CKD

SM-9589-A

INSTRUCTION MANUAL

DRY AIR TYPE SOLENOID VALVE

Pilot kick Type

ADK11-8A/8G/8N～25A/25G/25N-Z

- Please read this instruction manual carefully before using the product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

CKD Corporation

Ver.2

Safety precautions

When designing and manufacturing a device using CKD products, the manufacturer is obligated to manufacture a safe product by confirming safety of the system comprising the following items:

- Device mechanism
- Pneumatic or water control circuit
- Electric control that controls the above

It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.
Observe warnings and precautions to ensure device safety.
Check that device safety is ensured, and manufacture a safe device.

⚠ WARNING

1. **This product is designed and manufactured as a general industrial machine part. It must be handled by someone having sufficient knowledge and experience.**

2. **Use this product within its specifications.**
   This product cannot be used beyond its specifications. Additionally, the product must not be modified or machined.
   This product is intended for use in general industrial devices and parts. Use beyond such conditions is not considered. Consult with CKD for details when using the product beyond the unique specification range, outdoors, or in the following conditions or environments. In any case, measures for safety shall be provided when the vavle malfunctions.

   ① Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
   ② Use for applications where life or assets could be adversely affected, and special safety measures are required.

3. **Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.**
   ISO4414, JIS B 8370 (pneumatic system rules)
   JFPS2008 (principles for pneumatic cylinder selection and use)
   Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, standards and regulations, etc.

4. **Do not handle, pipe, or remove devices before confirming safety.**
   ① Inspect and service the machine and devices after confirming safety of the entire system related to this product.
   ② Note that there may be hot or charged sections even after operation is stopped.
   ③ When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Release any compressed air from the system, and pay enough attention to possible water leakage and leakage of electricity.
   ④ When starting or restarting a machine or device that incorporates pneumatic components, make sure that system safety, such as pop-out prevention measures, is secured.

5. **Observe warnings and cautions on the pages below to prevent accidents.**

■The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

⚠ DANGER : When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

⚠ WARNING : When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

⚠ CAUTION : When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation. In any case, important information that must be observed is explained.

Precautions with regard to guarantee

● Guarantee period

The guarantee period of our product shall be one (1) year after it is delivered to the place specified by the customer.

● Guarantee coverage

If any failure for which CKD CORPORATION is recognized to be responsible occurs within the above warranty period, a substitute or necessary replacement parts shall be provided free of charge, or the product shall be repaired free of charge at the plant of CKD CORPORATION.

However, the guarantee excludes following cases:

① Defects resulting from operation under conditions beyond those stated in the catalogue or specifications.
② Failure resulting from malfunction of the equipment and/or machine manufactured by other companies.
③ Failure resulting from wrong use of the product.
④ Failure resulting from modification or repairing that CKD CORPORATION is not involved in.
⑤ Failure resulting from causes that could not be foreseen by the technology available at the time of delivery.
⑥ Failure resulting from disaster that CKD is not responsible of.

Guarantee stated here covers only the delivered products. Any other damage resulting from failure of the delivered products is not covered by this guarantee.

● Confirmation of product compatibility

Our customer shall be responsible of confirming compatibility of our product used in our customer's system, machinery or device.

Thank you very much for purchasing the CKD's type ADK11-Z pilot diaphragm kick series Multilex Valve.

This MULTILEX VALVE is a fruit of our long years of accumulated experience.

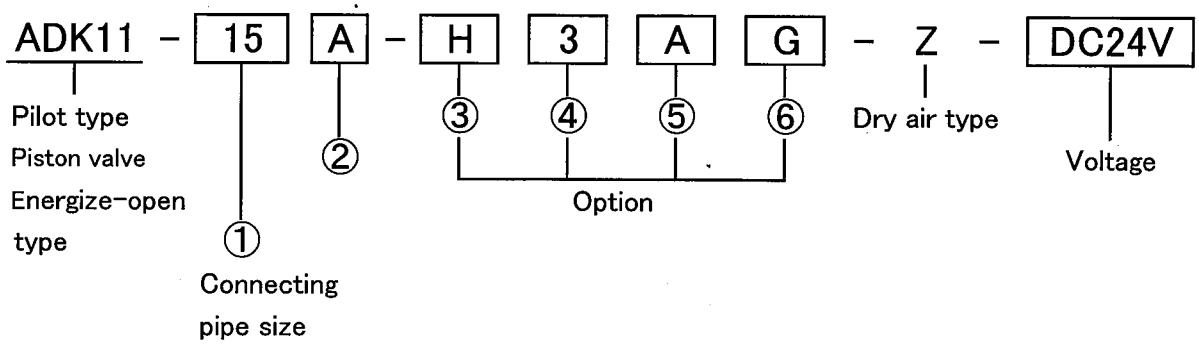
This INSTRUCTION MANUAL deals with the basic items regarding the installation, operation, maintenance, etc. required for bringing the efficiency of the MULTILEX VALVE into full play.

