

# JR-CVPS15

## Cavitation jet cleaner

### Operating Instruction



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**Part one: overview.**

The JR-CVPS15 Cavitation jet cleaner is driven by motor or petrol engine, which can control the speed of high pressure plunger pump by controlling the throttle size of petrol engine to control the pressure change of high pressure plunger pump. The pressure change of the high pressure plunger pump can also be controlled by controlling the opening size of the pressure regulating valve.

## **Part two:Technical performance parameters.**

The series pump contains the model and the technical performance parameters of the purchased model.

Executive standard: GB/ t9234-1997.

This manual is also applicable to the cavitating jet cleaner for the series of pumps.

## **Part three:structural features.**

### 1.The power end

The driving power source is 15KW motor. The transmission link is the form of the plum - shaped spring coupling.

OR 24 - HP gasoline engine power, transmission link for belt - type reduction.

### 2.The control end

Control terminal is 15KW control cabinet.

### 3.The hydraulic end

Hydraulic terminal is composed of pump head, inlet valve group, drain valve group, column plug, stuffing box, etc.When the plunger driven to do reciprocating motion of the crankshaft, the pump head cavity content variations, drive into the liquid valve, drain valve group accordingly on or off, by adjusting the throttle valve or overflow valve, forming high pressure liquid flow on the output side.

### 4.The pressure regulating valve

The valve is used to maintain the pressure and safety of the valve, so that the system pressure is maintained on the set value. Meanwhile, the valve is also used to protect the high pressure system from overpressure. When overpressure, the discharge flow will be opened automatically.Adjust the valve to change the setting pressure.Therefore, if only the overflow valve and the joint are configured, the pump pressure can be adjusted by adjusting the stud. Do not exceed the rated pressure of the pump.

## **Part four:Installation and piping requirements of pumps.**

1. When the pump is installed, it should be placed horizontally. Carefully check all parts before installation, and install the installation in good condition.
2. In order to reduce the head loss of the inlet pipe, the inlet pipe should be as short as possible.It is necessary to use a 2 meter long hose to isolate the mechanical vibration. To ensure reliable work, requires no less than the pump head backward head, to ensure the maximum flow of the pump, the water pipe diameter should match the pump head into the water channel, and should be inclined to put, avoid to produce bubbles.
3. The discharge line and pump should also be soft connected with high pressure hose to reduce vibration.
4. In order to maintain the convenience, there should be some space around the fixed pump for maintenance,

lubrication and other work.

5. When the pump seat must be fixed with bolts and foundation, it shall be levelled with iron, which can be fastened with bolts, such as uneven, and shall not be forcibly fastened.

## Part five: The lubrication of the pump.

1. Please use SAE 15w-40 type lube or equivalent lubricating oil. The following is the recommended type of lubricating oil.

Brand	Kind
AGIP	F. 1Supermotoroil 15W-40
BP	Vanellus C15W-40
CASTROL	GTX15W-40
ESSO	Unifl e 15w-40
MOBIL	Super M15W-40
SHELL	Rimula R4 15W-40/Helix Super 15W-40
TOTAL	Rubia 15W-40/Quartz 5000 15W-40

2. When the temperature is low in winter, it should operate at no load for more than 20 minutes, which will make the oil temperature rise a little higher and gradually increase the load.

3. The surface should be coated with molybdenum disulphide grease when the parts such as plunger and seat are removed.

## Part six: The operation of the pump.

1. Pump inspection:

A. The new pump or the long service pump, should check the parts before use, wash the anti-rust oil, check the main parts, can not rust, scratches, if there is, should be sanded. The parts that are seriously corroded should be replaced to check whether some bolts are loose.

B. If the crankcase is not clean, it should be cleaned and injected with new lubricating oil.

C. All kinds of seals should be replaced if they are old.

2. Pump start-up:

A. Inject the specified oil into the crankcase and check the oil level.

B. The new pump or the long service pump, before starting, should be in the coupling of the car, to check the operation of each part is flexible.

C. Open throttle valve or foot step valve (if no throttle valve is configured), no pressure start!

D. Note that the rotation direction of the motor input should be consistent with the direction indicated on the body.

E. Open the valve for the input pipe and output pipe. (if the input is broken, the plunger will be burned)

F. The connector of the input and output pipe must be tightened to avoid air intake.

G. Check the connection between the middle rod and the plunger.

H. Start the gasoline engine or motor.

I. Normal operation of no-load, can be pressurized gradually, if there is abnormal sound and vibration, should stop check in time.

