

Post-Flight Inspection and Cleaning

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Post-Flight Inspection and Cleaning

Post-flight Inspection

In preparation for the next flight, inspect the helicopter and make sure each area is free of problems. In addition, enter the results in the flight inspection log.

⚠ WARNING

- To prevent injury, make sure the engine is stopped before performing an inspection.
- The helicopter is very hot immediately after a flight. To prevent burns, allow the temperature of the helicopter to lower sufficiently before performing an inspection.

	Inspection Point	Inspection Items	Flight	
			Pre	Post
	Transmitter	<ul style="list-style-type: none"> • Battery Level • Operation • Antenna installation 	<input type="radio"/>	
1	Fuel	<ul style="list-style-type: none"> • Level • Leakage 	<input type="radio"/>	<input type="radio"/>
2	Coolant, oil	<ul style="list-style-type: none"> • Level • Leakage 	<input type="radio"/>	<input type="radio"/>
3	Rotor blades	<ul style="list-style-type: none"> • Dirtiness, damage • Movement 	<input type="radio"/>	<input type="radio"/>
4	Air cleaner	<ul style="list-style-type: none"> • Dirtiness 		<input type="radio"/>
5	Servo, linkage (rudder, throttle)	<ul style="list-style-type: none"> • Operation • Wobble 	<input type="radio"/>	<input type="radio"/>
6	Self monitor	<ul style="list-style-type: none"> • States of lighting 	<input type="radio"/>	<input type="radio"/>
	Radio signal distance test	<ul style="list-style-type: none"> • Radio signal reach 	<input type="radio"/>	
7	Tail rotor drive belt	<ul style="list-style-type: none"> • Tension • Abnormal noise • Wear, damage • Refuel 	<input type="radio"/>	<input type="radio"/>
	GPS system	<ul style="list-style-type: none"> • States of lighting 	<input type="radio"/>	
8	Antenna	<ul style="list-style-type: none"> • Installation state • Rust 		<input type="radio"/>

Fuel Inspection

Inspect for fuel leakage.
 Before performing this inspection, turn OFF both the main switch for the helicopter and the power switch for the transmitter.

For details, see page 4-19.

If you discover any fuel leakage, request a repair by your dealer before the next flight.

⚠ WARNING

Fuel leakage could lead to a fire.

Coolant and Oil Inspections

Inspect the coolant level and check for any coolant or oil leakage.

Before performing this inspection, turn OFF both the main switch for the helicopter and the power switch for the transmitter.

For details, see page 4-20.

A slight stain of coolant or oil does not indicate an abnormal condition. However, if there are any drops of coolant or oil leaking, request a repair by your dealer before the next flight.

NOTICE

- **Coolant leakage will adversely affect the cooling performance of the helicopter and cause it to overheat.**
- **Transmission oil leakage will reduce the internal lubrication of the transmission and damage the gears and bearings.**

Rotor Blade Inspection

Inspect the rotor blades for damage, dirtiness, and movement.

Before performing this inspection, turn OFF both the main switch for the helicopter and the power switch for the transmitter.

For details, see page 4-22.

If a rotor blade's surface is dirty, use household detergent on a soft cloth, wring out the cloth first, and use it to wipe the rotor blade's surface.

If a rotor blade is damaged, request a repair by your dealer before the next flight.

NOTICE

If a main or tail rotor blade does not move smoothly or is damaged, it could generate noise or vibration.

Air Cleaner Inspection

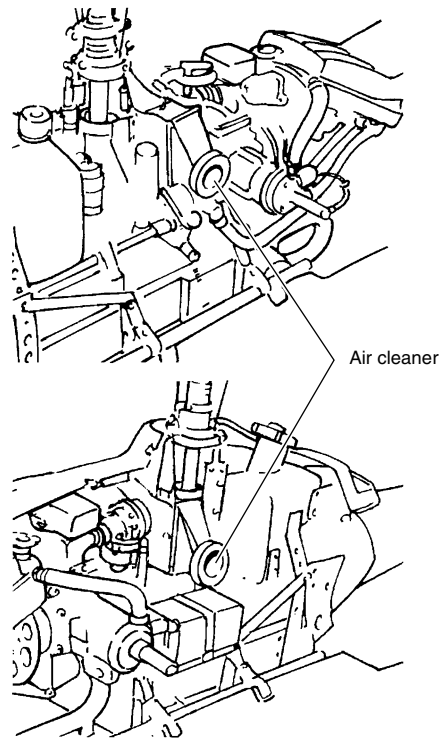
Inspect the air cleaner element for dirtiness. Before performing this inspection, turn OFF both the main switch for the helicopter and the power switch for the transmitter.

Make sure the air cleaner element is free of debris, dust, pollen, etc.

However, if the air cleaner element is dirty, replace air cleaner with new ones before the next flight.

NOTICE

A dirty or clogged air cleaner element will adversely affect the performance of the engine.



Servo and Linkage Inspection

Inspect the servos and linkages for proper operation.

Before performing this inspection, turn the power switch for the transmitter to ON and the main switch for the helicopter to START.

For details, see page 4-23.

If the servos operate abnormally or the linkages wobble, request a repair by your dealer before the next flight.

WARNING

- If the servos operate abnormally or the linkages wobble, they could adversely affect the control of the helicopter.
- If the throttle operates abnormally, it could adversely affect engine control, which could cause the helicopter to go out of control.

Self Monitor Inspection

Inspect the illumination of the indicator lights on the self monitor for proper operation.

Before performing this inspection, turn the power switch for the transmitter to ON and the main switch for the helicopter to START.

For details, see the table on page 3-5.

If the lights illuminate abnormally, request a repair by your dealer before the next flight.

⚠ WARNING

Take the appropriate actions in accordance with the indicator lights. By ignoring the lights and continuing to fly, you will lose control of the helicopter and cause a serious accident.

Tail Rotor Drive Belt Inspection

Inspect the condition of the tail rotor drive belt and apply lubricant to the belt.

Before performing this inspection, turn OFF both the main switch for the helicopter and the power switch for the transmitter.

For details, see page 4-25.

If there is a problem with the belt, request a repair by your dealer before the next flight.

⚠ WARNING

If there is a problem with the tail rotor drive belt, it could adversely affect the actuation of the tail rotor, which could cause the helicopter to go out of control.

Antenna Inspection

Inspect the antenna to make sure it is not loose or rusted at the area where it is mounted to the helicopter.

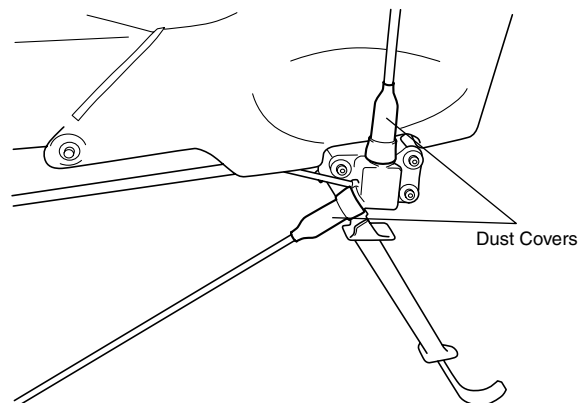
Before performing this inspection, turn OFF both the main switch for the helicopter and the power switch for the transmitter.

Peel the dust cover from the base of each antenna pole and make sure the antenna poles are not loose or rusted.

If they are loose or rusted, request a repair by your dealer before the next flight.

⚠ WARNING

If the antenna is loose or rusted, it will affect the reception of control signals, which could cause the helicopter to go out of control during flight.



Post-Flight Cleaning and Servicing

Agricultural chemicals, dust, dead bugs, and pollen could adhere to the helicopter after an aerial application.

If they remain stuck to the helicopter, they will cause a chemical reaction, which will lead to rust, insufficient lubrication, sealant deterioration, and discoloring.

To prevent these problems, use the methods described below to clean and service the helicopter after a flight, in preparation for the next flight. While cleaning, check all areas of the helicopter for any damage, abnormal wear, loose fasteners, etc.



WARNING

The helicopter is very hot immediately after a flight. Therefore, to prevent burns, clean it only after its temperature has lowered sufficiently.

NOTICE

Washing the helicopter with water will cause a sudden change in temperature, which could create problems in electrical parts. Therefore, clean it only after its temperature has lowered sufficiently.

Washable Areas

1 Side covers

They may be washed only after they have been removed from the helicopter.

Do not wash them in the installed state because the water could splash on other parts.

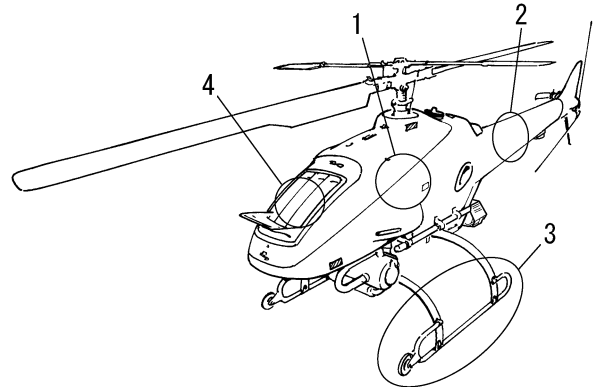
2 Tail body

Clean it carefully while making sure to prevent the GPS system and the gyro sensor from direct contact with water.

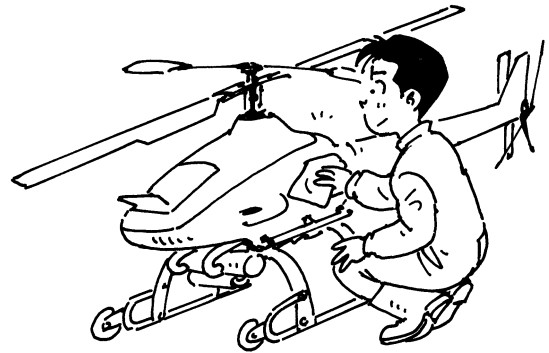
3 Leaves and runners

4 Radiator

Clean it by using caution not to damage the fins.



<i>NOTICE</i>
<p>Do not use a high-temperature, high-pressure cleaner to clean areas 1 to 4 above, as it could damage the film and paint on the surface.</p> <p>After cleaning the washable areas of the helicopter with water, ensure to wring out your cloth before you wipe the moisture off the surface.</p>



Non-Washable Areas

⚠ WARNING

The helicopter and the transmitter have a drip-proof construction and not a water-proof construction. Therefore, do not use water directly on areas other than those indicated in the previous section. Failure to observe this precaution could cause the electric parts or the sliding areas to malfunction, which could lead to a serious accident.

1 GPS System and Azimuth sensor

Washing these areas with water will cause them to malfunction as a result of exposure of the internal components to water. Therefore, use a soft, moist cloth that has been wrung out to wipe the dirty areas.

2 Control Panel

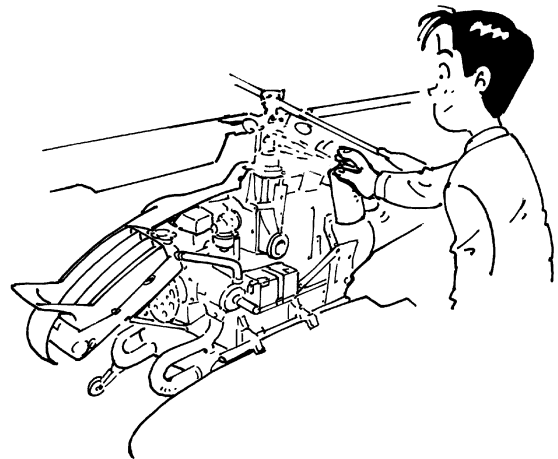
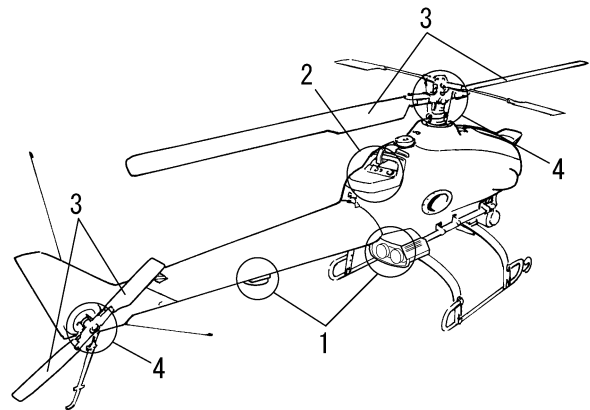
Washing these areas with water will cause the hour meter, GPS antenna, switches, and the monitor lights to malfunction as a result of exposure of the internal components to water. Therefore, use a soft, moist cloth that has been wrung to wipe the dirty areas.

3 Main and Tail Rotor Blades

Washing these areas with water will cause the rotors to lose their balance and create vibrations as a result of exposure of the internal components to water. If the rotor surface is dirty, use household detergent on a soft cloth, wring the cloth, and use it to wipe the rotor surface.

4 Main and Tail Rotor Head Areas

Washing these areas with water will adversely affect the lubrication of the bearings and slides, which could damage or wear those parts. Therefore, use a soft, moist cloth that has been wrung out to wipe the dirty areas. Apply a small amount of the dealer-specified anti-rust lubricant to the bearings, rod ends, and sliding portions of parts, and then wipe them with a dry cloth.



5 Servos and Electrical Parts

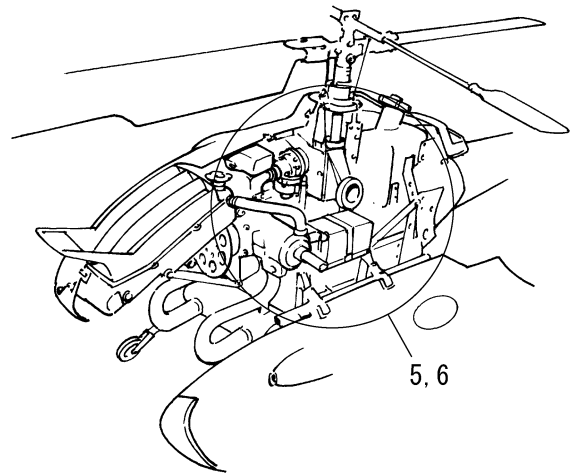
Washing these areas with water will cause them to malfunction as a result of exposure of the internal components to water.

