LED).
- ⑦ To stop charging battery, turn off the power before unplugging the connector and cord.

	POWER LED (RED)	CHARGE UP LED (GREEN)
POWER OFF	-	-
CHARGING	ON	-
80% CHAEGED	ON	ON
FULL CHAEGED	-	ON



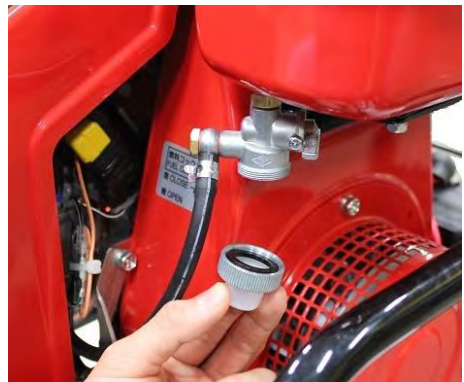
- D) Battery Charger safety function
Safety Function shutdown the circuit when the Battery Charger detects the unusual power current.

4. Periodical inspections

E) Troubleshooting

CASE	CAUSE	SOLUTION
POWER LED (LED) will not turn on	Improper connection of power connector	Connect the plug firmly
CHARGE UP LED (GREEN) will not turn on	Improper connection of Battery Charger cord	Connect the cord firmly
	Breaker trip	Get rid of the cause of the breaker trip, and then press the knob to recover battery.
	Over discharged battery	Recharge the battery. Replace the battery if you cannot recharge.
POWER LED (GREEN) turn on too soon	Battery wear out	Replace the battery with a new one.

- (3) Cleaning of fuel cock filter
- Close the fuel cock.
 - Untighten and remove the ring nut with pliers or the like.
 - Wipe away the fuel in the cup with cloth or the like.
 - Remove the filter from the fuel cock main unit and wash it in gasoline.
 - Install the filter, cup and ring nut to the original position positively. Be sure to open the fuel cock and check that no fuel leaks.
 - After inspection, close the fuel cock.



- (4) Change of fuel in tank
- After the fuel is stored for a long time, it may deteriorate and not start the engine smoothly. Sediment may attach the carburetor and rust generated. When the fuel has decreased down to the middle of the specified fuel level, replenish the fuel so that those troubles do not occur. Changing the fuel with new one every 6 months is recommendable.



Caution

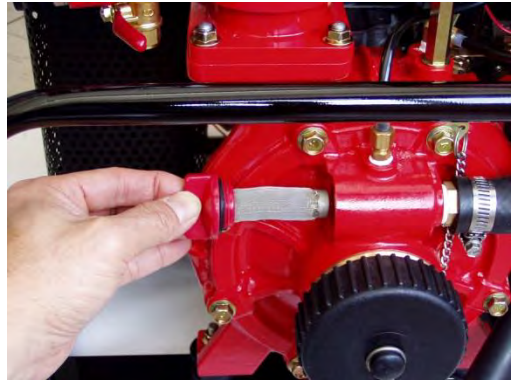
- Do not close the fire when replenishing fuel.
- The fuel may catch the fire and explode.

4. Periodical inspections

(5) Cleaning the water suction strainer

If the water suction strainer is clogged, water suction performance deteriorates. After absorbing water from a source of inferior water quality, always clean the water suction strainer.

- A) Remove the cap of the strainer.
- B) Pull out the strainer and wash away dust, sand and other foreign materials cleanly in water.
- C) Wash the recess for the strainer and cap.
- D) Insert the strainer and close the cap.



(6) Cleaning the ignition plug

Use the ignition plug, NGK B9HS.

Clean the ignition plug when it is stained by exhaust gas or carbon.

- A) Stop the engine and wait until it has cooled down sufficiently before starting any work.

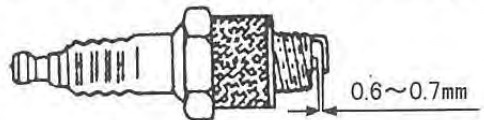


Caution

- Do not touch the ignition plug or high-tension cord during operation.
- You may get electrical shock.

- B) Remove the plug cap and remove the ignition plug using a box spanner for the ignition plug.
- C) Clean the outside, inside and electrode of the ignition plug fully.
- D) Adjust the electrode gap.
- E) Tighten the plug to the cylinder head and push in the ignition plug cap.