J. The stuffing box should be checked at any time, the crankcase and other parts are hot, the temperature is too high, should stop check.

K.In operation, if the stuffing box is found to be leaking badly, the wrench can be used to adjust the stuffing box to tighten the nut and adjust to the micro leakage.

L.When the pressure is down, the pressure should be reduced to zero, then the power is cut off or the diesel engine is turned off to avoid power failure or the shutdown of the diesel engine.

M.If the pump is not used for a long time, the oil can be drained, cleaned, coated with anti-rust oil, spread butter on the middle rod, loosen the cover and block, and open all valves (such as overflow valve).

N.The adjusted overflow valve shall not be rotated at will to avoid danger. Avoid overpressure.

## **Part seven:The system USES.**

### 1. Preparation before starting up.

Check whether the screws and nuts are loose in all parts of the cleaning machine before starting the machine. In the pump case, SAE 15w-40 oil is added, and the oil level should be checked (which is beneficial to the center point of the oil mirror).

### 2. Inlet pipe connection.

The high pressure plunger pump has no capacity to absorb water, so there must be a constant supply of water. Insert the water inlet hose into the inlet joint of the pump body, then cover the throat hoop and tighten the throat to ensure that the connection is strong and not leaking. Then connect the other end of the water pipe with the water tank (the water level is higher than the inlet) or the pump connection, and tighten the throat hoop. The inlet pipe requires that the filter be installed so as not to absorb impurities to damage the high pressure pump.

### 3.Outlet connection

Connect the insert end of the high-pressure hose to the quick-change joint at the outlet of the high-pressure pump; The other end is connected to the cleaning gun. Note: the high pressure water pipe cannot be hanged, stretch and straighten as far as possible.

### 4. Nozzle connection

Select the appropriate nozzles. First, insert the seal into the inside of the nozzle thread, then screw the nozzle clockwise on the head of the cleaning gun and tighten it with a wrench.

### 5.Start the system

Check that the inlet and outlet pressure pipes are connected reliably and the personnel are ready to start the gasoline engine. The gasoline machine first determine the fuel supply is adequate, if will switch to "on" position, pull out the air door, the appropriate accelerator, rotary switch key to "RUN" position, after being equipment normal operation, turn off the throttle.

Observe a period of time, if the equipment works well, no abnormal sound, can be used normally.

First, increase the throttle properly and turn the red valve wrench down completely. At this point, the high-pressure cleaning gun will begin to work, and the pressure size can be controlled by controlling the throttle size.(the first use of high pressure hose is contained in the air, the air emissions must be, can be the first nozzle unscrewing, keep on, blasts of water to clean the barrel has no gas when power off, then screw in the nozzle, and then use the reboot).

### 6. Shutdown operation

When using the end, the gasoline or diesel engine will first move the red valve up and OFF, properly reducing the throttle, and then the switch key to the "OFF" position.The motor device can only press the close button. In order to ensure the service life of the equipment, we recommend that fresh water be used to flush the pipeline after each use of seawater.

## **Part eight: Maintenance and maintenance.**

### 1. Transmission part:

A. After the first operation of the new pump for 20 hours, the lubricating oil must be replaced, the oil is changed every 500 hours, the valve is replaced every 1000 hours, and the plunger seal and washer are replaced.

B. Check the screw loose regularly.

C. Pump in the process of operation, the oil temperature is not higher than 75 °C, unless otherwise indicated, the medium temperature shall not be higher than 50 °C. Bearing oil temperature rise faster, if the working time is longer, should adopt cooling measures.

D. Oil change should be performed in hot oil, used oil to fully put net, wipe the crankcase, found that iron application tape glued net, oil is not too much, otherwise the resistance increases, would increase the oil temperature.

E. Replace gear or the crankshaft bearing shell shall notify the manufacturer or maintenance experience in mechanical maintenance, please master, connecting rod and crankshaft and needle roller bearing clearance should also pay attention to adjusting the circumstances, should be master maintenance with mechanical maintenance experience.

### 2. Maintenance of stuffing box:

A. Use hook spanner to tighten the coupling of the middle rod and plunger. If loose, the pump head and power end will be damaged.

