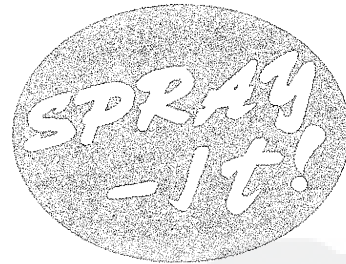




# OWNER'S MANUAL OPERATING MANUAL

Read this manual and have a sufficient understand of the operating procedures before using the power sprayer. In addition, read the "Engine Operating Manual" included with the sprayer.

Knapsack Power Sprayer  
MODEL  
**HP7S26H25**



**MARUNAKA CO., LTD.**

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CODE 310201024  
UK/HP 0401



# Knapsack Power Sprayer    Spray it!    Operating manual

MODEL    HP7S26H25

Thank you for buying this knapsack power sprayer. To assure safe and correct operation of the power sprayer, be sure to read this manual and have a good understanding of the operational procedures before using the sprayer.

## ■ Introduction

- The following warnings marked by a **▲** contain important safety information, so be sure to observe the warnings. Incorrect operation of the power sprayer may result in serious accidents.

<b>▲ Danger</b>	Failure to observe this type of warning will result in death or serious injury.
<b>▲ Warning</b>	Failure to observe this type of warning will result in a risk of death or serious injury.
<b>▲ Caution</b>	Failure to observe this type of warning will result in a risk of human injury or serious damage to the power sprayer.

- This operating manual contains instructions for operating the power sprayer and cautions regarding use. Before using the power sprayer, read this manual until you have a thorough understanding of its contents. Operate the power sprayer correctly and work safely with the sprayer in top condition.
- After reading this manual, store it in a safe place for future reference.
- If this manual becomes lost or damaged, please order another manual immediately from the store where you purchased the sprayer or from Marunaka.
- If you lend or give the power sprayer to another person, deliver this manual together with the sprayer and instruct the recipient to be sure to read it.
- Product specifications are subject to change without prior notice for purposes of quality, performance, and safety. Parts of the contents and illustrations in this manual may differ from the actual product.
- If you have any questions or concerns, please contact the store where you purchased the sprayer or Marunaka.

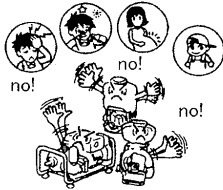

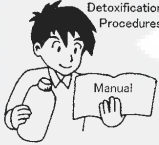

## ■ Contents


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## 1.To work safely


If the following cautions are not observed, death, injury or damage to the machine may result.

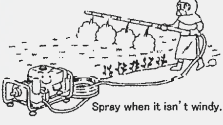
### ●Cautions regarding agricultural chemicals

<p><b>⚠ Warning</b></p> <p>◆Do not engage in spraying if you are not feeling well and any of the following applies to you: (Do not assist in spraying either.)</p> <ul style="list-style-type: none"> <li>-You suffer from liver or kidney problems</li> <li>-You have a special physical condition</li> <li>-You are pregnant</li> <li>-You have an injury</li> <li>-You are sensitive to agricultural chemicals</li> <li>-You are ill or recovering from an illness</li> </ul> <p>→Your physical condition is adversely affected by agricultural chemicals</p>	
<p><b>⚠ Warning</b></p> <p>◆Do not engage in spraying if any of the following applies to you: (Do not assist in spraying either.)</p> <ul style="list-style-type: none"> <li>-You consumed an alcoholic beverage prior to spraying</li> <li>-You are under 15 years of age</li> <li>-You are on medication</li> </ul> <p>→Incorrect judgment or operation may result in an accident</p>	
<p><b>⚠ Warning</b></p> <p>◆Do not spray or carry out spraying preparations with your skin exposed. Wear waterproof work clothes.</p> <ul style="list-style-type: none"> <li>-Wear a waterproof cap, long sleeved jacket, and long pants.</li> <li>-Wear rubber gloves and rubber boots.</li> <li>-Wear protective goggles and a protective mask.</li> </ul> <p>If a chemical soaks through your clothing, change your clothing immediately.</p> <p>→A chemical may cause poisoning if it comes in contact with the skin.</p>	
<p><b>⚠ Danger</b></p> <p>◆Read the labels, manual, and cautions for the agricultural chemical well, and use the chemical correctly. Check the toxicity of the chemical and procedures for emergency treatment in case an accident occurs.</p> <p>→If the cautions are not observed, death or serious injury may result.</p>	<p>Toxicity      Emergency treatment Detoxification method Procedures for use</p> 
<p><b>⚠ Danger</b></p> <p>◆Do not spray places where people pass by and do not spray at times when people pass by (for example, when children walk to or home from school.)</p> <p>→The chemical may have an adverse effect on health.</p>	