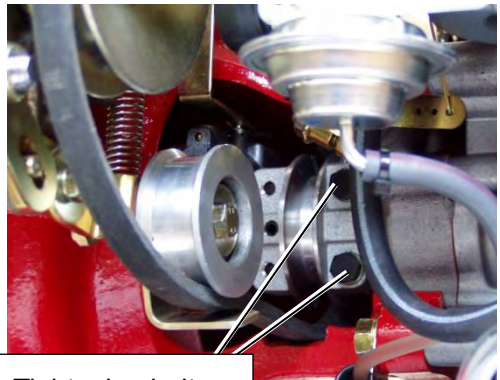
Gap of electrodes of ignition plug



(7) Inspection of V belt

If the belt of the vacuum pump has elongated, worn away or cracked, replace it with a new one.

- A) Extract 4 drive pulley tightening bolts, divide the drive pulley into two parts and remove from the axis.
- B) Place a new belt and install the pulley.



Tightening bolts

4. Periodical inspections



Caution

- Tighten the 4 bolts so that the drive pulley end gap is even.
Tightening torque: 11.5 – 14.5 N·m

(8) Vacuum test

- A) Attach the suction port cap.
- B) Close the pump drain cock.
- C) Start the engine and pull the suction lever.
- D) When the indicator of the compound gauge does down to -0.05MPa, return the suction lever and stop the engine.
- E) If the pointer of the compound gauge does not move 1 minute later, the vacuum is satisfactory. If the pointer moves, ask the sales agent to repair.
- F) Open the pump drain cock to remove vacuum and close the drain cock again.

(9) Water discharge test

Discharge water actually and check for any trouble.

- A) Noise
- B) Water fall
- C) Slow down of water suction
- D) Water leakage
- E) Starting response
- F) Looseness of tightening portions
- G) Fuel leakage
- H) Others

If any trouble is noticed, repair according to “5.Troubleshooting”.

5. Troubleshooting

For preventing the fire pump from troubles, routine checkup and maintenance are important. Let us locate any trouble at an early stage and remedy it immediately. For a trouble which is not easy to remove or not mentioned below, contact the sales agent specifying the model and serial number.

1. Engine area

	Symptom	Cause	Remedy
Hard to start	Fuel does not flow to carburetor	<ol style="list-style-type: none"> 1. Fuel filter or pipe is clogged 2. Needle valve sticks 3. Short of fuel 	<ol style="list-style-type: none"> 1. Clean 2. Ditto 3. Refill
	Fuel does not flow to combustion chamber (check upon removing spark plug)	<ol style="list-style-type: none"> 1. Choke does not close (auto choke) 2. Cranking speed is low (battery provided) 3. Carburetor (needle valve, jet) is clogged 	<ol style="list-style-type: none"> 1. Repair or adjust 2. Recharge battery 3. Clean
	Fuel flows to combustion chamber but engine does not start	<ol style="list-style-type: none"> 1. Overflow (excessive fuel) 2. Tickler is abused (excessive fuel) 3. Choke is closed all the way (auto choke) 4. Fuel is not volatile (old) 5. Fuel is mixed with moisture 6. Lubricating oil is excessive 	<ol style="list-style-type: none"> 1. Check and adjust carburetor 2. Discharge oil upon removing crankcase seal plug 3. Replace diaphragm or clean pipe 4. Replace 5. Eliminate moisture 6. Adjust properly
	Fuel system is abnormal	<ol style="list-style-type: none"> 1. Fuel filter is clogged 2. Carburetor valve seat is clogged 3. Improperly adjusted or clogged carburetor slow system 4. Carburetor is not tightened securely 	<ol style="list-style-type: none"> 1. Clean 2. Ditto 3. Adjust or clean 4. Retighten
	Sparks are poor	<ol style="list-style-type: none"> 1. Ignition plug is broken or contaminated, or gap is improper 2. Leakage from high voltage cord 3. Leakage from plug cap 4. Ignition coil is faulty 5. CDI unit is faulty 6. Starting motor does not rotate properly 	<ol style="list-style-type: none"> 1. Replace plug or adjust its gap 2. Replace 3. Ditto 4. Ditto 5. Ditto 6. Recharge battery

