Ⅰ. Introduction

YDH-Ⅰ Type Piston Milking Machine is widely used in milking for minitype breeder because of its simple structure, small auxiliary power and convenient operation and maintenance.

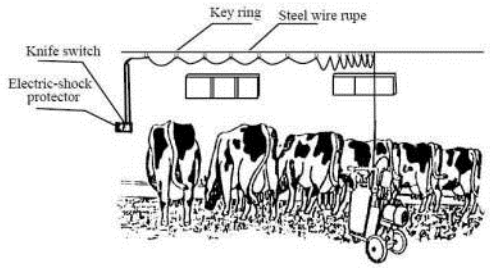
In order to reach the sanitary standard, improve the milk quality of dairy cow and prevent the mastitis in dairy cow, the milker must master certain machinery common sense and know how to use the milking machine rightly. So it will be more helpful for the milker to read this instruction carefully.

Ⅱ. Main technical performance data

1.Productive rate: YDH-Ⅰ milking 10-12 dairy cows per hour
2.Working vacuum: 0.04-0.05MPa
3.Pulsation frequency: 64 times/min
4.Auxiliary power: YDH-Ⅰ 550w 220V/380V

Ⅲ. structure and working principle

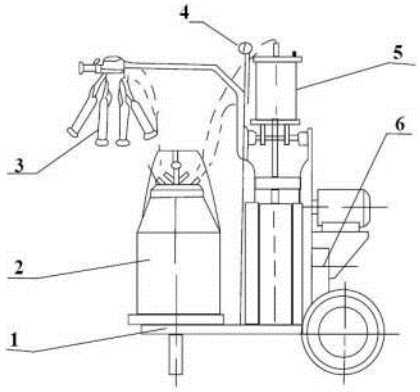
1. **Auxiliary power source (see picture 1)**



Picture 1

No matter the auxiliary power source is 220V or 380V, knife switch and electric-shock protector should be installed. Then use the insulating tape to fix the floating cable on the metal ring, which goes through the steel wire ropes fixed on the roof of the cowshed. Accordingly, the metal ring can glide on the steel wire ropes along with the cable line, which can help the electric source line of milking machine change along with the change of the milking places.

2. Structure (see picture 2)



Picture 2

The machine is made up of 1. milk barrel, 2.cluster, 3.vacuum gauge, 4.piston pump,5. reducer and,6.gearing.

Milk barrel is made up of barrel and barrel cover. The cubage of milk barrel is 25L and can contain fresh milk of 20 kilograms. There is a non-return three-way valve welded in the middle of the barrel cover. A ∅ 11 steel ball is installed in the valve. The upper tube is fixed by the seal ring and plastic stop screw; ∅ 14 lateral tube is connected with the joining tube of the inlet; ∅ 9 lateral tube is connected with the long air tube on the claw air inlet. Except a non-return three-way valve welded on the barrel cover, there is still a ∅ 19 milk inlet connected with long milk tube and ∅ 9 vacuum tube with vacuum gauge connecting tube.(see installation picture 1)

Cluster is made up of claw and four teat cup. The teat cup is respectively made up of shell,liner, small milk tube and small air tube. A chamber is formed between the shell and liner of the teat cup.

The milk claw is made up of claw base and claw shell. Adjusting bolt is installed on the claw base and is mainly used to adjust the vacuum of the milking machine and quicken the velocity of flow of the milk. On the claw shell are installed a half ball, stainless steel stick and sealing socket. The half ball is used to cut off the air source to help the teat cup fall off easily after finishing milking.The sealing socket is used to seal the claw when milking .On the claw, there are four milk inlets respectively connected with the small mammary tube, four pulsation inlets connected with the small air tube, a ∅ 19 milk inlet connected with the long milk tube and a ∅ 19 air inlet connected with the long air tube. The joint fault should be avoided among all the joint inlets.

Piston pump is made up of pump cover, pump casing, pump seat, inside aluminum cover swelling reed and piston (calfskin bowl) and outer connecting rod, connecting-rod connecting sleeve, horizontal axis, piston rod assembly and winch.

Pump cover and pump seat are castings and pump shell is plastic part. The piston is made of calf skin as a bowl, in which the swelling reed is installed to expand the calf bowl. Because the calf bowl had been dipped in the oil for a long time, so the fiction modulus between the calf bowl and pump shell is minimum when both are in the relative movement. Under the condition of working, the calf bowl should be often lubricated by using the lubricating oil. When the air volume becomes less, the swelling reed can be expanded and the calf bowl is pushed outward by using both hands to realize the normal work.(Referring to the installation picture 2 for detailed information)

Gearing----electric motor drives the strap wheel on the gearing to bring along the reducer strap wheel to drive toward to crank and connecting rod and help piston pump move back and forth alternately

The function of the reducer depends on the speed radio of its interior gearwheel and pinion to realize the pulsation times of 64 times/min.Except the gearwheel and pinion and their axis, there are still reducer shell, bearing and strap wheel.