B. It is found that the leakage (pressure drop 10 %) confirms that there is no leakage in the valve group and other parts. The nozzle size is the same as the initial state, which is deemed to be the seal failure, and the plunger packing seal should be replaced in time.

C. The plunger surface should be protected from any damage.

### 3. Maintenance of pump head:

A. Always check the drain valve cover to be loose, if loose will be damaged into the valve group.

B. Check the connection bolts of pump head and overflow valve and throttle valve (joint) frequently to prevent high pressure liquid leakage.

C. Always clean the strainer in the suction pipe, and you must ensure that the fluid is flowing smoothly.

D. Regular inspection should be made to the valve group. If the parts wear out, they should be replaced in time.

E. The pump head and the body connection bolt must be tightened to ensure the tight connection between the pump head and the body.

### 4. Precautions:

A. When the pressure is over 15Mpa, the joint should be taken off the joint to ensure the safety.

B. Allow the operator to wear gloves when the pressure is under 20MPa; When the pressure is 20-35mpa, double safety measures such as shouldering should be used. When the pressure exceeds 35MPa, the jet operation needs to be installed on the mechanical device, and the handheld operation is strictly prohibited.

## **Part nine: The warranty period.**

The factory may repair the goods for free within one year from the date of delivery, if the manufacturer is not able to work properly within one year from the date of delivery. (except vulnerable parts)

## **Part ten: To open a box.**

1. After unpacking, check the documents and accessories according to the packing list.
2. Observe whether there is any damage caused by transport in order to properly handle it.

## Part eleven:List of troubleshooting(for reference).

The fault phenomenon	Inspection area	Check the method	Inspection cycle	standards	Repair methods
Insufficient water in the suction pump	1. Check water supply	1. Confirm that the water supply has enough water.	often	1. The water intake must be more than the displacement.	1. Ensure sufficient water level is maintained in the tank. If the water intake is still insufficient, a larger diameter pipe or hose should be used to increase the flow rate.
	2.Check for impurities in the suction strainer.	2.Open the suction filter to check the filter screen.	often	2.The filter net should be cleaned and maintained without external impurities.	2.Remove all impurities, such as filter damage, replace the new network.
	3.The parts of the pump head may be damaged.	3.Disassemble the pump head and inspect the parts.	500 hours	3.The suction and discharge valve and seat shall be free of abrasion, damage or deformation.	3.If the seat and disc are damaged or deformed, replace.
	4.Check whether the suction line leaks.			4.When there is no load pressure, there should be no pulsation.	4.Seal all possible leaks.
Discharge too low pressure, and can not increase to rated pressure	1. Check the discharge flow and follow the methods and standards listed in failure 1.				
	2.The pressure gauge may be damaged.	2.Compare the readings with the other tables.	500 hours	2.The reading value of the pressure gauge should indicate actual pressure.	2.Update the damaged pressure gauge.

	3.The overflow valve is leaking.	3.Check the adjusting bolts.	500 hours	3.The adjusting bolt shall be screwed in.	3.Tighten the adjusting bolts according to the correct operation.
	4. Check whether the overflow valve is leaking.	4. Remove and check the situation.	500 hours	4. The valve core and seat of the overflow valve shall be free of abrasion and damage.	4. If damaged, it must be updated. If worn, reground.
	5.The throttle is leaking.	5.Check the adjusting bolts.	500 hours	5. The adjusting bolt shall be screwed in.	5.Tighten the adjusting bolts according to the correct operation.
	6. Check whether the throttle valve is leaking.	6. Remove and check the situation.	500 hours	6. The valve core and seat of the throttle valve shall be free of wear and damage.	6. If damaged, it must be updated. If worn, reground.
Discharge pulse	1.There are bubbles in the water.	1. Check whether the water supply box and input pipeline leak.	When necessary	1.There should be no bubbles in the water from the water source.	1. Draw water from the air entrainment area.
	2.Pump water.	2. Check the inlet strainer for pipe and hose.	When necessary	2. The inlet filter must be clean, and the pipeline shall have sufficient inner diameter.	2. Remove impurities from the filter screen and ensure the pipeline is in good condition.
	3. Failure of pump head.	3. Open the pump head to check the valve groups and seal rings.	When necessary	3. Valve disc action cycle should be stable, disc and seat should be sealed.	3. The deformation valve disc and seat shall be replaced, and the sealing difference shall be re-ground.
Inlet and drain disc and seat rupture	1. Check for deformation and uneven wear.	1. Open and check.	300 hours	1. All parts shall be properly sealed.	1. If there is any damage, replace it in time.
	2. Check whether the drain valve cover is loose.	2. Tighten the relevant threads.		2.Don't loosen up.	2. Tighten with a wrench.
	3. Check the inlet and drain valve group spring.	3.Compare with the new spring.	300 hours	3. The elastic force shall not be reduced, and there shall be no cracks and lots of rust.	3. If fatigue, cracks, excessive rust, must be replaced.