Our products are produced under severe quality control

You are requested to thoroughly go through this INSTRUCTION MANUAL before using the valve, and to perform correct operation and maintenance.

Content

1. MODEL CODE DEFINITION



Above model gives the followings:

Connectiong pipe size; Rc1/2, body material; CAC408, Seal material; NBR, and conduit; CTC19.

①	②		
	A	G	N
8	Rc 1/4	G 1/4	1/4 NPT
10	Rc 3/8	G 3/8	3/8 NPT
15	Rc 1/2	G 1/2	1/2 NPT
20	Rc 3/4	G 3/4	3/4 NPT
25	Rc 1	G 1	1 NPT

③ Option			
		Body	Seal
A)	H	CAC408	NBR
	J		FKM
	L	SCS13	NBR
	M		FKM

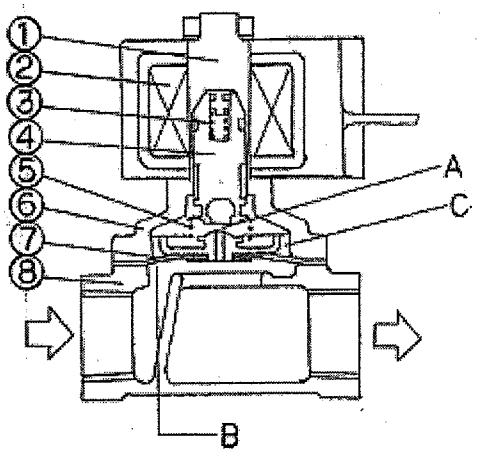
A)Additional parts re-wash process to remove residual oil

④⑤ Option		Voltage
3 A	Open frame type lead wire coil	DC
3 M	Open frame type coil with HP terminal box(G1/2)	
3 N	Open frame type coil with HP terminal box and pilot lamp(G1/2)	
3 I	Open frame type coil with HP terminal box (IP65)(G1/2)	
3 J	Open frame type coil with HP terminal box and pilot lamp(IP65)(G1/2)	
5 A	Open frame type with built-in diode lead wire coil	AC
5 M	Open frame type coil with built-in diade and HP terminal box(G1/2)	
5 N	Open frame type coil with built-in dipde, HP terminal box and pilot lamp(G1/2)	
5 I	Open frame type coil with built-in diode and HP terminal box(IP65)(G1/2)	
5 J	Open frame type coil with built-in diode, HP terminal box and pilot lamp(IP65)(G1/2)	

⑥ Option	
D	Cable gland(A-15a)
E	Cable gland(A-15b)
F	Cable gland(A-15c)
G	Conduit(CTC19)
H	Conduit(G1／2)
S	With surge absorber

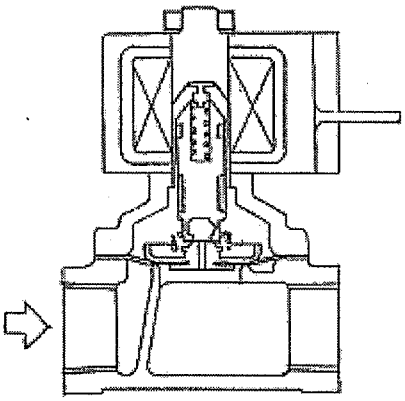
2. INTERNAL STRUCTURE, WORKING PRINCIPLE AND PARTS LIST

o At opened state



When the coil ② is energized, the plunger ④ is drawn to the stationary core ①, so that the pilot valve Ⓐ opens. Therefore the pressure in the diaphragm chamber Ⓒ becomes lower than the IN-side. This pressure difference between the IN-side and the diaphragm chamber Ⓒ pushes diaphragm up and opens the valve.
If the pressure difference is small, the diaphram ⑦ is pulled up by means of the tension spring ⑤.

o At closed state



When the energy applied to the coil ② is stopped, the plunger ④ leaves from the stationary core by a force of the spring ③ to close the pilot valve Ⓐ. This makes the pressure at IN-side flow into the diaphragm chamber Ⓒ through the bleed orifice Ⓑ, so that the pressure in the diaphragm chamber becomes higher than the OUT-side. Accordingly, the diaphragm ⑦ is pushed against the valve seat to close the valve.
If the pressure difference is small or the valve is mounted sideways or upside down, the diaphragm is pushed against the valve seat by a force of the plunger spring ③ to close the valve firmly.

