ATS203CD-23 OPERATIONS AND MAINTENANCES MANUAL

PRECAUTIONS AND WARNINGS

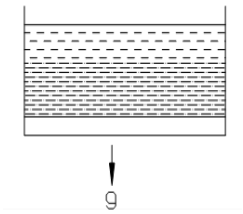
Separator is a kind of high-speed rotating machinery. When it's on, the drum generates a huge centrifugal force. In order to ensure the safety of operators and equipments, please strictly observe the following safe rules while using.

1. Don't start the separator, if the clamping ring is not clamped tightly, access devices and other fastening screws are not tightened.
2. If the drum does not stop completely, please don't loose any fastening parts of machine.
3. When any abnormal noise and vibration appear, Fill the liquid into the drum immediately, stop the machine and cut the power.
4. Not allowed to use flame heating or repair welding the main parts of drum, especially the drum bo dy, drum cover and clamping ring (If the drum need repair, please contact the manufacturer, and ask the specialist to repair, in order to avoid the accident)
5. Drum parts can not exchange with other machine's to use, the same type is also not allowed.
6. Lock tightly at the"0"label place, when the label crosses the 25℃ tag, stop use and contact the manufacturer. Please see the picture 5 .
7. Separator can not work over speed and overload.
8. Please use the spare parts, when drum parts need to be exchanged. And then do the balancing test again.

MANUAL CONTENTS:

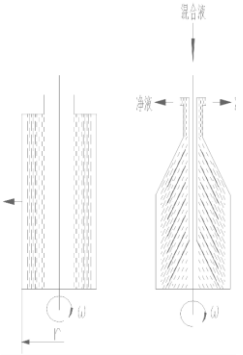
1. BASIC PRINCIPALS

Use the differences in density between the different substances, the centrifugal force separation and extraction of physical separation techniques. In the gravitational field, known as gravity separation, in centrifugal field called the centrifugal separation.



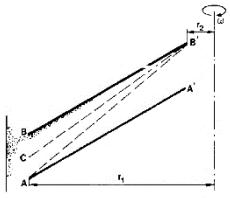
1.1 GRAVITY SEPARATION

Big density solid particles of the mixture slowly sinking under the gravitational attraction, the mixture become clear and the density small of liquid is up. Gravity separation takes a long time and occupies a lot of area. It's different to separate, especially when the density is close and viscosity.



1.2 CENTRIFUGAL SEPARATION

Mixture with different density become a circular ring under the force of centrifugal in a high-speeds rotating drum, the particle with max density move outward to the wall of the drum while the small density of liquid in the innermost layer. Centrifugal separation just takes only a short time that can get the effect of gravity separation because the centrifugal force formed by the high -speed rotation of drum is much bigger than gravity.



1.3 SEPARATION SPACES .

Improves the separating effects. There are a ground of discs within the drum of the disc separator which can divided the drum space into many thin-layer , it greatly shorten the settling distance and Movement route of the particles C in the separation space. If any particles between A and B can reach the internal surface of the disc can be separated.

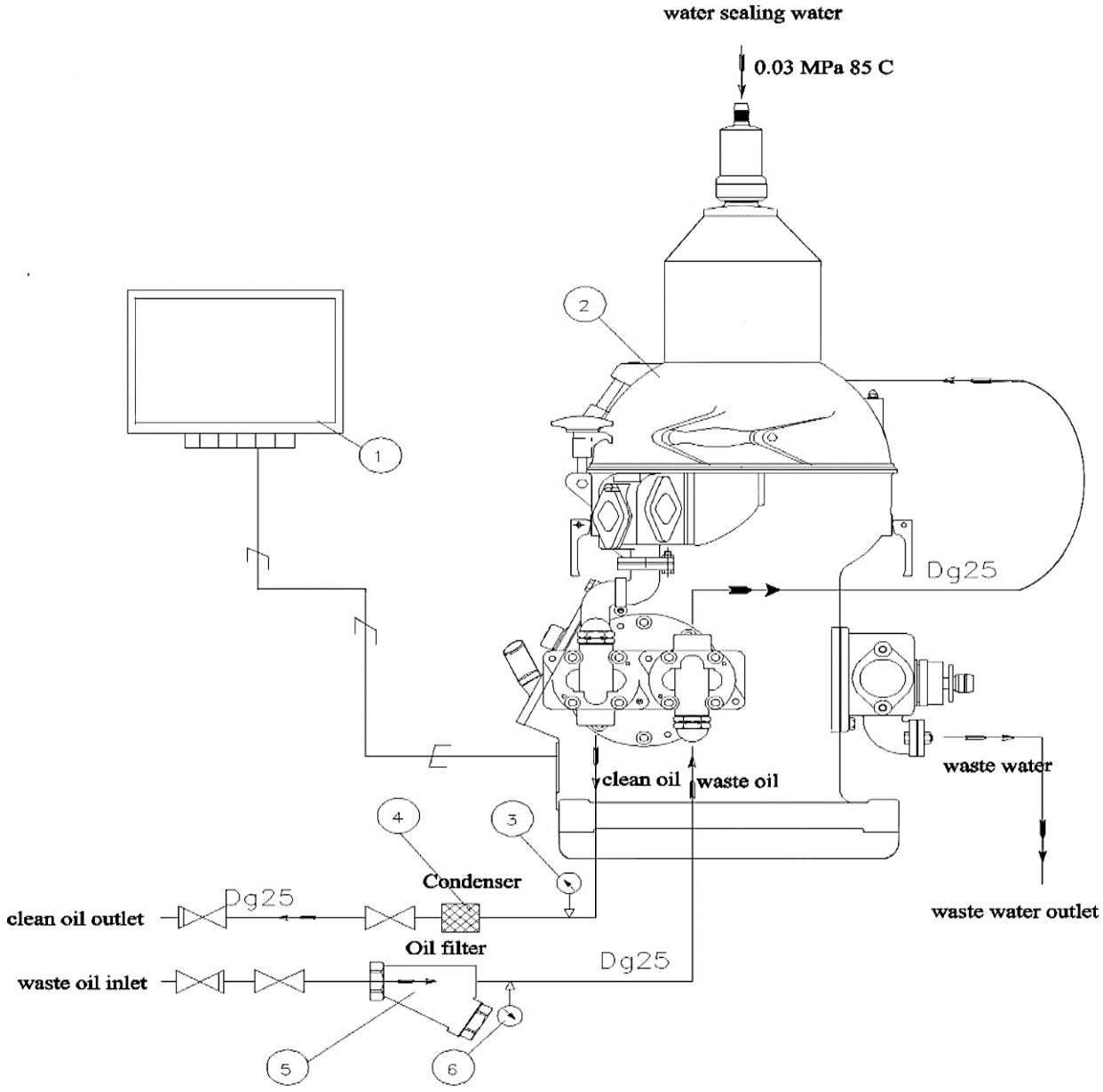
1.4 SEPARATIONS .

Usually, the separator is divided into two types. One is used for solids and two liquid phases from each other in one single continuous process, it is so called purifier. The other is used for solids and one liquid phase from each other, it is so called clarifier.

2. SYSTEM AND INSTALLATIONS

2.1. ATS203CD-23-SYSTEMS

The separator ATS203CD-23 is mainly used for fuel oil (light fuel) and lubricants clarification or purification treatment, suitable for the occasion of the ship and power plant and similar materials.



1. control box
2. oil separator
3. Pressure gauge
4. Flow control valve
5. condenser
6. vacuum meter

SYSTEM AND INSTALLATIONS CONT . . .

