

Users' manual

Nishigaki Fully Leak Proof Magnetic Drive Pump

Stainless Steel Horizontal Magnetic Drive Pump

TYPE J M [~3.7 kW]

Thank you very much for purchasing our magnetic drive pump.
We design and manufacture products with extreme care to ensure users' safety during operation, although inappropriate handling or usage may cause an unexpected accident. To avoid accidents, read this manual carefully, and use the pump appropriately. Also, keep this manual safe.

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[JM: ~3.7kW]

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| | 《Applicable Products》 | |
| | JM-43BX · 43C · 43D · 54C · 54DX · 65CY | |



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HC3-551B-1 (2015. 4)

[1] Precautions on Operation and Handling

1) Operating precautions

1. Do not run the pump dry or operate with cavitation or air mixed in.
[These operation may cause damages or scaring to metal, a liner or a balance ring]
Stop the pump and check rotation by turning the drive manually.
2. If the inner drive and the magnet of the drive couplings lose alignment, stop the pump immediately. (Do not run the pump with decoupled couplings for more than 1 minute.)
Magnet couplings may be damaged, if the pump operates with the magnets out of alignment.
In this case, the pump runs incorrectly due to a wrong inner drive rotation.
3. Do not run the pump with outlet closed for more than 2 to 3 minutes.
This may cause damage to metal parts and the magnets due to an increase in the liquid temperature or insufficient lubrication.

2) Prohibition of Dry-running

Do not run the pump dry, because bearings of the JM series lubricate themselves with pumping liquid.

In case a dry-run (even within 1 minute), do not allow large an amount of liquid to flow into the pump quickly. Leave the pump for 30 minutes to 1 hour after a dry-run, and then operate the pump after checking the rotation manually.

[Give the pump a rest to avoid scoring the rings or cracking metal due to a sharp temperature drop.]

[If the pump operated dry for more than 1 minute, ensure the pump, including all the parts inside, is in operative condition by disassembly before restarting.]

3) Temperature Influence

Liquid changes its properties such as viscosity, specific gravity, vapor pressure and corrosivity as its temperature changes.
Therefore, watch the changing characteristics of the pumping liquid carefully. The JM series operates between -10℃ and +150℃. Note that the operation temperature may vary according to pumping liquid.

4) Gravitational Influence on the Pump Characteristics

The pump requires more power with denser liquids. Be aware that the magnets may lose alignment or the motor may burn out.

5) Viscosity Influence on the Pump Characteristics

When transferring viscous liquid, the pump rate is lower and the liquid cannot be lifted as high as water. Also, the pump requires more power. Be aware that the magnets may lose alignment or the motor may burn out.

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HC3-551B-2

6) Influence of Slurry on the Pump Characteristics

The pump can accommodate liquid slurry with 0.5 mm or less diameter particles and 0.5 wt% or less concentration.

However, caution should be exercised to avoid magnetic materials (such as iron and nickel) mixed in the slurry.

7) Pump Operation Pressure

The operation pressure of the JM series is 1.0 MPa or less.

When using liquid pressure such as a hydraulic head at same time or denser liquid, make sure the total pressure is within 1.0 MPa.

[Suitable pump specifications will be prescribed when using corrosive, viscous or dense liquid or liquid with vapor pressure or specific temperature.]

[2] Pump Operation

1) Preparation for Use

1. Clean the pipes and the tank thoroughly, and then supply the liquid.
[Caution should be exercised to avoid magnetic materials (such as iron and nickel) mixed in.]

2. Confirm the pump is filled fully with pumping liquid.

3. Turn the motor manually to check it turns smoothly.

4. Confirm the rotating direction of the motor.

[Motor shaft direction must be clockwise as seen from the motor end]



Danger Be aware of splashing liquid.

When filling the pump with liquid, the liquid splashes, which is dangerous. When a hydraulic head pressure applied pump is stopped, the liquid flies out by the internal pressure. This is also dangerous. Exercise great caution.



Caution Fill the pump with liquid fully before operation.

Switch the motor on with the pump fully filled with liquid. An unexpected accident may occur due to internal damage of the pump. Caution should be exercised.



Danger Be aware of the rotation check hole on the motor pedestal.

Do not place a finger, hand or pole into the hole on the motor pedestal. Drive couplings rotate high speed inside, which may cause injury. Exercise great caution.