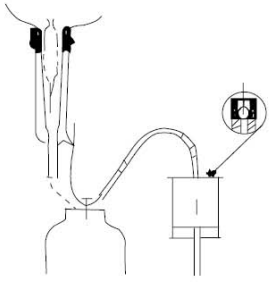
3. Working principle

-----the birth of the vacuum degree

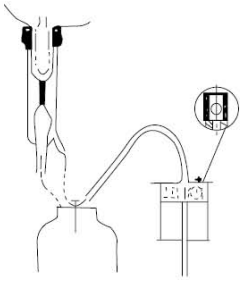
The electric motor drives the crank to turn to help connecting rod push the piston to move back and forth directly, When the piston moves down, the vacuum journey is formed; when it moves up, the atmosphere journey appears. Both journeys form a pulse .The piston moves back and forth to form the opening and closing state of teat cup liner.

-----Working course

Milking: when the piston moves down, the ball valve on the piston pump closes and the one on the milk barrel cover opens. Then the vacuum is produced in the closed milk barrel and milking parts. The equal pressures in the teat cup liner and pulsation chamber of the teat cup make the teat cup liner open and absord the milk juice from the teat . The milk juice flows into the claw and is then sucked into milk barrel, as shown in picture 3.



Picture 3



Picture 4

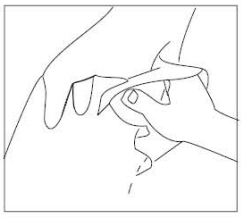
Rest: when the piston moves up, the ball valve on the piston pump opens automatically and meanwhile the atmosphere enters the pulsation chamber. Then the ball valve on the milk barrel cover closes automatically and makes the closed milk barrel and teat cup liner be vacuum. As a result, the differential pressure formed between the teat cup liner and the pulsation chamber makes the milk cup liner close and the milk flow stops. When milking, the vacuum degree showed in the vacuum gauge should be between 0.04-0.045MPa. The scale partition of the dial shows that one scale is 0.05MPa. As shown in picture 4.

Ⅳ. Usage of the milking machine

1.Check whether the electrical source voltage conforms to the requirement of the milking vehicle or not before operating the milking machine

2.After operating milk machine, keep the empty running for 3-5 minutes.There is no block and abnormal noise among all the moving parts. Then convert the cluster, namely , all the connecting inlet of the claw is upward and the teat up inlet upward. One minute later, the indicator of the vacuum gauge should reach 0.04-0.045MPa. Adjust the inlet valve on the claw when the vacuum is too high or too low. Milking can start until the cooperation of long-and short space between the steel ball and pressure reed reaches 0.04-0.45MPa.

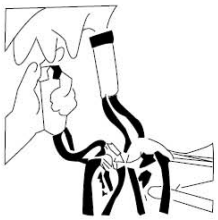
3.Swab and massage the teat by using the warm water before milking. Then milk the teat one by one by hand to spurt milk for 2-3 times. After affirming that there is no mastitis, the teat cup can be installed to milk. As shown in picture 5 and picture 6.



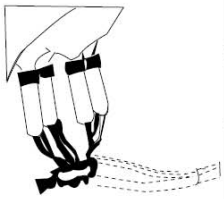
Picture 5

Picture 6

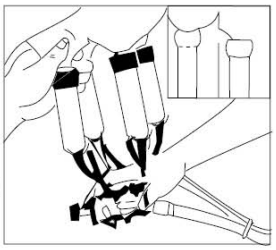
4.Before setting the teat cup, the milker should stand one side of the cow.The claw is held in palm by one hand. The stainless steel part of the claw is up and all the teat cup inlets are downward. Then push up the sealing band seat below the claw to make the vacuum in the big milk tube enter the claw and teat cup liner. Use another hand to pull the teat cup one by one through the teat quickly. as shown in picture 7. During the operation, the milk tube should be kept S-type to prevent the atmosphere from entering the teat cup.