2.2. INSTALLATION-PROCESS

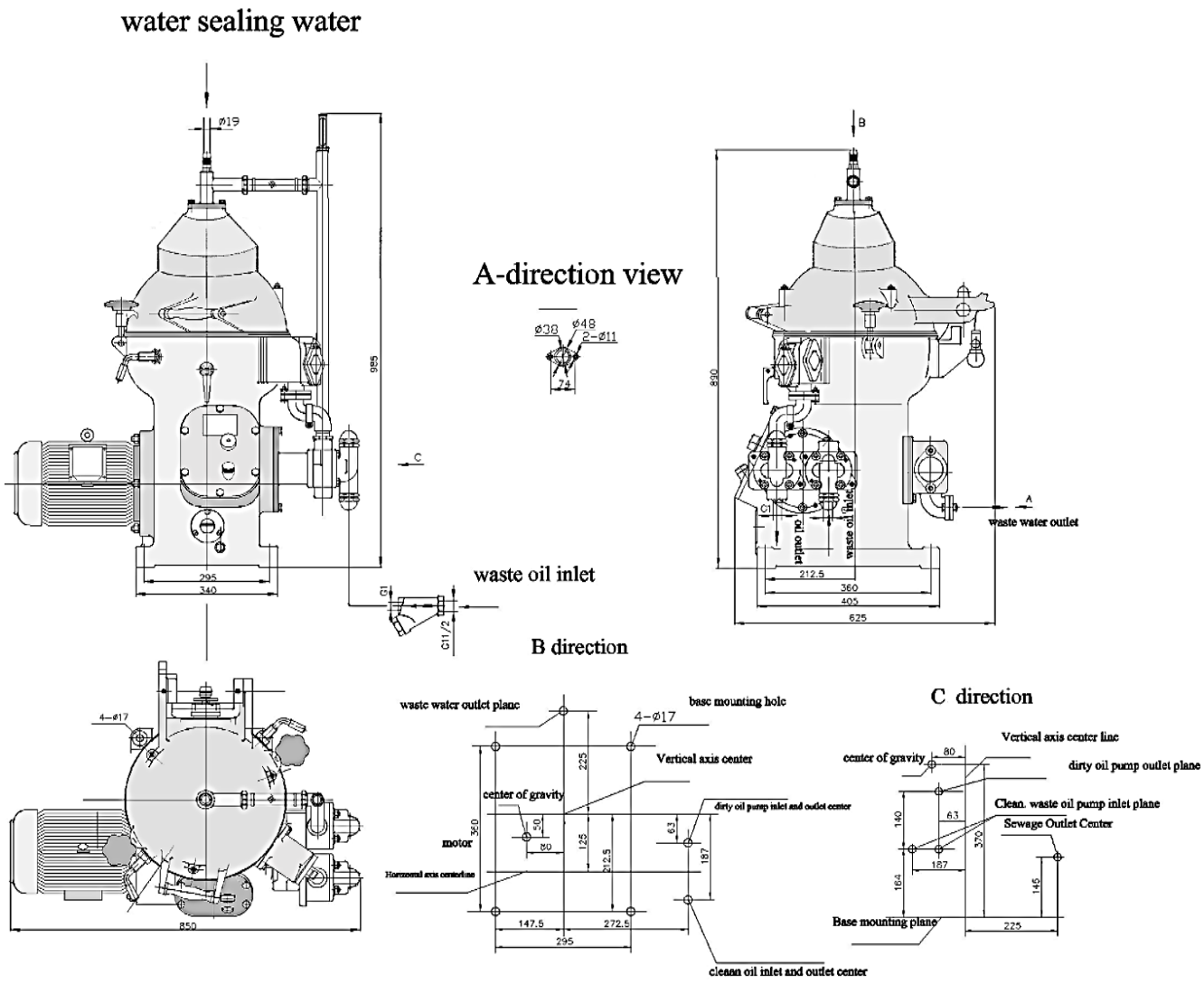
1. The heater can be electrical heating can also be steam heating. And the heater can be canceled when separate the light fuel oil or the oil does not require heating and the sump oil outlet can be connected into the feed-throat.
2. First, please check the appearance of the package before installation Second, open the package and check the complement of machine, spare parts and consumable parts according to contract list.

Offer area: one host, motor, a package of rotating drum (contain a separator rotating in it),1 group if special tools (see the user handbook, a group of wearing parts and spare parts (see the user handbook)

3. Hanging the separator first. When the base in position Installed balata damping pad on the each feet of the machine below, then tightening the screw. Piping connected with separator must be used hose.
4. The base of separator can be made of steel structure or pouring the concrete, both should be solid, strong and surface smoothness, and to minimize vibration and interference of the other machines.
5. To keep enough space for the maintenance when the machine is installed
6. To make the axis of the motor to be parallel to the longitudinal axis of the ship when the separator installed in the boat.
7. After the separator is already prepared, refer to chart 6, fix the drum.
8. The separator shape drawing is picture 2-2.

IMPORTANT: In order to lift the centrifuge during installation-processes kindly be reminded NOT to grab ONLY on the drum since doing so will severely-damage the centrifuge bearings and shafts also .

3. TECHNICAL-PARAMETERS .



Model	ATS203CD-23
Drum speed	6930 rpm
Counter speed	79-83rpm
Capacity(L/h)	1500L
Recommend capacity	refer to graph 3-1
Slagging type	Manual operation
Inter pressure fo the	≥0.04
Out pressure of clear oil gear pump	≥0.2
Motor	2,2kW 3P/380VAc/50Hz.
Weight	255kgs
Size (LxWxH)	1320mm x 1495mm x 1720mm.

TECHNICAL-PARAMETERS CONT . . .

<table>
<tr><td rowspan="2">Item</td><td colspan="5" rowspan="2">Heavy Fuel oil</td><td rowspan="2">Heavy Oil (Fuel Oil) .</td><td colspan="3">lubrication oil</td><td rowspan="2">Turbine Oil</td></tr>
<tr><td colspan="2">low-speed machine Branded oil</td><td>Medium speed machine self-cleaning oil</td></tr>
<tr><td rowspan="2">viscosity/(mm²/s)</td><td colspan="5">mm²/s (50℃)</td><td colspan="3">mm²/s (40℃)</td></tr>
<tr><td>13</td><td>20,5</td><td>36,2</td><td>80</td><td>180</td><td colspan="2">100 ~ 120</td><td>65</td></tr>
<tr><td rowspan="2">Density/(kg/mm3)</td><td colspan="8">Kg/m³ (20℃)</td></tr>
<tr><td colspan="2">≤900</td><td colspan="2">900 ~ 991</td><td colspan="2">880 ~ 900</td><td>900</td></tr>
<tr><td>separation temperature/℃</td><td>40</td><td>60</td><td>80</td><td colspan="2">98
(Not recommended)</td><td colspan="2">80</td><td>75</td></tr>
<tr><td>The ratio of actual productivity and rated capacity % .</td><td>110</td><td>100</td><td>60 ~ 65</td><td colspan="2">45 ~ 50</td><td>50 ~ 60</td><td>25 ~ 30</td><td>80 ~ 85</td></tr>
<tr><td colspan="9">Note:
1.The ratio of actual productivity and rated capacity is based as a percentage of rated processing of the 30th of GB445 heavy fuel oils .
2.The actual productivity of fuel oil is suitable to single-stage separation.
3.The actual productivity of lubricating oil is suitable to bypass continuous separation.</td></tr>
</table>

Separation conditions and actual productivity of mineral oil.