6 Frame

Washing this area with water will cause the YACS control to malfunction as a result of exposure of the internal electric components to water. Therefore, use a soft, moist cloth that has been wrung out to wipe the dirty areas.

7 Flight Transmitter

Washing this area with water will cause the transmitter to malfunction as a result of exposure of the internal switches and electric components to water. Therefore, use a soft, moist cloth that has been wrung out to wipe the dirty areas.



Simple Maintenance

Battery Recharging Procedure 7-1

Simple Maintenance

Battery Recharging Procedure

This helicopter uses a sealed battery.
It is not necessary to refill or inspect the battery fluid.

If there is any abnormality in the battery, request a repair by your dealer.



WARNING

The battery produces flammable gas (hydrogen gas). Mishandling it could lead to an explosion resulting in injuries. Make sure to observe the following:

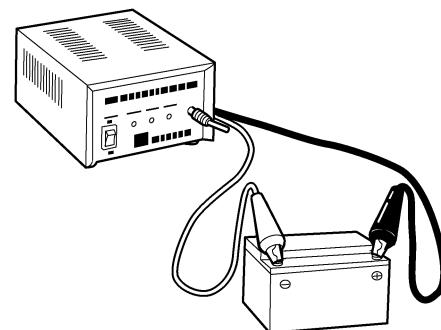
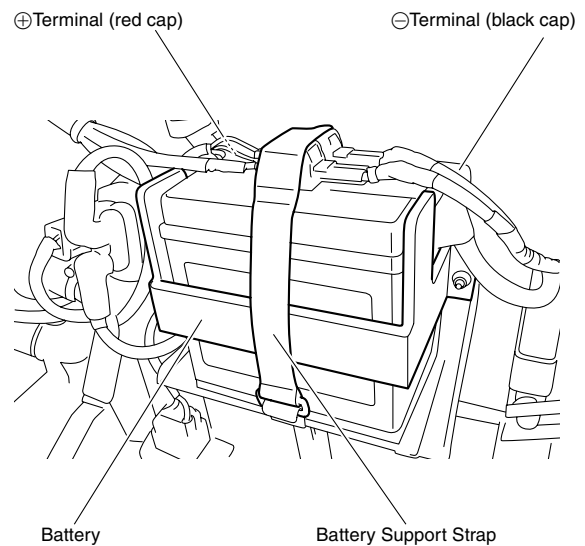
- Fire is strictly prohibited. Do not short a circuit, cause a spark, or let any fire such as cigarettes come near. This could cause an explosion.
- Do not connect to the battery terminals in the wrong order. Doing so could cause a fire.
- Recharge in a well ventilated place.
- Keep gasoline, oil, or organic solvent from getting on the battery, as this could cause the battery case to crack.
- Do not drop it or apply any other strong impact.
- The battery fluid is diluted sulfuric acid. Contact with the skin, eye, or clothing could lead to a serious injury.
- Keep out of reach of children.

First Aid

- In the unlikely event that the battery fluid gets on the skin, clothing, etc., immediately rinse with copious amounts of water.
- If it enters the eye, immediately rinse it with copious amounts of water, and seek medical attention.

NOTICE

- This is a sealed 12V battery.
- This battery has been filled with fluid and charged. No fluid level inspection or refilling is necessary.
- For recharging, use the dedicated sealed battery recharger. Contact your dealer for details.
- If the battery is to be left unused for a long time, remove the battery from the helicopter, and recharge every 3 months.
- When replacing the battery, make sure to use a genuine battery.



Removing the Battery

- ① Make sure to turn OFF the main switch on the control panel.
- ② Disconnect the negative \ominus and positive \oplus terminals of the battery, in that order.
- ③ Remove the battery support strap and take the battery out of the helicopter.

Reinstalling the Battery

Reinstall the battery in reverse order of removal.

TIP

- **Batteries are consumables.**
- **The battery should be replaced every year.**

Proper Management

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Proper Management

This unmanned helicopter for industrial applications has been manufactured for the purpose of aerial application of agricultural chemicals, fertilizers, and seeds.

Secure a storage location for the helicopter and its auxiliary devices, to prevent theft and illegal use outside of its intended purpose, such as criminal acts.

As a measure to prevent illegal use, this product is equipped with the following features:

- Areas of use are limited
- Specified operation period
- Specified total operation time

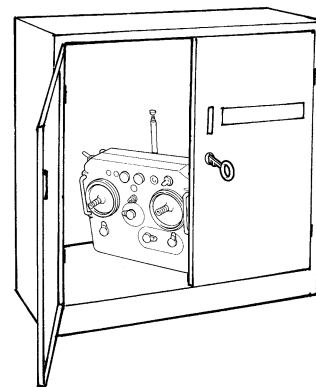
Storage Precautions

To select a storage site, consider factors such as sources of fire or spark, temperature, humidity, dust, theft, and the presence of any stacked loads in the area.

We recommend that you provide a dedicated cabinet for storing the auxiliary devices.

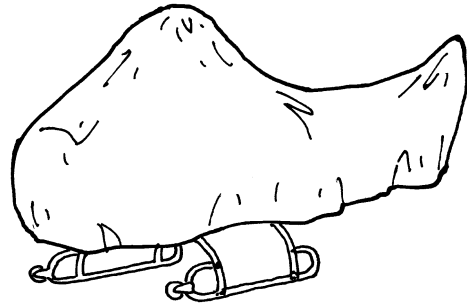
In addition to protecting the helicopter from damage and theft, or the auxiliary devices from loss, these measures will facilitate the monitoring of their maintenance conditions and ensure efficient preparation for the next flight.

- ① Store the helicopter, rotors, and transmitters in separate, lockable locations so that they will not be stolen or subject to other criminal acts.
- ② If the helicopter is stolen, immediately report the theft to your dealer. Then, contact your local police department.



Daily Storage Procedure

- ① Perform "Post-flight Inspection" (P6-1) and record the results in the flight log.
- ② Clean the helicopter. (See page 6-5.)
- ③ Place the helicopter cover (sold separately) and store it indoors, in an area that is not damp.
- ④ Clean the flight transmitter and remove its battery. (See page 4-2.)



Long-Term Storage Procedure

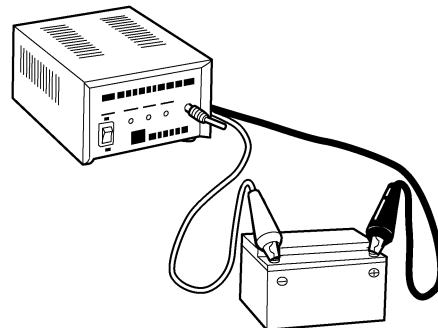
If the helicopter will not be operated for a few months, follow the storage procedure given below in preparation for the subsequent operation.

- ① Perform "Post-flight Inspection" (P6-1) and record the results in the flight log.
- ② Clean the helicopter. (See page 6-5.)
- ③ Remove the onboard battery and recharge it with a dedicated recharger. (See page 7-1.)
After recharging, store the battery in a cool and dark location, and recharge it every 3 months.

NOTICE

To disconnect the battery, first disconnect its negative terminal, followed by the positive terminal. Reversing this order could cause the battery to short.

- ④ Fuel must be drained from the fuel tank and the carburetor. Request the performance of this operation by your dealer.
- ⑤ Place the helicopter cover and store it indoors, in an area that is not damp.
- ⑥ Clean the flight transmitter and remove its battery. Store the battery in a cool and dark location.



Operating the Helicopter After Long-Term Storage

TIP

- Have a periodic inspection performed on the helicopter if you will be operating it after prolonged storage of 1 year or more.
- Contact your dealer for details.

To operate the helicopter after storing it for a few months, perform the following preparations:

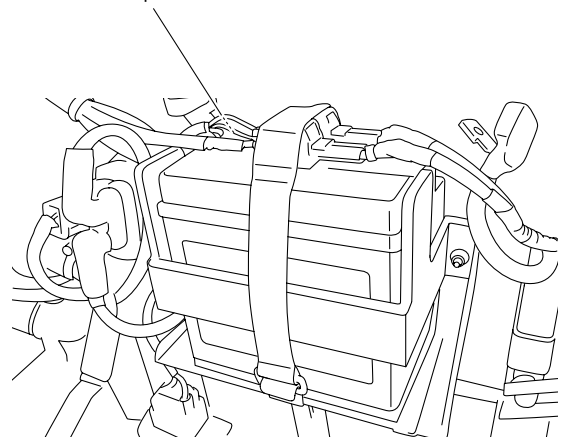
- ① Install fully charged batteries in the helicopter and the flight transmitter, after making sure the main switch on the helicopter is turned OFF.



WARNING

- Do not interchange the positive and negative poles when connecting the battery terminals, as it could cause a fire or malfunction.
- To connect the battery, first connect its positive terminal, followed by the negative terminal. Reversing this order could cause the battery to short.

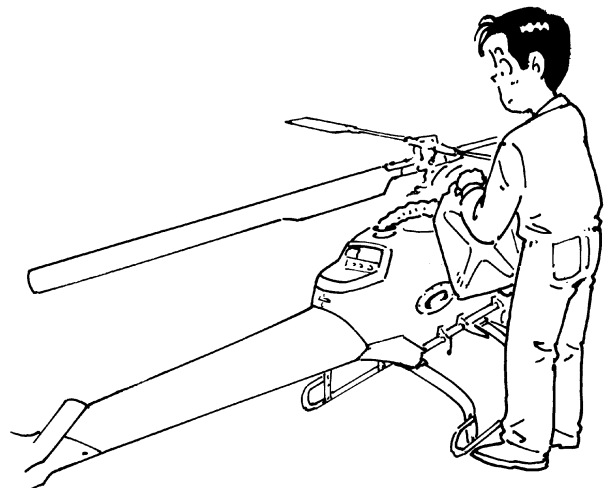
Connect the positive terminal first



- ② Prepare fresh fuel and pour it in the fuel tank. (See page 4-4.)

NOTICE

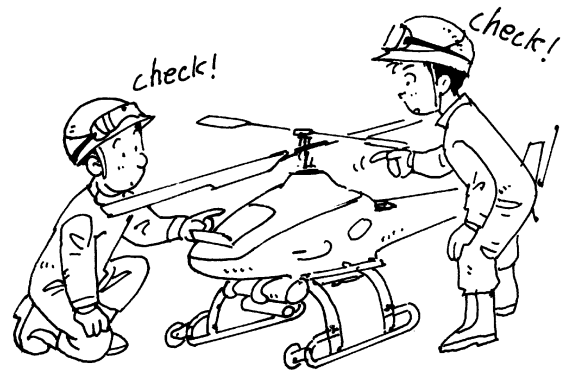
**Never use old leftover fuel.
This could cause the engine to stop or operate poorly**



- ③ Perform pre-flight inspections. (See page 4-17.)
- ④ Start the engine. After prolonged storage, the engine will be hard to start because it will take a while for the fuel to reach the carburetor.

TIP

If the engine does not start within 5 seconds after you have pressed the starter switch, wait about 10 seconds to allow the battery voltage to recover. Then, press the starter switch again.



Repeat the cycle of operating the starter motor for 5 seconds and waiting 10 seconds, 4 or 5 times. This will allow the fuel to reach the carburetor and the engine to start.

Other Types of Management

This helicopter and some parts fall under the list-controlled items of Japan's "Foreign Exchange and Foreign Trade Act". Use sufficient care to ensure that the list-controlled items are not stolen or lost.

Troubleshooting

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Troubleshooting

The problems listed here can be handled primarily by the user.

Problems or causes that are not listed here are handled by your dealer. If such problems occur, cancel the flight and contact your dealer to have the helicopter inspected and repaired.



WARNING

- Make sure to follow the instructions given in the “User Action” column, and do not take any actions that are not called for.
- If you have any questions, be sure to contact your dealer. If an inspection, adjustment, or part replacement is performed by a person who does not possess the know-how and proficiency to service the helicopter, it could lead to a serious accident.

Engine

Starter motor does not operate

	Main Cause	User Action	Remarks
1	Main switch on the helicopter is not turned to START.	Turn the main switch on the helicopter to START.	See page 5-3.
2	Power switch of the flight transmitter is not ON.	Turn ON the power switch of the flight transmitter.	See page 5-3.
3	Throttle stick on the flight transmitter is not in the SLOWEST position.	Move the throttle stick of the flight transmitter to the SLOWEST position.	See page 5-5.
4	Decompression is not operating.	Operate the decompression lever.	See page 5-5.
5	Helicopter battery terminals are loose.	Firmly tighten the battery terminals.	See page 7-1.
6	Onboard battery is faulty.	Recharge the battery with a dedicated recharger, or replace it.	See page 7-1.

The starter motor does not operate, and all 3 flight indicator lights, “OK”, “◀◻▶”, and “NG” illuminate simultaneously.

	Main Cause	User Action	Remarks
1		Request your dealer for repair.	

Engine does not start

	Main Cause	User Action	Remarks
1	There is no fuel.	Pour fresh fuel in the tank.	See page 4-4.
2	Poor quality fuel (old fuel)	Request your dealer for repair.	
3	Carburetor starter does not operate.	Operate the starter lever.	See page 5-5.
4	Spark plugs are faulty.	Immediately stop the flight and request a repair by your dealer.	
5	Spark plug caps are improperly installed.	Install the spark plug caps properly.	
6	Starter motor spins slowly.	Recharge the onboard battery with a dedicated recharger.	See page 7-1.

Engine speed does not increase

	Main Cause	User Action	Remarks
1	Main switch on the helicopter is not turned to FLIGHT.	Turn the main switch on the helicopter to FLIGHT.	See page 5-7.
2	Starter lever has not been returned.	Return the starter lever.	See page 5-6.
3	Decompression lever has not been returned.	Return the decompression lever.	See page 5-6.
4	Air cleaner element is dirty or clogged.	Immediately stop the flight and replace air cleaner with new ones.	
5	Spark plugs are faulty.	Immediately stop the flight and request a repair by your dealer.	