Stuffing box stuffing	Check for wear and tear.	Take it down, eyeballing it.	Unadjustable time	Packing shall not be damaged or show signs of uneven wear.	If damage or uneven wear is serious, it must be replaced.
Plunger	1. Check for wear and tear.	1. After dismantling, measure with a micrometer.	300 hours	1. The outer diameter of the plunger shall conform to the drawing requirements.	1. If the diameter is less than 0.6mm, it should be repaired or replaced.
	2. Check the plunger joint nut.	2. Use spanner to check the tightness.	often	2. The nuts should be tightened.	2. If it is loose, tighten with a wrench.
OSealing ring	Check for wear and tear.	Remove and then visually inspect.	300 hours	There should be no damage or grinding point.	If damaged, it must be updated.
The pump head	1. Check whether the bolts are loose.	1. Check the slack with a spanner.	50 hours	1. No part shall be loose.	1. Tighten all bolts.
	2. Check for abnormal sound.	2. Listening with ears	often	2. There should be no abnormal noise.	2. Remove, find the cause, and replace the parts.
The crosshead pin	Check the state of crosshead pins.	Move the crankshaft to check the clearance of pins.	300 hours		Excessive clearance should be replaced.
Connecting rod bearing	Check the connecting rod and crankshaft.	Front and rear skid linkage.	300 hours		Excessive clearance should be replaced.
Connecting rod bolts and locking washer.	1. Check the fastening degree of connecting rod bolts.	1. Use a wrench to check the tension.	200 hours	1. No sign of looseness.	If it is not tight, it must be tightened.
	2. Check the status of the stop gasket.	2. Skid rod to check the fastening degree.	200 hours	2. Stop the Angle of the gasket must be firmly by the bolt head and connecting rod.	2. If it is loose, tighten it again, bend the corners of the gasket, and tighten the bolts and connecting rods.
The crankshaft	Check if there is any lag wear and metal oxide skin marks.	Visual inspection	500 hours	The crankshaft shall not have excessive wear or other abnormal sound.	If not, it should be repaired.
Crankcase	Check for abnormal sounds.	Listening with ears	often	No irregular or abnormal sound.	If there is any abnormality, the inspection should be removed.



The overflow valve	1. Jump pressure value.	1. Contrast with the pressure value.	often	1.Can maintain rated pressure jump.	1.If the starting pressure is not consistent, the starting pressure value should be adjusted.
	2.leaking	2.visual	often	2. Can jump correctly, but does not leak.	2.Disconnect the grinding valve core and seat.
Throttle valve or foot valve.	1.The leakage is leaking.	1.visual	often	1.Can adjust the pressure, but does not leak.	1.Disconnect the grinding valve core and seat.
	2. The handle is leaking.	2.visual	often	2.Can adjust the pressure, but does not leak.	2. Adjust the large nut and tighten the sealing ring.
Lubricating oil	1. The amount of oil	1. Visual oil mirror.	often	1. When parking, the oil level of the crankcase should be in the middle of the oil mirror.	1. Oil level should not be too high or too low.
	2. Oil state	2. Remove a small amount of oil sample from the crankcase, place it in the middle of the finger, and judge the state of the oil by feeling.	100 hours	2. The oil should feel smooth and can't have the feeling of sand or viscosity.	2. Clean the oil in the box every 200 hours and reload the oil after washing.
Suction strainer	Check the screen.	Remove the strainer from the filter and check its condition.	often	The filter is not damaged and the filter is kept clean. The mesh number is greater than 80.	Remove filter, clean or replace damaged parts. If the water supply is dirty, wash it frequently.

## Respect to users

In order to guarantee the service life of the product, please completely according to the above instructions to operate the equipment, if you don't understand or don't understand place, please contact our company, we will give you the phone to guide the operation, do not wrong operation, the resulting quality problem or the personal property security problems, our company will not be responsible for.

**Thank you for your cooperation.**