2) Pump Operation

1. Close the outlet completely before starting the pump.

Magnets may lose alignment due to a liquid property or too large power requirement.

The pump must be started with a lower required power and the outlet closed. After that, open the outlet slowly to gain the specified pressure and liquid volume.

2. Do not exceed the specified liquid volume.

The motor may become over loaded. Also, exceeding the liquid volume may cause the magnets to lose alignment. Set the volume carefully.

3. Do not run the pump with the outlet closed for a long period (more than 2 to 3 minutes).

A pump operation with the outlet closed leads to a temperature increase inside the pump, which is dangerous. Exercise great caution.

4. The minimum operation liquid volume is determined by the model.

JM-4 3..... 40 L/min

JM-5 4..... 70 L/min

JM-6 5..... 100 L/min

Due to the temperature increase of the pumping liquid, lubrication for the metal parts may become insufficient, or the magnets may be damaged.

5. Inspect whether the current volume of the motor is stable and the motor is not overloaded during a pumping operation.

6. To start a pump which has been stopped for a long time, turn the pump drive couplings manually to check the inside of the pump is rotating normally.

[If the supply current becomes unstable, stop the pump immediately and inspect. An unstable current may be caused by air in the pump, foreign matter inside, scoring rings or faulty metal parts.]

3) Stopping Pump

1. When stopping the pump, confirm that the rotation stops slowly and smoothly.

[Unusual rotation stop may be caused by a magnetic matter inside the pump, faulty metal parts or scoring rings. Disassemble the pump to inspect.]

[3] Disassembly and Assembly Procedure of Pump

《Refer to the structural diagrams on HC3-551B-10・11 for disassembling》
《and assembling the pump.》

! Danger Be aware that the pump has strong magnets.

Individuals with cardiac pacemakers should avoid proximity to the pump. Also, caution should be exercised with magnetized recoding mediums (such as credit cards, floppy disks).

! Danger Caution should be exercised with the magnetic parts.

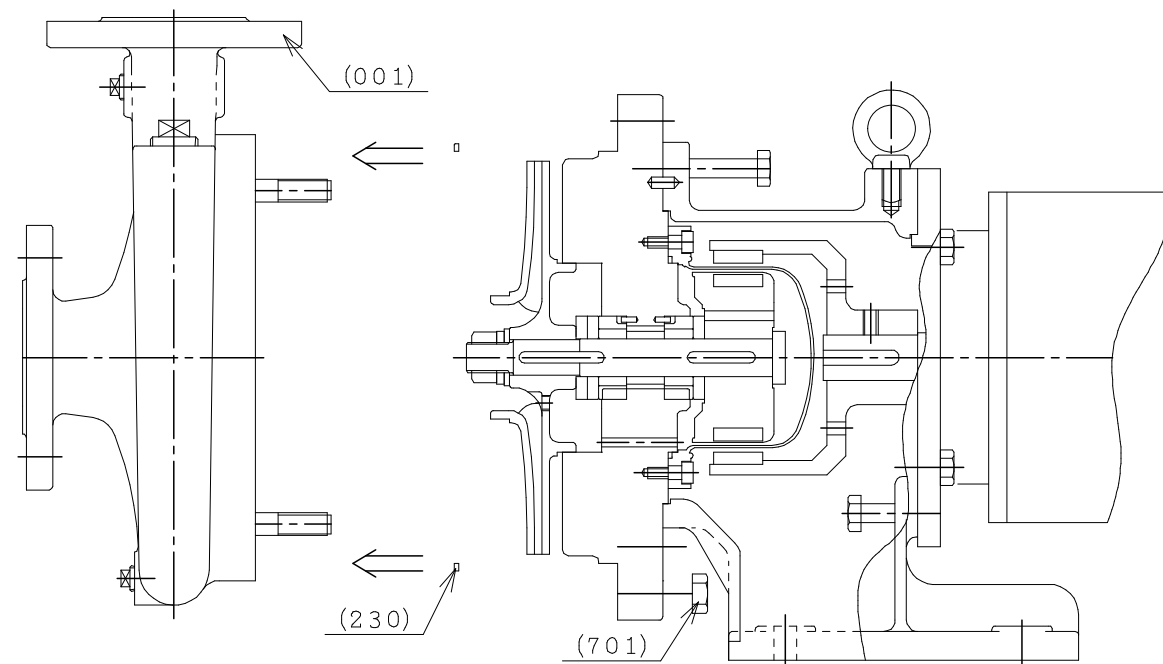
Be aware that the inner drive and drive couplings have strong rare earth magnets. The strong force of these magnets may cause unexpected injury to a hand or finger.