Part No.	Part Name	Material
①	Core assembly	K-M31,C1100
②	Coil assembly	
③	Plunger spring	SUS304
④	Plunger	K-M31,NBR(FKM)
⑤	Kick spring[Tension spring]	SUS304
⑥	Stuffing	C3771(SCS)
⑦	Diaphragm[Valve]	NBR(FKM)
⑧	Body	CAC408(SCS)

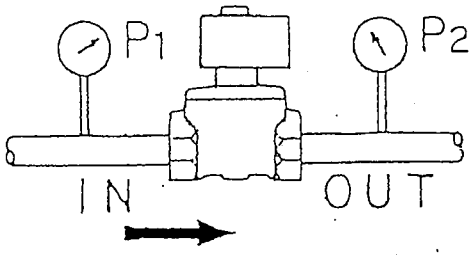
Item with brackets show options.

3. Cautions for Use

3-1 Cautions for Operation

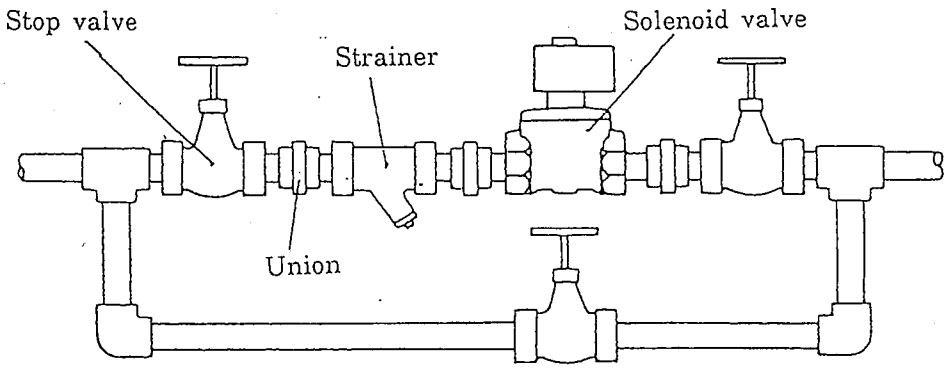
(1) Do not install the valve where there are much corrosive gas, explosive gas, or where rain water directly falls over such as outdoor.

(2) Be sure to operate within the specified pressure range. If not used within the specified pressure range, it may cause trouble.



(3) Be sure to keep the ambient temperature and fluid temperature within the specified temperature range while in use. If there is a chance that the fluid may freeze, try to keep the temperatures within the specified range by using an heat insulating material.

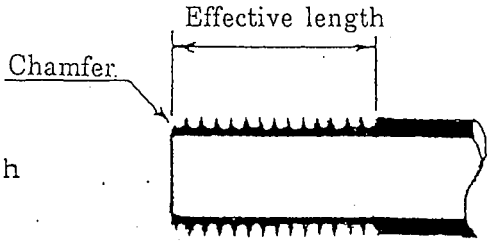
(4) For piping, use a by-pass circuit, which makes the maintenance and repair easy.



(5) Do not set the solenoid valve where more than 4G vibration is generated.

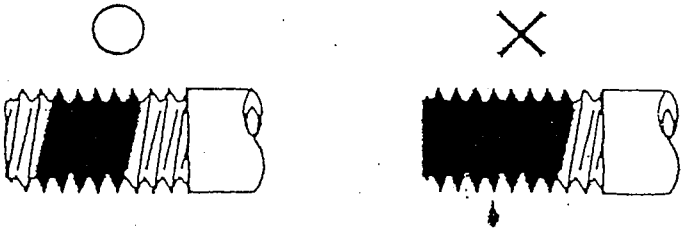
3-2 Cautions for piping

(1) Connect the pipe using the full effective screw length.
Also chamfer off about half a pitch of the screw at the pipe end.



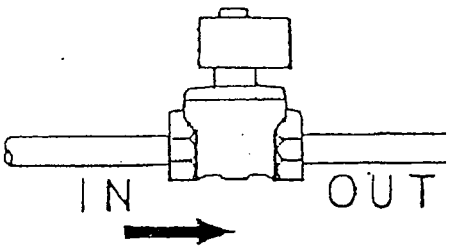
(2) Flush out foreign matter, chip etc. from the pipe.