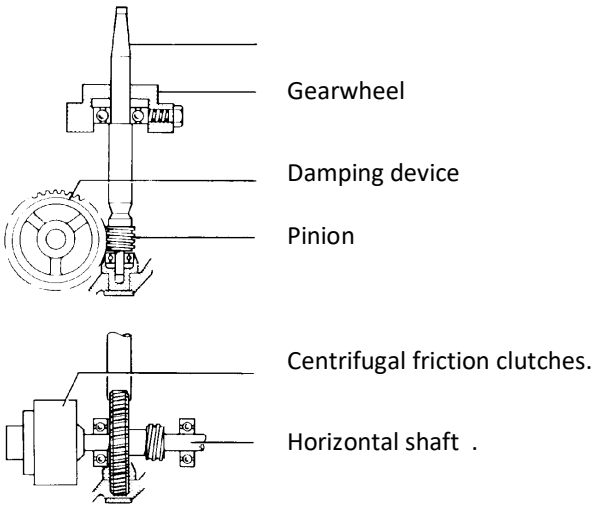
The product complies with the product standard GB/T 5745-2002. “Marine disc separator.” .

4. BODY-STRUCTURES .

Separator is mainly composed by the drive mechanism (horizontal shaft and vertical shaft), drum rack, speed measurement equipment, brakes, motor and etc.

4.1 DRIVES-MECHANISM

Through the friction clutch, the motor drives a gear pair on the axis, and then passed to a vertical shaft driven by the drum operation. Friction clutch can guarantee separator start, the process is relatively flat, accelerated and more uniform in order to prevent the motor and gear pairs overload. For reduce the buffers seat wear and reduce the impact of the rotating drum of machine vibration, so the buffer seat using elastic supporting structure, and absorb shock and vibration energy.(refer to picture 4-1)



4.2 SPEEDS-INDICATOR.

Check the separator is in the normal operation state, counter to the minute to show the separation of rotational speed. Normal operation, the counter speed shall comply with the limits prescribed in the Technical Specifications

4.3 BRAKES-EQUIPMENT.

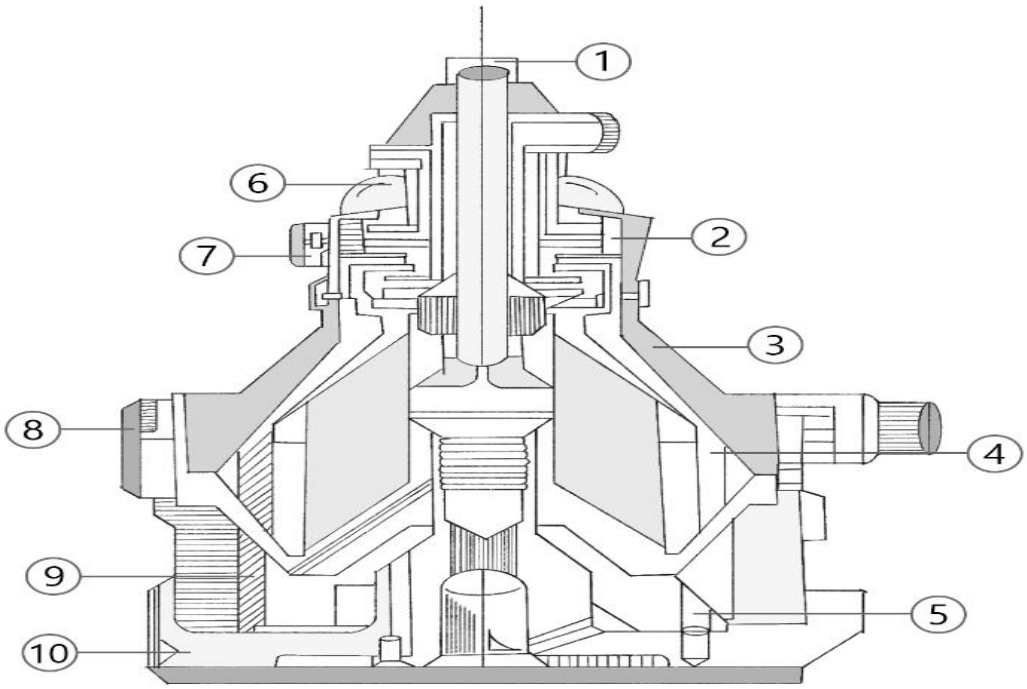
Separator drum rotation speed of the large amount of rotational inertia. Let it stop rotating separator parking, it would take a long time, the use of the brakes can reduce the stopping time, but also can rapidly through the critical speed of the vertical shaft. Encounter special exception, the brake is essentials.

BODY-STRUCTURES CONT . . .

4.4 DRUMS .

The drum is one of the most important parts of the separator, in Picture 4-2, the separation working is in the drum for the materials. Drum is composed of the rotor, drum cover, distributor, group of discs, disc top cover, the main lock ring, and etc.

The drum body and drum cover are locked together by the lock ring. with the drum inside the distributor and disc group. Disc group discs cover the neck, upper part equipped with a proportion of ring, tighten the lock ring using the gravity.



1. Waste oil .
2. Gravity discs .
3. Drum cover
4. The cover of neck.
5. Plate frame
6. Waste water
7. Small lock cap
8. Master lock rings
9. Disc sets .
10. The drum body .

Picture 4-2.

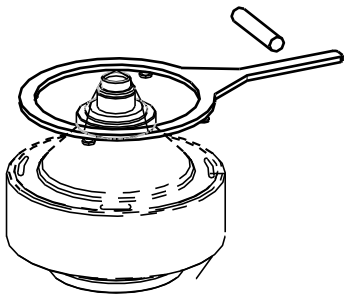
5. ASSEMBLY AND DECOMPOSITIONS .

Note: Don't disassemble the machine when the drum does not stop completely.

Discharge water seal, water pipe and oil inlet pipe, loose two clamping claw of the cover, lift the cover and lock, to prevent the cover fall accidently.

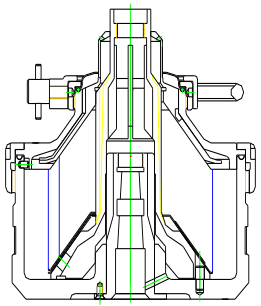
5.1 Drum installation and dismantling.

(1) Use the round copper bar to knock the main lock ring wrench (BMI-D2194000), dismantle the main lock ring (BMI-D2120006), Left tighten and Right loosen. (Picture 5-1) .



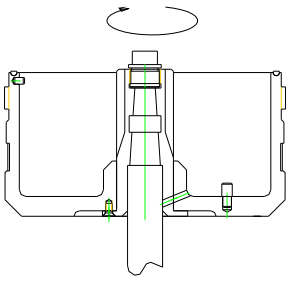
Picture 5-1

(2) Set the small lock ring wrench in the small lock ring (BMI-D2120003), dismantle the drum cover (BMI-D2120010) and small lock ring. (Picture 5-2).



Picture 5-2 .

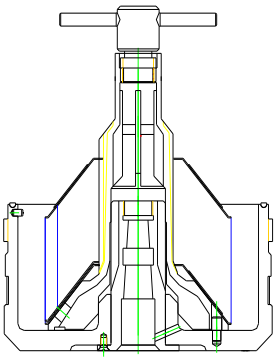
(3) Take down the disc top cover, use the fishing bolts (BMI-D2191000) lift out the distributor (BMI-D2120001) and disc group. (Picture 5-3) .



Picture 5-3 .

ASSEMBLY CONT . . .

(4) Dismantle the vertical shaft nut (BMI-D2140001) (Left-hand thread), then use split cylinder shaft flipping mother (BMI-D2190001) eject the drum body and dismantle it. (See the picture 5-4) .



Picture 5-4 .

5.2 Vertical shaft dismantling .

First dismantle speed detectors .

(1) Dismantle cover and seal ring

(2) Use the pressure cap wretch (BMI-D2192000) dismantle the pressure cap (Left-hand thread);

(3) Dismantle six screws of the pressure cap, and take off the pressure cap;

(4) Dismantle the taper pin of large helical gear, right poke the large helical gear

(5) Pull out the vertical shaft.

5.3 Horizontal shaft dismantling

First dismantle the motor, then dismantle oil pump.