<p><b>⚠ Danger</b></p> <ul style="list-style-type: none"> <li>◆ Do not under any circumstance drink, eat or smoke while spraying. If you need to eat, drink or smoke during a break or after spraying, first wash with soap and hands well and gargle.</li> <li>→ Chemical adhering to the skin will enter the body and adversely affect health.</li> <li>◆ Do not carry or store lunch boxes or other foods and beverages in the same container as the agricultural chemical and spraying equipment.</li> <li>→ The food and beverages will become contaminated and cause harm.</li> </ul>	 <p>Gargle Gargle</p>
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<p><b>⚠ Danger</b></p> <ul style="list-style-type: none"> <li>◆ If chemical contacts the skin, wash it off immediately with soap and water. If chemical permeates your clothing, change clothes. If you feel even slightly dizzy, nauseous, or have a headache or stomach ache during or after spraying, consult a doctor. At this time, report the chemical name to the doctor and describe the spraying job (spraying time, area, spraying procedure, etc.)</li> <li>→ If you do not receive immediate treatment, a serious health problem may result.</li> </ul>	
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<p><b>⚠ Warning</b></p> <ul style="list-style-type: none"> <li>◆ Conduct spraying on a planned basis. <ul style="list-style-type: none"> <li>• Complete weeding, etc. , prior to spraying, and do not enter the sprayed area after spraying.</li> </ul> </li> <li>→ Agricultural chemicals may have an adverse effect on your health. <ul style="list-style-type: none"> <li>• The same person must not spray for an extended period of time or on several days in succession.</li> </ul> </li> <li>→ When tired, your ability to work correctly becomes impaired and you become more susceptible to adverse health effects. Take breaks while working.</li> </ul>	 <p>Do not enter right after spraying!</p> <p>Dizzy</p>
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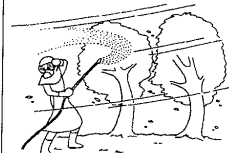
<p><b>⚠ Warning</b></p> <ul style="list-style-type: none"> <li>◆ Spray during the morning or evening when it is cool. Avoid spraying when it is hot during the day or when a strong wind is blowing.</li> <li>→ If you spray in intense sunlight, the chemical will condense and may cause chemical damage.</li> <li>→ If a strong wind is blowing, it may carry the chemical and cause it to contaminate areas other than the area to be sprayed, resulting in damage to people, domestic animals, beekeeping, honey, and/or aquatic animals.</li> </ul>	 <p>Spray when it isn't windy.</p>
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**⚠ Warning**

- ◆ Inspect the equipment well before using it to ensure that it doesn't fail during use.
- If the equipment fails during use, the chemical remaining in the chemical tank may cause chemical damage.

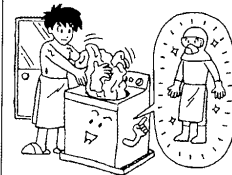
**⚠ Warning**

- ◆ Note the wind direction while spraying and keep your body upwind of the equipment to ensure that chemical is not blown onto your body.
- Advance into the wind as your spray, and make sure your body doesn't contact chemical adhering to crops in an area already sprayed.
- Breathing or touching chemicals will have an adverse effect on health.



**⚠ Warning**

- ◆ After spraying, bathe and wash your body well with soap.
- Take off all clothes worn when spraying and wash them. Do not wear those clothes the next day without washing them.
- Otherwise, the chemicals may cause illness.
- ◆ Rest and sleep well after a spraying job. Do not drink excessively or stay up through the night.
- Fatigue makes your body more susceptible to health problems.



**⚠ Caution**

- ◆ Dispose of empty chemical bags, boxes, glass bottles and plastic containers appropriately.
- If not disposed of properly, chemical damage will result.


**⚠ Caution**

- ◆ Clean the equipment well after using. Dispose of water used for cleaning in a non-cultivated area to prevent chemical damage. Do not allow the water to run into a river or pond, and do not dispose of it in the vicinity of a river or pond.
- If the equipment is not cleaned well and a different type of chemical is subsequently used, chemical remaining on the equipment may cause chemical damage.
- If water used for cleaning is disposed of near a river or pond, chemical harm will result to the aquatic plant and animal life.


**⚠ Warning**

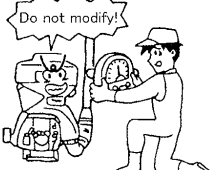
- ◆ Keep chemicals remaining after spraying in a sealed container and locked in a chemical storage box separate from food or animal feed.
- Inadequate storage procedures may result in a serious chemical accident.
- ◆ Store used equipment in a locked location that children and animal can not enter.
- If children touch or animals lick and touch chemical adhering to the equipment, serious chemical poisoning may result.

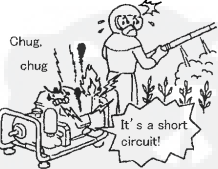


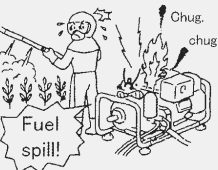
<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>◆ Do not use chemicals near sparks or flame (such as fires and cigarette lighters) that are marked as prohibited for use near flame (these include sulfur-, lactic-, and petroleum-based chemicals.) For storage, choose a location that is cool and where there are no sources of sparks or flame. Do not use a cigarette lighter in or bring a flame near the storage location.</li> <li>→ Failure to observe these precautions may result in a fire.</li> </ul>	
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● Cautions regarding the handling of the spraying equipment