(3) When connecting the pipe with the valve, carefully see that sealant or seal tape does not slip into the pipe.



(4) Match the flow direction of the fluid with "IN" and "OUT" of the solenoid valve.

(5) After piping, check for leakage.



3-3 Cautions for wiring

(1) Use the electric wire of nominal sectional area of more than 0.5 mm^2.

(2) Adoptthe switching circuit without chattering of contact points.

(3) Use 1A fuse.

(4) Apply voltage of ± 10% of the rated voltage.

(5) When a non-contact point relay circuit is used, be careful of its current leakage.

Select a relay of current leakage lower than 1% of the rated current.

4. Maintenance and inspection

4-1 Periodical inspection

(1) In order to use the solenoid valve in the best possible condition, perform inspection once or twice a year.

(2) What to be inspected.

(a) Check to see if no dust or foreign matter is accumulated or no high viscosity substance is adhered in the valve.
If such is observed, disassemble the valve and clean it.

(b) Check to see if no damage, abnormal wear, etc. is observed on the valve disc for a plunger and the diaphragm assembly in the actuator part.
If such is observed, replace the parts.

4-2 Disassembling - assembling - inspection

o Disassembling

(1) Turn off the power, and drain the fluid and pressure out before disassembling.

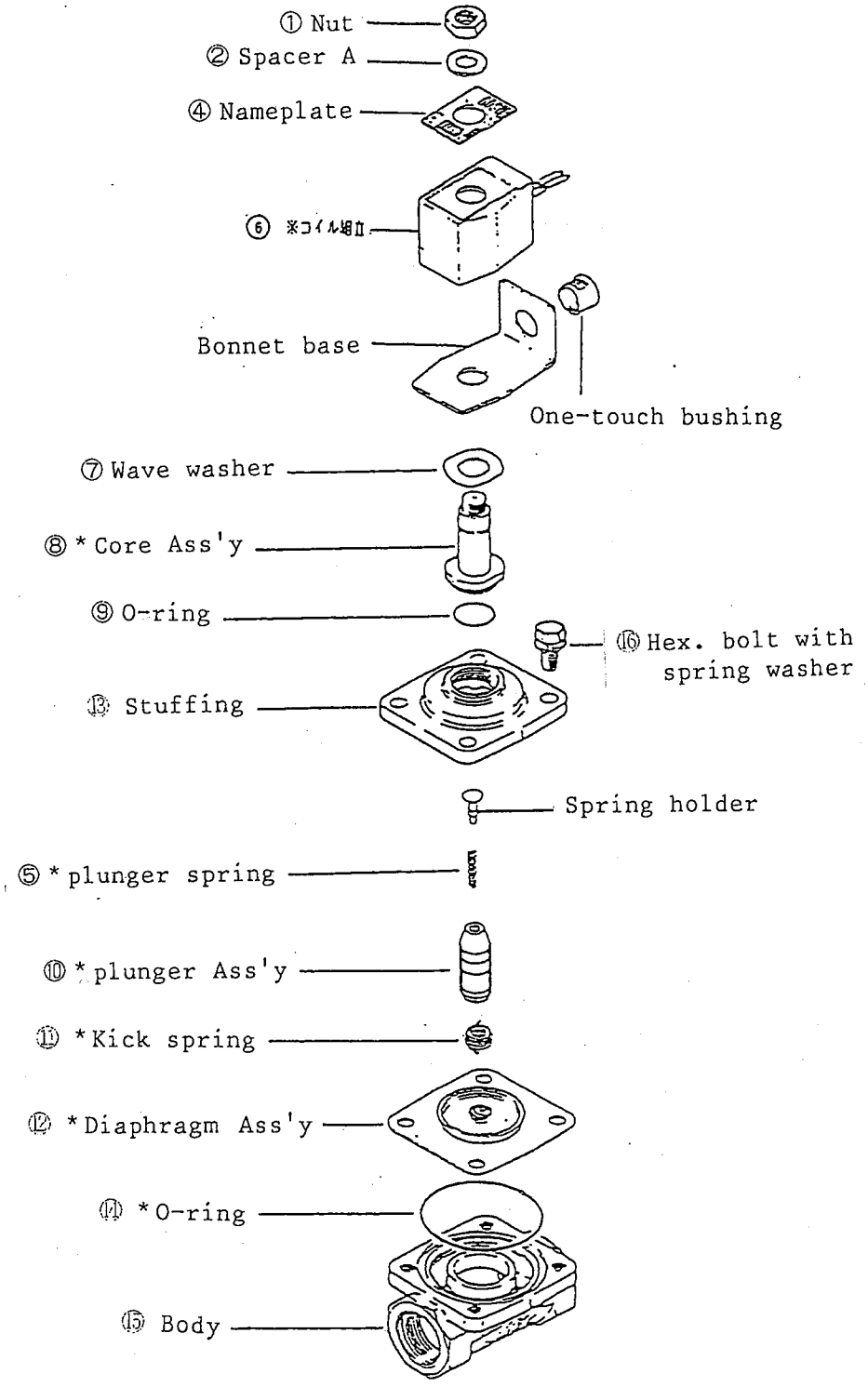
(2) To take out the coil ⑥;
The spacer A ②, nameplate ④, coil ⑥, bonnet base, and wave washer ⑦ can be taken out when the nut ① is loosened.

