SZLH508 PELLET MILL

OPERATION MANUAL

ZTMT
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Important instruction:

1 This manual detailedly describes SZLH508 series pellet mill, of each system structure, function and use and maintenance method. Before installation and use of the machine , customer should read the manual,and have a full understanding of the ministries and its structure and function ,then have operation and maintenance of the machine. Due to the continuous improvement of product structure, after a certain time period, the manual of narrative content and the actual situation of the products will have small changes.Users should pay attention to it.

2 Please propose your advice to us for melioration when finding quality problem or others.Thanks !

1.APPLICABLE SCOPE AND FEATURES

SZLH508 pellet mill is a machine which is used to produce hard pellets and is applicable to large and medium-sized feed mill with a capacity of more than 40,000 TPY per shift for producing high quality pellet feed.

1.2 This machine owns features of compact structure, fine appearance, convenient installation, operation and maintenance, and reliable performance.

1.3 Dies of various hole diameter such as Φ2, Φ3, Φ4.5, Φ5, Φ6, Φ8, Φ10 are available for this machine. Dies of different hole diameter can be made for users and users can choose freely according to different requirements.

1.4 This machine adopts a system of conversion speed-adjustable feeding and axial steam spraying, and a cleaning method of “LL” conditioner big opening, and also systems of external discharging, strong magnetic safety and overload protection, additionally, clamp type die, fully imported bearings in gearbox and power transmission through S-shaped spring coupling.

2.Model implication and Technical Specification

2.1 Model implication

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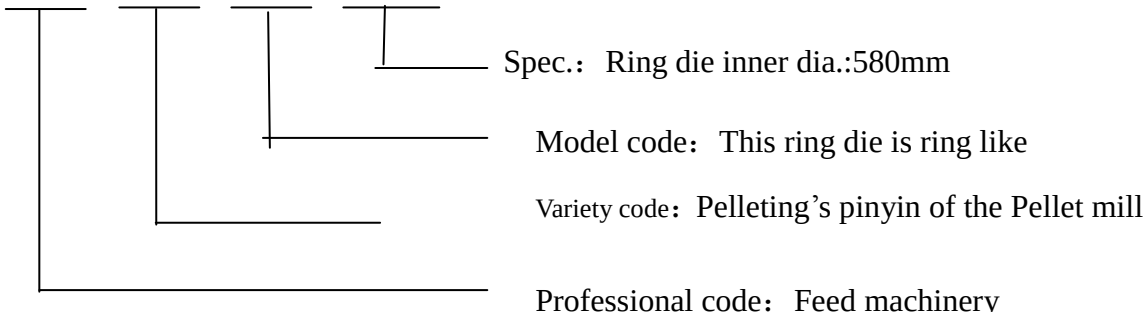
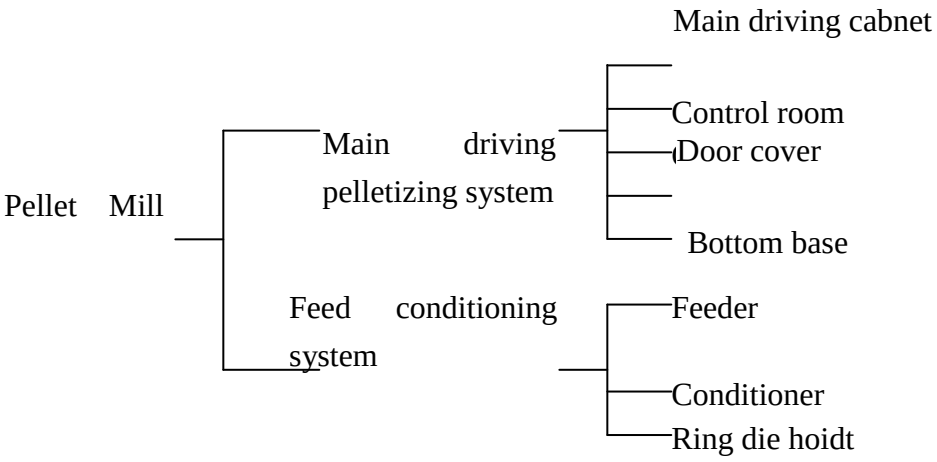


1. TECHNICAL SPECIFICATION AND PERFORMANCE INDEXES

No.	Description	Performance Indexes & Technical Parameters
1	Capacity	3-22t/h
2	Main Motor Power	110/132/160KW

3	Feeder Motor Power	1.5KW
4	Conditioner Motor Power	7.5KW
5	Pellet Forming Rate	≥95%
6	Pellet Powdering Rate	≤10%
7	Noise	≤85dB(A)
8	Steam Usage	≥1.5t/h
9	Overall Dimension (LxWxH)	3500x1470x2674mm
10	Weight	About 3.5t

3. MAIN STRUCTURE AND WORKING PRINCIPLE



3.1 Main Structure

This machine mainly consists of two parts, feeding and conditioning system and main driving and pelleting system. Read the system resolution chart and Figure 1 for the specific structure:

3.2 Working Principle

The powder compound feed in bin enters the conditioner from the feeder

through a magnetic separating device. With steam piped into conditioner, the feed is conditioned and mixed with steam and enters the pellet chamber through the feed chute, and is fed to two pelleting sections inside the die by a deflector. Because of high speed rotation of die, the feed is driven to between die and roller. Under the forceful extrusion, the feed is extruded solid and takes shape in the die hole. Since the extrusion of feed between die and roller is continuous, the shaped feed extrudes constantly from the die hole in shape of column, then is cut to pellets of required proper length to go the next process.

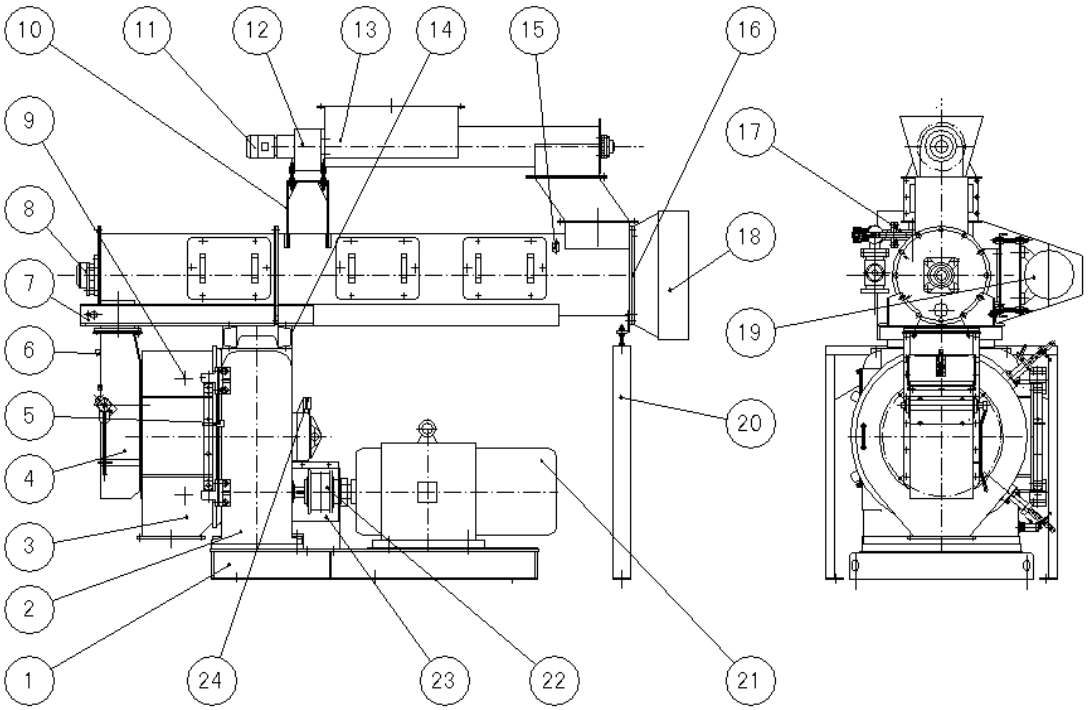


Figure 1 SZLH508 PELLET MILL STRUCTURE

1. Base 2. Gearbox 3. Pellet Chamber Door 4. Feed Chute 5. Limit Switch 6. Sight Glass 7. Hoist Guide 8. Bearing with Housing 9. Knife Assembly 10. Support 11. Speed-adjusting Motor 12. Reducer 13. Feeder Screw 14. Support 15. Molasses Inlet 16. Bearing 17. Steam Inlet 18. Guard 19. Motor 20. Support 21.Motor 22. Coupling 23. Guard 24. Limit Switch

3.3 Main Structure Of All Parts

3.3.1 Feeder

Feeder consists of screw shaft, shell, cycloidal pin gear reducer, conversion speed-adjustable motor, bearing with housing, etc. The pick of screw is of full face, the pitch is variable. The screw shaft is driven to rotate by cycloidal pin gear reducer, conversion speed-adjustable motor and chain drive to achieve the function of conveying feed.

3.3.2 Conditioner

Conditioner is sometimes called mixer. It consists of mixer shaft, picks, shell, axial sleeve collective pipe, steam system, bearing with housing, pulley, reducing motor, temperature controller, etc. Conditioner shell is pieced together with two sections whose length can be added properly according to the requirements of user. There is a sight and cleaning door for the convenience of maintenance and cleaning. When conditioning steam passes through the sleeve steam collective pipe and inlet is changed from radial to axial to make steam and feed fully contact and improve the conditioning effects.

3.3.3 Die Hoist (Option)

This device is used for user’s convenience of disassembling and assembling die and roller. Worm gear and worm are used for driving. When in use, pull out the guide, connect the hole of hoist and the screw hole on die with bolt for hoisting.