Engine has no power

	Main Cause	User Action	Remarks
1	Engine overheats.	Immediately stop the flight, and check the contents in the next section "Engine overheats".	
2	Spark plugs are faulty.	Immediately stop the flight and request a repair by your dealer.	
3	Air cleaner element is dirty or clogged.	Immediately stop the flight and replace air cleaner with new ones.	

Engine overheats

	Main Cause	User Action	Remarks
1	Coolant is leaking or insufficient.	Replenish coolant. If coolant is leaking, request a repair by your dealer.	See page 4-20.
2	Specified coolant is not used.	Use the dealer-specified coolant and tap water with the proper mixing ratio.	See page 4-20.
3	Radiator is dirty or its fins are clogged.	Clean the radiator.	See page 6-6.
4	Radiator fan motor is not operating.	If the motor does not operate when the main switch on the helicopter is turned to FLIGHT, request a repair by your dealer.	
5	Engine load is excessive.	Reduce the payload.	See page 4-10.

Coolant gushed out of recovery tank

	Main Cause	User Action	Remarks
1	Engine overheats.	Immediately stop the flight, and check the contents in the previous section "Engine overheats".	

Helicopter emits a burning smell

	Main Cause	User Action	Remarks
1	Engine overheats.	Immediately stop the flight, and check the contents in "Engine overheats" on page 9-2.	
2	Oil is leaking.	Immediately stop the flight and request a repair by your dealer.	
3	Wires are burned.	Immediately stop the flight and request a repair by your dealer.	

Engine idle is unstable

	Main Cause	User Action	Remarks
1	Spark plugs are faulty.	Immediately stop the flight and request a repair by your dealer.	
2	Spark plug caps are improperly installed.	Install the spark plug caps properly.	
3	Starter lever has not been returned.	Return the starter lever.	See page 5-6.
4	Idle speed is too low.	Slightly raise the throttle trim lever on the flight transmitter.	

Engine idle is too high

	Main Cause	User Action	Remarks
1	Throttle trim lever is improperly adjusted.	Lower the throttle trim lever.	
2	Carburetor throttle valve is not in contact with stop screw.	Check the operation of the carburetor. If it does not close fully, request a repair by your dealer.	See page 4-23.

Engine speed does not decrease after landing

	Main Cause	User Action	Remarks
1	Sensor operates abnormally due to a large shock sustained during landing.	Land the helicopter more gently. Turn OFF the YACS control switch.	See page 5-11.

Exhaust emits excessive smoke

	Main Cause	User Action	Remarks
1	Gasoline and oil mixing ratio is improper.	Replace the fuel.	See page 4-4.
2	Specified oil is not used.	Use the Yamaha-specified oil.	See page 4-4.

Engine makes noise

	Main Cause	User Action	Remarks
1	Engine is damaged internally or lubricated insufficiently.	Immediately stop the flight and request a repair by your dealer.	

Helicopter

Helicopter vibrates

	Main Cause	User Action	Remarks
1	Main rotor blades are positioned improperly.	Install the rotor blades by matching their color marks.	See page 4-15.
2	Main rotor or tail rotor retaining bolts are tightened improperly.	Follow the specified tightening procedure to tighten the bolts.	See page 4-15.
3	Main rotor or tail rotor is damaged.	Immediately stop the flight and request a repair by your dealer.	See page 4-22.
4	Cushion tape has peeled from the main rotor or tail rotor.	Immediately stop the flight and request a repair by your dealer.	See page 4-22.
5	Tracking of the main rotor or tail rotor is faulty.	Immediately stop the flight and request a repair by your dealer.	
6	Main rotor or tail rotor is imbalanced.	Immediately stop the flight and request a repair by your dealer.	
7	Chemical tank is improperly installed.	Securely install the chemical tank.	See the operation manual for the sprayer.

Helicopter cannot take off

	Main Cause	User Action	Remarks
1	Engine speed does not increase.	Immediately stop the flight, and check the contents in "Engine speed does not increase" on page 9-2.	
2	Engine lacks power.	Immediately stop the flight, and check the contents in "Engine has no power" on page 9-2.	
3	Payload is excessive.	Reduce the payload.	See page 4-10.

Helicopter makes noise during takeoff

	Main Cause	User Action	Remarks
1	Tail belt is loose.	Immediately stop the flight and request a repair by your dealer.	See page 4-25.
2	Bolts of parts are loose.	Check all parts for loose bolts.	

Helicopter descends after takeoff

	Main Cause	User Action	Remarks
1	Engine lacks power.	Immediately stop the flight, and check the contents in "Engine has no power" on page 9-2.	
2	Payload is excessive.	Reduce the payload.	See page 4-10.
3	Throttle stick is operated improperly.	Operate the throttle stick by making sure the amount of its movement does not decrease drastically.	

Helicopter moves considerably in rudder direction after takeoff

	Main Cause	User Action	Remarks
1	Rudder was operated excessively before takeoff.	Do not operate the rudder excessively when taking off with the YACS control ON.	See page 5-8.

Helicopter drifts in one direction

	Main Cause	User Action	Remarks
1	Trim is adjusted improperly.	Adjust the trims on the flight transmitter.	See page 5-9.

Helicopter descends when flare (brake) is applied

	Main Cause	User Action	Remarks
1	Rotor lift decreased due to an abrupt flare operation.	Do not operate the flare abruptly.	See page 5-8.
2	Payload is excessive.	Reduce the payload.	See page 4-10.

Helicopter moves considerably in rudder direction when flare (brake) is applied

	Main Cause	User Action	Remarks
1	Helicopter lost its balance due to an abrupt flare operation.	Do not operate the flare abruptly.	See page 5-8.

YACS

YACS warning light illuminates or flashes

	Main Cause	User Action	Remarks
1	Identifiable through the illumination or flashing pattern.	Immediately stop the flight and take appropriate actions accordance to the information on page 3-7.	See page 3-7.

Self monitor light other than “OK” illuminates

	Main Cause	User Action	Remarks
1	Identifiable through the illumination location.	Immediately stop the flight and take appropriate actions accordance to the information on page 3-5.	See page 3-5.

YACS control configuration takes time

	Main Cause	User Action	Remarks
1	Helicopter is not still.	Allow the YACS control to configure itself on a flat surface. (Configuration will not complete if the helicopter is tilted or moving.)	See page 5-4.

“” indicator light remains ON even after refueling

	Main Cause	User Action	Remarks
1	Fuel temperature is too high.	Keep the refueling tank in a shade because the fuel in it will reach a high temperature if the tank is left under a scorching sun.	

GPS

GPS control configuration takes time (outer lights flashing)

	Main Cause	User Action	Remarks
1	GPS radio signal reception is poor.	Wait until reception is restored or move to another location and redo the configuration. If the symptom does not improve after waiting or changing the location, request an inspection of the system by your dealer.	See page 3-9. See page 3-10.

GPS indicator outer lights do not flash (with engine stopped)

	Main Cause	User Action	Remarks
1	Power switch of the flight transmitter is not ON.	Turn ON the power switch of the flight transmitter.	
2	GPS system failure	Request your dealer for repair. (The helicopter can continue to fly under YACS control only.)	

Not all indicators illuminate even when GPS control switch is turned ON

	Main Cause	User Action	Remarks
1	GPS radio signal reception is poor (outer lights do not illuminate).	Wait until reception is restored or move to another location and redo the configuration. If the symptom does not improve after waiting or changing the location, request an inspection of the system by your dealer.	See page 3-9. See page 3-10.
2	Transmitter's GPS control switch is faulty.	Request your dealer for repair. (The helicopter can continue to fly under YACS control only.)	

Flight Transmitter

Output light does not illuminate

	Main Cause	User Action	Remarks
1	Transmitter has an internal failure.	Immediately stop the flight and request a repair by your dealer.	See page 4-18.

Battery monitor light illuminates

	Main Cause	User Action	Remarks
1	Battery's state of charge is low.	Replace with a fully charged battery.	See page 3-11.

Battery use duration is too short

	Main Cause	User Action	Remarks
1	Battery failure	Replace the battery.	See page 3-11.
2	Battery's memory effect	Use a battery discharger to eliminate the memory effect. (Contact your dealer on how to eliminate the memory effect.)	

Battery monitor light illuminates suddenly

	Main Cause	User Action	Remarks
1	Battery lead wire is damaged.	If the light illuminates when the battery lead wire is shaken by hand, the battery lead wire is damaged. Immediately stop the flight and request a repair by your dealer.	See page 4-2.

Dropped transmitter on ground

	Main Cause	User Action	Remarks
1	Transmitter may be damaged internally.	Immediately stop the flight and request an inspection of the transmitter by your dealer.	

Dropped transmitter into water

	Main Cause	User Action	Remarks
1	Transmitter may be damaged internally.	Immediately stop the flight and request an inspection of the transmitter by your dealer.	

Buzzer sounds a 3-3-7 pattern

	Main Cause	User Action	Remarks
1	Transmitter has an internal failure.	Immediately stop the flight and request an inspection of the transmitter by your dealer.	See page 3-11.

Sprayer

Chemical remains in right chemical tank

	Main Cause	User Action	Remarks
1	Helicopter is tilting.	This normal condition occurs because the helicopter tilts 5 degrees to the right during the flight. (Ultimately, the sprayer will discharge all the chemical in the tank.)	

Sprayer does not operate

	Main Cause	User Action	Remarks
1	Sprayer selector switch was operated improperly.	Select the switch position in accordance with the type of sprayer that is being used.	See page 5-3.

Other problems with liquid sprayer

See the operation manual for the liquid sprayer.

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Specifications

Specifications Data

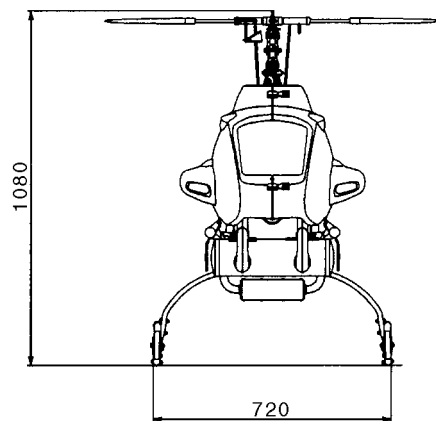
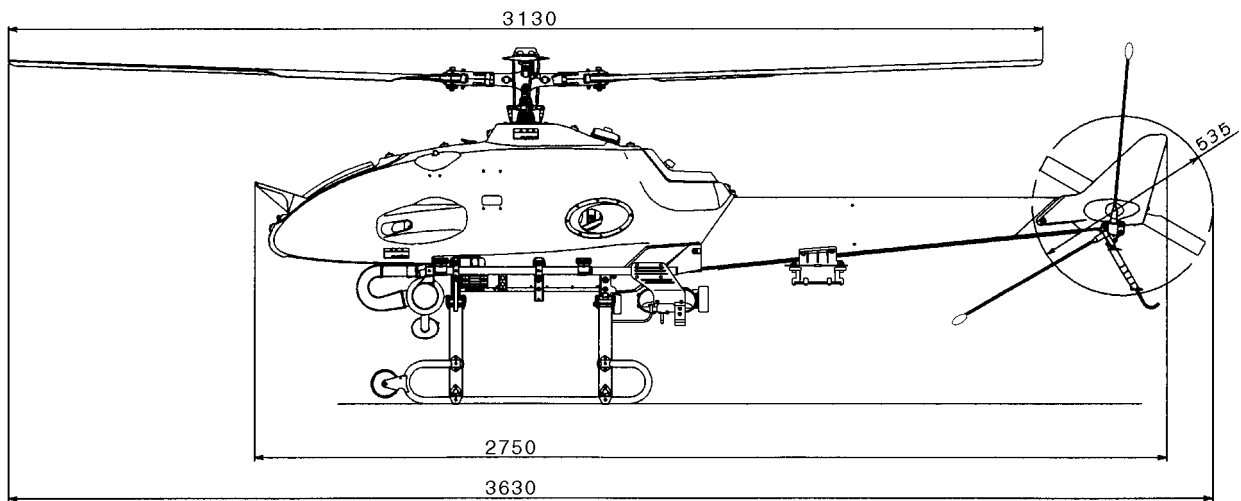
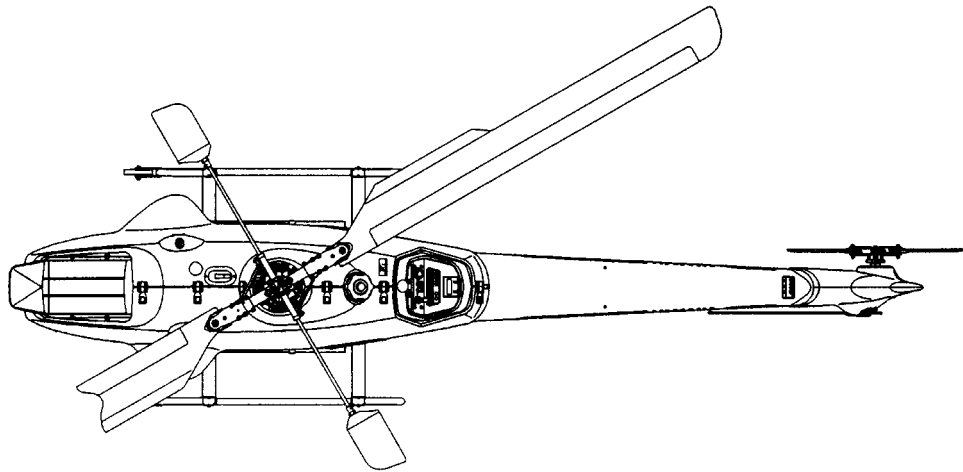
Data List

Product Name		RMAX TypeII G UNIT,		
Manufacturer Model		L25		
Performance	Chemical Load Capacity*	16 kg		
	Practical Range (visual range)	150 m		
Engine	Type	2-cycle, horizontally opposed 2-cylinder		
	Cylinder Displacement	246 cc		
	Maximum Output	15.4 kW		
	Cooling	System	Water-Cooled	
		Specified Coolant	Mixture of dealer-specified coolant and water	
		Mixing ratio	Dealer-specified ratio	
	Starting System	Electric Starter		
	Fuel	Type	Regular gasoline mixed with 2-cycle engine oil	
		Mixing ratio	50 parts gasoline to 1 part oil	
		Specified Oil	Dealer-specified oil	
Tank Capacity		6 liters		
Electrical	Control System	Name	YACS-G	
		Warning Device	Self Monitor, YACS Warning Light, GPS Indicator Light	
		Warnings	Low Fuel Level, Excess Load, Radio Signal Interference, Low Voltage, GPS Control Condition, Velocity Display, etc.	
	Radiowave Frequencies for Flying	72.690, 72.730, 72.810, 72.850, 72.910, 72.950 MHz		
	Battery	Onboard	12 V, 6.0 Ah, VRLA, leaded battery	
		Transmitter	9.6 V, 1.0 Ah, Ni-MH battery	
	Spark Plug	Unmanned helicopter spark plug (Yamaha P/N 94702-00271) (NGK P/N BR7HS-10)		
Helicopter Dimensions	Main Rotor Diameter	3130 mm		
	Tail Rotor Diameter	535 mm		
	Overall Length / Overall Length with Rotor	2750 mm/3630 mm		
	Overall Width	720 mm		
	Overall Height	1080 mm		

* The performance may vary with atmospheric temperature, humidity, and altitude.