1) Preparation for Disassembly

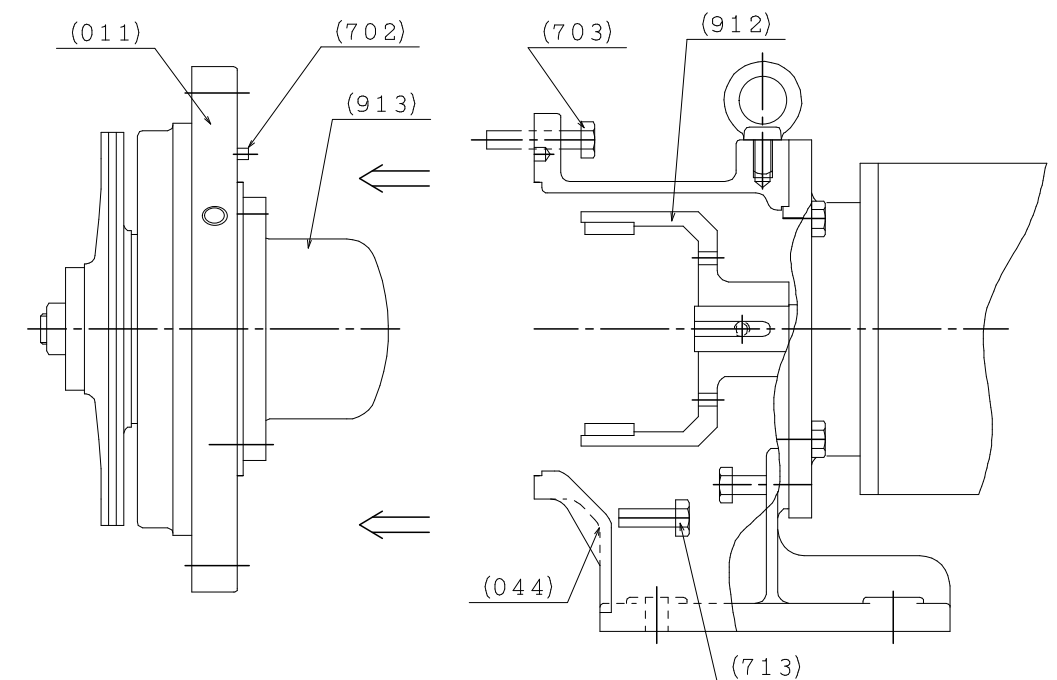
1. Note that the inner drive and drive couplings have strong rare earth magnets due to the nature of the magnetic drive. These magnets strongly attract magnetic materials (such as iron and nickel). Hence prepare a non-magnetic work table, such as wooden or plastic.
2. Keep magnetic tools (such as those made of iron) away from the magnetic parts.
3. Before disassembly, remove all liquid from the pump.
4. Switch the motor off before disassembly.

2) Disassembly Procedure (~3.7kW)