3.3.4 Feed Chute

Feed chute consists of chute, lever arm, inspection door, shell, etc. It adopts full stainless steel. You can inspect the conditioning quality of feed at every time by opening the inspection door. The inspection door can be used as a manual feeding port for abrading the die and feeding the greasy materials. External discharging lever arm of feed chute can prevent feed from entering the pelleting chamber for the convenience of trial run and breakdown removal.

3.3.6 Gearbox

See Figure 2 for the structure of gearbox which consists of pinion shaft, main gear, main shaft, quill shaft, gearbox body, die, roller, etc. A motor drives pinion shaft to rotate through S-shaped spring coupling, pinion shaft meshes with main gear so that the main gear is driven to rotate. And die is connected with quill shaft through die clamp and key resulting in the rotation of die. Main shaft does rotate (except overload) during the normal run, the front end is stationary support of roller and deflector, the rear end is equipped with overload protection

system.

3.3.7 Overload Protection System

When the foreign materials such as iron, stone, flaxen thread enter pellet chamber or the feed flow is excess, and rollers do not rotate along with die any more, the torque main shaft bears will exceed the normal torque resulting in that the shearing force transmitted to shear pin exceeds the allowable strength limit of its own, then shear pin break so that the shear pin housing rotates and touches limit switch to stop the machine.

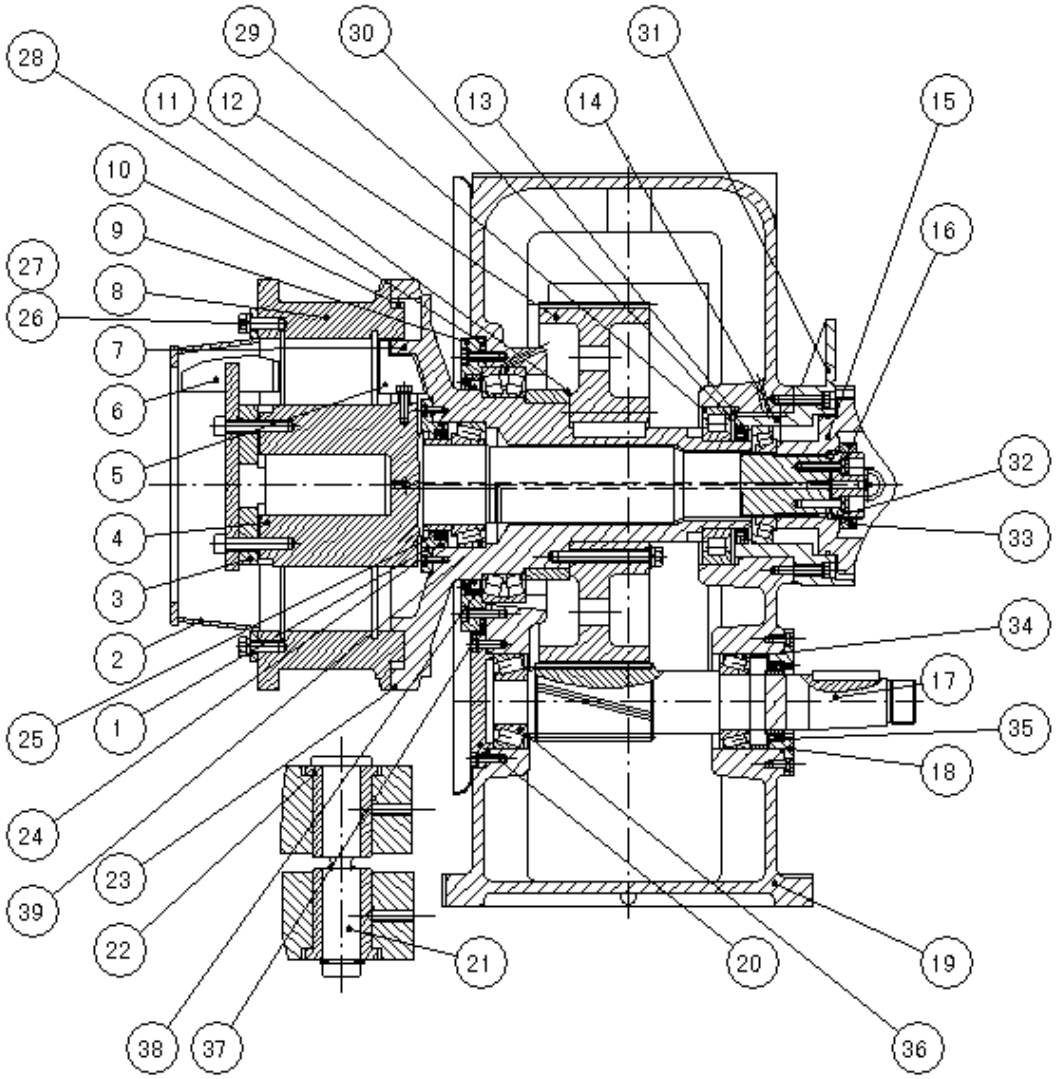


Figure 2 SZLH508 PELLET MILL GEARBOX STRUCTURE

1.Main Shaft Seal Cover 2. Feed Cone 3. Front Roller Support 4. Main Shaft 5. Wiper 6. Deflector 7. Quill Shaft 8. Die 9. Quill Shaft Seal Cover 10. Driving Key 11. Gear Retaining Ring 12. Main Gear 13. Oil Splash Plate 14. Bush 15. Main Shaft Splined Hub 16. Main Gland 17. Pinion Shaft 18. End Cover 19. Gearbox 20. Gearbox Front Liner 21. Shear Pin 22. Shear Pin Sleeve 23. Fastening Screw 24. Clamp 25. Oil Seal 26. Hexagon Socket Screw 27. Washer 28. Seal 29. Bearing 30. Oil Seal 31.Limit Switch 32. Clamp 33. Round Nut 34. Bearing 35. Oil Seal 36. Bearing 37.Clamp 38. Oil Seal 39. Bearing

3.3.8 Electric Control System

See Figure 3 for electric control principle. It is only used in the installation of a single machine. Separate design is needed for the use in the complete project.

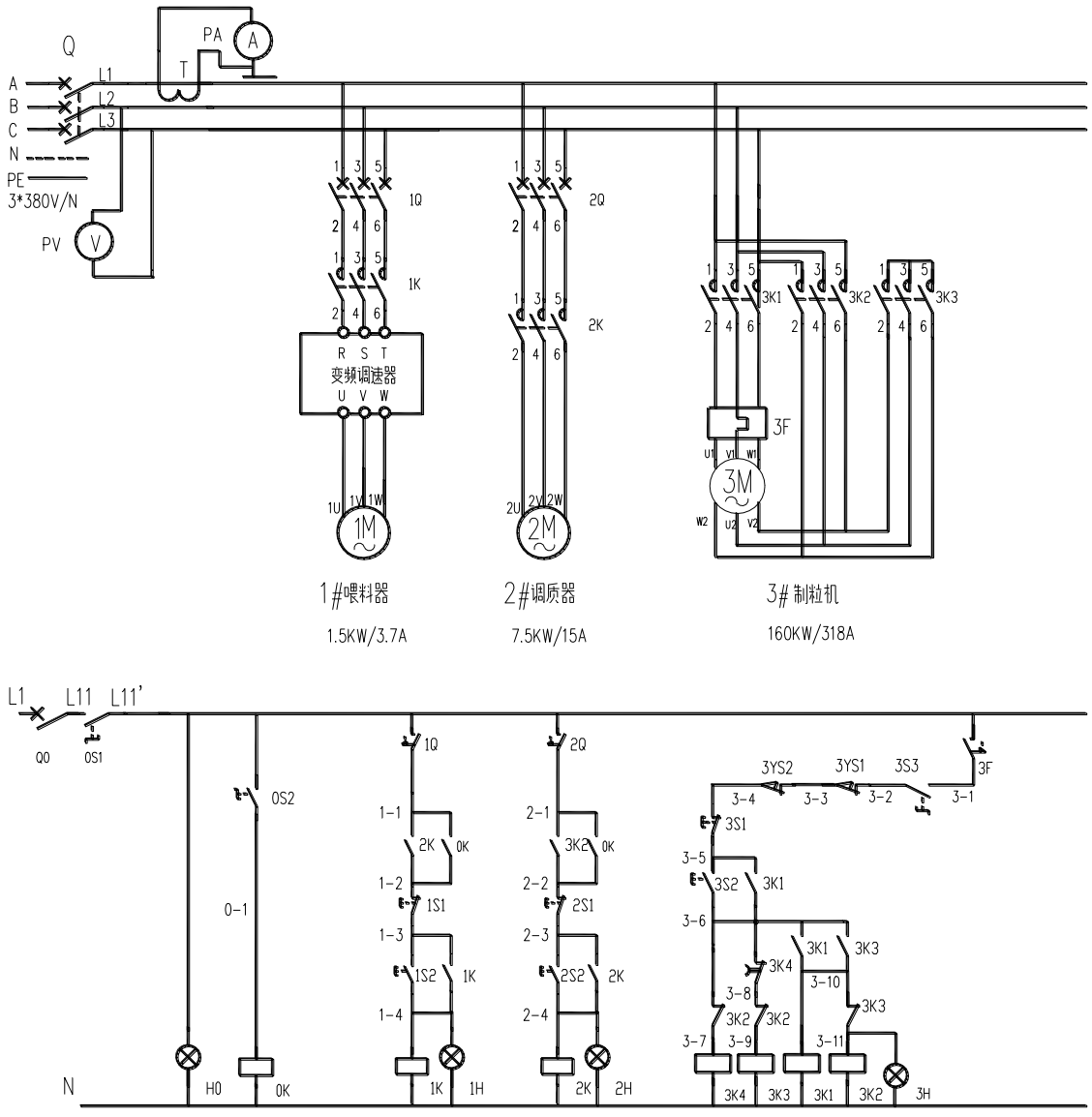


Fig. 3 SZLH508 Pellete Mill electrical schematic diagram

4. INSTALLATION, ADJUSTMENT AND TRIAL RUN

4.1 Installation

4.1.1 For equipment installation, the technological process (feeding, discharging, cooling, etc) should be thought over, floor should be determined and distance from the wall should be considered to make it easy for worker to operate and open the pellet chamber.