Dimensions

Unit: mm



Inspection

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Inspection

Inspection Types and Descriptions

The prescribed types of inspections are described below.

- Pre-flight and post-flight inspections are to be performed by the operator.
- For the 30-hour inspection, periodic inspection, and general inspection, contact your dealer (authorized service facility for Yamaha unmanned helicopters for industrial applications).

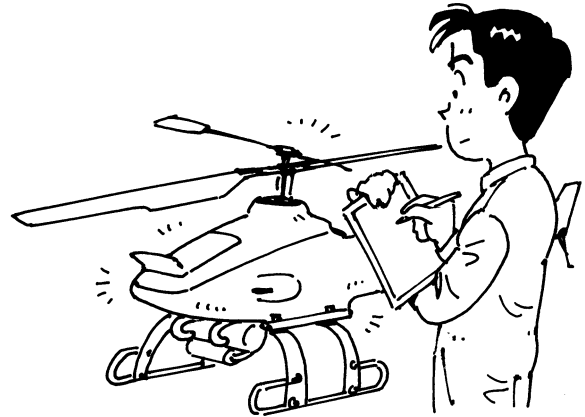


WARNING

Have your dealer perform the 30-hour inspection, periodic inspection, general inspection, and repairs. The performance of these inspections by a person who is not a certified unmanned helicopter service technician could cause the helicopter to malfunction or result in an accident.

TIP

Do not fly or perform an aerial application without having a periodic inspection performed every 100 hours of operation.



What are Yamaha-authorized service facilities for unmanned helicopters for industrial applications? It is a service facility staffed by certified service technicians for Yamaha industrial unmanned helicopters and equipped with the prescribed service equipment.

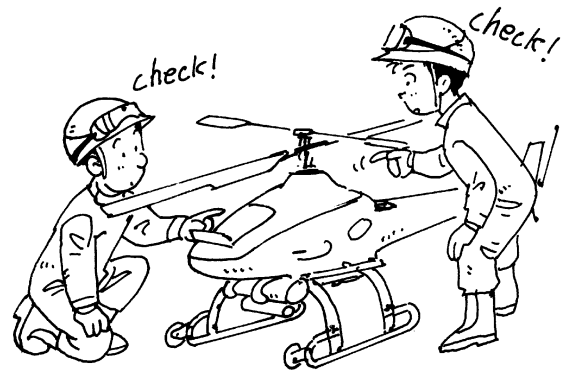
Pre-Flight Inspection

Ensures that the helicopter and the auxiliary equipment are free of problems before a flight.

See page 4-17 for details on the inspection.

Post-flight Inspection

Ensures that the helicopter and the auxiliary equipment are free of problems after a flight. See page 6-1 for details on the inspection. If a problem is detected, cancel the flight and promptly contact your dealer. Record the results of the inspection on the flight log.

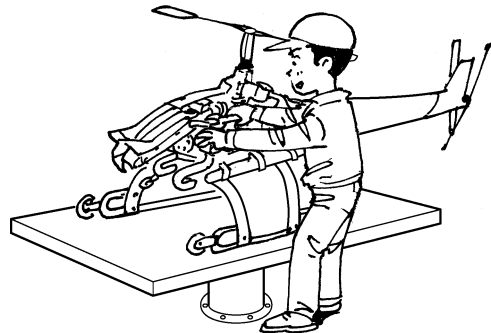


30-Hour Inspection

An inspection service performed after the delivery of a new helicopter, when the hour meter indicates a total of 30 hours of operation.

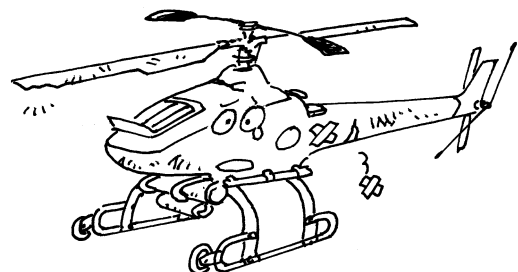
Periodic Inspection

An inspection service performed at a Yamaha-specified dealer once for every 100 hours of operation indicated by the hour meter. The service includes testing for durability and performance of the helicopter and sprayer.



General Inspection

An inspection service to ensure the safety of the helicopter when the hour meter shows a total of 500 or more hours of operation.



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 Please read this manual before using the product.

UNMANNED HELICOPTER FOR INDUSTRIAL APPLICATIONS

RMAX *TYPE II G*
UNIT,

**LIQUID SPRAYER
OPERATION MANUAL**




Foreword

Thank you for using the liquid sprayer for the RMAX TypeII G Unit, unmanned helicopter for industrial applications.

This operation manual describes the proper operating procedures as well as inspection and servicing methods for the liquid sprayer for the RMAX TypeII G Unit, helicopter. Before using this product, please be sure to read this operation manual, along with the separate operation manual for the RMAX TypeII G Unit, helicopter, and thoroughly understand the information contained therein.

In this manual, the warning notes, which are necessary for safe and proper operation of this product, are categorized and shown as follows. Please make sure to observe these instructions, as they all contain important information.

 DANGER
This indicates that improper operation will cause imminent danger, which could lead to serious injury or death.

 WARNING
This indicates that improper operation could lead to minor and serious injuries or death.

<i>NOTICE</i>
Indicates that improper operation could cause property damage.

TIP
Indicates proper operating procedure and tips on inspection and maintenance.



Indicates a prohibited action.
The specific prohibited action is illustrated near the symbol.

- After you have read this operation manual, keep it within easy access near the product.
- If you have lost this operation manual, contact your dealer to request another copy.
- Contact your dealer if you have any questions or comments regarding the contents of this operation manual.
- Some diagrams and contents in this manual may differ from the actual device, due to specification changes, etc.

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Product Inspection

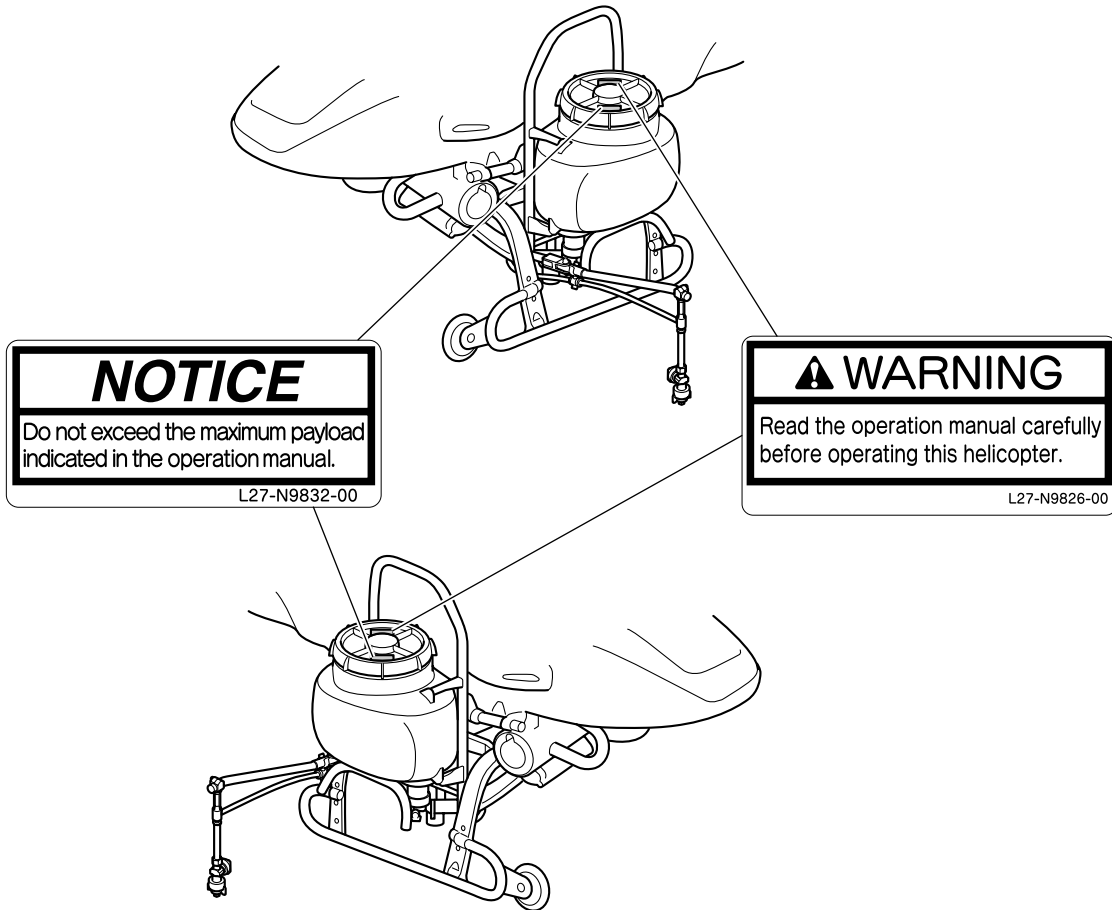
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Safety Precautions

Product Safety Label Locations

Before using the device, please read and understand the affixed product safety labels thoroughly.



Requirement

1

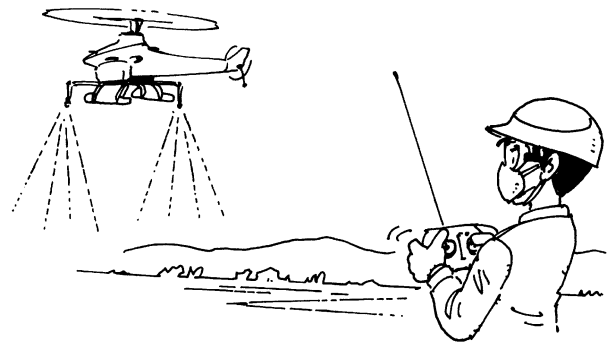
Basic requirements

⚠ WARNING

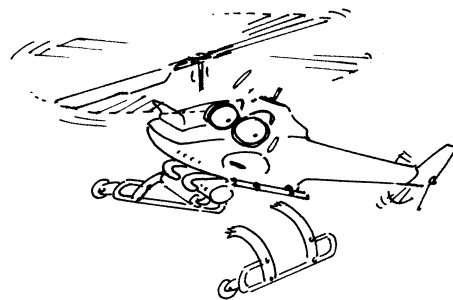
To ensure safe use, please make sure to read the operation manual thoroughly before use.

**⚠ WARNING**

This liquid sprayer for the unmanned helicopter for industrial applications has been manufactured for the purpose of aerial application of agricultural chemicals, fertilizers, and seeds. Do not use it for other applications. It could also cause unexpected accidents.

**⚠ WARNING**

Do not modify the helicopter or the auxiliary devices. Do not use parts other than genuine parts. Any modification of the helicopter or use of non-genuine parts may cause unexpected accidents.



Operator requirements

⚠ WARNING

Flying this helicopter requires a high level of skill. The helicopter should be operated only by a person who possesses an appropriate license.



⚠ WARNING

Make sure to wear a helmet during flight. To perform an aerial application, make sure to wear clothing that is appropriate for the operation. Performing a flight and an aerial application in clothing that is not appropriate for the task could cause loss of visibility, maneuvering error, or cause your foot to slip, resulting in unexpected accidents. Furthermore, it could harm your health through exposure to agricultural chemicals.



Observe the following clothing requirements:

- Wear a helmet.
- Wear goggles and a particle mask.
- Wear long-sleeved clothing with secure buttons and fasteners.
- Wear slip-proof shoes that are easy to walk with.
- Do not wear objects that could obstruct vision when there is wind, or adversely affect operation (especially towels and gloves).

⚠ WARNING

A minimum of 3 people is required for an aerial application: a navigator who has been briefed on the aerial application procedure, an assistant who readies, mixes, and supplies agricultural chemicals, and an operator. Beware that an understaffed operation could lead to an accident.

⚠ WARNING

The operation of an unmanned helicopter involves considerable mental fatigue. The operator should not fly the helicopter continuously for more than one hour, but should take a rest every hour. Prolonged continuous flight operation could cause the operator to lose concentration and could lead to an accident.



⚠ WARNING

Do not fly the helicopter after drinking alcohol or taking a cold medicine, or if you are in poor physical condition. Flying the helicopter in poor physical condition could cause loss of concentration, and could lead to an accident.