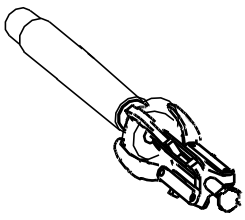
(1) Dismantle the tighten screw and gasket in the friction drum;

(2) Use three-jaw pull out the friction drum, see the picture 5-5;

(3) Dismantle the bearing cap of engine base.

(4) Dismantle the taper pin of transmission gear and transmission gear;

(5) Use the copper bar knock the horizontal shaft right end (oils pump), take out the bearing and large spiral gear.

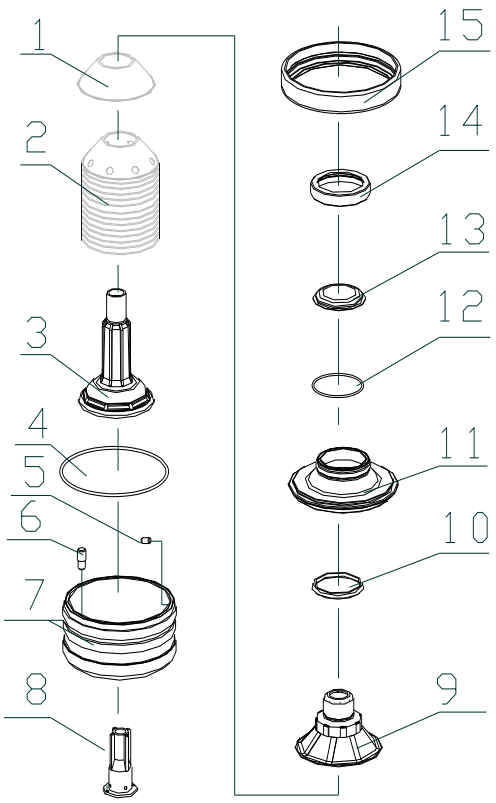


Picture 5-5 .

ASSEMBLY CONT . . .

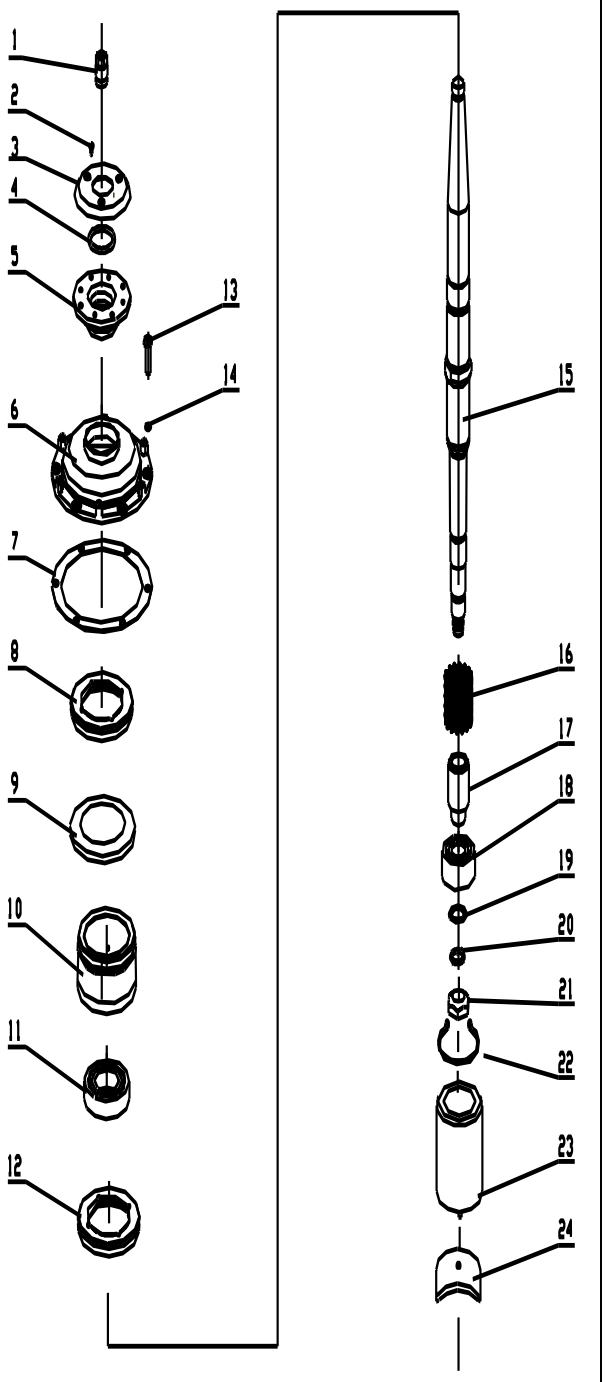
5.4 Dismantling and installation drawing

5.4.1 Drum

No.	Drawing No.	Description & specification	Qty.	Illustrations .
				
2	BMI-D2122000	Disc	66	
3	BMI-D2120001	Distributor	1	
4	BMI-D2120005	Large seal ring	1	
5		Pins GB/T119-1986 A6X10 .	1	
6	BMI-D2120008	Locating pin of plate rile	1	
7	BMI-D2120009	Drum body	1	
8	BMI-D2120007	Ontology collar	1	
9	BMI-D2120012	Disc top cover	1	
10	BMI-D2120004	Points hetero seal rings	1	
11	BMI-D2120011	Drum cover	1	
12	BMI-D2120002	Small seal ring	1	
13	BMI-D2120013	Gravity ring	1group	
14	BMI-D2120003	Gravity lock ring	1	
15	BMI-D2120006	Main lock ring	1	

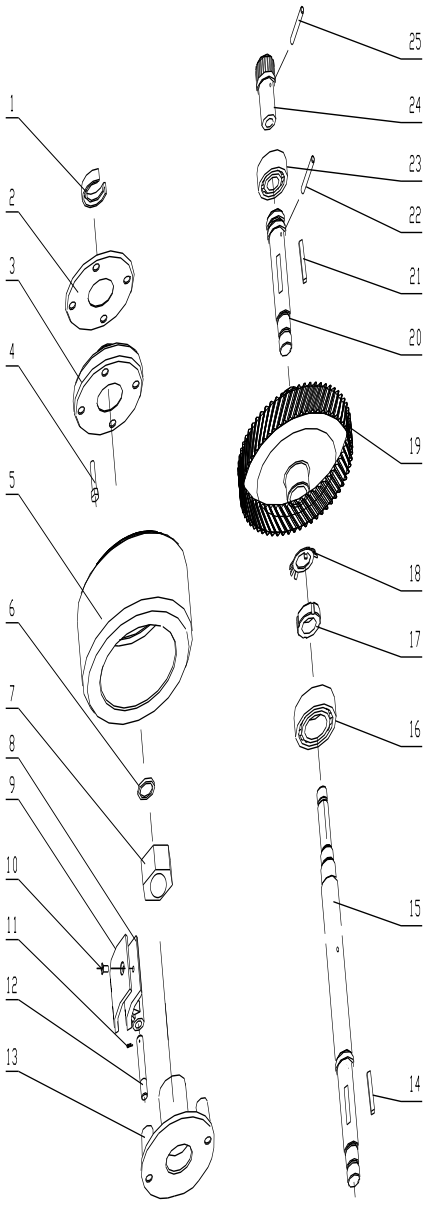
ASSEMBLY CONT . . .