5. Troubleshooting

Symptom		Cause	Remedy	
Hard to start	No sparks are produced	<ol style="list-style-type: none"> 1. Ground wire is short-circuited 2. Ignition plug is broken or contaminated 3. Ignition plug gap is improper 4. Ignition coil is faulty 5. CDI unit is faulty 6. Wiring is not connected properly or is open-circuited 7. Main switch is faulty 	<ol style="list-style-type: none"> 1. Repair short-circuited part 2. Replace 3. Replace plug or adjust its gap 4. Replace 5. Ditto 6. Review and adjust connections 7. Replace 	
	Compression is poor	<ol style="list-style-type: none"> 1. Piston is worn or seized 2. Piston ring is seized or broken 3. Oil seal is worn or broken 4. Lubricating oil falls short 5. Cylinder head gasket is broken 	<ol style="list-style-type: none"> 1. Replace or correct 2. Replace 3. Ditto 4. Refill properly 5. Replace 	
Running malfunction	Unusual sound	Mechanical sound	<ol style="list-style-type: none"> 1. Flywheel is loose 2. Skirt is hit by on account of worn piston 3. Internal contact of armature plate 4. Foreign matter in crankcase 5. Impeller hits foreign matter or is in contact with casing 6. Loosening 	<ol style="list-style-type: none"> 1. Retighten 2. Replace piston 3. Reassemble 4. Eliminate foreign matter 5. Eliminate foreign matter or correctly reassemble 6. Retighten
		Knock sound (fuel system anomaly)	<ol style="list-style-type: none"> 1. Fuel falls short (main jet clogged or wrong diameter part used) 2. Overload 3. Speed too low or high 4. Ignition plug is wrong 	<ol style="list-style-type: none"> 1. Clean or replace 2. Change nozzle diameter or use safety nozzle 3. Adjust to proper speed 4. Replace with right ignition plug
	Unsmooth rotation	Fuel system anomaly (misfire, hunting)	<ol style="list-style-type: none"> 1. Carburetor main jet clogged or maladjusted 2. Fuel filter clogged 3. Overflow 4. Carburetor mounted improperly 	<ol style="list-style-type: none"> 1. Clean or replace 2. Clean 3. Check and adjust carburetor 4. Correct mounting surface or replace carburetor

5. Troubleshooting

Symptom		Cause	Remedy
Running malfunction	Unsmooth rotation	<ol style="list-style-type: none"> Governor maladjusted Governor actuating part worn Fly weight caulked poorly Governor arm tightened poorly Governor spring tension poor Governor lever link hole is worn or there is too much play 	<ol style="list-style-type: none"> Adjust Replace Correct or replace Readjust and retighten Replace Replace or correct
	Cooling system anomaly	<ol style="list-style-type: none"> Insufficient cooling air 	<ol style="list-style-type: none"> Be attend to ventilation

2. Pump area

Symptom		Cause	Remedy
Water suction improper	Vacuum not obtained	<ol style="list-style-type: none"> Air is sucked because suction pipe is not tightened properly Air is sucked from top end of suction pipe Drain cock is left open Mechanical seal is faulty Water discharge valve is clogged with contaminants or its sealing is faulty Casing rubber packing is faulty Casing is not tightened properly 	<ol style="list-style-type: none"> Tighten securely Plunge completely in water Close securely Replace Eliminate contaminants or replace seal Replace Tighten securely
	Vacuum pump abnormal	<ol style="list-style-type: none"> Vacuum pump is broken Locked by foreign matter or frozen inside V belt slipping or broken 	<ol style="list-style-type: none"> Replace Eliminate or thaw Replace
	Rotates	<ol style="list-style-type: none"> Vacuum pipe clogged or not tightened properly Vacuum pump worn Clogged strainer 	<ol style="list-style-type: none"> Clean or retighten Repair Clean