1. Unscrew the bolt (701) fastening the cover to dismount the casing (001), and remove the cover packing (230).

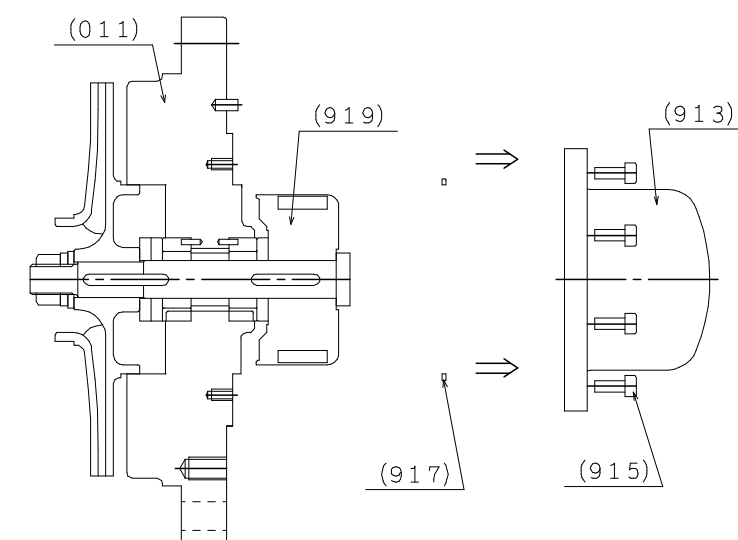


2. Unscrew the bolt (713) fastening the motor pedestal and remove the bolt (703) to pull out the casing cover (011) from the pedestal (044). [Pull out the seal case (913) vertically to the axis. Also, caution should be exercised with the magnets of the drive coupling (912).]

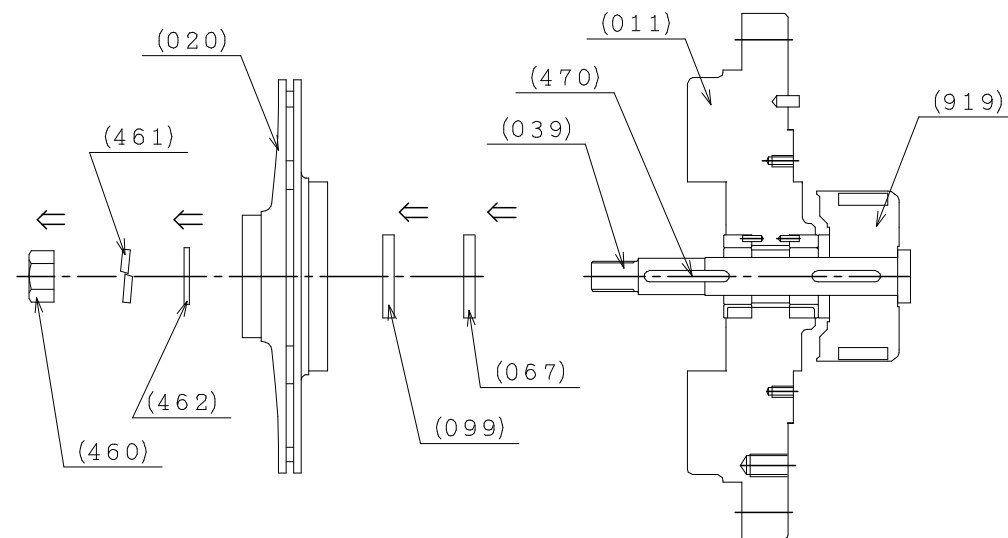


[JM-43 BX, 43C and 54C do not contain bolts (713), because the same bolts tie the cover and pedestal.]

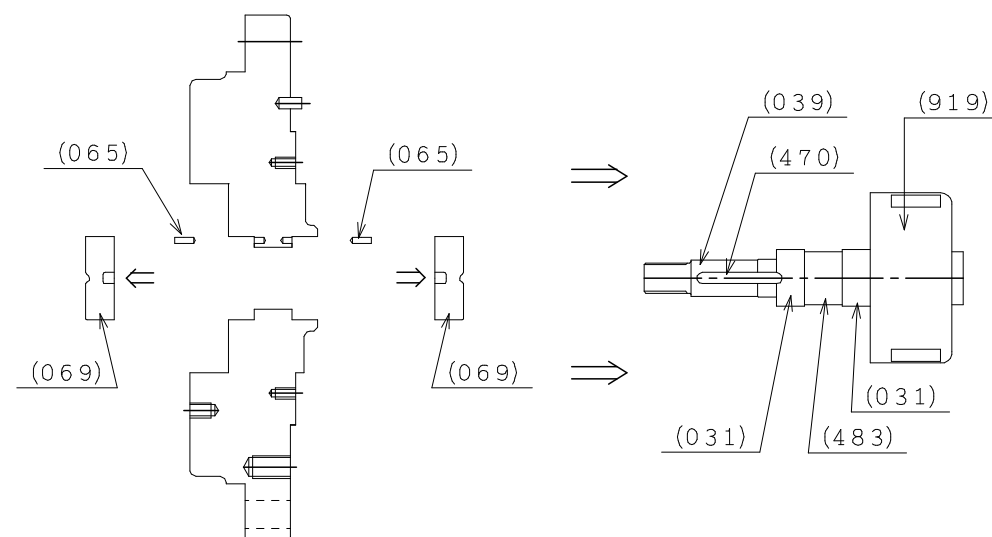
3. Remove the seal case bolt (915) fastening the seal case on the casing cover (011) to take the seal case (913) out. Remove the case packing (917).