(3) To take out the inner valve;
When 4 hex. bolts ⑯ is removed, the valve can be separated to upper part including the stuffing ⑬ and the body ⑮. In this case, it is not necessary to remove the coil if its lead wire is free.
The plunger assembly ⑩, kick spring ⑪ and diaphragm assembly ⑫ as a solid inner valve assembly can be taken out. Be careful not to loose the plunger spring ⑤.

(4) During assembling and disassembling the plunger assembly ⑩, kick spring ⑪, and diaphragm assembly ⑫, note that the kick spring ⑪ is counter clockwise wound spring. Therefore, for disassembling, turn the kick spring ⑪ paying the utmost care not deform it.

(5) Clean each part with a neutral detergent or kerosene. Never use an organic solution which may expand the rubber parts.

Component parts and expendable parts kit



* mark shows expendable parts.

o Assembling

(1) Reassemble the unit by taking the reverse order of the disassembling. Do not forget any parts unassembled.

(2) Assembling of the kick spring (11) with the plunger assembly (10) and diaphragm assembly (12).
Turning clockwise, engage an end of kick spring (11) with a slit at the bottom of plunger assembly (10). Likewise engage another end of kick spring (11) with slit at the pilot valve seat of diaphragm assembly (12) Be careful not to deform the kick spring (11).

(3) It is not necessary to pay attention to the flow direction of INLET or OUTLET when assembling the stuffing (13) to the body (15), but there are space differences between 4 bolts.