<p><b>⚠ Danger</b></p> <ul style="list-style-type: none"> <li>◆ Do not operate the engine inside a building, vinyl covereasure, or other walled-in structure.</li> <li>→ Toxic substances in the exhaust gas (carbon monoxide, etc) may cause poisoning resulting in breathing difficulty, loss of consciousness, and death.</li> </ul>	
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<p><b>⚠ Danger</b></p> <ul style="list-style-type: none"> <li>◆ Do not modify the spraying machine or use it for other than its determined purpose. Do not use any attachments other than those specified by the manufacturer.</li> <li>→ This may cause serious damage to the machine or a chemical accident.</li> </ul>	
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<p><b>⚠ Warning</b></p> <ul style="list-style-type: none"> <li>◆ Before spraying, inspect the electrical wiring codes and electrical components of the engine.</li> <li>If any insulation jackets are torn or insulation parts damaged, replace those parts before starting the engine.</li> <li>→ If the equipment is operated without replacing torn insulation jackets or damaged insulation parts, electrical shock and fire may result.</li> </ul>	
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<p><b>⚠ Warning</b></p> <ul style="list-style-type: none"> <li>◆ The engine is hot during operation. Do not place inflammable materials close to the engine.</li> <li>Keep away from fuel containers, paper, cloth, straw, or other inflammable materials. Before operating inspect the engine surface for oil, fuel, and dust, and wipe off any such materials found.</li> <li>→ Heat from the engine and exhaust gas may cause a fire.</li> </ul>	
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<p><b>⚠ Warning</b></p> <ul style="list-style-type: none"> <li>◆ Before spraying, inspect the engine fuel pump, fuel hose, and other parts of the fuel system. If any fuel leaks are discovered, replace the leaking part before starting the engine.</li> <li>→ A fuel leak during operation may cause a fire.</li> </ul>	
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<p><b>⚠ Warning</b></p> <ul style="list-style-type: none"> <li>◆ Do not point chemical outlets such as the spray nozzle or lance toward people.</li> <li>→ This will cause a serious chemical accident. It will also cause electrical shock due to static electricity.</li> </ul>	
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<p><b>⚠ Warning</b></p> <ul style="list-style-type: none"> <li>◆ Make sure the engine has cooled sufficiently before covering the spraying machine with a sheet after use.</li> <li>→ A hot exhaust pipe or muffler may cause the sheet to ignite and start a fire.</li> </ul>	
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<p><b>⚠ Warning</b></p> <ul style="list-style-type: none"> <li>◆ When transporting the spraying machine on a truck or other vehicle, secure the spraying machine tightly to the bed of the truck with a rope.</li> <li>→ Otherwise the spraying machine may fall off the truck, causing injury and severely damaging the machine.</li> <li>◆ When loading the spraying machine on a truck, put on the emergency brake and put the truck in reverse or low gear so that it can't move.</li> <li>→ Otherwise, the truck may start moving and cause the spraying machine to fall off.</li> </ul>	
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<p><b>⚠ Warning</b></p> <ul style="list-style-type: none"> <li>◆ When storing the spraying machine for a prolonged time, drain the fuel from the fuel tank and carburetor, and remove the battery.</li> <li>→ The fuel will deteriorate and may cause engine trouble or a fire the next time the sprayer is used.</li> </ul>	
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<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>◆ The engine is hot during operation. Do not touch it with your bare hands, and do not allow children to approach the equipment.</li> <li>→ Touching hot engine parts (exhaust pipe, muffler, etc.) will cause burns.</li> </ul>	
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<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>◆ Be sure to turn off the engine when cleaning, inspecting, maintaining, or repairing the machine, or when attaching or removing attachments.</li> <li>For safety, remove the plug cap and the battery's negative terminal as well.</li> <li>→ There is a danger of being caught in revolving parts and injured.</li> <li>There is also a danger that the engine will start unexpectedly, causing serious injury.</li> </ul>	
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<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>◆ Have the machine inspected and maintained once a year. In particular, change the fuel hose and belt regularly.</li> <li>→ Using a machine that is not well maintained will prevent the machine from performing at peak capability and obtaining good results, and may also cause injury.</li> </ul>	
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<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>◆ Be sure to replace covers and other parts removed for inspection, maintenance, or repair before using the machine.</li> <li>→ There is a danger of being caught in revolving parts and injured.</li> </ul>	
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<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>◆ Be sure to place the machine on a level, stable surface when cleaning, inspecting, maintaining, or repairing it, or when attaching or removing attachments.</li> <li>→ The machine may fall and cause injury.</li> <li>◆ Turn off the engine before filling the chemical tank. Fill the chemical tank on a level, stable surface.</li> <li>→ Filling the tank on an unstable surface may cause the machine to fall and the chemical to splatter. If the engine is running, the chemical may spray out unexpectedly.</li> </ul>	
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● Cautions when handling fuel

<p><b>⚠ Warning</b></p> <ul style="list-style-type: none"> <li>◆ After adding fuel, tighten the fuel tank cap well and completely wipe off any fuel that has spilled.</li> <li>→ Spilt fuel may ignite when the engine is running and start a fire.</li> </ul>	
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<p><b>⚠ Warning</b></p> <p>◆ Do not add fuel while the engine is running or while it is still hot after being turned off. Add fuel after the engine has cooled. → If fuel spills on hot engine parts, it will ignite and start a fire.</p>	
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<p><b>⚠ Warning</b></p> <p>◆ When handling fuel, stay away from flame (lit cigarettes, stoves, wood fires, etc.) and electrical sparks (static electricity, batteries, switch short-circuits, welding sparks, etc.). Exercise sufficient caution when adding fuel, and when mixing 2-stroke gasoline and transferring fuel to the small tank. → The fuel may ignite and start a fire.</p>	
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● **General cautions**

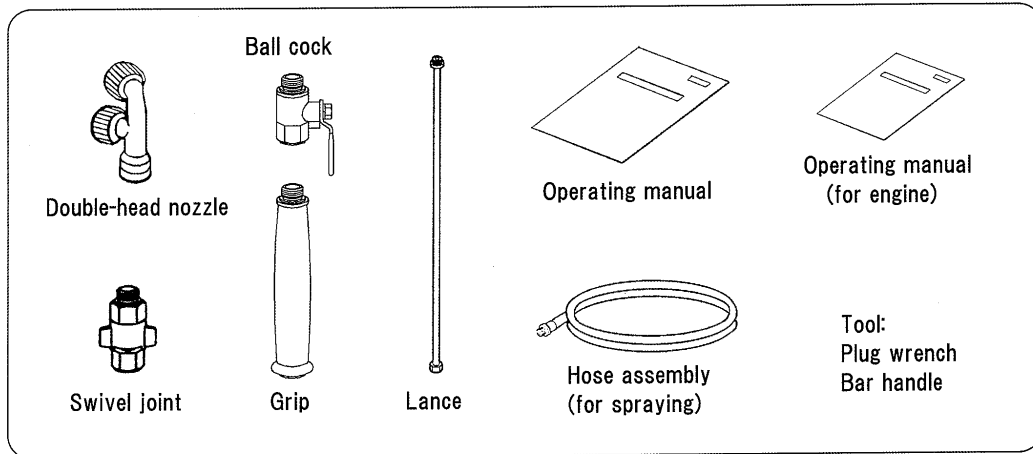
<p><b>⚠ Warning</b></p> <p>◆ Inspect and maintain the equipment well before using it to ensure that there are no breakdowns during spraying. Make sure that there are no loose or missing screws and no leaks in the chemical pipe or hose. → If inspection and maintenance are not performed sufficiently, serious human injury or damage to the machine may result.</p>	
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**2. Specifications**