4.1.2 The equipment must be installed on the firm foundation. Dig the foundation according to the base size on the schematic diagram (see Figure 4), pour cobble concrete and screw the foundation bolt on. Some good practice should be followed when installing the pellet mill on the floor to make sure that vibration of machine during the normal run can be absorbed after the installation.

4.1.3 Generally pellet mill is positioned on the floor where dimension should be digged with proper size.

4.1.4 Appropriate steam system (See Figure 5) is critical for the successful operation of the pellet mill.

Note: all steam pipelines must be cleaned before they are put into use, and they must be cleaned after long-term use to remove impurities in the pipe and protect pipeline accessories such as pressure reducing valve and valve.

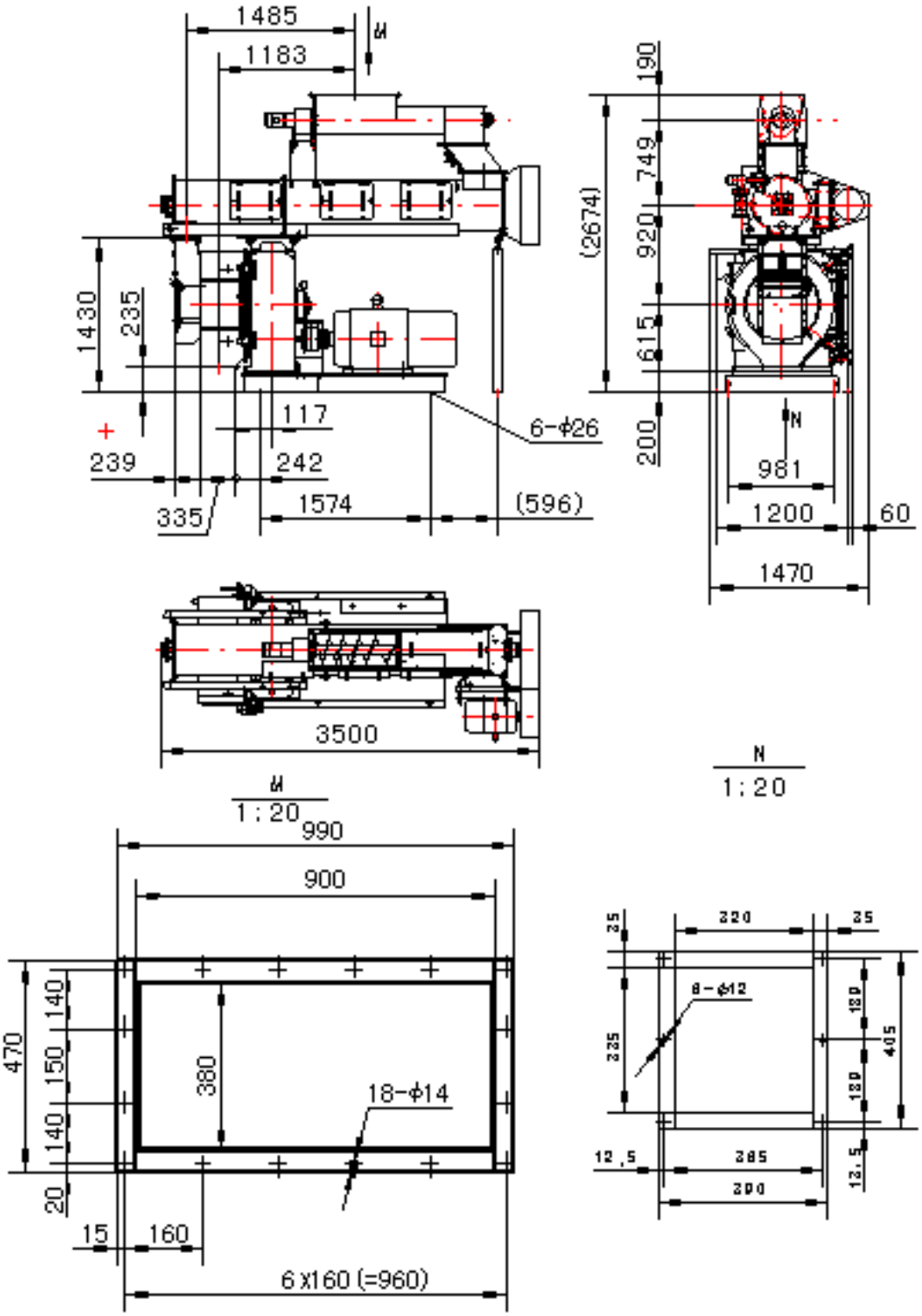


Fig.4 SZLH508 PELLETING MILL SAMPLE

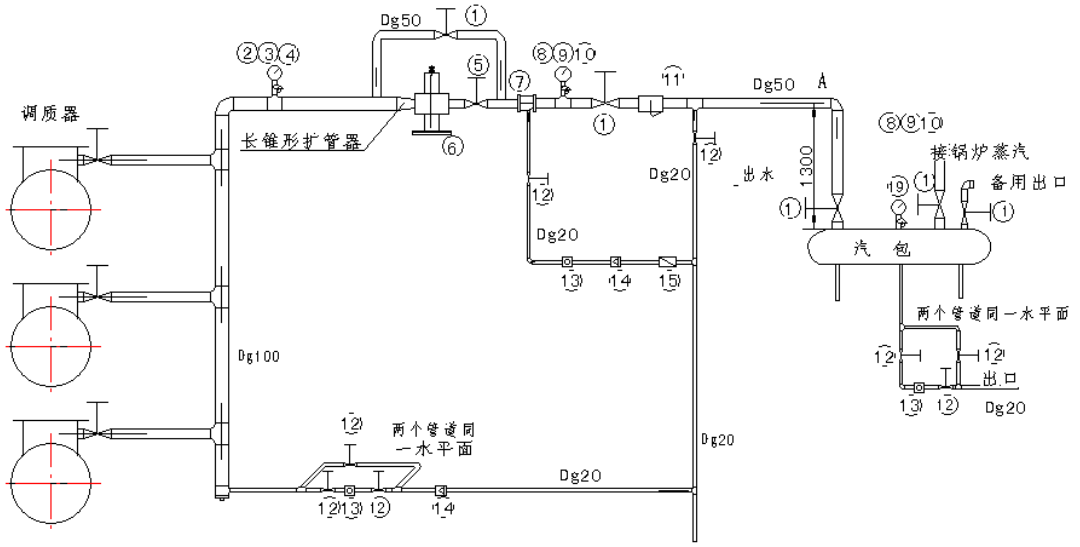


Fig.5 SZLH508 Pellet Mill inlet steam pipeline

Note: 1. The drained water goes back to the water supplying system of boiler or the water is to be completely drained.

2. Pipes are taped according to the actual conditions. (Threads are in British system)

3. Steam tank is not included in the steam pipeline, but can be made to order.

No	Name	Model	Specification	Qty	Remarks
1	Stop valve	J41T-16	Dg50	4	
2	Pressure gauge		3/8”	1	Nominal pressure 0-10bar; Dial dia. 100mm
3	Gauge cock		3/8”	1	
4	Siphon		3/8”	1	Ring siphon
5	Stop valve	J41T-16	Dg40	1	
6	Regulator	DP17	Dg40	1	Outlet pressure 0.05-0.4Mpa (yellow spring)

7	Moisture separator	S3	DN65	1	Flange (connecting DIN PN16)
8	Pressure gauge		3/8”	2	Nominal pressure 0-16bar; Dial dia. 100mm
9	Gauge cock		3/8”	2	
10	Siphon		3/8”	2	Ring siphon
11	Strainer		2”	1	With 100 mesh stainless steel filtering screen
12	Stop valve	J41T-16	Dg20	8	
13	Steam trap	HM10-8	3/4”	2	
14	Sight glass		3/4”	2	
15	Check valve		3/4”	1	
16	Safe valve			1	

4.2 Adjustment

4.2.1 Adjustment of die-roller clearance (see Figure 6)

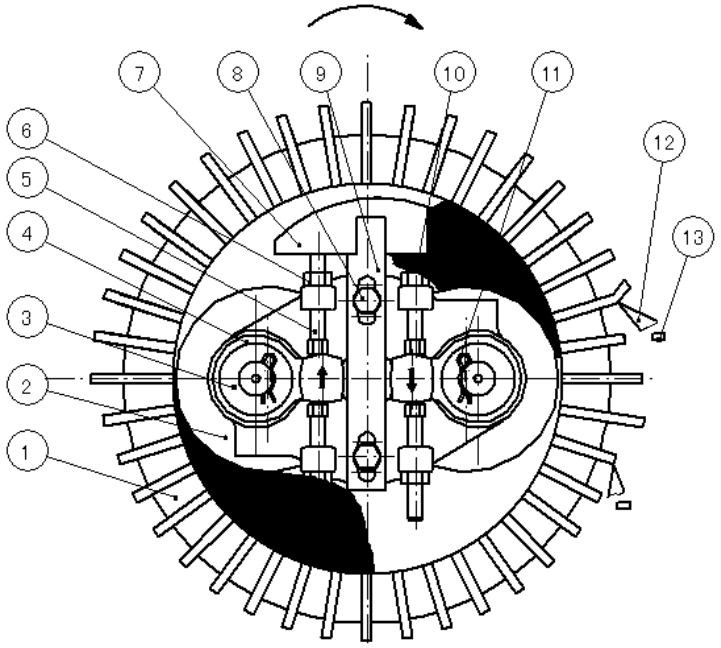


Figure 6 PELLET CHAMBER WORKING PRINCIPLE

1. Die 2. Roller 3. Roller Shaft 4. Retaining Pin 5. Adjusting Screw 6. Retaining Nut 7. Deflector 8. Deflector Screw 9. Deflector Base 10. Pelleting Area 11. Bolt 12. Knife 13. Pellet Feed