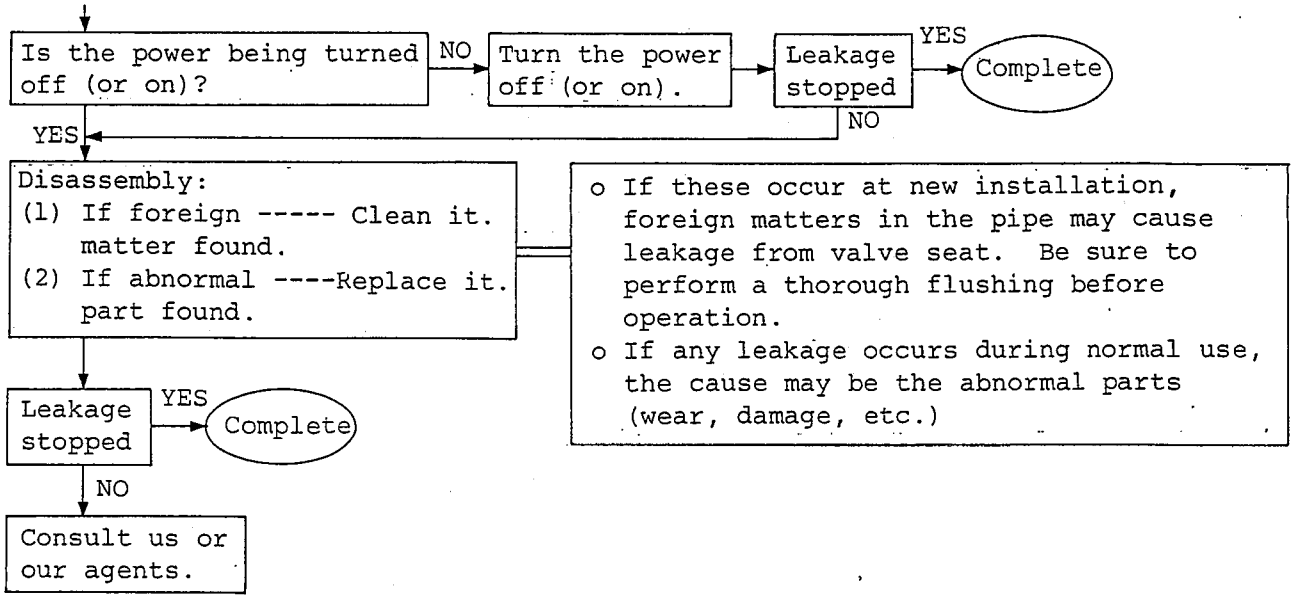
o Inspection

(1) Check to see if no internal nor external leakage from the valve body is observed, when applied the rated pressure.

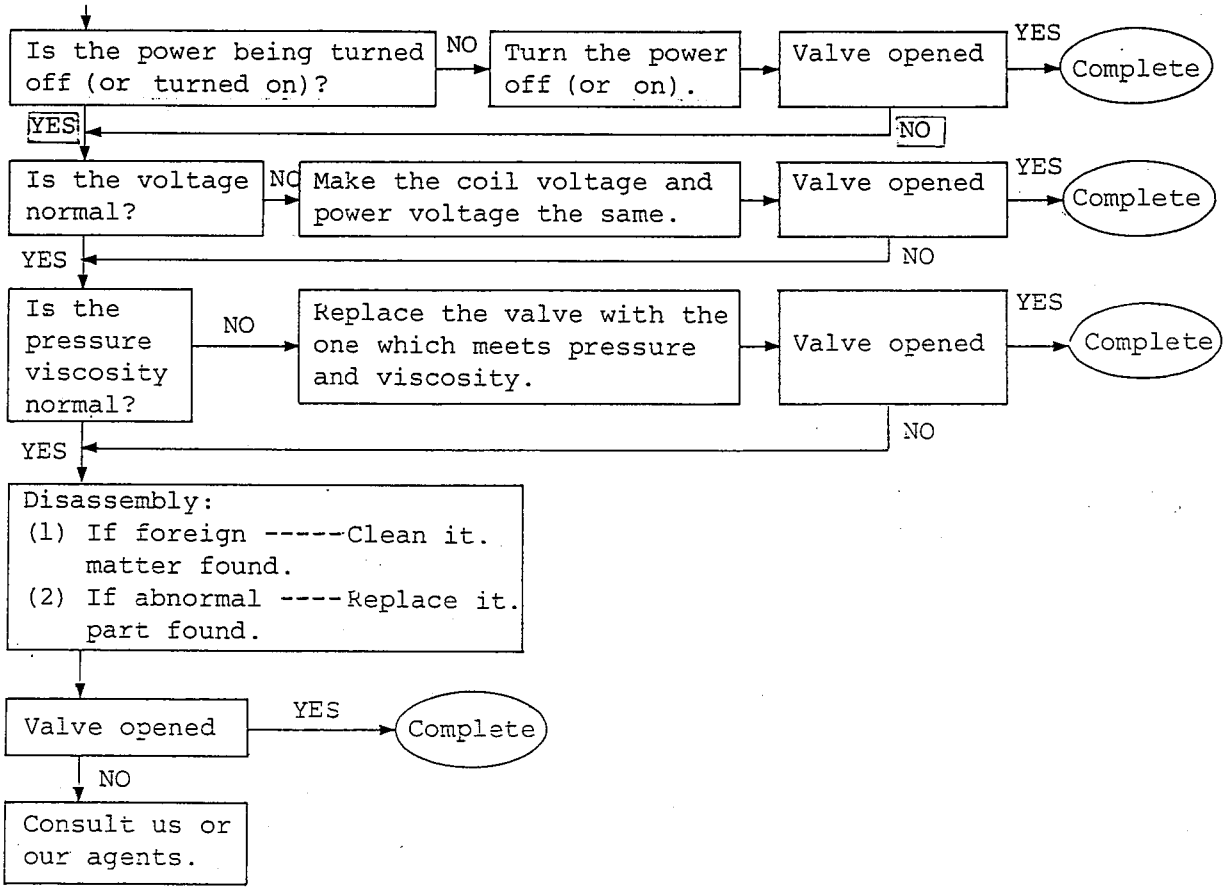
(2) Then apply electric signal and see if the valve properly opens and closes.

4-3. Troubleshooting

1) Valve does not close or it leaks.



2) Valve does not open or fluid does not flow out.



3) Valve vibrates