Model		HP7S26H25
Dimensions	Overall length (mm)	355
	Overall width (mm)	455
	Overall height (mm)	655
Body weight	(kg)	9.9
Chemical tank capacity	(ℓ)	26
Pump type		Piston pump
Pump spray pressure	MPa(kgf/·)	0~2.5(0~25)
Nozzle spray rate	(ℓ/min)	0~3.2
Engine type		HONDA GX25
Displacement	(mℓ)	25
Fuel tank capacity	(ℓ)	0.55
Standard accessories	Hose assembly(for spraying), Double-head nozzle, Ball cock, Grip, Swivel joint, Lance, Plug wrench, Bar handle Operating manual, Operating manual for engine	
		1 each

### 3. Accessory Checklist

When you open the box, make sure that you have all of the accessories.  
If any are missing or damaged, contact the store where you bought the sprayer.



### 4. The Purpose of this Product

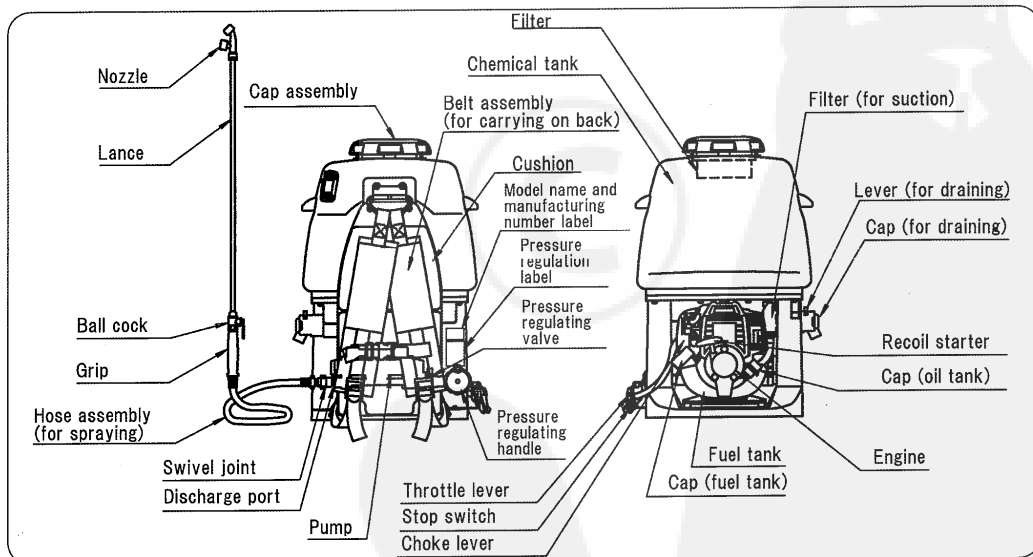
Use this product to spray agricultural chemicals and spray water.

※Agricultural chemicals.....Insecticides, Disinfectants, Weed killers

#### ⚠ Danger

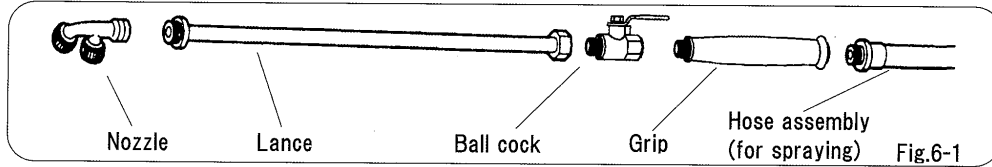
- ◆Do not modify the sprayer or use it for other than intended purpose. Do not use any attachments other than those specified by the manufacturer.
- Otherwise, serious chemical injury or damage to the machine may result.

### 5. Names of Each Part

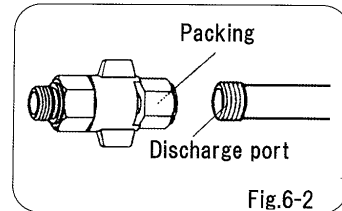


## 6. Preparations for Operating

- Confirm that there are no loose screws or connections on the machine.
- Attach nozzle and hose assembly (for spraying) to the body of the sprayer.



- ① Assemble the nozzle, lance, ball cock, grip and hose assembly (for spraying) (Fig.6-1).  
Make sure before connecting that none of the packing used for connections have been lost, cut or torn.
- ② Connect the swivel joint to the pump discharge port. Check whether the packing is provided and is not broken, then screw the swivel joint into the pump discharge port. (Fig.6-2)
- ③ Connect the hose assembly (for spraying) to the swivel joint.