5. Troubleshooting

Symptom		Cause	Remedy
Water suction improper	Deterioration of suction function	Vacuum leakage (water flow discontinues at engine stop)	<ol style="list-style-type: none"> 1. Tighten securely 2. Replace 3. Check and repair 4. Replace 5. Replace or clean rubber 6. Replace or retighten 7. Return lever to stop position
		No vacuum leakage	<ol style="list-style-type: none"> 1. Check and repair 2. Prolong operation time 3. Adjust to standard speed 4. Adjust or replace 5. Clean 6. Ditto 7. Reduce to within 8 m
Improper water discharge	Dose not rise to specified pressure	Engine is abnormal	<ol style="list-style-type: none"> 1. Repair engine 2. Adjust 3. Change nozzle diameter 4. Decrease load or adjust engine
		Pump proper is abnormal	<ol style="list-style-type: none"> 1. Eliminate 2. Eliminate foreign matters 3. Reduce to within 8 m 4. Replace 5. Retighten 6. Retighten 7. Thaw 8. Eliminate

5. Troubleshooting

3. Electric

Symptom		Cause	Remedy
Starting poor	Starting motor dose not rotate	<ol style="list-style-type: none"> 1. Battery capacity is poor 2. Magnet switch malfunctions 3. Start switch is faulty 4. Grounding is faulty 5. Fuse is blown 	<ol style="list-style-type: none"> 1. Recharge 2. Ditto 3. Check or replace wiring 4. Correct 5. Replace
Battery faulty	Battery is discharged soon	<ol style="list-style-type: none"> 1. Battery is deteriorated 2. Wiring is short-circuited 3. Charging is poor 4. Switch operation is wrong 	<ol style="list-style-type: none"> 1. Replace 2. Repair short-circuited part 3. Recharge 4. Operate properly
Wiring faulty	Wiring is burnt	<ol style="list-style-type: none"> 1. Battery is connected reversely 2. Connected is short-circuited 3. Fuse is blown 	<ol style="list-style-type: none"> 1. Connect correctly 2. Correct 3. Replace
	Lamp dose not light	<ol style="list-style-type: none"> 1. Grounding is faulty 2. Connection is faulty 3. Lamp is burnt out 	<ol style="list-style-type: none"> 1. Correct 2. Ditto 3. Replace
Lamp faulty	Lamp burns out	<ol style="list-style-type: none"> 1. Operation is improper 2. Rectifier is faulty 	<ol style="list-style-type: none"> 1. Tum off and then correct 2. Replace

6. Specifications

1. Firefighting pump		
Model	FT400-A1	FT300-A
Class	B-3	C-1
Long × wide × high	601 mm×463 mm×515 mm	
Mass	45 kg	44 kg
2. Pump		
Method	High-pressure 1-stage turbine pump (with inducer)	
Discharge water volume	Normal 0.50 m ³ /min	Normal 0.53 m ³ /min
	High pressure 0.29 m ³ /min	High pressure 0.34 m ³ /min
Pump pressure	Normal 0.55 MPa	Normal 0.50 MPa
	High pressure 0.80 MPa	High pressure 0.70 MPa
Nozzle diameter	Normal 18.0 mm	Normal 19.0 mm
	High pressure 12.5 mm	High pressure 14.0 mm
Speed or revolution	6000 rpm	
Water inlet	Nominal 65 mm, fire engine threads	
Water outlet	Nominal 65 mm, fire engine threads (with Machino intermediate fixture)	
3. Vacuum pump		
Method	Oil-less vacuum pump : 4-vane eccentric-rotary type	
Maximum suction height	Approx. 9m (-0.085 MPa)	
Drive method	V belt clutch type	

6. Specifications

4. Engine			
Method	Air-cooled, 2-cycle, vertical 1-cylinder type		
Model name	E200		
Displacement	200mL		
Authorized output	8.8 kW/6000rpm		
Cooling method	Forced air cooling		
Lubrication method	Separate lubrication		
Lubricating oil	For 2 cycle engine		
Starting method	Starting motor, recoil starter		
Fuel	Regular automotive gasoline		
Ignition method	No-contact magneto (CD ignition type)		
Ignition plug	NGK B9HS		
Fuel consumption	5.6L/ h		5.4L/ h
Fuel tank capacity	4.0L		
5. Accessories			
Battery	12V-18Ah/10h	1pc	12V-14Ah/10h 1pc
Charger	AC100V - DC12V	1pc	AC220V - DC12V 1pc
Tool bag	Tool kit, 1 instruction manual, Ignition plug		
Pump cover	1		
6. Optional parts			
Search light lamp	12V-25W		1 pc
Search light stand	1 tripod		

7. Wiring diagram

