Foreword

The Company specializes in the research and manufacture of “cold heading forming machine” in order to provide each industry with efficient, high-precision and high-quality production tools and constantly research and develop in line with the spirit of seeking refinement and truth, so as to cooperate with each industry to achieve production automation, lower cost and increase profit.

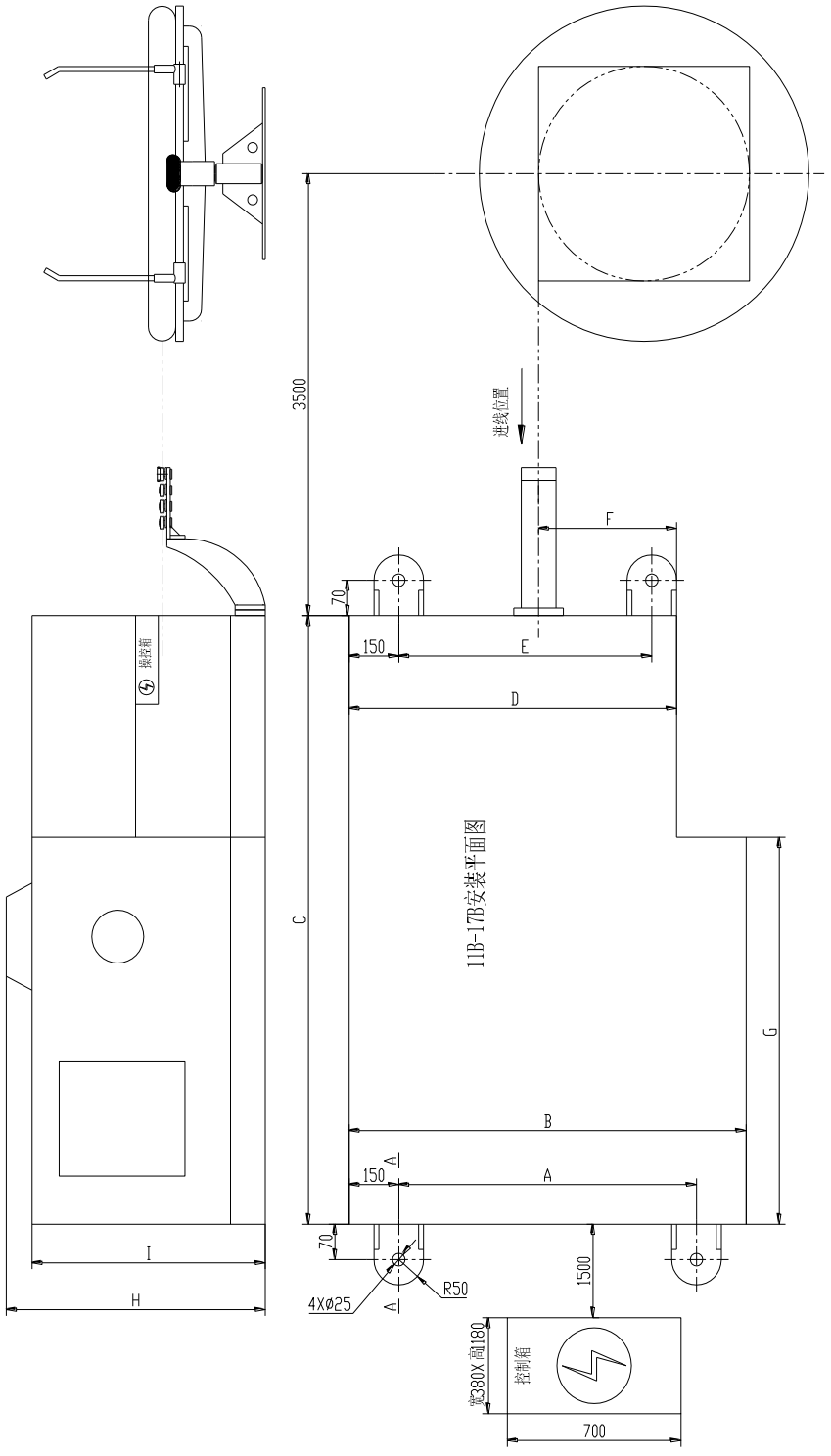
Thank you for wisely choosing our “Z, Y”-series automatic cold heading forming machines and including them in your production plan. In the Operating Instructions, you’ll be informed of specification description, description of mechanical installation, test run and operation method, safety precautions and maintenance essentials, etc.