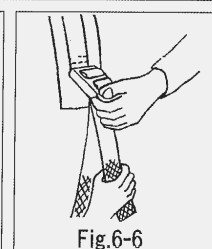
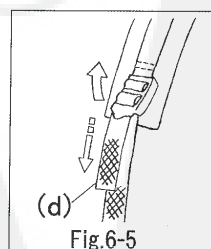
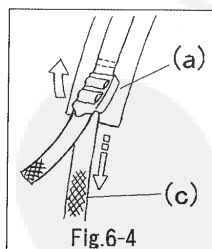
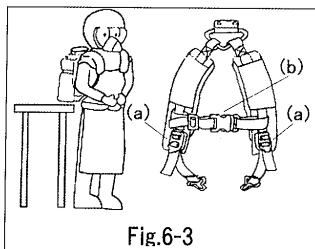


- Adjusting the length of the belt assembly (for carrying on the back)

- ① Before carrying the sprayer on your back, disconnect the connection fitting (b) from the chest belt. (Fig. 6-3)  
Move up the belt connection fitting (a), and pull the internal belt (c) to extend it to facilitate carrying on the back. (Fig. 6-4)
- ② Let your arms pass through the belts, and carry the sprayer put on a proper table on your back.
- ③ Adjust the belt length so that the cushion (on the back) is in close contact with your back. Pull the end (d) of the outer belt to shorten the belt. (Fig. 6-5)
- ④ Insert the fitting (b) of the chest belt until a click sound is heard.  
Move up and down the chest belt, and set it to a position where you do not feel tight. After that, adjust the chest belt length so that the sprayer is in close contact with your back. (Fig. 6-3)
- ⑤ For making the belt longer, move up the connection fitting (a) to slide and extend the belt naturally. At this time, make sure to hold the end (d) of the outer belt with one hand, and adjust only one belt at a time. (Figs. 6-5 and 6-6)

### ⚠ Caution

- ◆ Do not adjust the belt drastically. Do not adjust the left and right belts at the same time.  
→ Such adjustment is dangerous: The belt may slide drastically, and become too long or come off.



- Fill the engine with the fuel, and check the oil.

**⚠ Caution**

◆ Please be sure to read the included Operating Manual for the engine.

- ① Put the main body in a horizontal, stable place.
- ② Use vehicle gasoline as the fuel.
- ③ Follow all printed instructions (for engine). Fill fuel tank with fuel, leaving a margin so as not to exceed the fuel limit. Failing to leave a margin may result in overflow from the opening due to expansion of fuel with changes in temperature.

**⚠ Warning**

◆ When handling fuel, keep sprayer away from fire (lit cigarettes, stoves, bonfires, etc.), electric sparks (sparks caused by static electricity, batteries, shorts in switches, welding, etc.).  
→ Failure to observe this warning may cause fuel to ignite and result in fire.

**⚠ Warning**

◆ Never add fuel or oil while the engine is running or when the equipment is still hot. Only add fuel or oil after the engine has sufficiently cooled down.  
→ Oil spilt on heated engine parts may cause fuel to ignite and result in fire.

**⚠ Warning**

◆ Be sure to tighten lid on fuel tank after adding fuel. Completely wipe up fuel spills.  
→ Fuel spilt on engine during operation may cause fuel to ignite and result in fire.

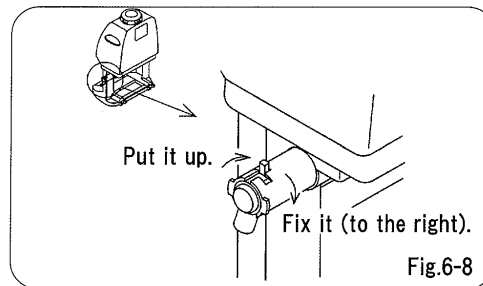
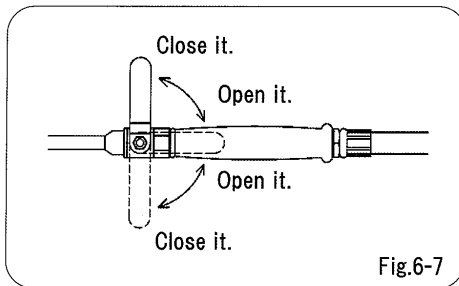
**⚠ Caution**

◆ Never use mixture of gasoline and engine oil.  
→ It may cause defective startup, output deterioration and clogging in the fuel system.

- ④ Keep the main body horizontally, and check the engine oil. Check whether the oil level reaches a position just below the oil filler port. If the oil quantity is insufficient, refill the oil. If the oil is considerably contaminated or discolored, replace it in accordance with the instruction manual of engine.

- Handling the chemical.

- ① Close the ball cock (Fig. 6-7), and put up the lever attached to the cap (for draining) to close the drain port. After that, put down the lever to the right to fix the lever and disable opening of the drain port. (Fig. 6-8)
- ② Make sure to prepare the chemical to a predetermined dilution rate in accordance with the instruction manual offered by the chemical manufacturer, stir the diluted chemical sufficiently to dissolve it completely, then pour it into the chemical tank. (The dilution list is shown on the last page.)
- ③ When pouring the chemical into the chemical tank, make sure to let the chemical go through the attached filter.  
Foreign substances and dusts in the chemical may cause failure.



### ⚠ Warning

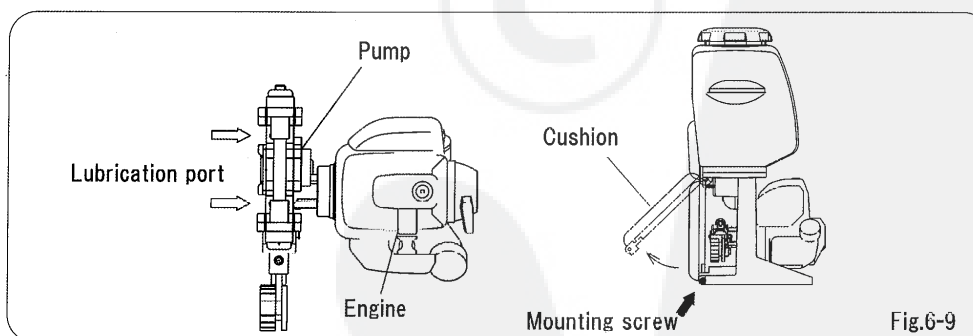
- ◆ Make sure to tightly close lid on chemical tank. Do not tip the tank more than absolutely necessary or lay it down.
  - Doing so may cause chemical to gush out or overflow.
- ◆ Tightly screw together connecting parts of the hose assembly (for spraying), ball cock, lance and nozzle.
  - Failure to do so may cause chemical to gush out.
- ◆ Never point the nozzle toward people.
  - Exposure to chemicals may cause serious poisoning or chemical accident.