5.4.2 Vertical shaft

No.	Drawing No.	Description and specification	Qty.	Illustrations .
1	BMI-D2140001	Vertical shaft nut	1	
2		Screw GB/T67-2000 M6X10	3	
3	BMI-D2140004	Cover cap	1	
4	BMI-D2140017	Seal ring	1	
5	BMI-D2140005	Pressure tighten cover	1	
6	BMI-D2140006	Pressure cover	1	
7	BMI-D2140016	Gasket	1	
8	BMI-D2140007	Bumper cover	1	
9	BMI-D2140009	Buffering ring	1	
10	BMI-D2140018	Bearing base	1	
11		Bearing GB/T276-1989 D207	1	
12	BMI-D2140008	Bumper base	1	
13		Bolt GB/T5783-1986 M10X25	6	
14		Gasket GB/T93-1987 10	6	
15	BMI-D2140003	Vertical shaft	1	
16	BMI-D2140010	Small spiral gear	1	
17	BMI-D2140011	Bearing bush	1	
18		Bearing GB/T292-1983 D36205	1	
19	BMI-D2140012	Gasket	1	
20		Gasket GB/T856-1988 18	1	
21	BMI-D2140013	Nut	1	
22		Defector ring GB/T893.1-1986 52	1	
23	BMI-D2140014	Bearing base	1	
24	BMI-D2140015	Spring	1	

ASSEMBLY CONT . . .

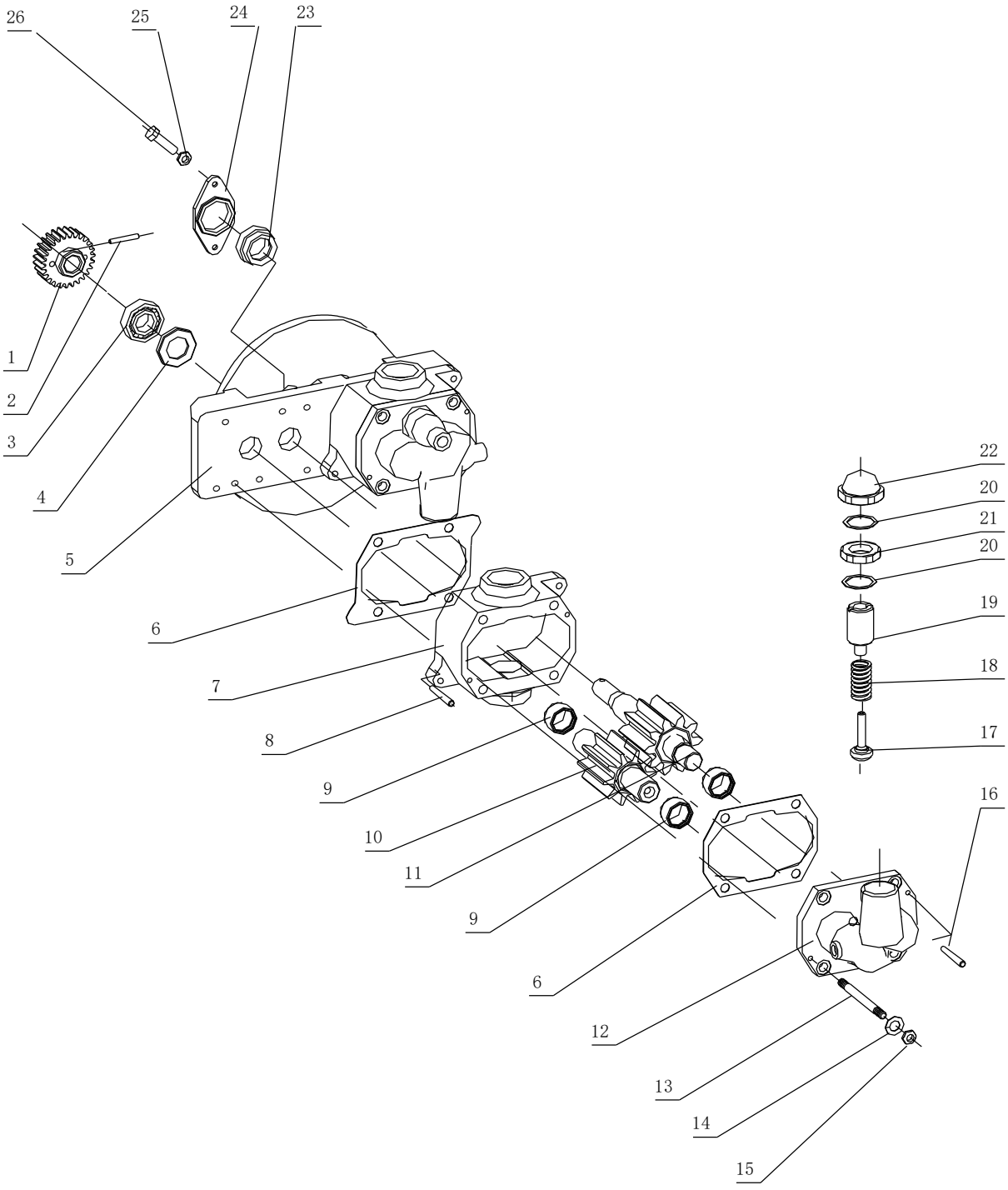
5.4.3 Horizontal shaft .

No.	Drawing No.	Description and specification	Qty.	Illustrations .
1		Oil seal HG4-692-67 PD45X75X12	1	
2	BMI-D2150007	Gasket	1	
3	BMI-D2150006	Bearing cover	1	
4		Bolt GB/T5783-2000 M8X20	4	
5	BMI-D2150001	Friction drum	1	
6		Gasket GB/T856-1988 20	1	
7		Nut GB/T6173-2000 M20X1.5	1	
8	BMI-D2150003	Cast piece	2	
9	BMI-D2150002	Friction plate	2	
10		Bolt GB/T68-2000 M6X16	4	
11		Melt GB/T91-2000 2X20	2	
12	BMI-D2150004	Cast piece pin axis	2	
13	BMI-D2150005	Cast piece base	1	
14		Key GB/T1096-1979 8X28	1	
15	BMI-D2150010	Horizontal shaft	1	
16		Bearing GB/T276-1989 406	1	
17		Nut GB/T812-1988 M42X1.5	1	
18		Gasket GB/T858-1988 42	1	
19	BMI-D2151000	Large helical gear	1	
20	BMI-D2150008	geared sleeve	1	
21		Key GB/T1096-1979 8X22	1	
22		Melt GB/T117-2000 A6X45	1	
23		Bearing GB/T276-1989 305	1	
24	BMI-D2150009	Transmission gear	1	
25		Melt GB/T117-2000 A5X40	1	

ASSEMBLY CONT . . .

5.4.4 Oil pump

In order to prevent large particles impurities into the oil pump and broken, this machine has the sump oil filter. When installing the machine, fit the oil filter on the sump oil inlet pipe.