4. Remove the impeller nut (460), lock washer (461) and washer (462) from the below shaft (039) to take the impeller (020) out. After taking impeller out, remove the metal cover (099) and thrust metal (067).
[Avoid giving a shock to the axis when removing the parts.
The metal parts may be damaged.]

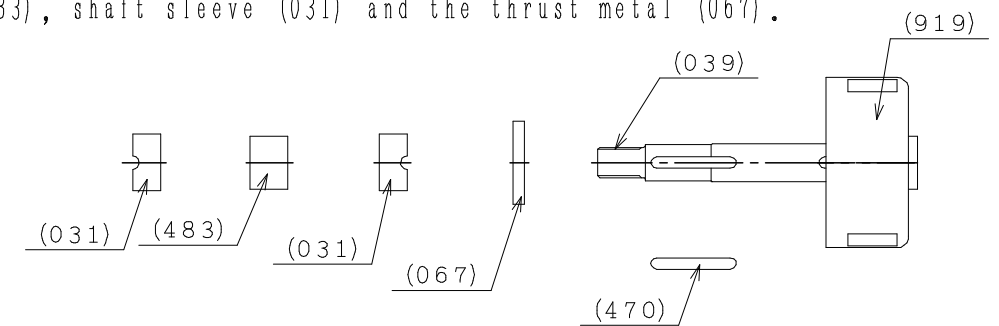


5. Remove the below shaft (039) with the inner drive (919) from the casing cover (011). Take out the metal (069) from the casing cover (011). Remove the set pin (065).
[Exercise caution with the metal parts and the magnets in the inner drive.]
[Remove the parts with care horizontally to the axis.]

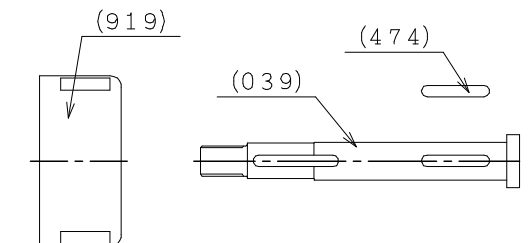


6. Remove the impeller key (470) from the below shaft (039).

7. Remove the parts in order of the shaft sleeve (031), the bearing sleeve (483), shaft sleeve (031) and the thrust metal (067).



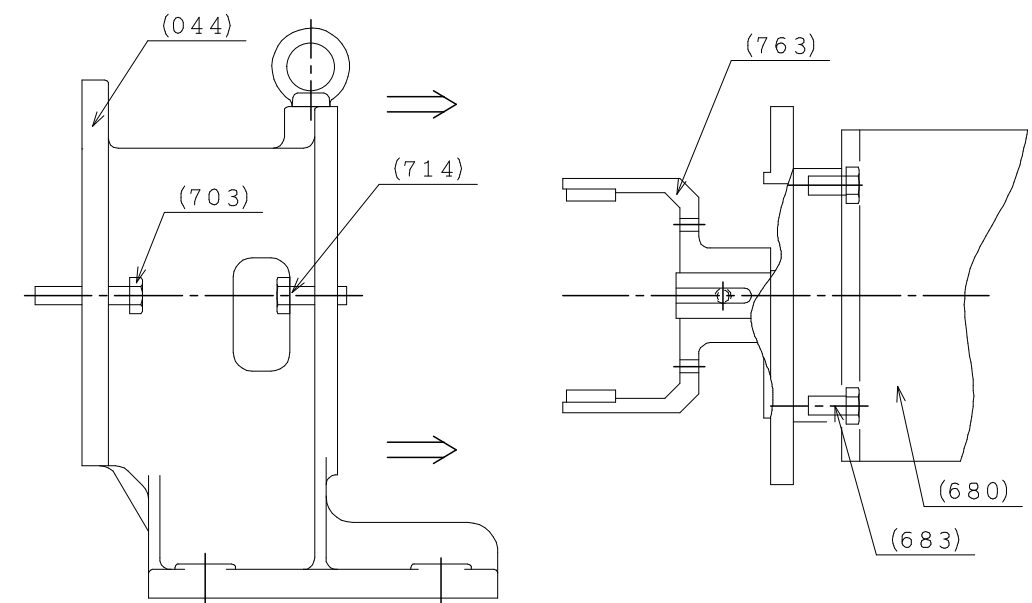
8. Remove the inner drive (919) from the below shaft (039), and then remove the inner drive key (474).