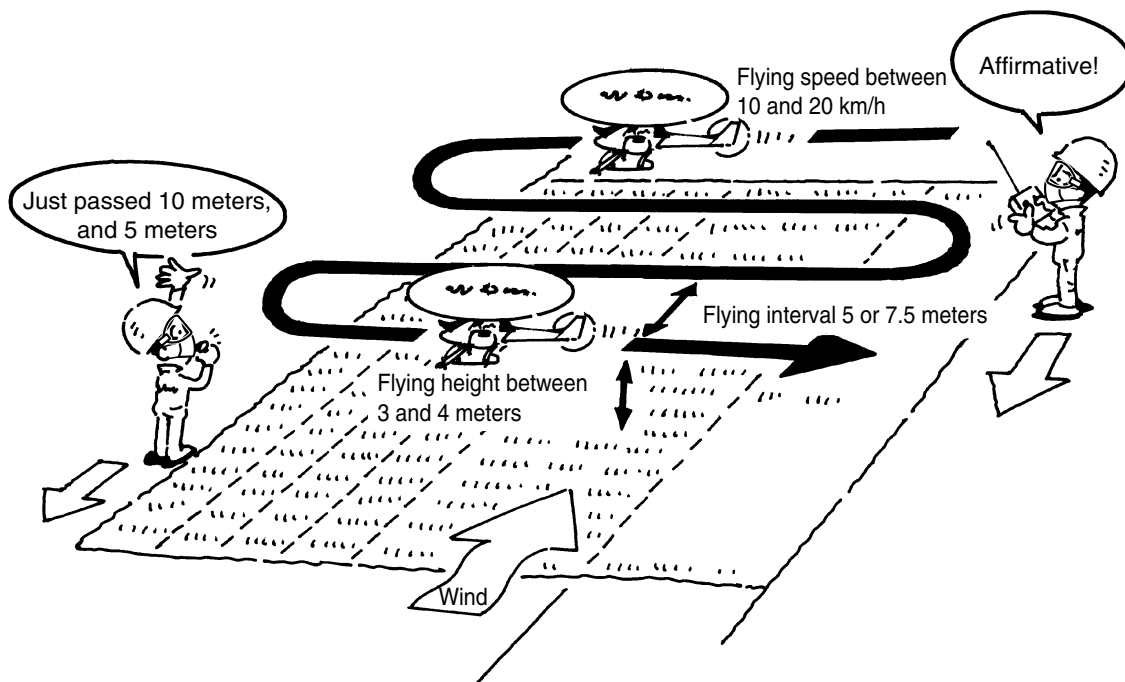
Spraying Precautions

When operating an unmanned helicopter for the purpose of spraying agricultural chemicals, ensure safe operation, as well as the safety of humans, animals, agricultural products, and the environment during aerial application.

General Flight Pattern for Aerial Application

Example: Disease and pest control of a rice paddy

- Flight altitude: 3 to 4 m
- Flying speed: 10 to 20 km/h
- Flying interval: 5 or 7.5 m
- Wind velocity: 3 m/s maximum



⚠ DANGER

When performing tasks such as refueling, never approach (or allow others to approach) within 20 m of the helicopter until the main rotor has come to a complete stop and the engine has stopped. Entering within 20 m of the helicopter could cause a serious accident.

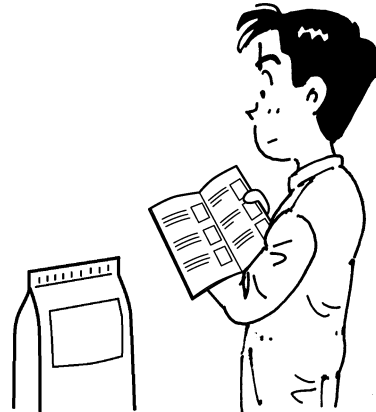
Using Registered Agricultural Chemicals

Use nationally registered agricultural chemicals, and use them properly by reading the usage instructions and precautions included in the manual for each respective chemical.



WARNING

Do not use agricultural chemicals other than those registered. Failure to do so could expose animals, plants, or people to agricultural chemicals for which the operator will be held socially responsible.



WARNING

Control and handle agricultural chemicals strictly in accordance with their manuals. Negligent control and improper handling of agricultural chemicals could lead to chemical pollution or health hazards.

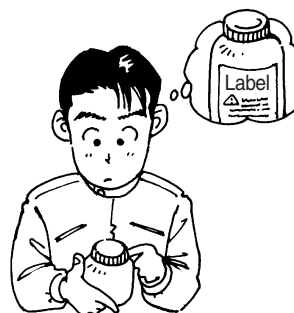


Spray Chemical

Since the agricultural chemical is diluted at a low dilution rate, make sure to observe the following:

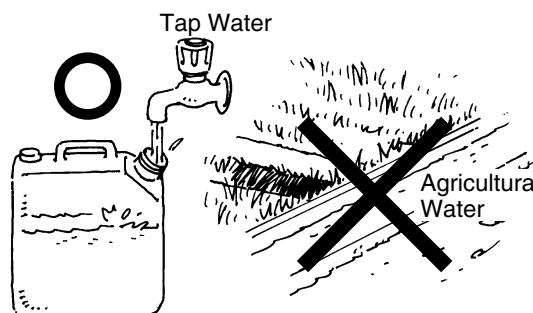
(1) Agricultural Chemical

- Use nationally registered agricultural chemicals.
- In low-volume liquid spraying, the characteristics of the agricultural chemical can easily change when mixed with other agricultural chemicals, and may produce solids or turn to a gum-like state. When mixing, use agricultural chemicals that have been checked in advance for physio-chemical change, compatibility with the sprayer, mixture toxicity, etc.
- Spreading agents (surface active agents) cannot be added.



(2) Dilution Water

For dilution water, make sure to use tap water. Do not use agricultural water, as this could lead to debris clogging or characteristic change in the agricultural chemical.



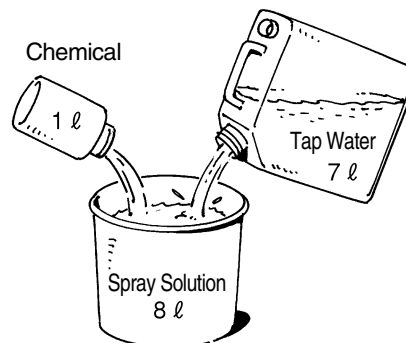
(3) Dilution Rate

For example, to make 8 l of spray solution of an agricultural chemical diluted to 8x, dilute 1 l of agricultural chemical with 7 l of tap water (dilution water). This will make 8 l of spray solution.

Agricultural chemical: $8 \text{ l} \times 1/8 = 1 \text{ l}$

Tap water: $8 \text{ l} - 1 \text{ l (agricultural chemical)} = 7 \text{ l}$

Since flowable and water-dispersible chemicals can easily precipitate, combine and mix them well just before aerial application flight.

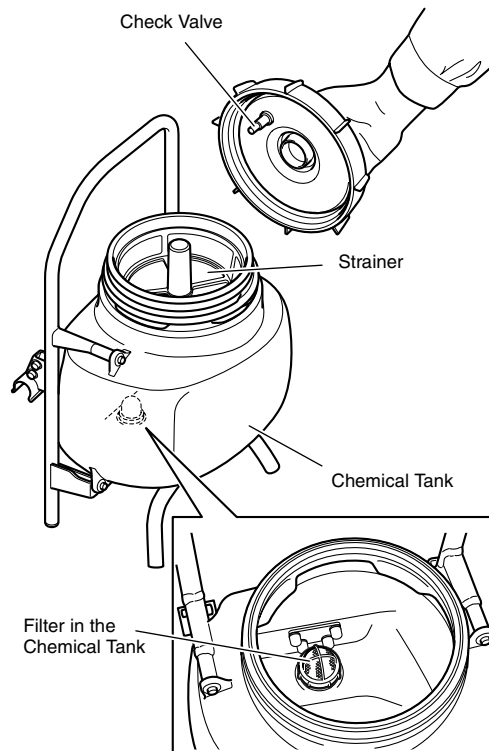


Pouring the Spray Solution

- Check the inside of the chemical tank (into which the solution will be poured), the check valve, the strainer section, and the filter for any debris or sediments. If you find any debris or sediments, make sure to remove them before pouring the solution.
- Keep the chemical tank load to 8 ℓ or less per side (16 ℓ combined for left and right tanks).

TIP

- For higher altitudes and temperatures, decrease the load.
- For information on load capacity, see the operation manual for the helicopter.



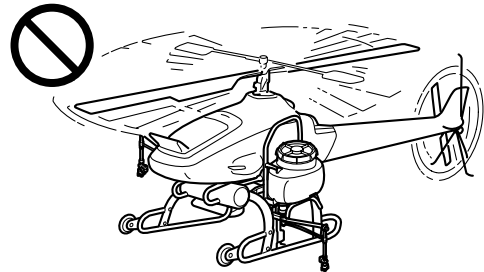
Usage Precautions

Stop the engine when replenishing the chemical.

When replenishing the chemical, make sure to stop the engine. If this task takes longer than one minute, turn OFF the main switch on the helicopter.

⚠ DANGER

Never approach (or allow others to approach) within 20 m of the helicopter until the main rotor has come to a complete stop and the engine has stopped. Entering within 20 m of the helicopter could cause a serious accident.

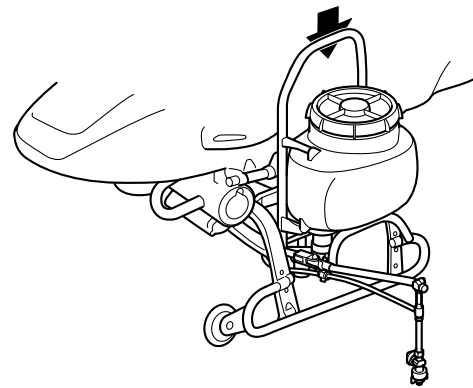


Securely mount the chemical tanks.

Prior to the flight, check that both chemical tanks are securely mounted.

NOTICE

If the chemical tanks are not securely mounted, they could come off during flight.

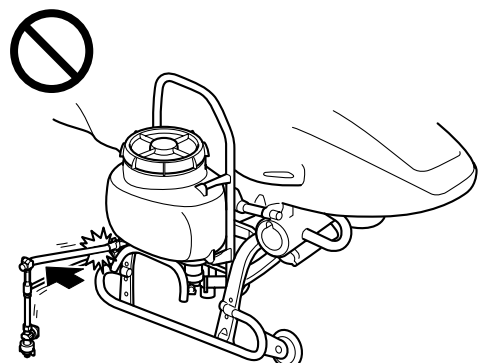
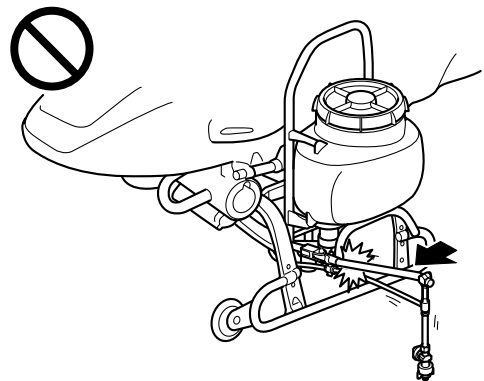


Do not apply excessive force on the boom.

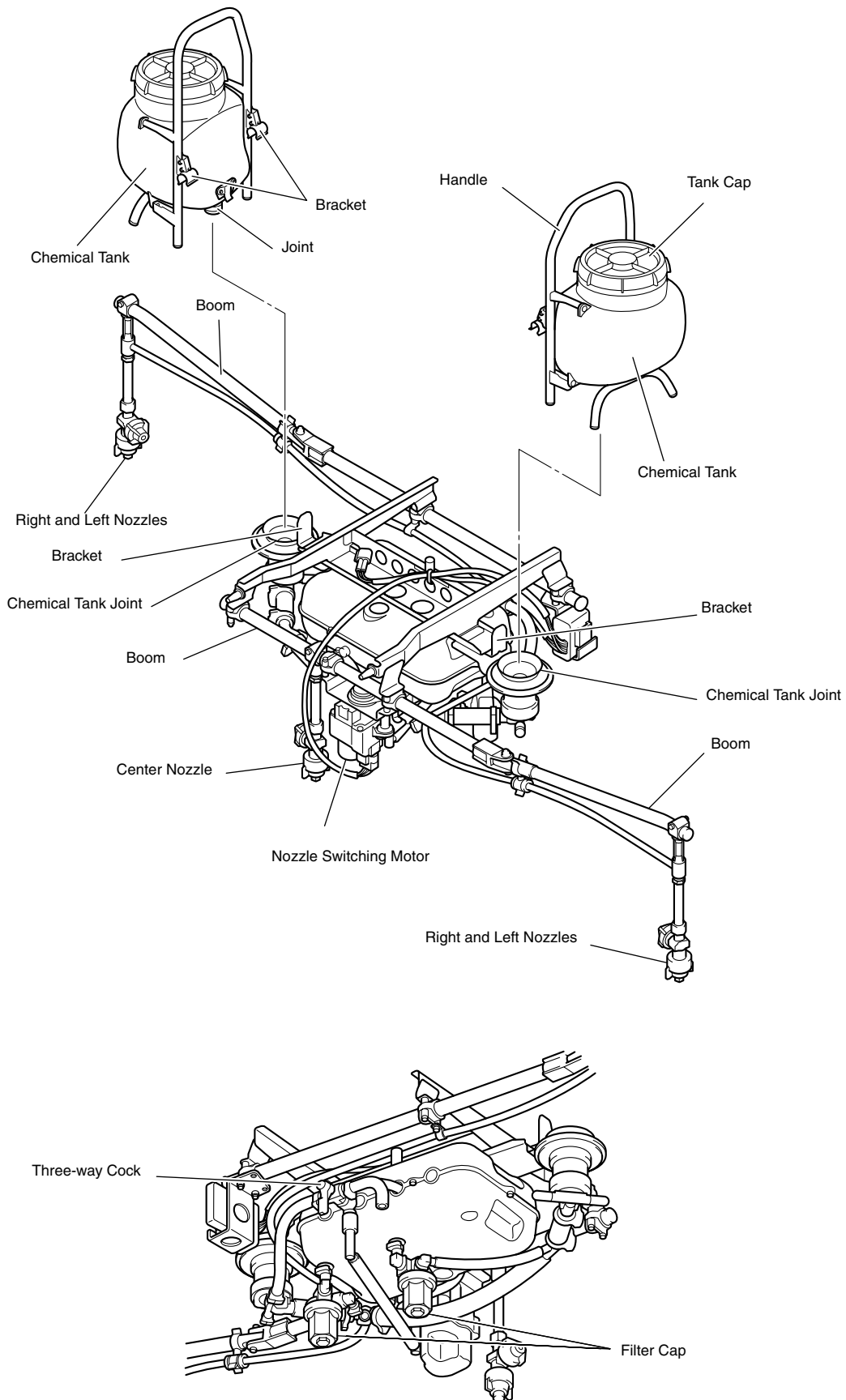
When performing tasks such as replenishing the chemical, use caution not to trip on the boom.