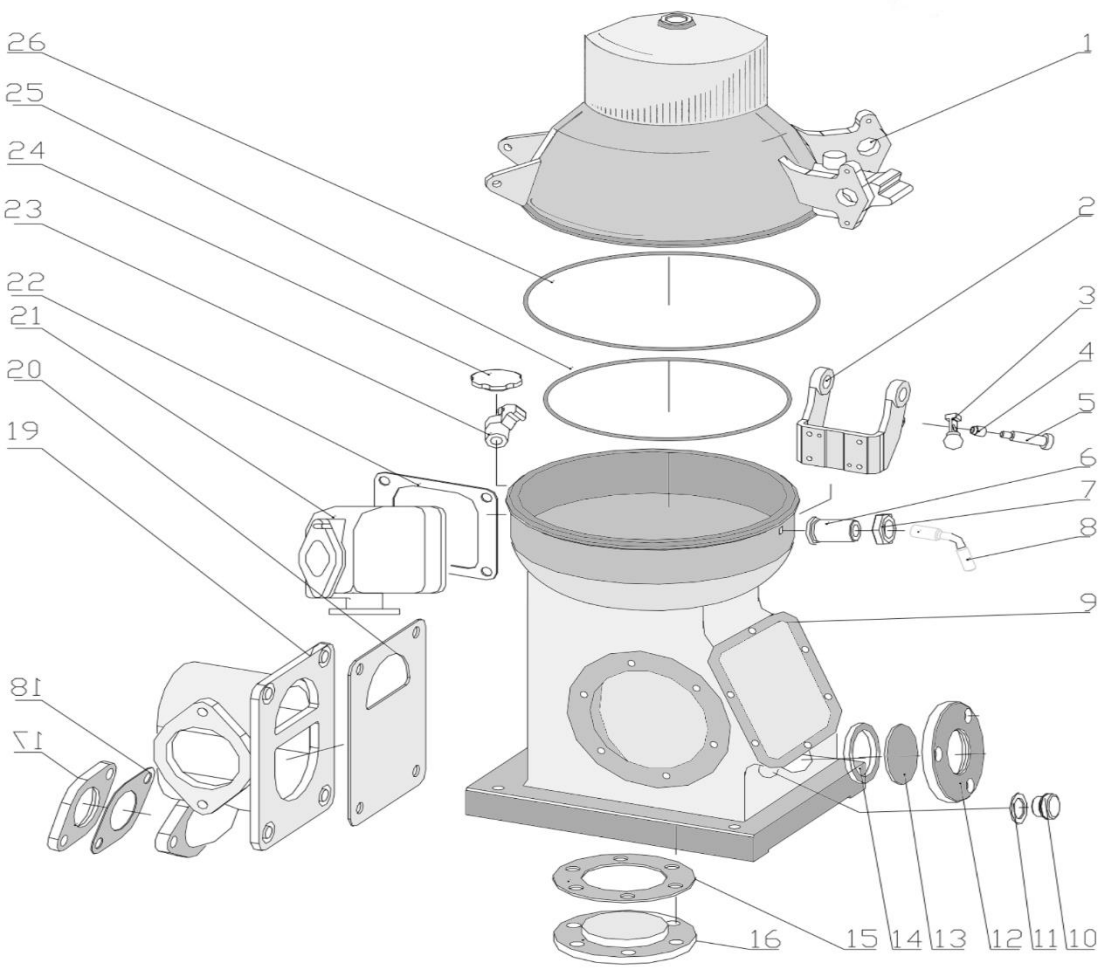


ASSEMBLY CONT . . .

No.	Drawing No.	Description and specification	Qty.
1	BMI-D2101010	Transmission gear	2
2		Melt GB/T117-2000 A3X26	2
3		Bearing GB/T276-1989 203	2
4	BMI-D2101009	Oil resisting cover	
5	BMI-D2101008	Oil pump base	2
6	BMI-D2101003	Gasket	4
7	BMI-D2101004	Oil pump shell	2
8		Melt GB/T118-2000 A8X40	4
9	BMI-D2101002	Bush	6
10	BMI-D2101005	Driven gear	2
11	BMI-D2101006	Driving gear	2
12	BMI-D2101001	Oil pump cover	2
13		Bolt pillar GB/T898-1988 AM10X80	8
14		Gasket GB/T848-1985 10	8
15		Nut GB/T6170-2000 M10	8
16		Melt GB/T881-2000 5X40	4
17	BMI-D2101016	Safe valve	2
18	BMI-D2101015	Spring	2
19	BMI-D2101013	Spring base	2
20	BMI-D2101012	Gasket	2
21	BMI-D2101014	Hexagon flat nut	2
22	BMI-D2101011	Acorn nut	2
23		Feeder 3/16" L=185	2
24	BMI-D2101007	Flange	2
25		Nut GB/T6170-2000 M8	4
26		Bolt GB/T5783-2000 M8X30	4

ASSEMBLY CONT . . .

5.4.5 Frame

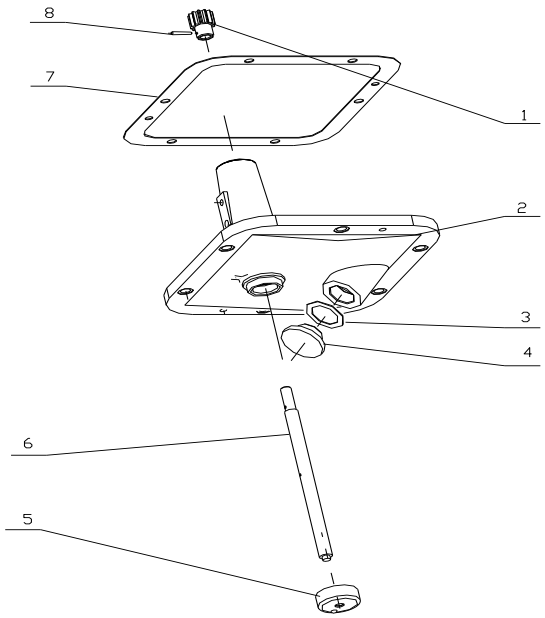


ASSEMBLY CONT . . .

No.	Drawing No.	Description and specification	Qty.
1	BMI-D2161000	Oil collector	1
2	BMI-D2160002	Holder	1
3	BMI-D2160003	Strut	1
4		Nut GB/T6170-2000 M8	1
5	BMI-D2160005	Strut screw	1
6	BMI-D2160031	Sleeve	2
7	BMI-D2160022	Nut	2
8	BMI-D2160025	Fixed link	2
9	BMI-D2160001	Base	1
10		Drain plug GB/T2028-1980 M16X1.5	1
11	BMI-D2160015	Gasket	1
12	BMI-D2160012	Oil level gauge ring	1
13	BMI-D2160013	Perspective plate	1
14	BMI-D2160016	Gasket	1
15	BMI-D2160010	Bottom cap	1
16	BMI-D2160014	Gasket	1
17	BMI-D2160009	Gasket	1
18	BMI-D2160006	Sewage observation box	1
19	BMI-D2160016	Gasket	1
20	BMI-D2160017	Flange	1
21	BMI-D2160008	Net oil watch box	1
22	BMI-D2160030	Gasket	1
23	BMI-D2160018	Press block	2
24	BMI-D2162000	Hand wheel	2
25	BMI-D2160033	Seal ring	1
26	BMI-D2160032	Seal ring	1

ASSEMBLY CONT . . .

5.4.6 Speed-detectors.

No.	Drawing No.	Description and specification	Qty.	Illustrations .
1	BMI-D2170007	Counter gear	1	
2	BMI-D2170004	Speed detector cover	1	
3	BMI-D2170003	Gasket	1	
4	BMI-D2170001	Plug screw	1	
5	BMI-D2170002	Counter cover	1	
6	BMI-D2170006	Counter spindle	1	
7	BMI-D2170005	Gasket	1	
8		Melt GB/T117-2000 A3 x 30	1	

6. CONTROL AND OPERATIONS .

6.1. PREPARE FOR USE.

- According to the Oil density, choose the appropriate diameter ring, reference 6.4
- Check the brakes whether loose or not while the brake lever should be vertical down., ,
- Open the cover, turn the drum to be flexible, no stuck phenomenon
- Check the oil level of gearbox should be located in the scale line of endoscopy.
- Check the motor rotation (the right direction should consistent to the turning mark of the motor), especially after the first start or motor equipment maintenance.
- Check the separator system piping.

6.2. START

- Start the separator, Please stop the machine if it abnormal vibration,and check the drum assembly situations.
- Restart the machine after parts to normal. The moment when the motor starts load will exceeds the rated value due to the inertia of the drum and increases rapidly, exceeding the rated current. When the separator reaches the rated speed, the current is immediately stable and lower than the motor rating. The whole starting procedure takes about two minutes. Of course, it can also test the speed of the measuring device it seems that the separator has reached full speed when the speed of in line with the main technical parameters.