### ⚠ Caution

- ◆ Follow printed instructions provided by chemical manufacturer when using wettable powder. Dilute and mix as instructed in a bucket-like container and then pour into the chemical tank. Finish spraying quickly because wettable powder are likely to settle.
  - Using the wrong mixture ratio may result in chemical damage to agricultural products. Failure to thoroughly mix chemical may cause uneven concentration when spraying and may result in chemical damage to agricultural products. This may also cause pump failure.

### ● Lubrication to the pump

There are two lubrication ports (marked with “⇨”) on the top face of the pump. When using the sprayer for the first time, at the beginning of the season and at every 25 hours of operation, put two or three drops of oil (engine oil) to the pump. It is recommended for easy lubrication and easy inspection to remove set screws (marked with “➡”) on the both sides, move up the cushion outward, and remove the cushion. (Fig. 6-9)



## 7. Starting and Operating Engine

### **⚠ Warning**

- ◆ Examine all electric parts on the engine as well as cords before operating. Run the engine only after replacing any defective insulated coating or insulated parts.
  - Running the engine with damaged insulated coating or insulated parts may cause electric shock or result in fire.
- ◆ Examine fuel pipes and hoses on the engine before operating. Run the engine only after replacing any defective parts if there are fuel leaks.
  - Fuel leaks during operation may result in fire.

### **⚠ Warning**

- ◆ Engines are extremely hot while running. Do not run engine near flammable materials. Keep away from containers which have fuel, paper, straw, etc. Check the engine and wipe away any oil, fuel or dust before operating.
  - Heat from the engine or exhaust may cause such materials to ignite and result in fire.

### **⚠ Caution**

- ◆ Refrain from using this equipment and attachments in excess of their capability.
  - Running the engine at full throttle results in fairly high revolutions. In addition to having a bad effect on pump and engine life, this may also cause damage to the product.
- ◆ Use special care when handling.
  - Do not drop or bump into surrounding objects. This may result in dents, cracks or damage.
- ◆ Do not put water or chemicals on the sprayer itself or the engine when pouring chemicals into the tank or while spraying.
  - This may cause equipment failure.
- ◆ In case of abnormal sound, vibration or smell, immediately inform the shop where you purchased the sprayer or our company. Do not continue using.
  - Further use after noticing something abnormal may cause a serious accident or result in equipment failure.
- ◆ Do not touch spark plug, spark plug cap, or high voltage cords when running the engine.
  - Doing so may result in serious electric shock.

## ● Starting the Engine.

### **⚠ Caution**

- ◆ Be sure to read the enclosed Operating Manual for the engine.

- ① Confirm that the chemical tank contains chemical.

### **⚠ Caution**

- ◆ Do not operate the engine with an empty chemical tank. Pour at least one liter of liquid into tank. To avoid running without liquid while spraying, lower the revolutions of the engine to an idle or stop the engine soon after the liquid stops coming out of the nozzle.
  - The pump will begin to take in air and it will be impossible to operate if there is less than one liter of liquid in the tank. Continuing to run engine without liquid will cause damage to the pump.

- ② Set the stop switch to the ON position. (Fig.7-1)
- ③ Push the priming pump on the carburetor several times until fuel begins to flow.
- ④ Set the throttle lever to the LOW position. Set the choke lever in the CLOSE position When the engine is cold.
- ⑤ Turn the pressure regulating handle to the START position. (Fig.7-2)
- ⑥ While holding the sprayer steady, grip the recoil starter handle and yank it quickly.
- ⑦ While checking the engine status after startup, return the choke lever gradually to the OPEN position.
- ⑧ For 2 to 3 minutes after startup, perform warming up.

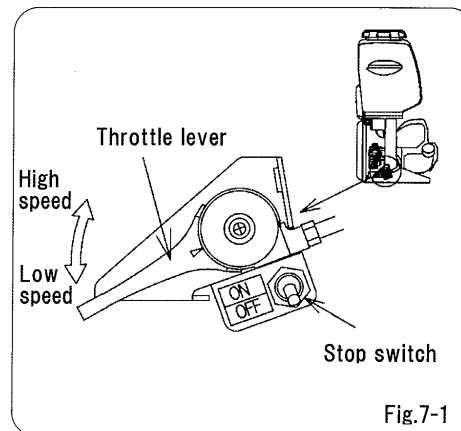


Fig.7-1

#### ● Adjusting Pressure

- Open the ball cock. Adjust the speed of the engine using the throttle lever while checking the condition of the spray coming out of the nozzle.

#### ⚠ Caution

- ◆ Because this sprayer has a centrifugal clutch, the pump will not work if the engine is running at low speeds. Do not operate the engine with the clutch engaged (in the range where the clutch is slipping).

#### ● Manipulating the pressure regulating valve

- Turn the pressure regulating handle in the range "LOW ~ SPRAY ~ HIGH" to a position suitable to the work condition while referring to round protruding portions as the reference. Because fine steps are provided, fine adjustment is available. (Fig. 7-2) Use the low pressure for spraying the herbicide, use the spray for spraying normal agricultural chemical, and use the high pressure for places requiring high pressure (for washing, etc.).