NOTICE

If an excessive force is applied against the folding direction of the boom, it could become damaged.



Part Names



2

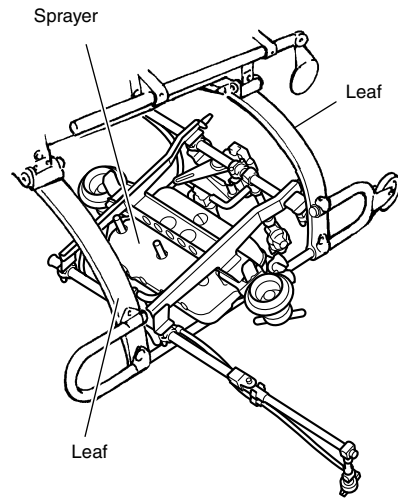
Mounting and Removing the Sprayer

Mounting and Removing the Sprayer

① Position the sprayer under the frame.

TIP

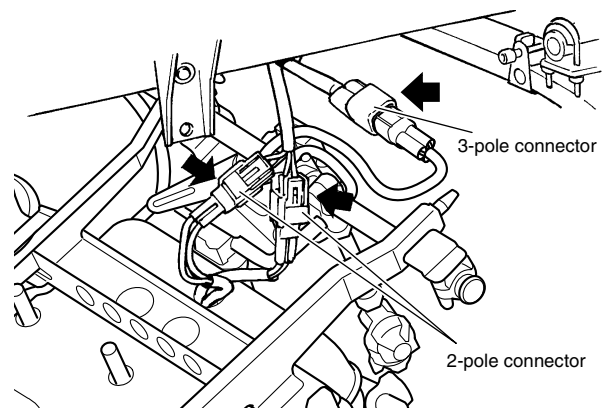
Extend the sprayer boom, and slide horizontally from between the leaves.



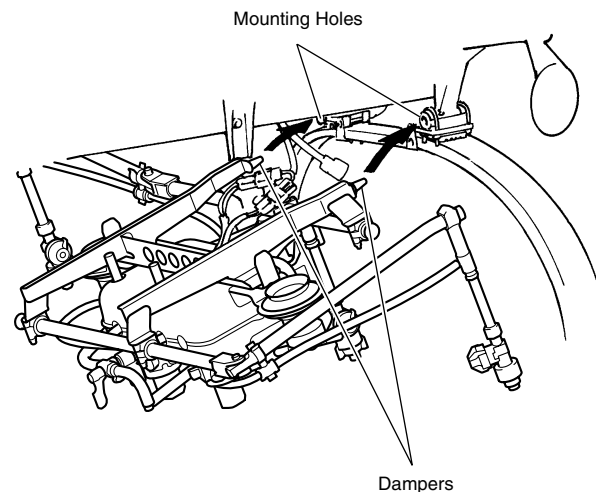
② Of the three connectors running from the frame, connect the 2-pole connectors to the sprayer pump's power connectors, and the 3-pole connector to the power connector of the nozzle switching motor.

TIP

If necessary, apply the dealer-specified grease onto the O-rings of the joints on the bottom of the chemical tanks.



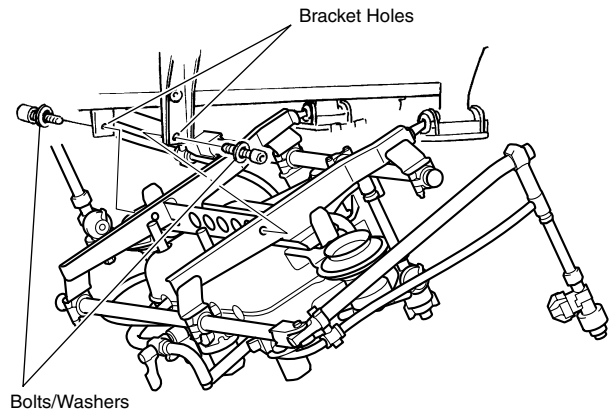
③ Insert the dampers of the sprayer (2 locations) into the mounting holes (2 locations) on the frame.



- ④ Lift the rear of the sprayer, and fasten by inserting bolts and washers through the right and left bracket holes on the frame.

Tightening Torque	3 to 4.5 N·m (0.3 to 0.45 kg·m)
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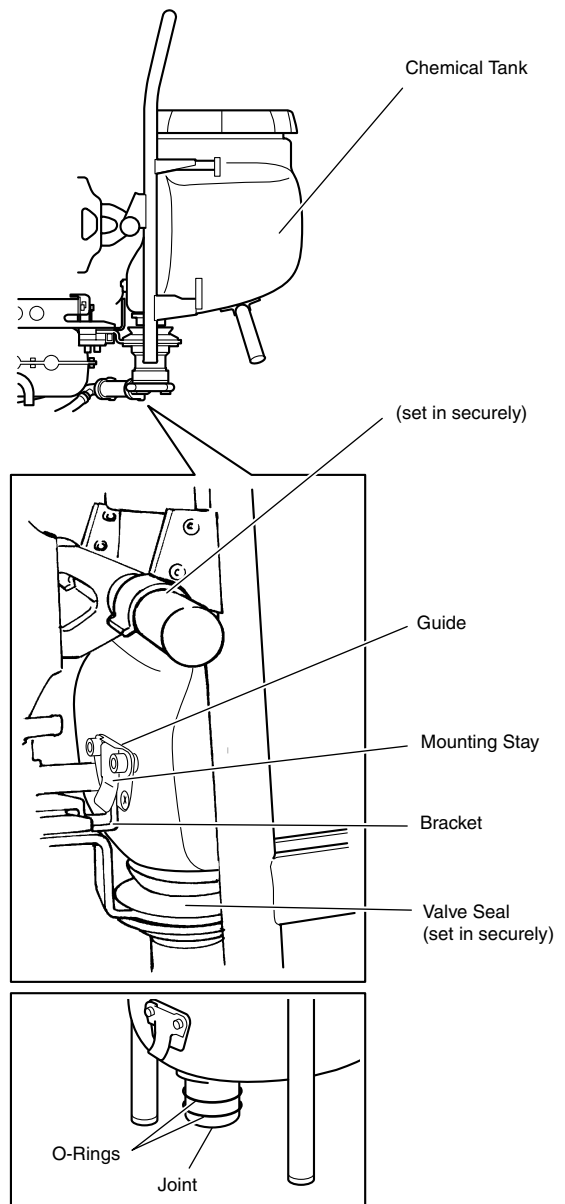
TIP	
Use a 4 mm hex wrench.	



- ⑤ Securely mount the left and right chemical tanks by fitting the sprayer's brackets into the mounting stays on the chemical tanks.

NOTICE
If the chemical tanks are not mounted properly, it could cause the helicopter to shake, the chemical to leak, or the chemical tank to fall off the helicopter.

TIP
If necessary, apply dedicated grease (Yamaha Grease B) onto the O-rings on the bottom of the chemical tanks.

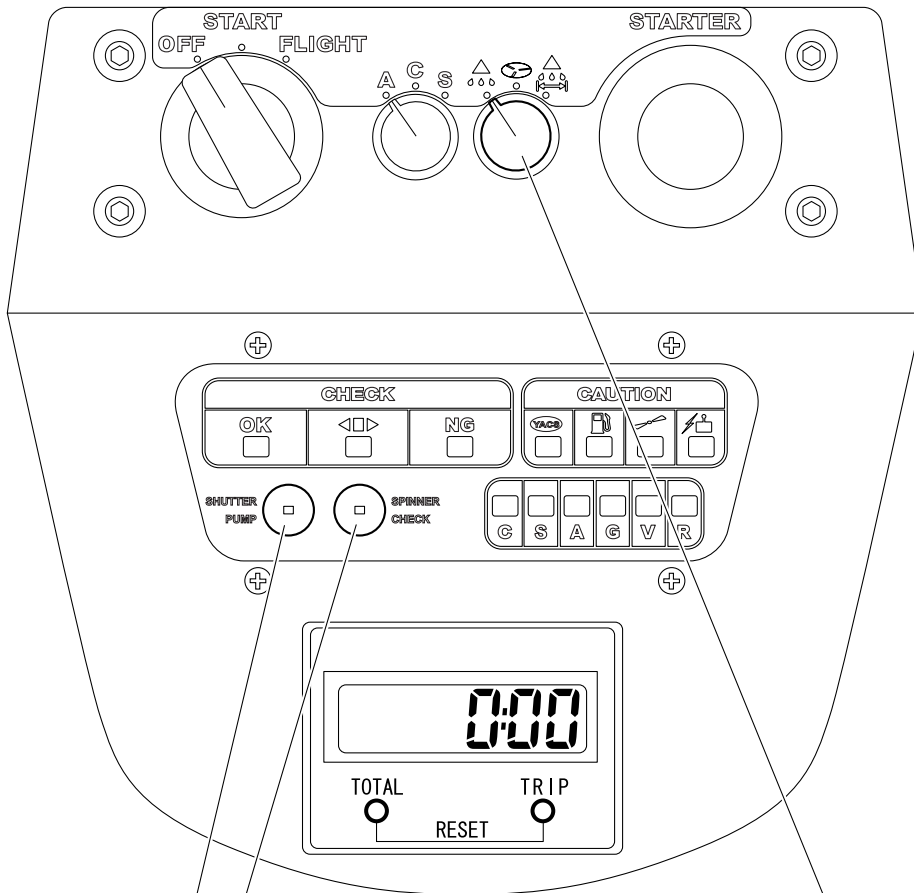


- ⑥ To remove the sprayer, follow the mounting procedure in reverse order.


Spraying Method


Relevant Switches

Helicopter Control Panel



Shutter Pump Cleaning Switch
Spinner Constant Rotation Switch
 Used for cleaning the pump.
 See "Cleaning the Sprayer" on
 page 5-1.

Sprayer Selector Switch
 To use the speed-dependent
 function, switch to "  ".

When not using the speed-
 dependent function, switch to
 "  ".

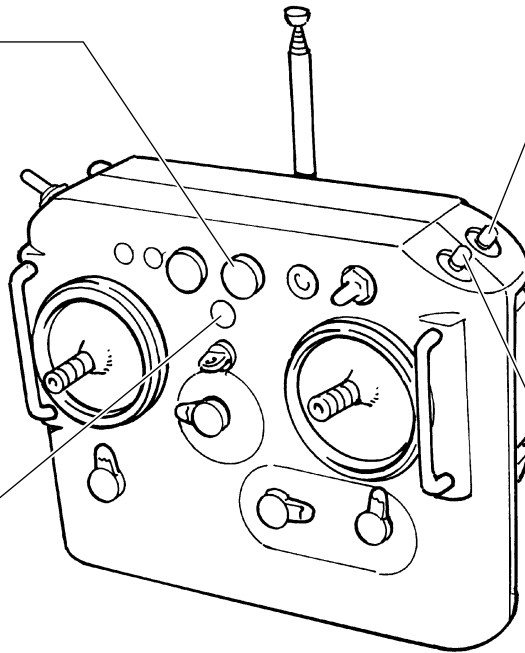
Flight Transmitter

Spray Volume Adjuster (for Liquid)

This adjusts the amount of liquid discharged.
See "Spray Specifications Settings" on page 4-7.

Spray Switch

This is an ON/OFF switch for the spray pump.
See "Using the Sprayer" on page 4-3.



Power Switch



This is the power switch for the transmitter.

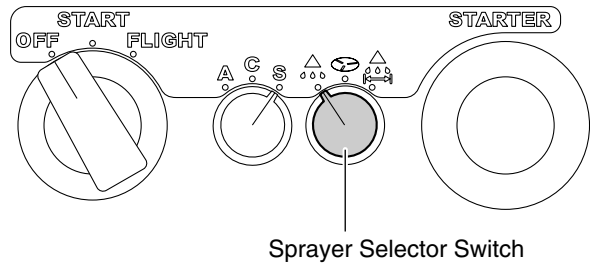
Spray Volume Switch

This switches between the left/right nozzles and the center nozzle.
See "Using the Sprayer" on page 4-5.

Using the Sprayer

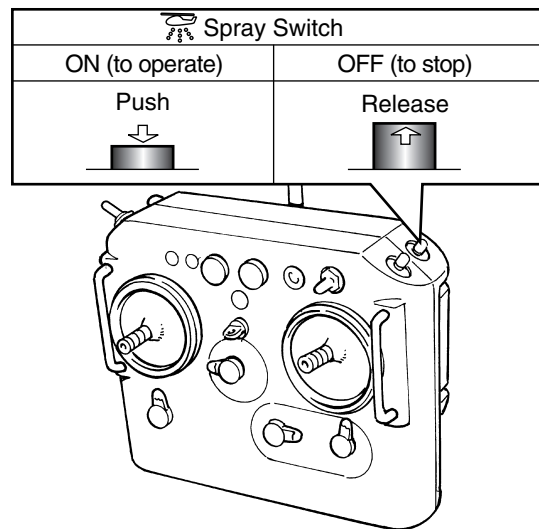
Spraying with Flight Transmitter

- Switch the sprayer selector switch on the flight control panel to “”. To use the speed-dependent function, switch to “”.



- Set the spray volume adjuster and the spray nozzle settings according to “Spray Specifications Settings” on page 4-7.

- Turn ON (“in” position) the spray switch (the ON/OFF switch) on the flight transmitter to actuate the spray pump. Press again (“out” position) to stop.

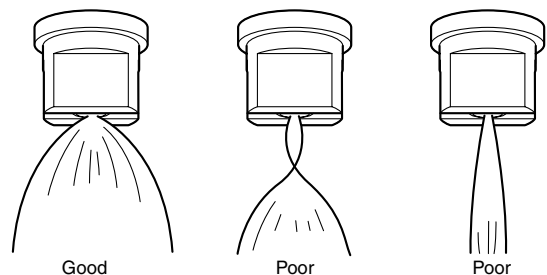


- Check the spraying condition. Check if the spraying condition from each nozzle is good.

NOTICE

Do not keep the pump running for more than 10 seconds with nothing spraying out from the nozzle, or on an empty tank. The pump could burn out.