Before using the machine, please carefully read and properly keep the Operating Instructions, because the accuracy and service life of the machine relies on proper operation essentials and meticulous maintenance. In case of any damage caused by production error or operation negligence and improper maintenance because of some reasons, please attach vehicle registration number and damaged part number, describe in detail the damage, and ask Wenzhou Boyu to research and judge for you, and prevent continuous production due to the error, so that performance and functions of the machine can be fully exerted, and it can be guaranteed that equipment operation is normal and perfect.

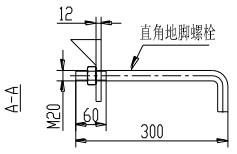
Contents of Operating Instructions

(Attached figures)

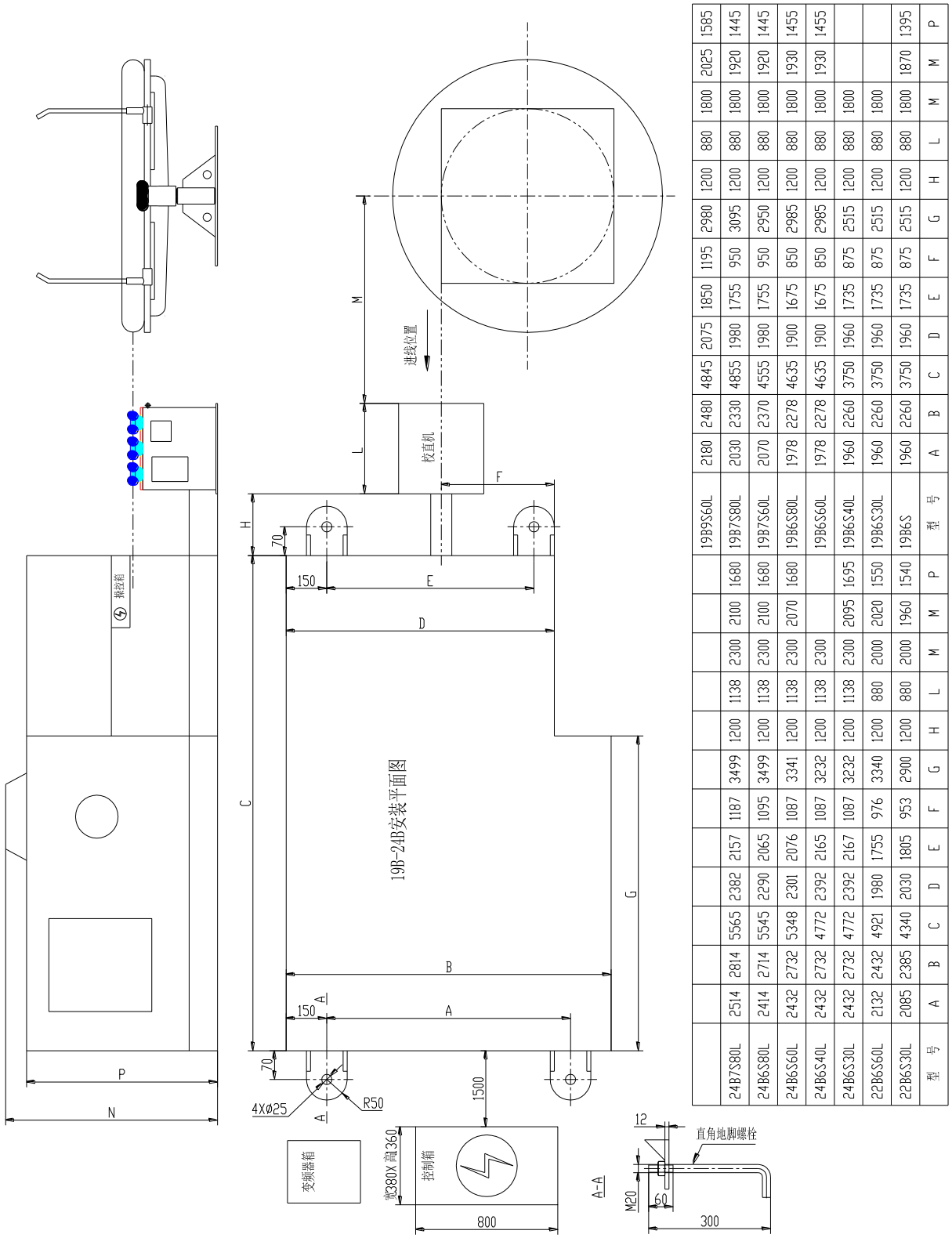
Chapter 1 Overall Dimensions



型 号	A	B	C	D	E	F	G	H	I	型 号	A	B	C	D	E	F	G	H	I
17B6S70L	1850	2150	4050	1870	1645	764	2703			14B6S20L									
17B6S40L	1800	2100	3630	1820	1595	764	2403			14B6S	1700	2000	2880	1710	1485	685	1860	1450	1250
17B6S30L	1800	2100	3480	1820	1595	764	2253			12B6S20L	1320	1620	2435	1360	1135	595	1580	1355	1060
14B7S60L	1840	2140	3445	1860	1635	749	2220	1575	1275	11B7S30L	1356	1656	2797	1391	1166	655	1870	1355	1060
14B7S40L	1830	2130	3310	1850	1625	759	2035	1560	1250	11B6S50L	1316	1616	2867	1351	1126	605	1770	1355	1060
14B6S60L	1700	2000	3445	1720	1495	689	2220	1575	1275	11B6S40L	1316	1616	2797	1351	1126	605	1720	1355	1060
14B6S40L	1700	2000	3260	1720	1495	689	2035	1560	1250	11B6S30L	1316	1616	2797	1351	1126	605	1720	1355	1060
14B6S30L	1700	2000	3130	1720	1495	689	2034	1560	1230	11B6S20L	1300	1600	2410	1320	1020	550	1532	1325	1030