[Check the wear level of the metal parts (031) (067).]

[Do not give a shock to the inner drive (919) due to the strong magnets inside the drive.]

9. Loosen the motor bolts (683) and the bolt (714) to remove the motor (680) and the drive coupling (912).



[Exercise caution with the magnets inside the couplings, during a drive coupling and motor removal.]

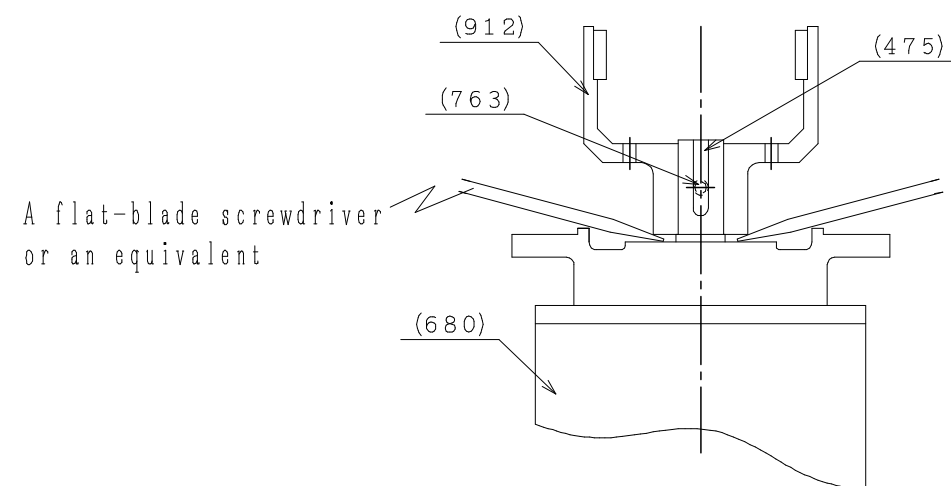
[Pull the coupling out vertically, without stopping, when removing the drive coupling and the motor.]

[Never stop while pulling the drive coupling.]

[The magnets are characteristically fragile and easily damaged.]

Avoid damaging the magnets carefully, not to hit with the seal case (913), when removing the drive coupling and the motor.]