Picture 7



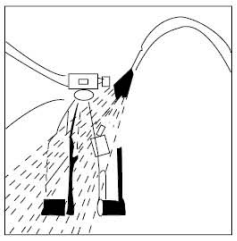
Picture 8



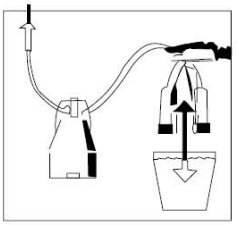
Picture 9

5.Milking should be carried out under the condition of stable vacuum, as is shown in picture 8.Meanwhile, whether the milking is finished or not depends on observing the transparent part of the claw. When it is finished, use your hand to add more power on the claw and press it several times to make the milking be complete, as is shown in picture 9.

Then hold the claw in the palm and pull down the sealing band seat to cut off the vacuum in the claw and in the teat cups. Accordingly the teat cups fall off automatically. As shown in picture 10.



Picture 10



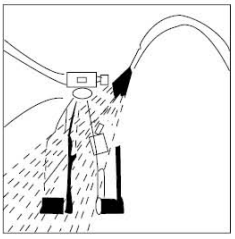
Picture 11

At last, use the sanitizer to sanitize the teat, as is shown in picture 11.

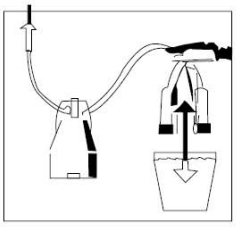
6.Hang the cluster on the pothook of the machine when they are plunked,uncover the milk barrel cover, spill the milk in it and then continue to do the next milking.

V. Cleaning and sanitizing of the milking machine

1.Cover the barrelhead in time when finishing milking. Use the clean water to wash the dirty off the cluster (see picture 12) and then put the clean cluster into another barrel with the hot water or sanitizer. Start the milking machine to make it work and wash it more times. Clean the cluster, milk barrel and milk tube.At last ,use the clean water to wash them again until the residual sanitizer is washed completely. See picture 13.



Picture 12



Picture 13

2.After the milking vehicle has been used for a week, the claw,milk barrel and the cluster should be all taken down and washed completely with the brush.

VI. Check and maintenance

1.Lube oil($30^{\#}$ gear oil,0.4kg)should be exchanged after the reducer was used 750 hours

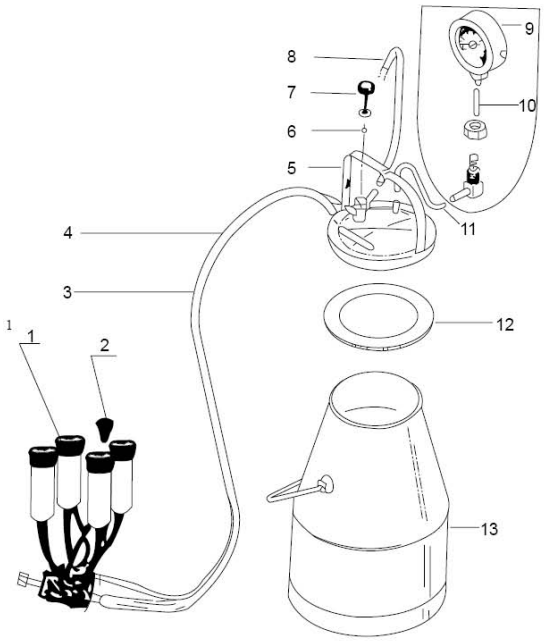
2.Every week, a certain of edible oil or 20# gear oil is used to lubricate the place between the piston in the piston pump and the pump shell. Pull out the skin tube in the piston pump and pour the oil into it.

3.Two sets of teat cup liner are prepared for exchangeable use to prolong their service life-About one month is needed for exchange. Keep the liner replaced in the shade to prolong the service life of the latex. Then, another liner is used.Before the liner is used, it should be checked. If there appears flaw and distortion, the new liner is needed.

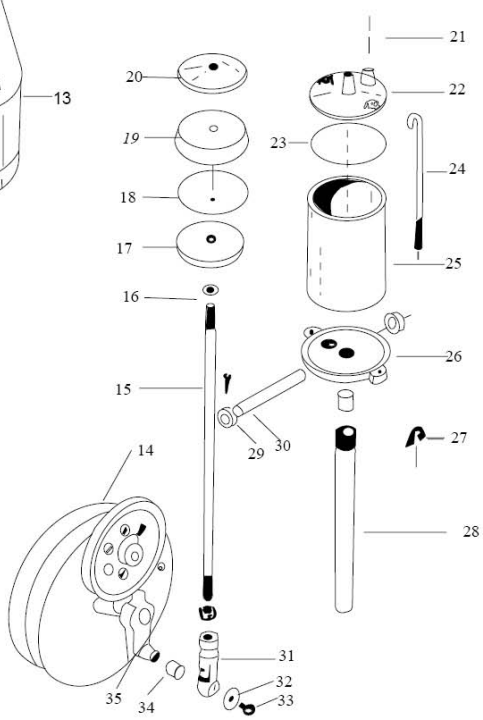
4.For various innocuous latex tubes, they should be replaced in time when they are found to have flaw.