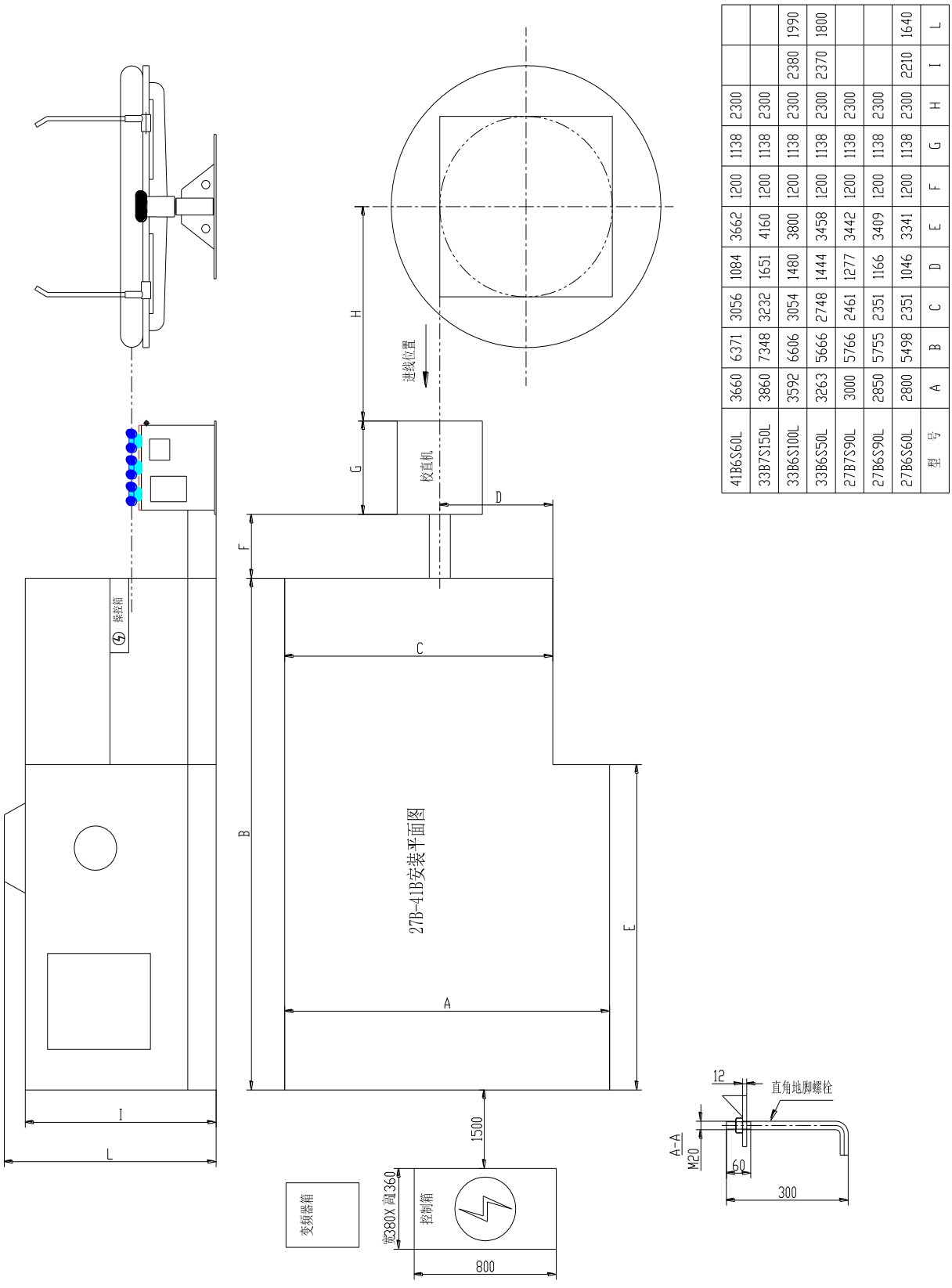


操控箱	Operation control box	宽 380 x 高 180	W380 x H180
安装平面图	Installation plan	控制箱	Control box
进线位置	Position of incoming line	直角地脚螺栓	Right-angle foundation bolt



型号	A	B	C	D	E	F	G	H	L	M	P	M	A	B	C	D	E	F	G	H	M	M	P
19B9S60L	2180	2480	4845	2075	1850	1195	2980	1200	880	1800	2025	1585											
19B7S80L	2030	2330	4855	1980	1755	950	3095	1200	880	1800	1920	1445											
19B7S60L	2070	2370	4555	1980	1755	950	2950	1200	880	1800	1920	1445											
19B6S80L	1978	2278	4635	1900	1675	850	2985	1200	880	1800	1930	1455											
19B6S60L	1978	2278	4635	1900	1675	850	2985	1200	880	1800	1930	1455											
19B6S40L	1960	2260	3750	1960	1735	875	2515	1200	880	1800													
19B6S30L	1960	2260	3750	1960	1735	875	2515	1200	880	1800													
19B6S	1960	2260	3750	1960	1735	875	2515	1200	880	1800	1870	1395											