Open the pellet chamber door, screw eight fastening bolts off the feed cone and remove feed cone and remove feed cone to clear away the accumulated feed on the inside surface of die and outside surface of rollers. Loosen the retaining nut and twist the adjusting screw to make adjusting gear to turn. Make adjustment according to the arrow direction of roller adjusting gear. When the clearance becomes smaller, adjust to the opposite direction; when the clearance becomes bigger, if it is checked that the adjustment cannot be carried out in the shown direction, that mans rollers are wrongly assembled and must be reassembled correctly. It is very important to control the clearance between die and roller. Too small clearance will severely wear rollers and die; too big

clearance will result in difficulty of pelleting. Generally, proper clearance is 0.05-0.3mm. judge through visual inspection and take it as appropriate that rollers just touch the surface of die and rotation of die can just drive rollers to turn round without feed. Attention, do not forget to screw the retaining nut and lock screw on after the adjustment of clearance between die and roller.

4.2.2 Knife Adjustment

Pellets with different diameter have different length, generally, pellet length is 1.5-3 times longer than pellet diameter. To make adjustment, loosen the lock handle on the knife post first, pull out knife post, and loosen the lock handle on the positioning bushing, set the positioning bushing at a proper place according to the graduation of knife post, then lock the positioning bushing and move the knife post to make the positioning bushing and fixing sleeve touch, and lock the knife post handle. Note that distance between knife and the surface of die cannot be smaller than 3mm to avoid the touch of knife and die.

4.3 Trial run

4.3.1 Turn off the power of pellet mill.

4.3.2 Remove knife on pellet chamber door from die and open the pellet chamber door.

4.3.3 Check to see if there are iron pieces and other impurities inside the feeder, conditioner and pellet chamber.

4.3.4 Check the die clamp bolt and 48kgm of tightening moment is regarded as fine.

4.3.5 Check to see if the clearance between die and rollers is appropriate, and turn the die with hand to make sure that pellet mill is not blocked.

4.3.6 Check the oil level of oil level gauge at the side gearbox and make sure that the oil level is at the point of 2/3 graduation. Meanwhile, lubricate main shaft bearing, roller bearing and other lubrication points according to Figure7.

1. Lubricate with dilute oil, renew it after 200 hours' working and then change it every 6 months;(Use #68 machine oil)
2. No.2 high-grade lithium radical lube. (Inject once or twice every shift).
3. Calcium radical lube.

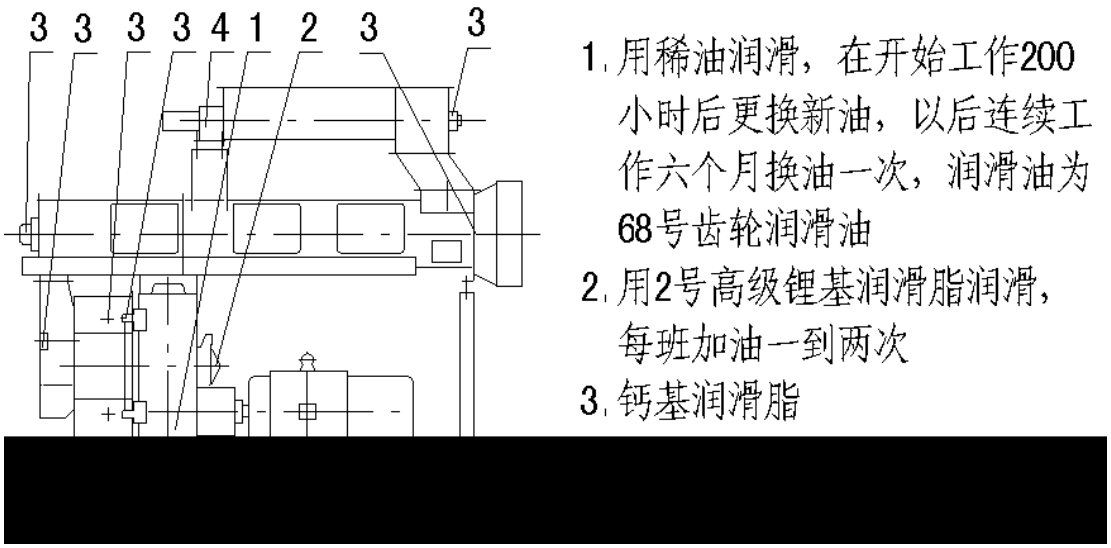


Fig.7 SZLH508 Pellet Mill lubrication chart

4.3.7 Close the pellet chamber door and turn on the main motor.

4.3.8 Start the main part of machine and check to see if the rotation direction of die is correct (die should rotate clockwise when facing the die).

4.3.9 Manually check to see if limit switch at the rear side of gearbox functions. Power shall be able to be turned off when you push the touching head of limit switch.

4.3.10 Do not make pellet mill run for a long time without feed. It will result in the wear of die and roller due to the excess surface touch.

WARNING: Do not place any object (including hand) in the pallet mill when the pellet mill is running.

5. USE CONDITIONS, OPERATION AND SAFETY RULES

5.1Use Conditions

The equipment technologically related to the pellet mill should match.

5.1.2The working voltage should be stable with deviation not more than ±5%.

5.1.3The supplied steam should accord with the rules of this manual.

5.1.4Galvanometer and operation switch should be installed on the site of pellet mill for the convenience of observation and operation.

5.2Operation

Correct operation includes two meanings: firstly, to make equipment bring the efficiency into full play to improve the output and make the pellet quality accord with requirements; secondly, to be able to correctly use and maintain the

equipment to make it have a longer service life. It is wrong to neglect any aspect.

The related part of the machine should be adjusted before operating the pellet mill. We have mentioned this previously and will not repeat here. Secondly, a check of trial run should be carried out before operating this machine. Only like this can you correctly operate the pellet mill.

5.2.1 Starting Steps

When the trial run is completely over, the formal staring can be carried out. You should pay attention to the starting sequence when starting the machine, the sequence should be from the bottom to the top. The steps are as following:

5.2.1.1 Do your beat at the check according to the steps of trial run.

5.2.1.2 Adjust the steam pressure, remove the condensate in the steam pipe.

5.2.1.3 Turn on the main motor.

5.2.1.4 Turn on the conditioner motor.

5.2.1.5 Turn on the feeder motor, adjust the feeder to the lowest rotational speed.

5.2.1.6 Open the discharging door and open the admission valve at the same time. Slightly adjust the rotational speed of feeder motor. After pellet is produced, gradually adjust the rotational speed of feeder and steam adding volume to a proper level.

5.2.1.7 Adjust the knife to make the pellet length appropriate.

5.2.1.8 Further adjust the rotational speed of feeder to make the working current reach the rated current value, and relevantly adjust the steam flow to make the temperature and humidity appropriate.

5.2.2 Points for attention when starting the operation and newly replacing the die.

5.2.2.1 For the unskilled operator, when carrying out the step of 5.2.1.6, you can open the pellet chamber door or adopt the external discharging system to make the initial feed not enter the pellet chamber but fall on the ground. When you feel by hand that steam content and conditioning temperature are proper, that is, when you firmly grasp the feed, it can shape into a ball, and when you loosen your grip, it can fall apart, that means the conditioning effect is good. At this moment, let the feed enter the pellet chamber for pelleting. Observe the galvanometer of the main part of machine at any time after the starting of the

machine is normal, and adjust the feeding volume and admission volume in time. And observe at any time by opening the inspection door of the feed chute.

5.2.2.2 During the production with load, if moisture added to feed is too much and die is not suited to feed formula due to excess width, feed will be extruded from under the rollers but not the die holes, resulting in block. In this case, shut off steam at once and shut off feeder motor, conditioner motor and the main motor of pellet mill, then clean up the die. After making sure that the surface of die holes has no adhesive feed, start the main part of machine, add a few dry feed until feed is extruded from most of the die holes. Remember the last adjusting point of steam valve and the adjusting point for feeding control as the key adjusting points during the everyday operation. The two adjusting points vary with the feed formula. Factors such as moisture content, grease content, fibre content and use volume of steam will vary the adjusting points.

5.2.2.3 During the trial run of new die, first use the greasy materials to make sure that feed is extruded from all the die holes (over90%), then add the feed with bigger friction to grind the die holes.

5.2.2.4 When new die is put into use, the rotational speed of feeder should be slowly adjusted. The

Feeding speed con not be increased before the amperemeter pointer is stable. If die is blocked up, first get rid of the feed in the pellet chamber, and then restart the main part of pellet mill. At this moment, you can not start at the feeding speed set originally and should use the lower feeding speed for running. Since feed in the die holes clog the holes tightly after cooling, an extra force should be imposed to make feed pass through the die holes. Then, the feeding volume and steam volume can be increased according to the condition of amperemeter. An experienced operator can make the pellet mill reach the highest capacity within several minutes.

5.2.2.5 Do not be careless and impatient when using a new die. It is very necessary to let the new die be heated with a rise in temperature before it attains the highest capacity.