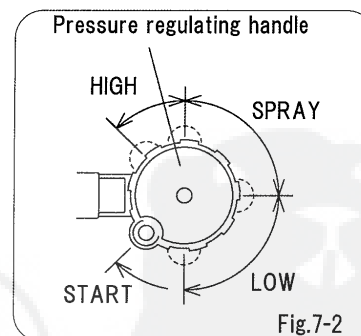


Fig.7-2

- The sprayer requires less power when the pressure regulating valve is set at low pressure. Running the engine with the throttle lever fully open will result in the too many revolutions and it thus recommended to operate with the throttle lever at a medium setting.

- The pressure regulation label is adhered on the side of the pressure regulating valve.

#### ⚠ Caution

- ◆ Engine speed is adjusted by a stopper on the throttle lever so that the engine runs at 6,500min · (rpm) when the throttle is fully open and the pressure regulating valve is set at high pressure. Do not operate at excessive speeds by changing the position of the stopper or running at full throttle with the pressure regulating valve set a low pressure.
- Doing so will reduce the efficiency of the pump and may cause engine and pump failure.



## ● Spraying Operations

### **⚠ Danger**

- ◆ Using soapy water, wash off any chemicals that come in contact with the skin. Also, change any clothes that have been permeated by chemicals. Consult a physician immediately if you experience even slight dizziness, headaches, stomachaches, or nausea during or after spraying. Report to the physician at this time the name of the agricultural chemical used and details of spraying operations (spraying time, size of area sprayed, method of spraying, etc.)
- Failure to obtain quick treatment may result in the most serious type of chemical accident.

### **⚠ Warning**

- ◆ Never point the nozzle in the direction of any person when spraying agricultural chemicals. Stop spraying when children or any person not involved in spraying operations is in the vicinity.
- ◆ Determine which direction the wind is blowing when carrying out spraying operations. Be sure to stand upwind and avoid getting any chemicals on your body. Proceed with spraying operations from downwind to upwind and use caution to not come in contact with chemicals that have been sprayed on agricultural products.
- Inhaling or exposure to chemicals can result in serious health problems.

- ① Turn the double-head nozzle for control toward the spray direction, open the ball cock, and start the spray work.
- ② The chemical tank is empty when spray flow is disrupted, lacks force, or if engine speed abruptly increases. Close the ball cock, slow the engine down, move the stop switch to the OFF position and stop the engine. Switch off and supply chemical.

### (Reference) Concerning nozzle

When using non-standard nozzle:

Use nozzle that force spray out at approximately 2~4 liters per minute (with pressure of 1.5MPa)

Using nozzles that force out too much spray will result in malfunction because of the inability to increase pressure.

Running at low pressure also results in a lack of mixing inside the chemical liquid tank with overflow.

Using a nozzle that forces out too little spray will lengthen spraying time and also reduce efficiency.

## 8. Completing Operations

① Close the ball cock, slow the engine down gradually, idle the engine for a while for cooling, then set the stop switch to the OFF position to stop the engine. (Fig. 8)

② Washing the chemical tank, pump, hose assembly, ball cock, spray pipe and nozzle.

When the work is finished, push the cap (for draining) in the tank, and drain the remaining chemical.

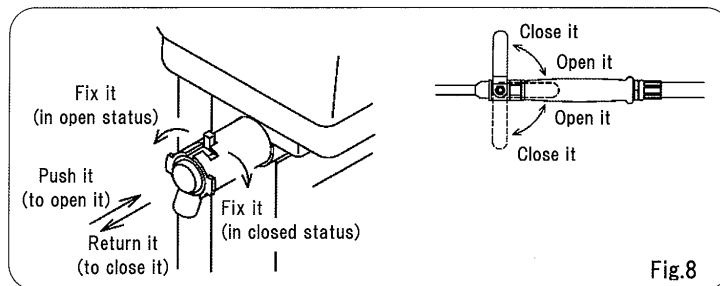
Return the cap (for draining) to the former status, pour fresh water, and wash the inside of the chemical tank. Start the engine, and run the engine for 2 to 3 minutes while spraying so that the power sprayer, hose inner surface and spray nozzle are sufficiently cleaned.

At this time, open and close the ball cock 3 or 4 times.

When washing is finished, push the cap (for draining) again, and drain the solution.

Push down the lever to the left while the cap (for draining) is pushed down so that the drain port is kept open without being held by hand.

Put up the lever to close the drain port. (Fig. 8)



### ⚠ Caution

◆ After washing, remove the hose assembly (for spraying) from the pump, and run the engine with the throttle lever at a medium setting for 15 to 20 seconds until the water does not come out of the discharge port any more so that the water inside the pump is discharged completely.

→ If water remains inside the pump, it will be frozen in winter or at the beginning of spring, and the pump will be damaged.

### ⚠ Caution

◆ Always wash this sprayer out after use.

→ Failure to adequately wash out the sprayer and using with other chemicals may cause chemical damage because of mixing with residual chemical from the previous use.

◆ Throw away all left-over chemical in the tank, as well as water used for washing, in non-agricultural ground. Absolutely do not pour into rivers, ponds or surrounding areas.

→ Disposing of chemical or water which is used for cleaning near rivers or ponds will cause chemical damage to water plants, etc.

## 9. Inspection and Maintenance

### ● Inspect the pump.

- ① Check to make sure all screws are tightened and that no parts are missing.
- ② Check to make sure there are no loose connections on hoses, nozzle, lance or ball cock. Also check that none of the packing have been cut or torn.
- ③ Thoroughly clean the nozzle and filter (for suction). Because it is a screw-in type, the filter (for suction) is easily removable. Occasionally inspect and clean this filter. (Fig. 9)  
Clogged nozzles should be cleaned with a fine wire.
- ④ Confirm that there are no leaks.  
If there is a leak, replace any worn parts.  
Consult the shop where you purchased the sprayer.