型号	A	B	C	D	E	F	G	H	L	M	P	M	24B7S80L	2514	2814	5565	2382	2157	1187	3499	1200	1138	2300	2100	1680
24B6S80L	2414	2714	5545	2290	2065	1095	3499	1200	1138	2300	2100	1680											
24B6S60L	2432	2732	5348	2301	2076	1087	3341	1200	1138	2300	2070	1680											
24B6S40L	2432	2732	4772	2392	2165	1087	3232	1200	1138	2300													
24B6S30L	2432	2732	4772	2392	2167	1087	3232	1200	1138	2300	2095	1695											
22B6S60L	2132	2432	4921	1980	1755	976	3340	1200	880	2000	2020	1550											
22B6S30L	2085	2385	4340	2030	1805	953	2900	1200	880	2000	1960	1540											

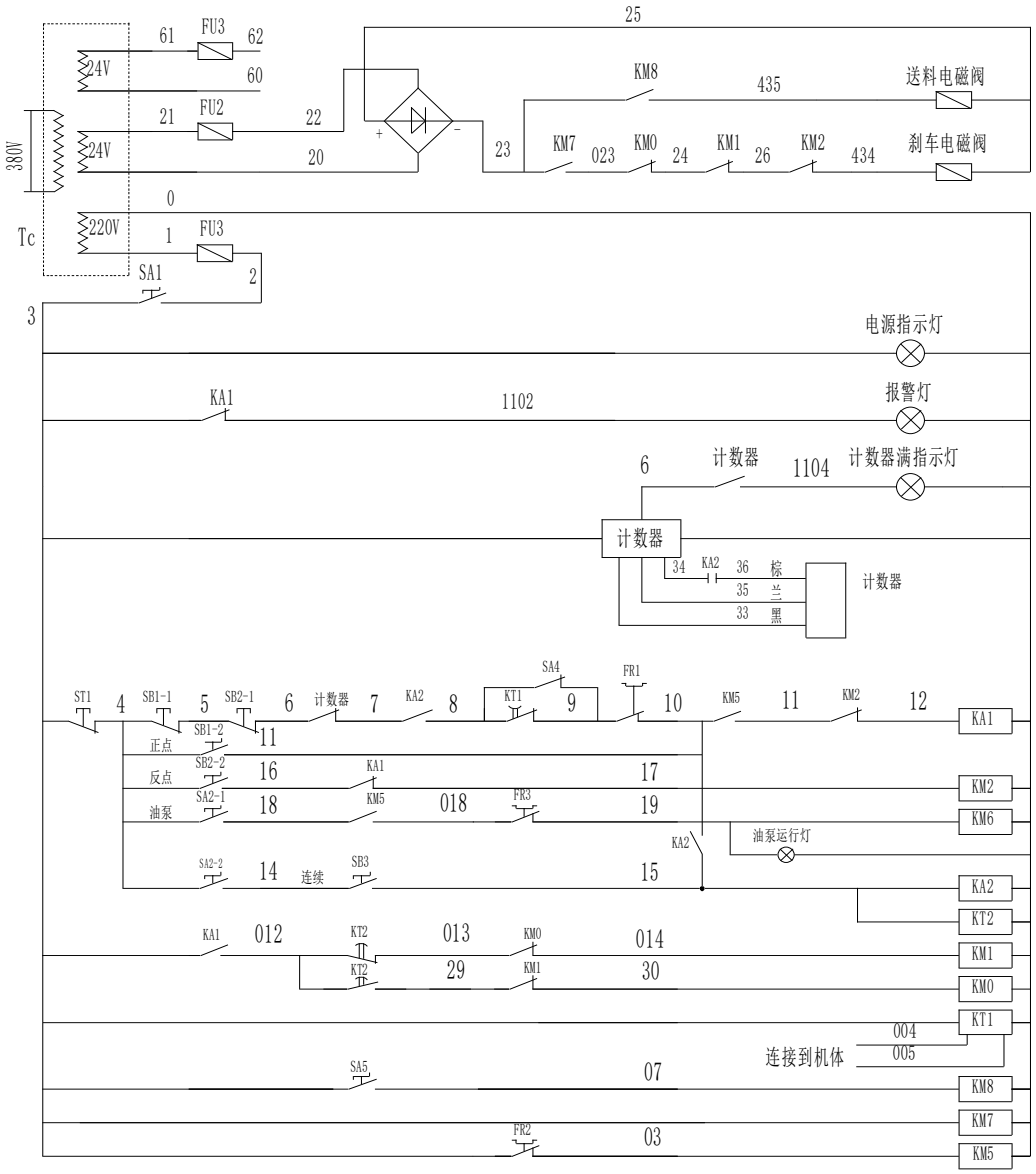
操控箱	Operation control box	宽 380 x 高 360	W380 x H360
进线位置	Position of incoming line	控制箱	Control box
安装平面图	Installation plan	校直机	Straightener
变频器箱	Frequency converter box	直角地脚螺栓	Right-angle foundation bolt