5.2.2.6 For dies whose hole diameter is equal to or bigger than 4.5mm, excess steam should be used. Powder feed with high moisture content is relatively easy to fill up the die holes, but the extruded pellet feed is too soft. This trouble can be overcome by slowly increasing the dry materials until feed becomes dry

and hard. The excess dry materials will block up the die holes.

5.2.2.7 Operator can operate the new pellet mill and new die according to the above operation sequence. After being familiar with the pellet mill, he will try to find out all skills and skillfully use the pelleting experience to make the pelleting equipment to be in the best production condition and produce high-quality and high-output pellet feed. But one point should be remembered firmly:" Do not feed to the pellet mill excessively, or just the opposite consequence will be brought about."

5.2.3 Stopping Steps

When the production is over, the machine must be stopped. When stopping the machine, we should pay attention to the stopping steps which should be opposite to starting steps and is from the top to the bottom. The steps are as following:

5.2.3.1 Close the discharging door.

5.2.3.2 When seeing no feed from the inspection door, turn off the feeder motor, steam valve and conditioner motor.

5.2.3.3 Feed the greasy materials through the inspection door to fill up the die holes.

5.2.3.4 Turn off the main motor.

5.2.3.5 After the main machine stops, open the pellet chamber door remove the accumulated feed inside.

5.3 Points for attention during operation

During the operation, we should pay attention to some problems. Any neglect of these problems will severely affect the production.

5.3.1 There should not be foreign materials such as stone, iron impurity and flaxen thread in the powder feed.

5.3.2 Turn on the main motor first when starting the machine; Turn off the feeder motor first, then turn off the conditioner motor when stopping the machine.

5.3.3 Feed the greasy feed before turning off the main motor.

5.3.4 Remove the accumulated feed in the pellet chamber after stopping the machine.

6. COMMON TROUBLE ANALYSIS AND REMOVAL

No	TROUBLE	CAUSES	REMOVAL METHOD
1	No material enters the pellet chamber.	1.Bin arches or screw is blocked. 2.The feeder drive loses efficacy. 3.The conditioner is blocked.	1.Break the arch or change bin structure, clean up the screw. 2.Replace the drive. 3.Clean up the conditioner.
2	Material can enter the pellet chamber normally, but pellet cannot be produced.	1.Die holes are blocked. (a.Die is too thick; b.formula is irrational) 2.Moisture in material is too much or too little. 3.Die-roller clearance is big. 4.Deflector is damaged.	1.a.Thin the die holes; b.Change the formula. 2.Adjust the steam volume. 3.Adjust to a rational die-roller clearance. 4.Replace deflector.
3	The current of the main motor of pellet mill is unstable.	1.The added dry saturated steam is not sufficient. 2.The material flow entering the pellet chamber is unstable. 3.The mixing shaft of conditioner is damaged.	1.Improve the steam quality. 2.The powder feed returning to the pelleting bin is irregular. Re-improve the condition of returned feed. 3.Replace the mixing shaft or picks.
4	The main machine has big noise and fierce vibration.	1.The gearbox or roller bearing in the pellet chamber wears seriously. 2.Die and roller wear seriously. 3.Roller clearance is too small. 4.There is foreign materials in the pellet chamber.	1.Replace bearings. 2.Replace die and rollers. 3.Adjust the roller clearance. 4.Clear off the foreign materials.

7. MAINTENANCE AND REPAIR

7.1 Routine Maintenance

7.1.1 Strictly follow the lubrication diagram to inject lube to each lubrication point. Note that the correct choice of lube is very important for the normal run of pellet mill. For main shaft bearing, roller bearing and other bearing, use No.2 high-grade lithium radial lube or its similar grease; For the inside of the gearbox, use the imported high-grade antioxidant turbine engine oil. ZHONGTIAN can provide complete specifications. If user must choose some unproved grease or dilute oil of other brand, please inform ZHONGTIAN its specification so that we can compare some index to make sure if it can be used.

7.1.2 Check the distance between knife and die every shift to make sure that it is not smaller than 3mm.

7.1.3 Check every shift to see if bolts and screws in the pellet chamber are loose.

7.1.4 Remove the accumulated feed in the pellet chamber and on the outer surface of the machine every shift.

7.1.5 Inject about 30g lube to each roller bearing every four hours. Inject 50g lube to the main shaft bearing every 8-10 hours.

7.2 Regular Check and Maintenance

7.2.1 Check the oil level of feeder and reducer and chain drive every week. Replace oil in the reducer after the initial run of 200 hours, later replace oil once every 1000 hours of continuous run.

7.2.2 Check the wear conditions of wear ring and driving key every week and replace in time.

7.3 Repair

The check and repair of pellet mill mainly include the disassembling and assembling of pellet mill and the replacing and repairing method of easily-worn parts.

The disassembling and assembling of pellet mill include the disassembling and assembling of feeding system, mixing system, main driving system and feed chute system. (See Figure 8)

The pellet mill can be divided into four parts by disassembling the fasteners between the feeding system, mixing system, main driving system and feed chute system.

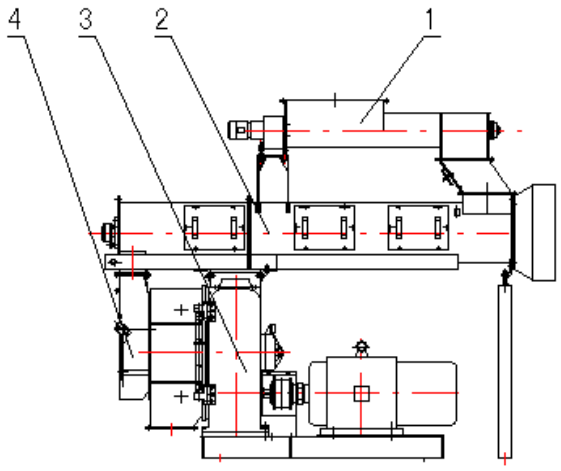


Figure 8 SZLH508 PELLET MILL

1. Feeding System 2. Mixing System 3. Pelleting System 4. Feed Chute System.

7.3.1 Feeding System

Feeding system mainly consists of speed-adjusting motor, reducer, feeder shell and screw shaft.

7.3.1.1 Reducer

Cycloidal pin gear reducer is used for feeder reducer with the reducing ratio of 1:17. It's directly coupled with speed-adjusting motor so that the effective rotational speed of feeder screw is regulated between 12-120 rpm.

7.3.1.1 Feeder Screw

See Figure 3 for the structure of the feeder screw. It consists of screw shell, screw shaft and bearing with housing. The screw is used for feeding and the rotational speed can be adjusted so that the feeding volume can be changed to reach the rated current and capacity. Screw shaft can be drawn out from the right end of the screw shell for cleaning and inspection.

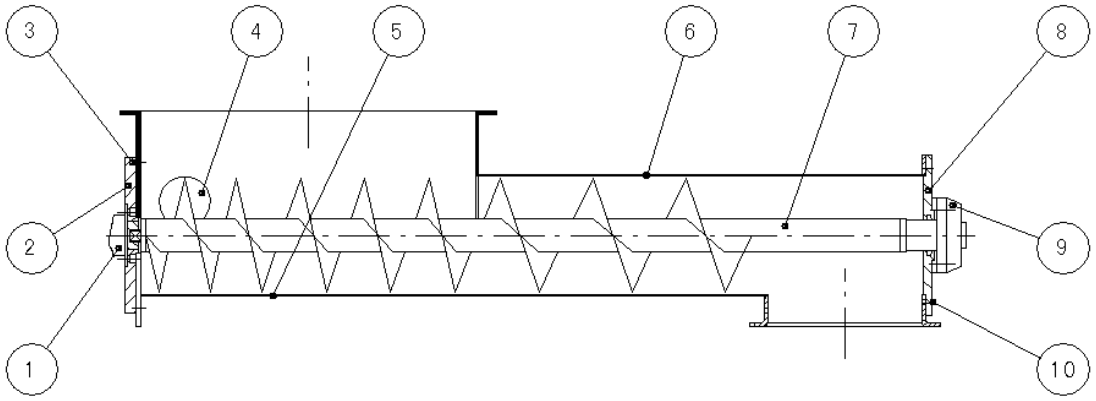


Figure 9 FEEDING SYSTEM OF SZLH508 PELLET MILL

1. Speed-adjusting Motor 2. Front End Plate 3. Nut 4. Cover 5. Screw Shell 6. Inspection Door 7. Screw Shaft 8. Rear End Plate 9. Bearing with Housing 10. Nut

7.3.2 Mixing System

The mixing system mainly consists of mixer shaft, shell, motor, puller, support, etc. (See Figure 10)

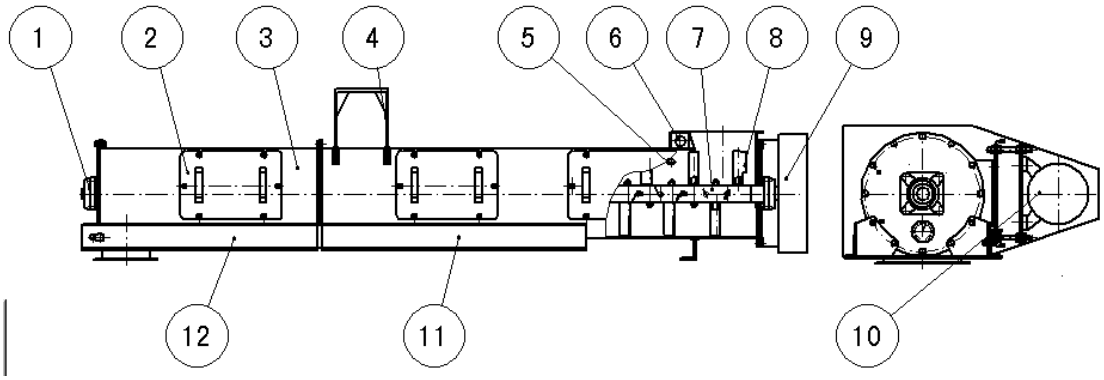


Figure 10 Mixing System of SZLH508 PELLET MILL

1. Bearing with Housing 2. Inspection Door 3. Shell 4. Base 5. Oil Inlet 6. Steam Inlet 7. Mixing Shaft 8. Paddle 9. Guard Cover 10. Motor 11. Base 12. Hoist (option)

The disassembling and assembling steps are as following:

a. Loosen the tightening bolt of guard to remove the guard 9;
b. Adjust bolt 15 and belt tensity to remove the belt 10;
c. Remove the big pulley 8 and motor pulley with proper “puller”;
d. Disassemble bolt to remove the support plate;
e. Disassemble bolt to remove motor 10 and motor base;
f. Disassemble bolt to remove the bearing housing 1 at left and right sides;
g. Disassemble bolt 19 to remove the left end cap and right end cap;
h. Pull the mixer shaft 7 out from the right side of shell 3 with strength.