Illustration of Spraying Conditions

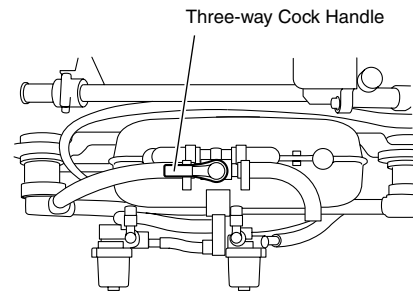


How to Release Air Pockets

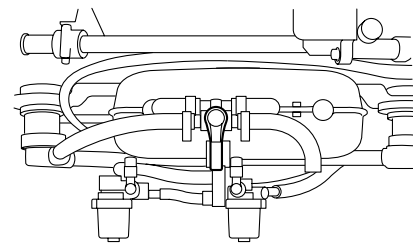
When the chemical tanks are plugged/unplugged, or when the chemical is sprayed until the chemical tanks are empty, air pockets will get entrained inside the sprayer piping, causing the spraying condition to deteriorate.

With the chemical tanks set in place, if the air pockets are not completely released by discharging from the nozzles, turn OFF the sprayer switch, and release the air pockets as follows:

- ① Facing the rear of the helicopter, turn the three-way cock handle on the rear of the sprayer so that it points to your left.
- ② Turn ON the sprayer switch, and run the spray pump for 5 to 7 seconds.
- ③ Point down the three-way cock to the spraying position, and verify that the discharge condition from the nozzle is good.



Air Releasing Position (pointing left)




Spraying Position (pointing down)



DANGER

When releasing air pockets, do not perform the task (or allow others to approach the helicopter) until the main rotor has stopped rotating completely and the engine has stopped.









TIP




If you are using the speed-dependent function and need to release air after receiving the GPS signal, set the sprayer selector switch to “△”. After releasing air pockets, return the sprayer selector switch to “△”.


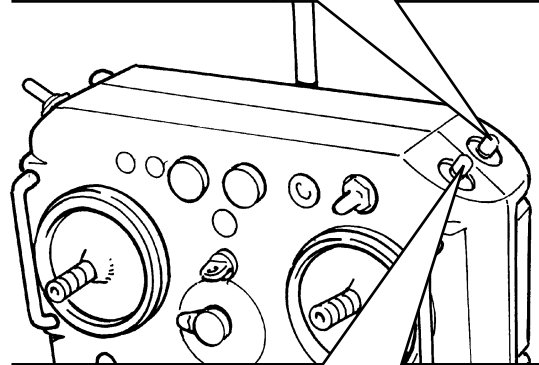
Switching Between Nozzles




Set the spray volume switch on the flight transmitter to “1” (“out” position) to discharge from the right and left nozzles. Set it to “1/2” (“in” position) to discharge from the center nozzle.

To switch between nozzles, turn OFF the spray switch, and perform the task after the spray pump has stopped.

		Nozzle
ON (to operate) Push 	“1” Release 	Sprays from left and right nozzles
	“1/2” Push 	Sprays from center nozzle
OFF (to stop) Release 	“1” Release 	Stops spray pump
	“1/2” Push 	

 Spray Switch	
ON (to operate)	OFF (to stop)
Push 	Release 



 Spray Volume Switch	
“1/2” (Center nozzle)	“1” (Left and right nozzles)
Push 	Release 


TIP

If you switch between nozzles with the spray volume switch while the spray switch is in the ON state, the spray pump will stop for approximately one second, during which the nozzle switching motor runs.

Using the Speed-Dependent Function

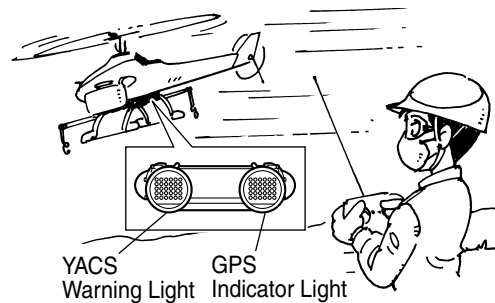
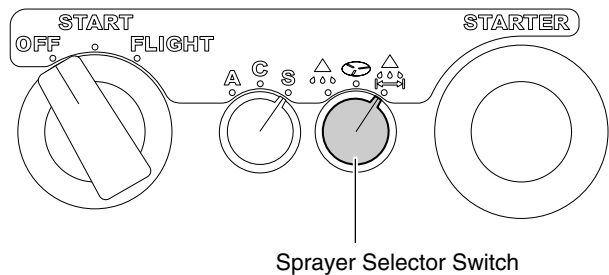
TIP

- The speed-dependent function can be used only when all of the following three conditions are met:
 - Low-volume liquid spraying at 7.5m spray width, 8L/ha
 - Left and right nozzles are selected
 - The GPS signal reception is good (i.e. the outer GPS indicator lights are ON)
 The state of the flight mode selector switch on the helicopter and the GPS control switch on the flight transmitter are irrelevant.
- When the center nozzle is used, the speed-dependent function does not work, and discharging is done in proportion to a constant volume set by the spray volume adjuster on the flight transmitter.

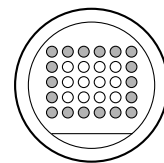
- ① Switch the sprayer selector switch on the flight control panel to “”.
- ② Set the spray volume adjuster and the spray nozzle settings according to “Spray Specifications Settings” on page 4-7.

TIP

If the flight velocity exceeds 20km/h, only the outer lights of the YACS warning lights illuminate. If this happens, drop the flight velocity to 20km/h or less.



Only the outer lights of the YACS warning lights illuminate



If the GPS signal reception is poor (the outer GPS indicator lights are ON), the speed-dependent function does not work, and the chemical is discharged at a constant rate set by the spray volume adjuster on the flight transmitter.

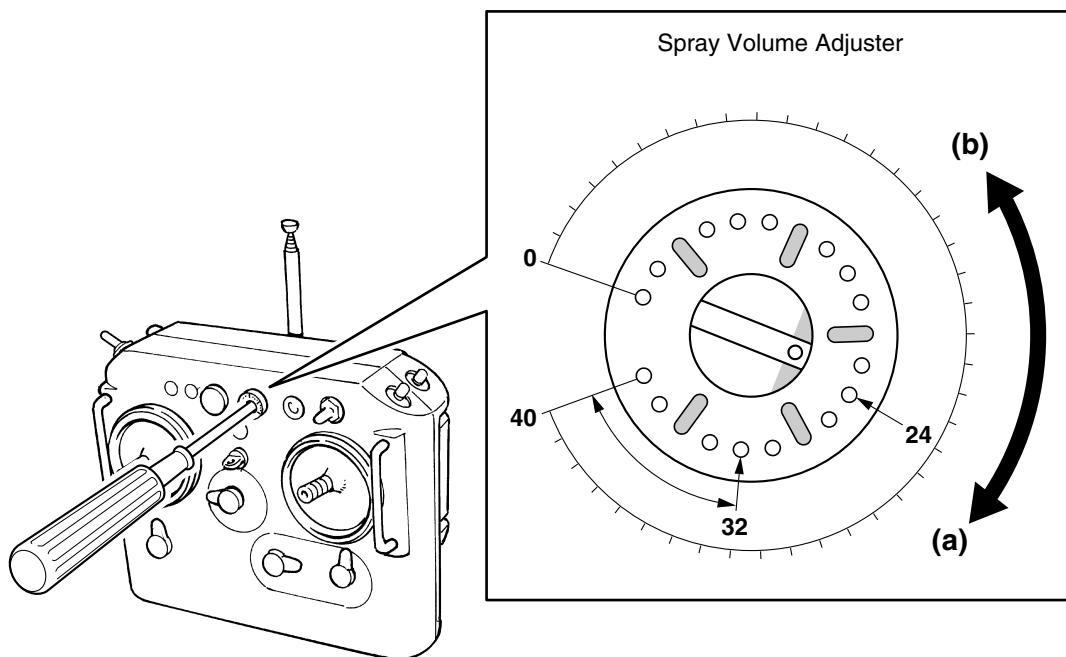
During a GPS-controlled flight, if the GPS signal reception worsens (GPS indicator lights cycles a pattern “outer lights ON > inner lights ON > OFF”), the speed-dependent function does not work, and the chemical is discharged at a constant rate set by the spray volume adjuster on the flight transmitter.

In this case, immediately turn OFF the GPS control switch according to the operation manual for the helicopter.

Spray Specifications Settings

Set the spray volume adjuster and spray nozzles according to the chemical to be used.

Spray Specifications		Spray Volume (L/ha)	Spray Width (m)	Nozzle Color	Number of Nozzles	Volume Position	Remarks
Low-Volume Liquid Spraying	Right and Left Nozzles	8	7.5	Yellow	2	Level 24	Standard
	Center Nozzle	8	3.75	Yellow	1 (has groove)	Level 24	Standard



TIP
<ul style="list-style-type: none"> ● The adjuster covers a range of volumes, allowing you adjust the spray volume according to the chemical used. ● When you turn all the way towards the (b) direction, and start turning back towards the (a) direction, the first notch you reach is Level 1. ● Turning in the (a) direction increases the spray volume, and turning in the (b) direction decreases the spray volume. ● Levels between 32 to 40 use maximum current, therefore, do not use continuously. ● After adjusting the volume, make sure to put the rubber cover back on. ● The spray specifications settings above are only to be used as a guideline. Before the actual spraying task, make sure to check the spray volume for the chemical you are using.

Cleaning and Inspections

⚠ WARNING





Control and handle the agricultural chemicals strictly in accordance with their manuals. Negligent control and improper handling of agricultural chemicals could lead to chemical pollution or health hazards.

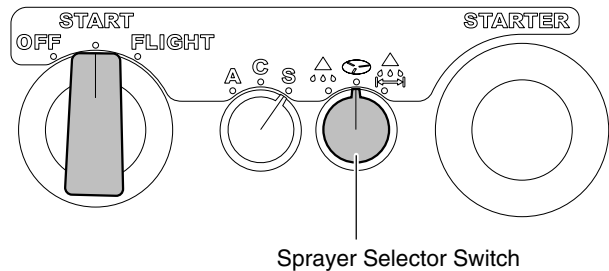
NOTICE

- Clean the sprayer after every spraying work, as the spraying performance could deteriorate due chemicals solidifying onto the sprayer.
- Use a drain pipe to collect the leftover chemical and cleaning solutions from cleaning into a container, and dispose it according to the operation manual for the chemical.
- During winter seasons, the pump or the filter cap may become damaged by frozen liquids. Therefore, for long-term storage during winter seasons, drain the leftover chemical and remove the filter cap.

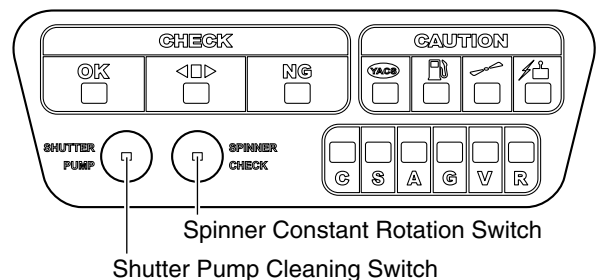
Cleaning the Sprayer



Cleaning the Spray Pump

- ① Turn the sprayer selector switch to “”.
- ② Mount the chemical tank filled with tap water, and turn the main switch of the helicopter to “START”. Press the “” switch on the control panel to clean the inside of the sprayer piping.
- ③ To switch between the right/left nozzles and the center nozzle, press the “” switch to temporarily stop the pump, then use the “” switch.
- ④ Drain the chemical inside the spray piping through the drain pipe, by pointing the three-way cock handle to the right, thereby actuating the spray pump.
- ⑤ After draining out the chemical, point the three-way cock handle to the spraying position (down).
- ⑥ Remove the filter and nozzles, and wash them with tap water. (See pages 5-3 and 5-4.)
- ⑦ If you want to wash the sprayer thoroughly, remove the sprayer and wash with tap water. When doing this, use caution to keep the 2-pole and 3-pole connectors from getting wet. (See page 3-1.)

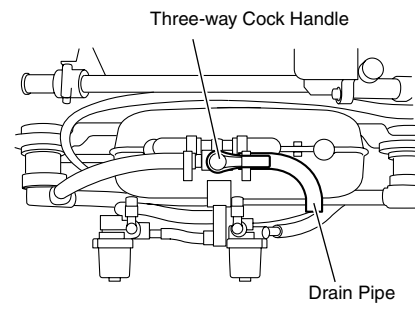


5

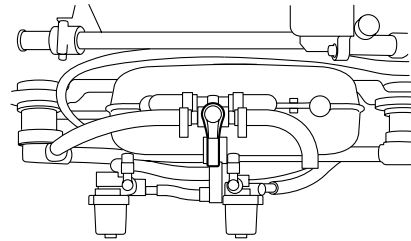


	Press once	Press again
	Switches to right and left nozzles or center nozzle	Switches to right and left nozzles or center nozzle
	Operates pump	Stops pump

TIP
<ul style="list-style-type: none"> ● Operating the pump for more than one minute could drain the battery. ● During cleaning, do not use the flight transmitter to switch between right/left nozzles and center nozzle.



Chemical Draining Position (pointing right)



Spraying Position (pointing down)

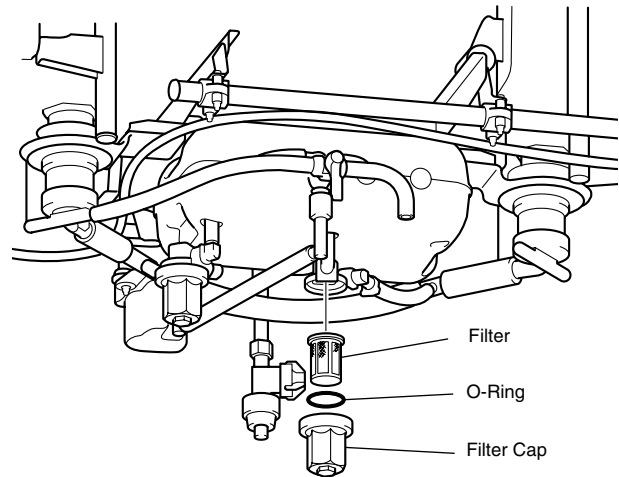
Inspecting and Cleaning Various Parts

Filter Inspection and Cleaning

- ① Turn OFF the main switch of the helicopter.
- ② Remove the left and right chemical tanks.
- ③ Remove the filter cap, and visually inspect if the filter inside is clogged.
If clogged, wash it with tap water.