6.3. SEPARATION

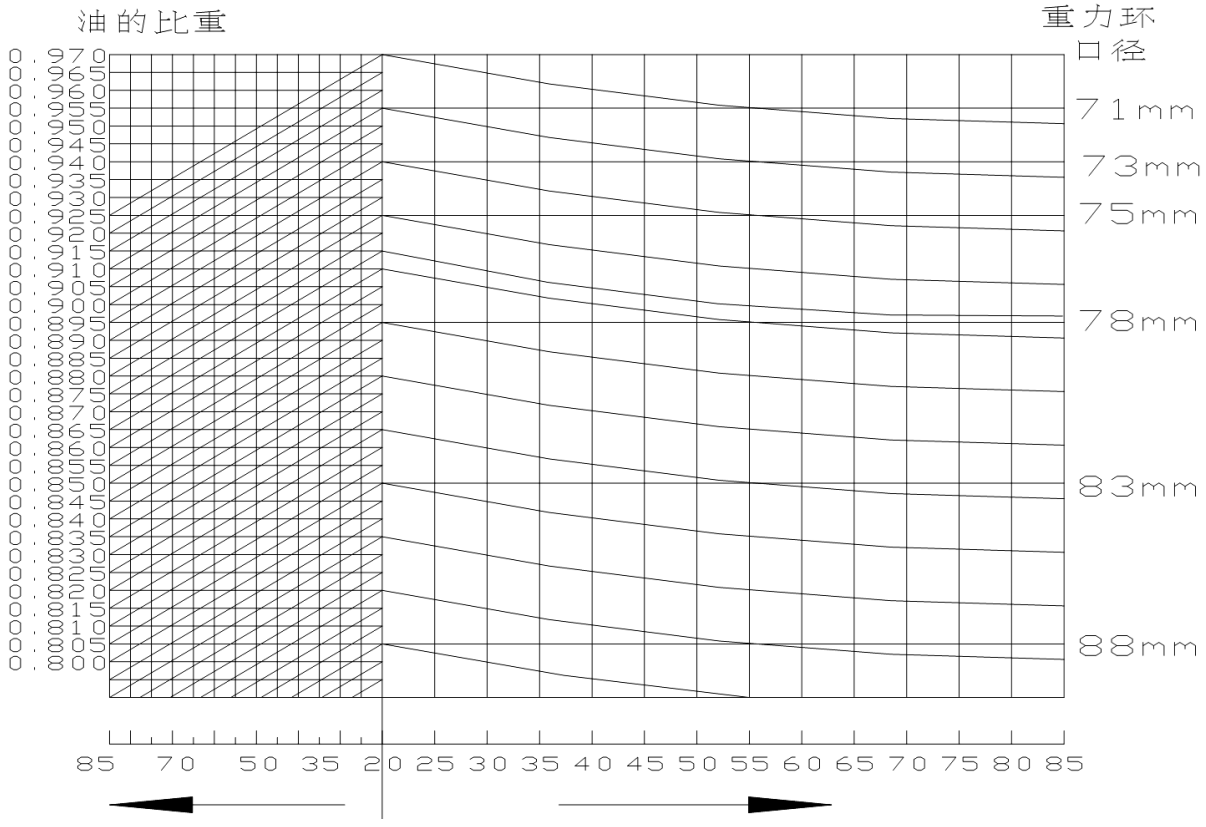
- Separator to reach full speed after purification separator (liquid - liquid - solid), the first should be added to the water seal, the pressure of water seal should be less than 0.1MPa, to reduce the flow when pressure great. Please stop adding water seal water when the water out from sewage mouth. The water seal can not be added to the clarify separation (liquid - solid), and into the next step operation directly.
- Slowly open the valve of the waste oil, adjust the flow to reach the recommended capacity
- Check the separation temperature whether to meet the requirements, if not a three-way valve should open to allows oil to return to the waste oil cabinet and cycle heating oil by heater up to meet the requirements
- After the separating temperature to normal, put the material into the separator and close the small purifier oil outlet valve, and set the back pressure to 0.2MPa
- After normal separating , net oil and sewage outflow from the machine through different channel, impurities remain in the drum wall and should shut down to clean up periodically. The clean-up interval time should be considered on the fuel characteristics and conditions.

CONTROL AND OPERATIONS CONT . . .

6.4. CHOICE OF GRAVITY DISC.

Each separator equipped with a set of different diameter of gravity disc for purification (liquid - liquid - solid) devices, its diameter for 71, 73, 75, 78, 83, 88 mm. The different proportion of oil-water mixtures can be separated by changing the diameter of gravity disc.

In general, try to use the large diameter of gravity disc get the best separation at the condition of not destroy the water seal layer of in the drum .But can not be use the gravity disc with too large diameter ring, otherwise the water seal layer will be destroyed and oil and water will outflow from outer edge of the disc top cover to cause the massive oil spill from sewage mouth. Example: The specific gravity of separation oil is 0.88g/mm3 at 50 ℃ ,and the oil temperature is 80 °C, To choose the right diameters of the gravity disc, first reference Picture 7-1, found the straight line in line up to 50 ℃ in the left side of the oil temperature, intersecting with 0.880.88g/mm3 horizontal, cited by the intersection of diagonal parallel lines and sub-line intersection, and then from the intersection of the right vertical line intersects the curve of the parallel lines and the separation temperature of 80 ℃, by the intersection of the right horizontal line and the proportion of diameter reading line intersect, the intersection at 78 83 between, close to the 78mm, so choose the proportion of gravity disc 78mm. The test can be used from small to large when can not measure the proportion of oil. Trials and errors to a level diameter, until the mouth of the sewage outflow of oil, then narrow a level of the gravity disc.



Picture 7-1 .

CONTROL AND OPERATIONS CONT . . .

6.5. CHECKS-ITEM .

Check whether working normal for separator , you should regularly inspect the items of the following table .

Check Item	Interval between inspections	Standard values .	Measured values .
Vibrate (mm/s)	1 Hour	≤7.1	
Separations temperature (℃).	1 Hour	Recommendation ±2.	
Current (A)	1 Hour	±1	
Flow rate（L/h）	1 Hour	Recommendation .	
Outlet pressure of net oil gear pump (MPa)	1 Hour	0.2±0.1	
leakage	1 Hour	no	
rotate speed of counter (r/min)	4 Hours	79～83	
oil level in gearbox	4 Hours	between the two scale line	
oil level in gearbox	8 Hours	no impurities and emulsify.	

6.6. SHUT DOWN.

- Cut off the heater circuits or steam pipes.
- Cut off the oil-taking , the way of light oil flushing or emptying should be used to prevent pipe blockage when it is a heavy fuel oil with high condensation pour point .
- Adding a small amount of hot water to the drum by the water seal road to get rid of leftover oil
- Cut off the power supply, make the machine stop by itself or use the brake to reduce the drum speed

6.7. EMERGENCY STOP.

When machine fail required emergency shutdown, turn the power off first, do not stop feeding and release the two brakes. Then the machine will stop turning soon.

7. MAINTENANCES.

7.1. LUBRICATIONS .

Lubrication is very important to ensure machine working normally .Lubricant oil insufficient, change or grades are inappropriate will cause the bad lubrication conditions and resulting in serious effective consequences. So users should pay particular attention about it. When the separator working normally, the helical gear rotation splashing out of the lubricating oil not only lubricates the bearings on the horizontal shaft, vertical shaft, and also lubricate transmission gears.

We recommended HH-20 Aviation Lubricants or SAE30, SAE40 lubricants. The first oil begins to change at the 250 hours after the separator first operation, after depending on the quality of lubricating oil. Clean up the wall and bottom of the gearbox carefully when changing oil. Ensure the lubricant at the scale level of observation cover of gearbox, the quantity of lubricating oil is about 10 liters. The thread of the main lock ring and the drum body coated with molybdenum disulfide grease when the drum re-install after dismantled.

7.2. CRITICAL-COMPONENT .

According to the requirements, regularly check and maintenance to centrifuge during it is using. This is to reduce the separator's failure, to keep it is always in the normal state.