To assemble the mixer, follow the steps opposite to the above.

7.3.3 Main Driving And Pelleting System

The main driving and pelleting system mainly consists of gearbox, base, motor, coupling, pellet chamber, etc. (See Figure 11)

The disassembling and assembling steps are as following:

a. Disassemble the bolts of guard to remove half guards Ⅰ4 and Ⅱ5;
b. Disassemble the bolts of bushing to remove the bushing 8;
c. Disassemble the clamp and spring of the coupling hub 3;
d. Disassemble bolt 1A to remove motor 1;
e. Remove the hub 3 from the motor with proper “puller”;
f. Remove the hub 3 from the pinion shaft in the gearbox with proper “puller”.

The disassembling and assembling of gearbox include the disassembling and assembling of pinion shaft, main shaft, quill shaft and main gear.

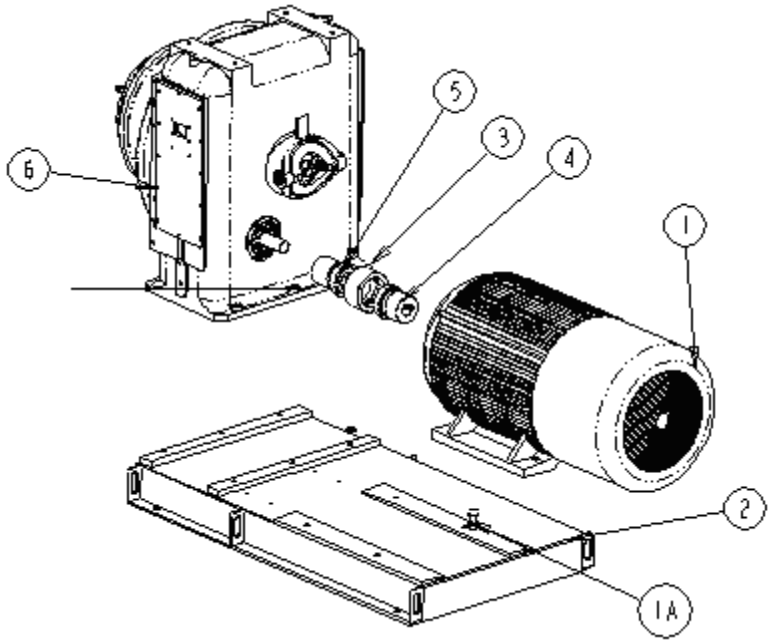


Figure 11 MAIN MOTOR

1. Motor 2. Base 3. Hub 4. Half Cover Ⅰ 5. Half Cover Ⅱ 6. Motor Adapter Rail Ⅰ 7. Motor Adapter Rail Ⅱ 8. Bushing 9. Gearbox

7.3.3.1 Disassembling and Assembling of Pinion Shaft

The disassembling and assembling steps of pinion shaft are as following (see Figure12):

a. Loosen the ball valve 21 to let the lube out of the gearbox body and remove key9;
b. Disassemble bolt 7 to remove the rear end cap 6, oil seal 8 and paper gasket5;
c. Remove the end cap from the front of gearbox 1;
d. Knock the pinion shaft 2 from the front of gearbox with proper strength to make it separate from bearing3;
e. Remove the pinion shaft from the rear of gearbox with strength..

To assemble the pinion shaft, follow the steps opposite to the above.

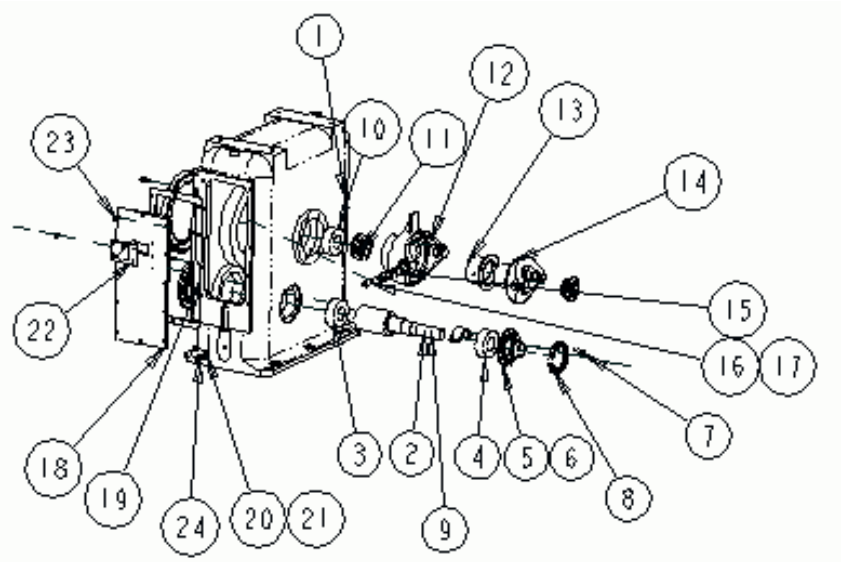


Figure12 DISASSEMBLING AND ASSEMBLING OF PINION SHAFT

1. Gearbox Body 2. Pinion Shaft 3. Pinion Bearing (Front) 4. Pinion Bearing (rear) 5. Paper Gasket 6. Bearing Rear Cover 7. Screw 8. Oil Seal 9. Key 10. Quill Shaft Bearing 11. Oil Seal 12. Flange Housing 13. Inner Shear Pin Bushing 14. Flange Bushing 15. Shear Pin Bushing 16. Shear Pin 17. Retaining Ring 18. Right End Cap of Gearbox 19. Rubber Gasket 20.Pinpe Nipple 21. Ball Valve 22. Oil Filler 23. Bolt 24. Bolt

7.3.3.2 Disassembling and Assembling of Main Shaft

The disassembling and assembling steps are as following (see Figure 13):

a. Open the pellet chamber door of pellet mill to remove the fed cone and die (See the disassembling and assembling of die for details);
b. Loosen roller adjusting screw 19, remove retaining ring 21 and roller adjusting gear 20;
c. Disassembling screw to remove the front roller support 18 and roller assembly17;
d. Disassemble screw 5;
e. Disassemble bolt 25 and remove the gland 22, butterfly spring 23 and rubber pad 24 in turn;

f. Knock the main shaft 13 from the left side and remove it from the right side with proper tool.

To assemble the main shaft, follow the steps opposite to the above.

7.3.3.3 Disassembling and Assembling of Quill Shaft and Main Gear.

The disassembling and assembling steps are as following (See Figure 12 and 13):

a. First disassemble the main shaft according to the steps of main shaft disassembling;(Figure13)
b. Disassemble the retaining ring 17 to remove the shear pin 16; (Figure 12)
c. Disassemble bolt to remove the outside flange14; (Figure 12)
d. Disassemble bolt 23 to remove the right end cap 18 of gearbox and rubber pad 19;(Figure12)
e. Remove screw 26;(Figure 13)
f. Disassemble screw 27 to remove the quill flange 1;(Figure13)
g. Knock the end of quill shaft from the rear of gearbox 1, remove the quill shaft 2 from the front and remove the main gear 9 from the side. (Figure 13)

To assemble the quill shaft and main gear, follow the steps opposite to the above.

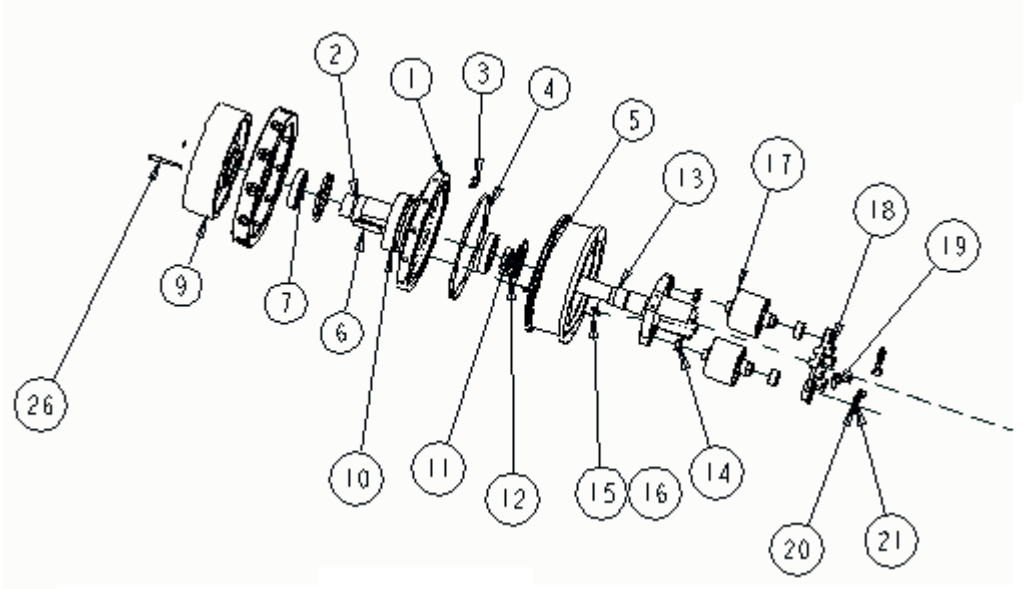


Figure13 DISASSEMBE AND ASSEMBLE OF QUILL SHAFT MAIN SHAFT AND MAIN GEAR

1. Quill Flange 2. Quill Shaft 3. Driving Key 4. Quill Wear Insert 5. Screw 6. Key 7. Gear Retaining Ring 8. Screw 9. Main Gear 10. Main Shaft Bearing 11. Oil Seal 12. Seal Holder 13. Main Shaft 14. Roller Shaft Bushing 15. Wiper 16. Screw 17. Roller Assembly 18. Front Roller Support 19. Roller Adjusting Screw 20. Roller Adjusting Gear 21. Washer 22. End Cap 23. Butterfly Spring 24. Rubber Pad 25. Screw 26. Screw 27. Screw