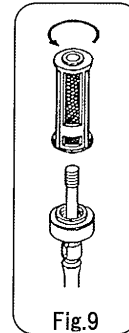


Fig.9

### ● Inspect the engine. (Consult the engine Operating Manual for details.)

- ① Inspect to make sure there are no loose or missing screws in any part of the engine.
- ② Clean the air cleaner.
- ③ Clean and adjust the spark plug.
- ④ Clean the cooling fan, air intake opening and parts around the muffler.
- ⑤ Check and replace the engine oil. At the same time, check whether the engine oil does not leak.
- ⑥ Inspect the fuel line. Also check if there are any fuel leaks.
- ⑦ Inspect the fuel filter. Clean the fuel tank.

## 10. Cleaning and Storing

- ① Completely remove any water from the pump. (Refer to No.8; Completing Operations)
- ② Pull the recoil starter handle on the engine until there is resistance.
- ③ After removing gasoline from the fuel tank, push the priming pump until gasoline in the Gas line runs out. Remove gasoline from the tank once more.
- ④ Replace the engine oil.
- ⑤ Set the throttle lever in the low speed position.
- ⑥ Wipe away any dirt or dust.
- ⑦ Store the sprayer in a dry, Warm location where there is no chance of freezing.

## 11. Equipment Failure and Countermeasures

This is a list of possible causes of equipment failure and countermeasures to take when you think the sprayer is broken. In case these countermeasures are not sufficient to restore the sprayer to proper working condition, contact the shop where you purchased the sprayer or our company. Do not take the machine apart by yourself. Please inform us of the following in detail at that time:

1. Model
2. Product number
3. Details of equipment failure (when, where and how the failure occurred)

○ Pump is not taking up liquid.

Cause	Countermeasure
<ul style="list-style-type: none"><li>• Loose connection at the nozzle, lance, ball cock or hose assembly.</li><li>• Extremely low engine speed.</li><li>• Clogged filter (for suction) or nozzle.</li></ul>	<ul style="list-style-type: none"><li>• Retighten.</li><li>• Increase engine speed to the proper range.</li><li>• Clean.</li></ul>

○ Pressure does not increase.

Cause	Countermeasure
<ul style="list-style-type: none"><li>• Clogged or damaged nozzle.</li></ul>	<ul style="list-style-type: none"><li>• Clean or replace.</li></ul>

○ The engine does not start.

Cause	Countermeasure
<ul style="list-style-type: none"><li>• Did not follow instructions as indicated in the Operating Manual?</li><li>• Fuel in the tank?</li><li>• Plug cap is not firmly attached.</li><li>• Dirty spark plug.</li></ul>	<ul style="list-style-type: none"><li>• Follow instructions in the Operating Manual.</li><li>• Add fuel.</li><li>• Attach spark plug cap properly.</li><li>• Clean the spark plug.</li></ul>

## 12. After-sales service

If there is still something wrong with the machine even after inspecting and taking countermeasures, contact the store where you purchased the sprayer or our company with the following information:

<Details>

- Model and product number.
- Condition during use.
- How many hours the sprayer has been used?
- Inform us in as much detail as possible concerning conditions at the time of equipment failure.

## 13. Time limit for supplying repair parts

The time limit for supplying repair parts for this sprayer will be 9 years after production stops. However, in the case of special parts, we may need to be consulted about date of delivery even during this supply period. In principle, the supply of repair parts will end after the period stated above. However we will handle customer inquiries concerning availability, date of delivery and price of parts even after the end of the supply period.

#### 14. Agricultural-chemical dilution list

Amount of water (ℓ)		100	5	10	15	20	22	25	
Multiple	100	1000.0	50.0	100.0	150.0	200.0	220.0	250.0	Chemical quantity mℓ · g
	200	500.0	25.0	50.0	75.0	100.0	110.0	125.0	
	250	400.0	20.0	40.0	60.0	80.0	88.0	100.0	
	300	333.3	16.7	33.3	50.0	66.6	73.3	83.3	
	350	285.7	14.3	28.6	42.9	57.2	62.9	71.4	
	400	250.0	12.5	25.0	37.5	50.0	55.0	62.5	
	450	222.2	11.1	22.2	33.3	44.4	48.9	55.6	
	500	200.0	10.0	20.0	30.0	40.0	44.0	50.0	
	600	166.7	8.3	16.7	25.0	33.4	36.7	41.7	
	700	142.9	7.1	14.3	21.4	28.6	31.4	35.7	
	800	125.0	6.3	12.5	18.8	25.0	27.5	31.3	
	900	111.1	5.6	11.1	16.7	22.2	24.4	27.8	
	1000	100.0	5.0	10.0	15.0	20.0	22.0	25.0	
	1200	83.3	4.2	8.3	12.5	16.6	18.3	20.8	
	1500	66.7	3.3	6.7	10.0	13.4	14.7	16.7	
	2000	50.0	2.5	5.0	7.5	10.0	11.0	12.5	
	2500	40.0	2.0	4.0	6.0	8.0	8.8	10.0	
	3000	33.3	1.7	3.3	5.0	6.6	7.3	8.3	
	3500	28.6	1.4	2.9	4.3	5.8	6.3	7.1	
	4000	25.0	1.3	2.5	3.8	5.0	5.5	6.3	
4500	22.2	1.1	2.2	3.3	4.4	4.9	5.6		
5000	20.0	1.0	2.0	3.0	4.0	4.4	5.0		