Ⅶ. Faults phenomena and treatment methods

Faults	Reasons	Treatment methods
A bnormal noise	a. There are loose connections between each part of the engine	a. Check and tighten the screws and joints between each part of the engine
	b. There is no lubricating oil between each part of the engine	b. Pure some drops of lubricating oil between each part of the engine.
Too low or no vacuum	a. There is no lubricating oil to seal between piston and cylinder body;gasleakage	a. Put off the tube on the piston pump cover and pure into lubricating oil ,and then start the engine and work for 3 to 6 minutes, and pull up the cow hide bowl to outside.
	b. The seal ring of the piston pump up-cover is not airproof; gas leakage	b. Open the piston pump up-cover, and lay some grease on the seal ring,and then reinstall it and make sure it is sealed with the top of the cylinder bottom.
	c. There are cracks between the clusters and tube; the joints are not airproof; gas leakage.	c. Check the teat cup liner and its tube,and change the cracked ones. Check the joint between the teat cup,claw and their tubes is airproof or not. Reinstall them in the case of gas leakage and make sure that it will not airproof.
	d. Something wrong with the plastic ring in the admisssion valve;too much gas leakage	d. Change the plastic ring.
	e. Electromotor skids;less rev leads to less pulsation.	e. Check the electromotor and exclude the faults; as for the skidding,please refer to the following treatment methods.
	f. The steel ball and valve in the cover of milk bucket rust together.	f. Open the up-cover of the milk bucket and put out the steel ball and put its rust off,and reinstall it.
ELectromotor Skidding	a. Too high vacuum and load value.	a. Adjust air inlet valve and make much more air in so as to make the vacuum valve live up to the required scope.
	b. Belt too loose.	b. Move the motor cabinet and tighten the belt.
	c. Lubricationg oil on belt roller.	c. Wipe it and dry the belt,and lay some friction modifier to enlarge the frictional force between belt roller and belt.
Too high vacuum value	a. Vent valve failure.	a. Screw off vent valve and check the incision of the screw and it's better to make it to the bottom.



Installation picture 1



Installation picture 2

Warranty Ordinance

1.Please read the instruction manual carefully before using the machine.If there appears the quantity problem under the condition of the normal use and maintenance, the company is responsible for warranty.

2.The main parts of the machine (reducer assembly,vacuum pump assembly,electric motor, claw assembly)are guaranteed for 12 months. once these parts go beyond the warranty period,we are responsible for supplying accessories and maintenance and the consumer offer the expense.

3.If the damage is caused by the improper use (such as irregularly maintenance,no adding the lube oil), we are responsible for supplying accessories and maintenance and the consumer offter the expense.

4.The rubber products used in the machine are guaranteed for three months. Once the products go beyond the warranty period, the consumer is responsible for the exchange.

5.Please contact us in time when you need spare parts.We can provide you with good service.

Warranty card for YDH-Ⅰ、Ⅱ milking machine

Name of consumer		Purchasing date	
No.of the machine			
Address			
Date of survey	Maintenance contents		

Table for parts of the installation figure

No.	name	No.	name
1	Cluster	18	Swelling reed
2	Artificial teat	19	Piston (calf skin bowl)
3	Lang air tube	20	Iron cover
4	Long milk tube	21	Steel ball(⌀ 12)
5	Barrel cover	22	Casing cover
6	Steel ball(⌀ 11)	23	Casing cover washer
7	Seal ring 1	24	Pressure hook
8	Plastic stop screw	25	Pump stell
9	Vacuum gauge	26	Pump seat
10	Hose connector of vacuum gauge	27	Pressed pole nut
11	Vacuum gauge connecting tube	28	Joining sleeve of connecting rod
12	Barrel mat	29	Adjusting sleeve for horizontal axis
13	Milk barrel	30	Horizontal axis
14	Reducer	31	Active extension rod assembly
15	Connecting rod	32	Metal board
16	Nut M16	33	Bolt M5×15
17	Fluctuate press board and mat	34	Bearing(203)
		35	Crank

Other parts:

YDH-I triangle belt A630 gearwheel bearing 6204

YDH-11 trianle belt A710 pinion bearing 6201