7.3.4 Disassembling and assembling of easily-worn parts

The replacement of easily-worn parts of pellet mill includes the disassembling and assembling of roller, shear pin, main shaft bearing and die.

7.3.4.1 Disassembling and assembling of roller

Disassembling and assembling of roller include reassembling of roller assembly and the disassembling and assembling of roller assembly (See Figure14).

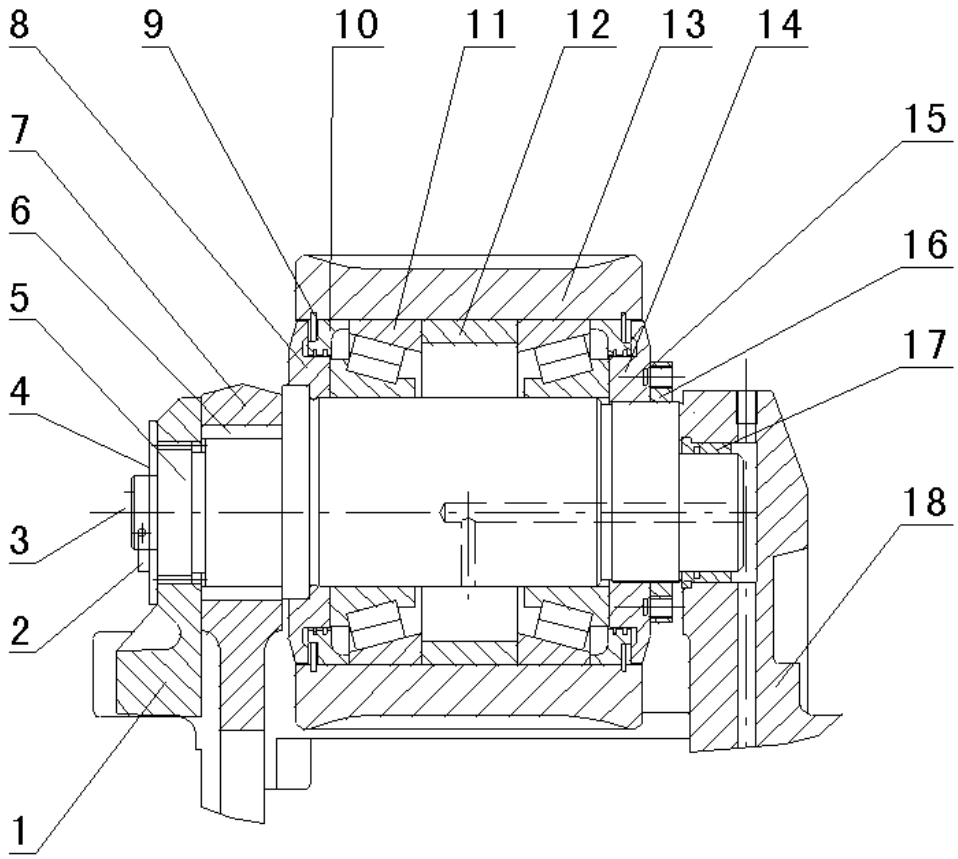


Figure14 ROLLER ASSEMBLY

1. Roller Adjusting Gear 2. Clip 3. Lube Fitting 4. Washer 5. Roller Shaft 6. Front Bushing 7. Front Roller Support 8. Shaft Collar 9. Retaining Ring 10. Inner Collar 11. Bearing 12. Spacer 14. Inner Lock Nut 15. Lock Nut 16. Lock Washer 17. Rear Bushing 18. Main Shaft

7.3.4.1.1 Reassembling of Roller Assembly

(1) Disassemble the used roller

a. Loosen lock nut 15 to remove retaining washer 16;
b. Disassemble inner lock nut 14 and retaining ring 9 and knock roller shaft 5 out to the left with a wooden hammer;
c. Disassemble inner collar 10;
d. Knock outer side edge with hammer or pull out two outer rings of bearing 11 with proper “puller”.
e. Disassemble spacer12.

(2) Assemble the roller

Step A:

a. Replace the worn parts and clean the parts to be assembled;
b. Assemble the roller spacer 12 in the roller;
c. Assemble two outer rings of bearing with proper tool (The big end of cone face outwards.).

Step B:

a. Assemble the roller inner collar 10 and retaining 9 in the roller;
b. Assemble the roller inner lock nut 8 and inner ring of bearing on the roller shaft;

Step C:

a. Assemble the roller assembled in step A onto the roller shaft;
b. Assemble another inner ring of bearing on the roller shaft;
c. Assemble the roller inner lock nut;
d. Make sure that bearing clearance is adjusted, then assemble the retaining washer 16, tighten the lock nut 15, pull the retaining ear and insert it to the nut groove;
e. Check to see if roller can rotate freely, readjust the bearing clearance if necessary.

7.3.4.1.2 Disassemble and Assembling of Roller Assembly

(1) Disassemble the roller (See Figure 15).

a. Back off the knife 12 and open the pellet chamber door;
b. Disassemble the feed cone bolts and remove the feed cone;
c. Loosen deflector screw 8 and remove deflector 7;
d. Remove backing pins 11 and apron, adjust retaining nuts 6, loosen adjusting screw 5, and remove roller adjusting gears 4;
e. Loosen bolt 20 and remove the front roller support 4;
f. Pull the roller assembly outwards with strength, thus the roller assembly can be removed.

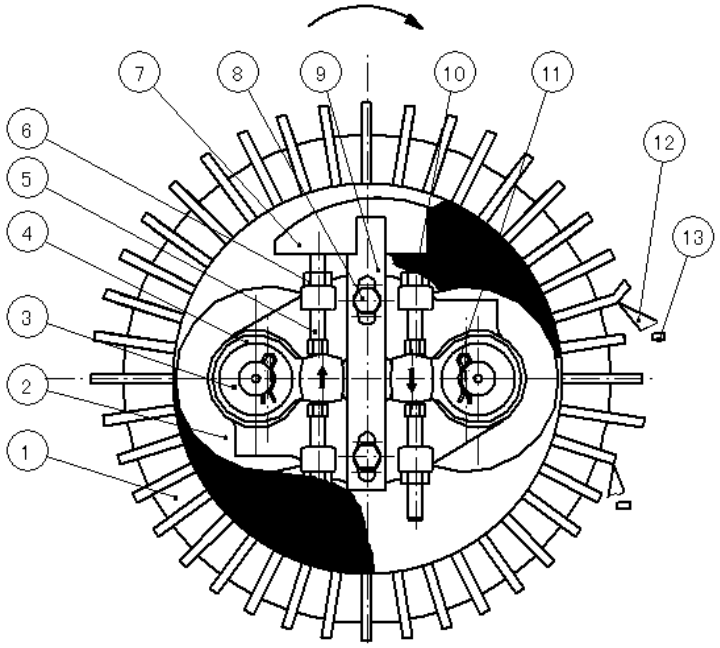


Figure 15 PELLETING CHAMBER

1. Die 2. Roller 3. Roller Shaft 4. Roller Adjusting Gear 5. Adjusting Screw 6. Retaining Screw 7. Deflector 8. Deflector Screw 9. Deflector Base 10. Pelleting Area 11. Clip 12. Knife 13. Pellet Feed

(2) Assemble the roller assembly

a. Clean the interior of pellet chamber;
b. Assemble roller to the position shown in Figure16, make sure of the position of eccentric shaft shown by arrow “E”;
c. Assemble the front roller support and tighten the bolt;
d. Assemble roller adjusting gear to the head of roller shaft to make the clearance between roller and die proper;
e. Assemble apron and backing pins 11, tighten roller adjusting screw 5 and retaining nuts 6;
f. Assemble deflector 7 and feed cone in turn.