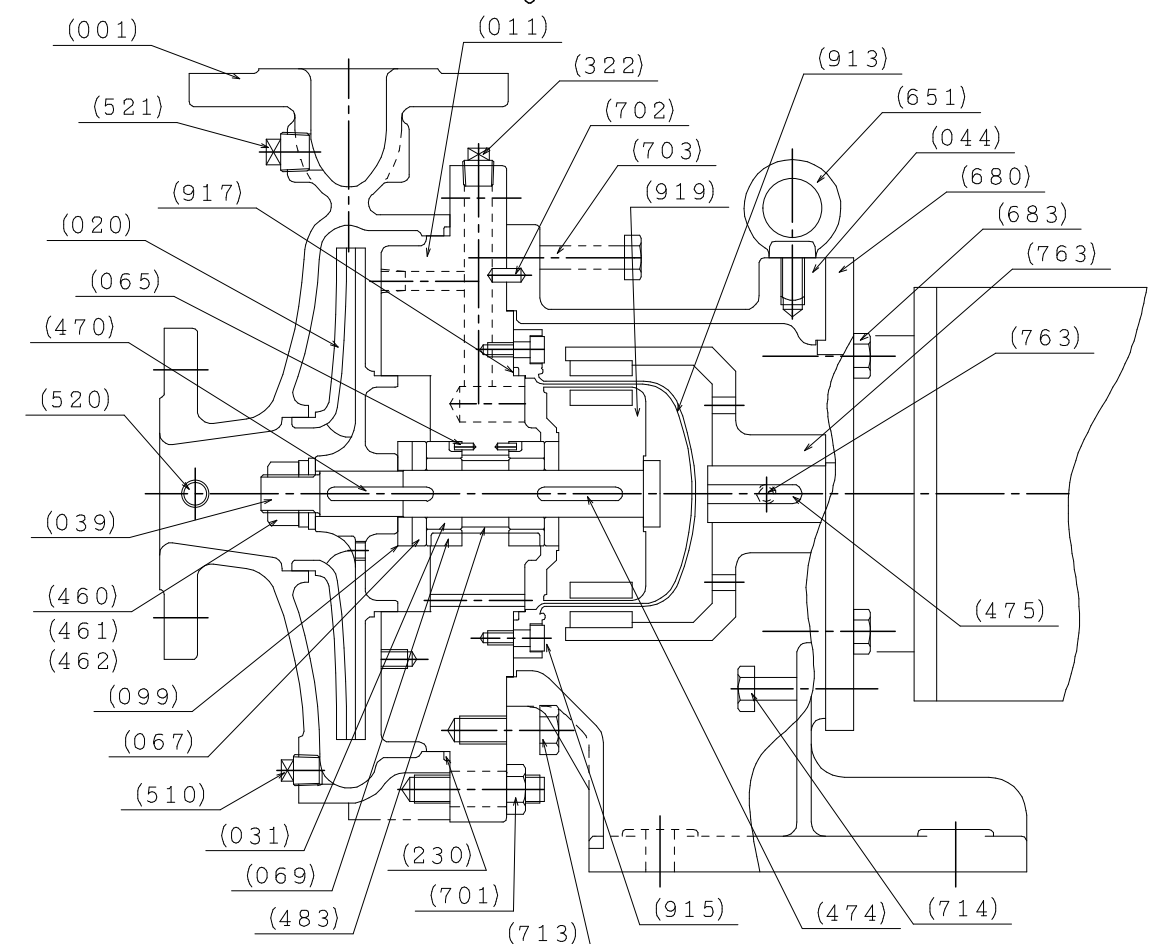
- 1 O. Unscrew the fully threaded pump set bolt (763) to remove the drive coupling (912) from the motor (680).
 [Place a flat-blade screwdriver between the drive coupling and the hub to remove the coupling.]



3) Assembly Procedure

1. Put the pump together in the reversed order of the disassembly procedure.
2. Be aware that the magnets are strong and handle them carefully.
3. Handle the metal parts with care.
4. Clean the parts before assembly, and confirm no magnetic materials or particles are attached to the magnetic parts. The procedures should be carried out in a dust free clean room.

(Reference Drawing) JM-43D/3.7kW



※This figure shows a representation. (Structure・material)

| No. | NAME OF PART | MATERIAL | No. | NAME OF PART | MATERIAL |
|-------|-----------------|----------|-------|---------------------|----------|
| (001) | Casing | SCS14 | (510) | Drain Plug | SUS316 |
| (011) | Casing Cover | SUS316 | (520) | Vacuum Gauge Plug | SUS316 |
| (020) | Impeller | SCS14 | (521) | Pressure Gauge Plug | SUS316 |
| (031) | Shaft Sleeve | SiC | (651) | Eye Bolt | S S |
| (039) | Bolow Shaft | SUS316 | (680) | Motor | — |
| (044) | Pedestal | FC200 | (683) | Motor Bolt | SUS304 |
| (065) | Set Pin | SUS316 | (701) | Bolt | SUS304 |
| (067) | Thrust Metal | SiC | (702) | Baffle | SUS304 |
| (069) | Metal | SiC | (703) | Bolt | SUS304 |
| (099) | Metal Cover | SUS316 | (713) | Bolt | SUS304 |
| (230) | Cover Packing | PTFE | (714) | Bolt | SUS304 |
| (322) | Plug | SUS316 | (763) | Pump Set Bolt | S S |
| (460) | Impeller Nut | SUS316 | (912) | Drivig Coupling | FC200 |
| (461) | Lock Washer | SUS316 | (913) | Seal Case | SUS316 |
| (462) | Washer | SUS316 | (915) | Seal Case Bolt | SUS304 |
| (470) | Impeller Key | SUS316 | (917) | Case Packing | PTFE |
| (474) | Inner Drive Key | SUS316 | (919) | Inner Drive | SUS316 |
| (475) | Drive Key | S45C | | | |
| (483) | Bearing Sleeve | SUS316 | | | |

✖ This figure shows a representation.