NOTICE

- If a tear exists in the filter, replace it, as it could cause the spray pump or the nozzles to become clogged.
- When putting on the filter cap, securely fasten the O-ring to prevent air entrainment and liquid leakage.

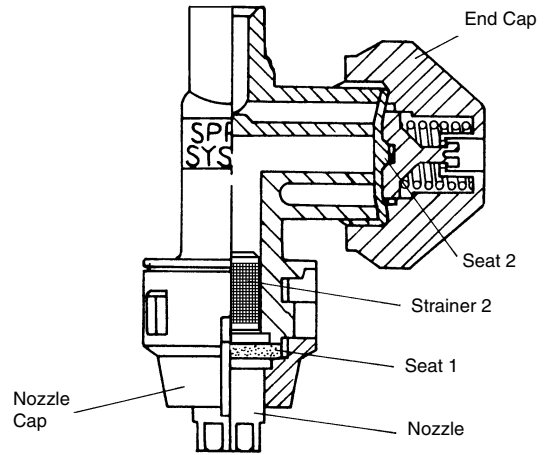


Nozzle Inspection and Cleaning

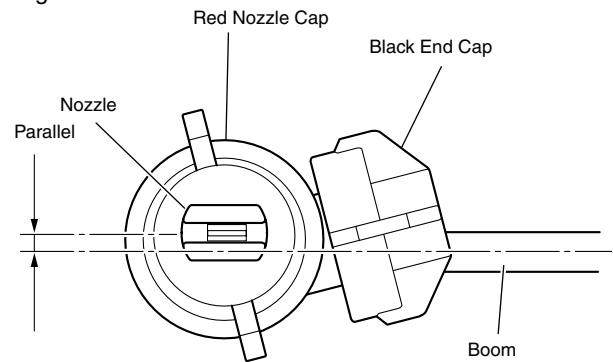
- ① Loosen the nozzle caps and end caps for the left, right and center nozzles. Remove seat 2, strainer 2, seat 1, and nozzle, and check them for damage and wear. If clogged, wash it with tap water.
- ② Reattach the nozzles so that the nozzle spraying hole and the boom are parallel.

	Nozzle Number	Nozzle Cap Color	End Cap Color
Right and Left Nozzles	XR TEEJET 11002 VS	Yellow	Black
Center Nozzle	XR TEEJET 8002 VS	Red	Blue

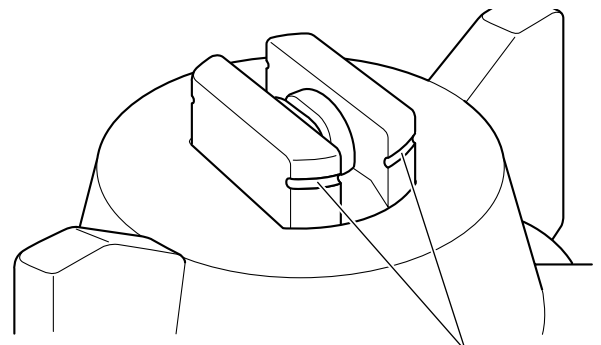
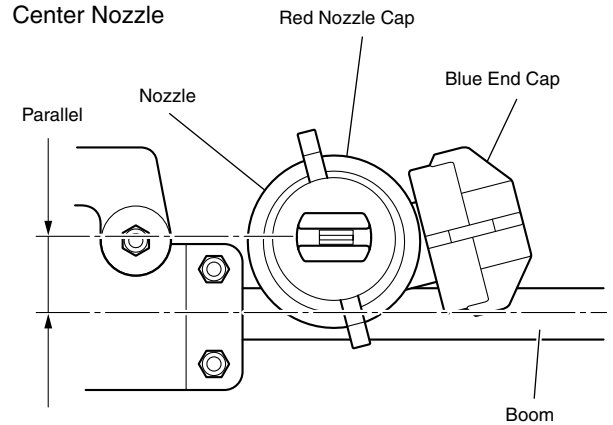
TIP
<ul style="list-style-type: none"> ● When reattaching the nozzles, do not confuse the left/right nozzles and the center nozzle. ● Only the center nozzle has a groove along its outer perimeter.



Right and Left Nozzles



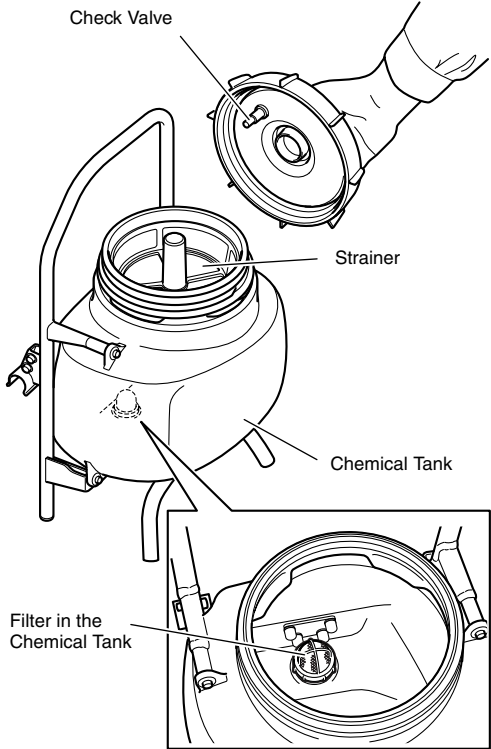
Center Nozzle



Only the center nozzle has a groove along its outer perimeter

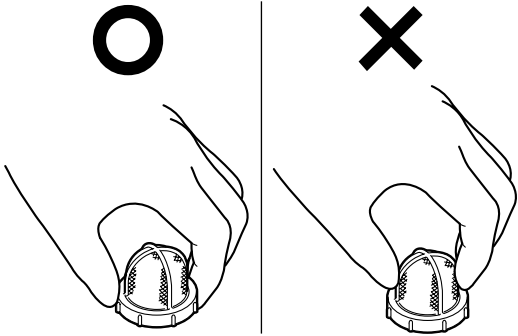
Chemical Tank Inspection and Cleaning

- ① Inspect the check valve on the chemical tank cap to check if it is clogged.
- ② Remove the strainer and visually check if it is clogged.
If clogged, wash it with tap water.



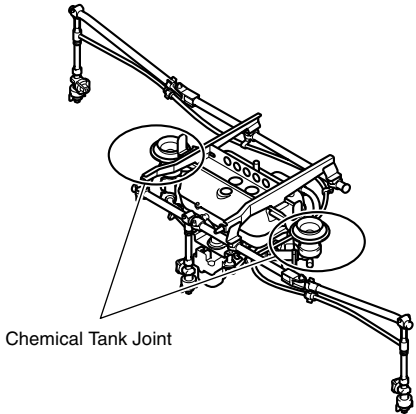
- ③ Remove the filter by turning it counterclockwise, and visually check if it is clogged.
If clogged, wash it with tap water.

<i>NOTICE</i>
<ul style="list-style-type: none">● If a tear exists in the strainer or filter, replace it, as it could cause the spray pump or the nozzles to become clogged.● When using a chemical that precipitates quickly, frequently remove and clean the strainer and filter.● When removing the filter, do not pull it by the mesh part, as this could damage the filter.



Chemical Tank Joint Inspection and Cleaning

Visually check if the valve seal part of the chemical tank joint is clogged.
If clogged, wash it with tap water.



Troubleshooting

The problems listed here can be handled primarily by the user.

Problems or causes that are not listed here are handled by your dealer. If such problems occur, cancel the flight and contact your dealer to have the helicopter inspected and repaired.



WARNING

- **Make sure to follow the instructions given in the “User Action” column, and do not take any actions that are not documented.**
- **If you have any questions, be sure to contact your dealer. If an inspection, adjustment, or part replacement is performed by a person who does not possess the know-how and proficiency to service the helicopter, it could lead to a serious accident.**

The spray pump does not operate

	Main Cause	User Action	Remarks
1	Poor connection with the power connector of the spray pump.	Securely connect the power connector of the spray pump.	See page 3-1.
2	The nozzles are being switched.	If the nozzles are switched while the spray pump is running, the nozzle switching motor runs for approximately one second, during which the spray pump automatically stops. The spray pump will resume automatically.	See page 4-5.
3	The onboard battery is faulty.	Recharge the battery with a dedicated recharger, or replace it.	See the operation manual for the helicopter
4	Deterioration in the spray pump performance.	Quickly cancel the flight, and request a repair by your dealer.	
5	A break in the wiring.	Quickly cancel the flight, and request a repair by your dealer.	
6	A blown fuse.	Quickly cancel the flight, and request a repair by your dealer.	

The spray pump operates, but nothing is discharged

	Main Cause	User Action	Remarks
1	Air pockets have not been sufficiently released.	Release air pockets by opening the three-way cock.	See page 4-4.
2	Clogged chemical tank joint.	Clean the chemical tank joint.	See page 5-5.
3	Clogged filter.	Clean the filter.	See page 5-3.
4	Clogged nozzle.	Clean the nozzle.	See page 5-4.
5	Wrong nozzle attached.	Attach the correct parts.	See page 5-4.
6	Clogged check valve on the chemical tank cap.	Clean the check valve.	See page 5-5.
7	Deterioration in the spray pump performance.	Quickly cancel the flight, and request a repair by your dealer.	

The discharge volume is low / The spraying angle is narrow / The chemical is not getting atomized / The chemical drips in large droplets

	Main Cause	User Action	Remarks
1	Incompatible agricultural chemical.	Choose a different agricultural chemical. If it is a mixture of two agricultural chemicals, revise the chemicals that are mixed.	
2	Poorly adjusted spray volume.	Readjust the spray volume on the flight transmitter.	See page 4-7.
3	Clogged nozzle.	Clean the nozzle.	See page 5-4.
4	Entrained air pockets in the spray pump.	Release air pockets by opening the three-way cock.	See page 4-4.
5	Clogged spray pump	Clean the spray pump. If the problem persists, request a repair by your dealer.	See page 5-1.
6	Poorly sealed seat 2.	Clean seat 2.	See page 5-4.



The chemical is leaking.

	Main Cause	User Action	Remarks
1	Poorly sealed seat 2.	Clean seat 2.	See page 5-4.
2	Loose clamp on a piping joint.	Tighten the clamp more tightly.	
3	Hardened or deformed hose.	Quickly cancel the flight, and request a repair by your dealer.	
4	Poor sealing in the spray pump.	Quickly cancel the flight, and request a repair by your dealer.	

Nozzles do not switch.

	Main Cause	User Action	Remarks
1	Bad connection with the power connector of the nozzle switching motor.	Securely connect the power connector of the nozzle switching motor.	See page 3-1.
2	Malfunction in the nozzle switching motor.	Quickly cancel the flight, and request a repair by your dealer.	

The speed-dependent function is non-functional.

	Main Cause	User Action	Remarks
1	The sprayer selector switch is not set to “  ”.	Select “  ”.	See page 4-6.
2	The GPS radio signal reception is poor.	Wait until the reception recovers, or spray without the speed-dependent function.	See the operation manual of the helicopter. See page 4-6.
3	The nozzle switch is set to center nozzle.	The speed-dependent function cannot be used with center nozzle. Switch to right and left nozzles.	See page 4-6.

Specifications

Specifications Data

Item		Data		
Device Name		Liquid sprayer		
Spraying Method Category		Low-volume liquid spraying		
Spray Volume		8L/ha		
Spray Specifications	Flight Velocity	13 to 20 km/h	15 km/h	10 to 20 km/h
	Flight Altitude	3 to 4 m		
	Flight Width	7.5 m	3.75 m	7.5 m
Discharge Performance	Speed-Dependent Discharge Method	Yes	No	No
	Discharge Method	Nozzle method (left/right)	Nozzle method (center)	Nozzle method (left/right)
	Discharge Pressure	0.17 to 0.44 Mpa (at 13 to 20 km/h)	0.25 Mpa (at 15 km/h)	0.44 Mpa (at 20 km/h)
	Maximum Discharge Volume	2.0 L/min	0.75 L/min	2.0 L/min
Nozzle	Nozzle Method	Flat type		
		XR11002	XR8002	XR11002
	Standard Number of Nozzles	2	1	2
Pump	Pumping Method	Double-acting piston method		
	Driving Method	Motor-driven		
	Power Rating	DC12V (supplied by helicopter)		
Maximum Chemical Tank Load Capacity		16 L (8 L per tank)		
Device Weight		7.4 kg		

Product Inspection

About Inspections

The prescribed types of inspections are described below.

- The pre-flight inspection is to be performed by the operator.
- For periodic inspections and replacement of parts, contact your dealer or an authorized service facility for Yamaha unmanned helicopters for industrial applications.

Pre-Flight Inspection

Before a flight, make sure to inspect the following:

NOTICE

Failure to perform pre-flight and regular inspection could lead to problems. Therefore, make sure to perform these inspections.

Part Names	Description
Battery (9.6V for transmitter)	Check fully charged
Filter	Check for debris and tear
Chemical Tank	Check for leaking valve
Joint	Check for leaking valve
Cock	Release air pockets
Complete Nozzles	Check discharge condition

Periodic Inspection

Section	Description
Joints	Disassemble, inspect, adjust, clean, replace
Chemical Tank	Inspect and replace
Nozzle	Clean
Pump	Clean and replace
Hoses	Inspect and replace
Filter	Clean and replace
Other	Inspect, correct, tighten

* The inspection items and descriptions may change for various reasons.

Replacement Parts

The following parts are consumables. If a deterioration in performance is seen due to wear, damage, deterioration of a part, replace these parts.

The replacement parts may change due to various reasons.

Part Names	Description of Problems
Seat 1, Seat 2 (Nozzle parts)	Leakage, dripping
O-ring (joint)	Leakage
Seal valve (joint)	Leakage
Valves	Leakage
Pump unit assembly	Leakage, poor discharge

* The frequency of replacement varies with chemicals used.

Customer Support

To pose any questions regarding the product you are using, to make a comment regarding service, or to file a complaint, please contact your dealer.

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