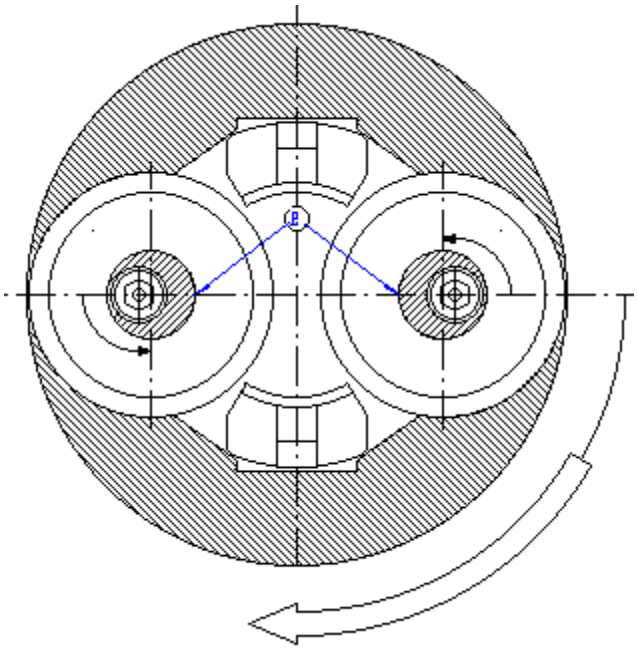


Fig.16 SZLH508 Pellet Mill pressure roller conditioning

7.3.4.2 Disassembling and Assembling of Shear Pin (see Figure 12)

(1) Disassembling of shear pin

a. Turn off the main motor of pellet mill;
b. Loosen the retaining ring17;
c. Slightly knock the shear pin 16 and remove it.

(2) Assembling of shear pin

a. Slightly knock the spare shear pin into the shear pin sleeve;
b. Make sure that the shear pin sleeve 15 does not move and is tightly attached to the shell. Install the retaining ring 17 onto the shear pin.

7.3.4.3 Disassembling and Assembling of Main Shaft Bearing

(1) Disassembling of Main Shaft Bearing

a. Remove the main shaft according to the above-mentioned steps of disassembling the main shaft;
b. Disassemble the main shaft bearing with proper “puller”.

(2)To assemble the main shaft bearing, follow the steps opposite to the above.

7.3.4.4 Disassembling and Assembling of Die (see Figure 17)

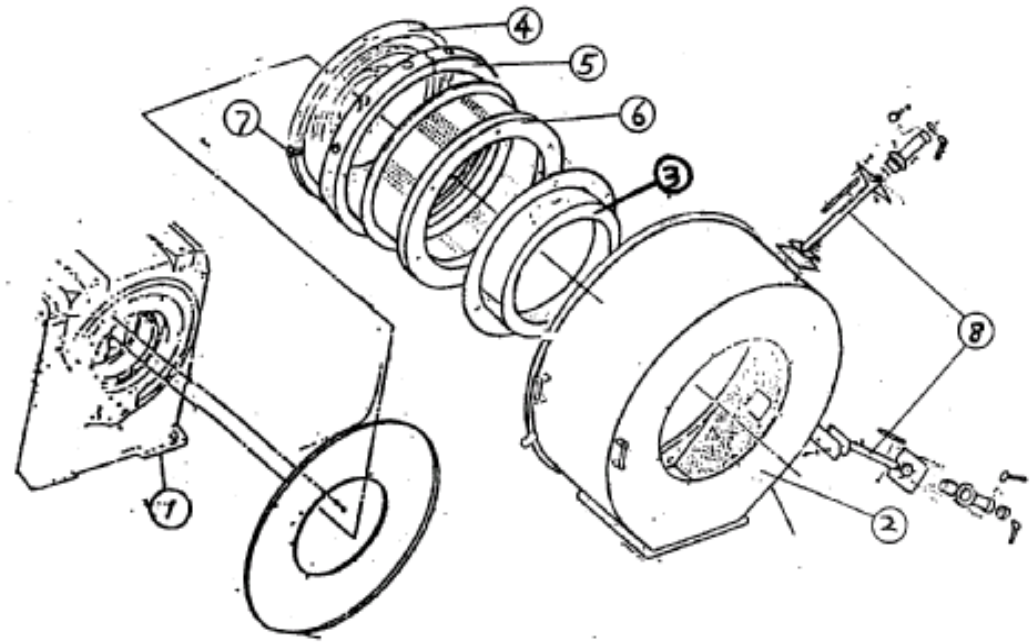


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Figure 17 DISASSEMBLING AND ASSEMBLING OF DIE

1. Gearbox 2. Pellet Chamber Door 3. Feed Cone 4. Quill Flange 5. Die Clamp 6. Die 7. Bolt 8. Knife Post Assembly

(1) Disassembling of Die

a. Remove knife assembly 8 and open the pellet chamber door2;
b. Disassemble the feed cone bolts and remove the feed cone3;
c. Relieve the pressure of roller against die; (Turn the roller shaft with roller adjusting gear, roller adjusting screw and nut.)
d. Disassemble the die connecting bolt 7 and remove die clamp 5;
e. Pull the die 6 from pellet mill;

(2) Assembling of Die:

a. Put the weight of die on the hoist;
b. Push die into the pellet chamber to make the positioning face of die match the positioning face of quill flange;
c. Tighten the die clamp 5;
d. Adjust roller to ensure a proper clearance between roller and die;
e. Assemble the feed cone 3;

f. Close the pellet chamber door and adjust knife assembly 8 to a proper position.

7.3.4.5 Disassembling and Assembling of Driving Key

the used and damaged key must be replace. Remove the used key with a key puller and assemble a new key. (see Figure 18)

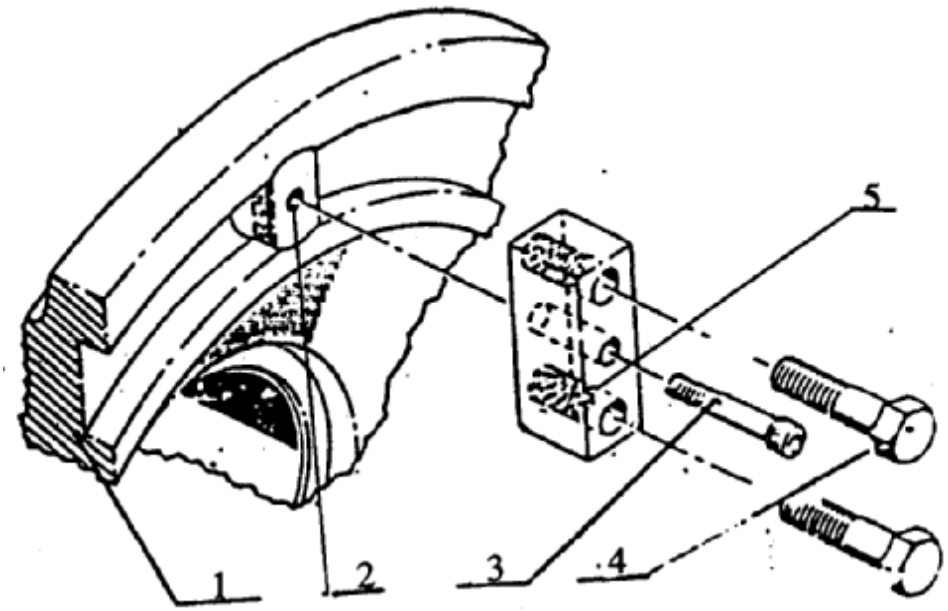

Figure 18 DISASSEMBLING AND ASSEMBLING OF DRIVING KEY

1. Quill Flange 2. Driving Key 3. Positioning Screw 4. Disassembling Screw 5. Driving Key Puller

Remove the die driving key according to the following steps:

a. Remove die according to the above-mentioned steps of disassembling of the die;
b. Remove the positioning screw 3 of die driving key and insert the disassembling screw4;
c. As shown in Figure 18, set the puller, twist off two disassembling screw 4 and pull the die driving key out. If the threads of disassembling screw reach the bottom of key puller and the key does not come out yet, back off the disassembling screw and install a partition plate between key puller and quill flange face. Again twist off two disassembling screws to pull the

driving key out.

d. Check the hole of quill flange 1 (key is just pulled out of the quill flange). The inner hole should not have any scar. Get rid of the corrodent with abrasive paper and solvent.
e. Turn the positioning screw into the die driving key to prevent the threads from corrosion

To assemble the driving key, follow the steps opposite to the above.

8. LIST OF MAIN VULNERABLE PARTS

Item	Code	Description	Qty/Unit	Mounting Parts
1		Die	1	Pellet Chamber
2		Roller	2	Pellet Chamber
3		Roller Shaft Bushing	2	Main Shaft
4		Shear Pin	2	Shear Pin Housing
5		Knife	2	Knife Post Assembly
6		Deflector	1	Pellet Chamber
7		Die Driving Key	1	Pellet Chamber
8		Wear Ring	1	Pellet Chamber
9		Clamp	1	Pellet Chamber
10		Main Shaft Bearing	1	Front of Gearbox (near the die)
11	SKF	Main Shaft Bearing	1	Front of Gearbox (near the spear pin)
12	SKF	Front Bearing of Quill Shaft	1	Front End of Quill Shaft of Gearbox
13	SKF	Rear Bearing of Quill Shaft	1	Rear End of Quill Shaft
14	SKF	Front Bearing of Pinion	1	Front End of Pinion
15	SKF	Rear Bearing of Pinion	1	Rear End of Pinion Shaft
16	GB278-6	Hinge Support Bearing	2	Hinge Support of Pellet Chamber Door
17	CKS	Feed Chute Bearing	2	Discharging Handle

18	SKF	Conditioner Bearing	6	Both Ends of Conditioner
19		Feed Bearing	2	Both Ends of Feeder
20		Roller Bearing	4	Roller Assembly
21	Double Lips	Main Shaft Oil Seal	1	Front End of Main Shaft
22	Double Lips	Quill Shaft Oil Seal	1	Front End of Quill Shaft
	Single Lip	Rear Oil Seal of Quill Shaft	1	Rear End of Quill Shaft
23	Double Lips	Rear Oil Seal of Pinion	2	Rear End of Pinion Shaft

Warranty period: 1 year warranty from the date of sale of this product (except vulnerability parts)In case any quality shortage and damage are found out, we will supply free repair. If not quality shortage and damage, we will supply parts and service that are not cost-free.

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