7.2.1. DISCS-GROUP.

To keep the disc group fully pressed, otherwise it will destroy the dynamic balance of the drum. Cause the machine abnormal vibration. It seems that there are not enough pressure on the disc group and should increase discs when the main ring compress tightly to the drum cove easily and make marking aligning,

7.2.2. LOCK-RING AND DRUM-THREADS .

Keeping checking frequently about it , because main lock ring and drum body thread will be damaged balance after long-term use , such as excessive wear and effect the safe operation. For a new drum, the drum body should scale to align with the "0" on the lock ring ..It will be staggered due to wear after a long time use. Check the stagger angle, take out the O-ring between the end of the drum cover and disc group, and then lock the locking ring, and check the staggered angle of mark "0".Please stop using the drum when the stagger angle ≥ 25 °. Check the thread before assembly, Usually use in the process, prior to each assembly should check the thread. Carefully trim with a finishing file and whetstone if damaged, and covered with grease to the thread parts to prevent wear and bite and can't remove the drum.

7.2.3. VERTICAL-SHAFT CONE WITH DRUM-BODY .

Does not allow any defects to the drum body with the vertical shaft cone, each disassembly should be protected, the surface can not be injured. Damage defects, Use scraper, Whetstone and sandpaper to smooth if damaged .No allow machine processing method or sandpaper a wide range repairing with sandpaper, otherwise it will affect or damage it joint rate and cause the machine abnormal vibration. Otherwise, regular inspection the run-out accuracy of vertical shaft cone. Contactwith a dial indicator fixed in the body, the measuring point contact with the cone, its maximum valueof run-out accuracy must no larger than 0.03 mm. Reassembled the vertical shaft is bigger than0.03mm, and carefully check the bearings and buffer device. If still bigger that you need, replace thevertical shaft and other parts or contact with the manufacturer.

MAINTENANCES CONT . . .

7.2.4. FRICTION-PLATE.

Shall not be stained with oil or something can make it lobbing when replace the friction films.

7.2.5. SCREWS-GEAR.

- The reasons that affect the life of the helical gear is complex. The thickness of fixed chordal in the 2/3 of the original size can still be used in the normal wear conditions.
- The high wear Is a normal phenomenon in initial operation or just replace the spare parts. By the running time (about 250 hours), you should check the reason and solve it when the wear and tear is still high.

7.2.6. PERIODIC-CLEANING .

The slag gathers in the drum after long time using and effect separating and cause the vibration of the separator. So the drum needs periodic cleaning. Disc group also require regular cleaning, regular cleaning the disc according to the cleanliness and handing materials.

7.2.7. OIL-SEAL .

Validity of the oil seal is one year after leaving the factory. Please re-oil seal when more than one year or long-term parking.

7.4. MAINTENANCES CYCLES FOR SEPARATION.

MAINTENANCE-ITEM .	250 HOURS.	1000 HOURS .	4000 HOURS.	8000 HOURS .
If lubricant for gearbox need replace	√	√	√	√
Wear to the friction plant		√	√	√
Wear to the brake pad	√	√	√	√
Wear to the big screw gear			√	√
rubber seal	√	√	√	√
Cone between the vertical shaft and drum	√	√	√	√
wear to vertical shaft series of bearings			√	√
wear to horizontal shaft Series of bearings				√
Corrosion		√	√	√

7.5. TIME-BASED MAINTENANCES .

The overhaul requirement of separator is 2years.

7.6. STORAGE AND TRANSPORTATIONS .

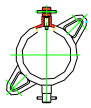
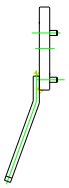
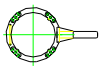
Don't allow inversion when the separators in the shipping. Don't allow the water enter into the case. Don't allow a drum machine in transportation Not allowed to drum into the machine to transport. Separations should be stored in coved place with humidity less than 70%, the temperature is below 40 °C and no corrosive material .

8. MALFUNCTIONS .

Please read the following chapter carefully when the separator in the trouble or damaged

PROBLEMS .	POSSIBILE-CAUSES.	TROUBLESHOOTS .
Abnormal vibration when machine operation not normal	- Separations tube assembly is incorrect - Wears or Damages on the rubber buffer-rings. - Excessive wear or damage to helical gear - Damage to the upper of vertical shaft and bottom of the bearing.	- Open a drum, and reassembled - change it - replace the gear - replace
Large oil leakage from outlet pipe	- The water sealing in the drum is broken . - The sealing between the drum body and drum cover is bad	- Stop oiling and add the water seal agains . - Reassemble the or replace seal
Absolutes oil contained too much water after separating from purification (separate water) devices	The diameter of gravity disc is too small	Select a bigger gravity disc according to the Fig.6-1 (Gravity disc choosing figure)
The water contained too much oil after separating from purification (separate water) devices.	- Not-enough water sealing in the drums. - The diameter of gravity is too large.	- Increase the water seal water . - Replace the small diameter gravity discs .
Oil leakage from water tube when clarify (Separate impurity) devices working.	Sealing ring of the separate impurity device is not pressures or damages.	Increase the disc increase compaction force or replace sealing rings .
Pump can't suction oil or there are not enough oil.	- Suction line leaks. - Filter is blocked . - Oil pump relief valve leakage - Oil viscosity is too large .	- Clear the air leakage - Clean the filter - Tighten or check the seal band - Improve oil temperature and lower viscosity .

9. SPECIAL-TOOLS AND ACCESORIES .

NO.	ILLUSTRATIONS .	DESCRIPTIONS .	PARTS NO. .	NOTES .
1.		Wrench for gravity lock rings .	BMI-D2195000	Used to disassembly and assembly the gravity lock ring (left-hand thread）
2.		Drop bolts .	BMI-D2191000	Used for lifting distributor and disc groups .
3.		Wrench for pressure covers .	BMI-D2192000	Disassembly and assembly of the compression cover of the vertical shaft (left hand threads) .
4.		Wrench for main lock rings.	BMI-D2194000	Disassembly and assembly the main lock ring(left hand thread) .
5.		Down tube shaft nuts .	BMI-D2190001	Used to remove the drum body .

SPECIAL-TOOLS AND ACCESORIES CONT . . .

NO.	PARTS NO. .	DESCRIPTIONS .	QTY.	NOTES .
1.	BMI-D2120002	Small sealing ring	2	In the spare parts
2.	BMI-D2120005	Big sealing ring	2	In the spare parts
3.	BMI-D2140009	Buffer ring	2	In the spare parts
4.	BMI-D2180003	Brake pad	4	In the spare parts
5.	BMI-GB/T869-1986 4X10	Rivets bed	8	In the spare parts
6.	BMI-D2150002	Friction plate	4	In the spare parts
7.	BMI-GB68-85 M6×16	Screw	4	In the spare parts
8.	BMI-HG4-692-67 BMI-PD45×75×12 .	Oil seal	2	In the spare parts
9.	BMI-D2122000	Disc	3	In the spare parts
10.	BMI-D2140015	Plate spring	2	In the spare parts
11.	BMI-D2180003	Spring	2	In the spare parts
12.	BMI-D2120004	Seal ring for Separate impurity .	2	In the spare parts
13.	BMI-D2160032	Seal ring	2	In the spare parts
14.	BMI-D2160033	Seal ring	2	In the spare parts
15.	BMI-D2140017	Seal	2	In the spare parts
16.	BMI-207 GB/T276-89 .	Bearing	1	In the spare parts
17.	BMI-D2120013	Gravity disc	1pairs.	In the spare parts

10. SPARES-PART.

NO.	PARTS NO. .	DESCRIPTIONS .	QTY.	NOTES .
1.	BMI-D2120013	Gravity discs .	1 Group.	In the spare parts.