型 号	A	B	C	D	E	F	G	H	I	L
41B6S60L	3660	6371	3056	1084	3662	1200	1138	2300		
33B7S150L	3860	7348	3232	1651	4160	1200	1138	2300		
33B6S100L	3592	6606	3054	1480	3800	1200	1138	2300	2380	1990
33B6S50L	3263	5666	2748	1444	3458	1200	1138	2300	2370	1800
27B7S90L	3000	5766	2461	1277	3442	1200	1138	2300		
27B6S90L	2850	5755	2351	1166	3409	1200	1138	2300		
27B6S60L	2800	5498	2351	1046	3341	1200	1138	2300	2210	1640

操控箱	Operation control box	宽 380 x 高 360	W380 x H360
进线位置	Position of incoming line	控制箱	Control box
安装平面图	Installation plan	校直机	Straightener
变频器箱	Frequency converter box	直角地脚螺栓	Right-angle foundation bolt

14-33B单速冷镦机原理图



1. KM0　连续接触器
2. KM1　正点接触器
3. KM2　反点接触器
4. KM5、KM6　油泵接触器
5. KM7　刹车接触器
6. KM8　送料接触器
7. KT1　检错器（AMD）
8. KT2　时间继电器
9. KA1. KA2　中间继电器
10. FR1、2、3　热过载继电器

温州博宇机械有限公司

单速冷镦机原理图	Schematic Diagram of Single-Speed Cold Heading Machine	连续接触器	Continuous contactor
送料电磁阀	Feed solenoid valve	正点接触器	Positive point contactor
刹车电磁阀	Brake solenoid valve	反点接触器	Negative point contactor
电源指示灯	Power indicator	油泵接触器	Oil pump contactor
报警灯	Alarm indicator	刹车接触器	Brake contactor
计数器	Counter	油泵接触器	Oil pump contactor
计数器满指示灯	Full counter indicator	检错器	Error detector
棕/兰/黑	Brown/blue/black	时间继电器	Time relay
正点/反点/油泵	Positive point/negative point/oil pump	中间继电器	Intermediate relay
连续	Continuous	热过载继电器	Thermal overload relay
油泵运行灯	Oil pump running light	温州博宇机械有限公司	Wenzhou Boyu Machinery Co., Ltd.

Chapter 2 Installation Method of Forming Machine

1. Foundation

Please first understand the position of the machine and components with reference to the foundation drawing, and determine whether the foundation is secure and solid.

2. Cold heading forming machine

Please put the base of the machine on the selected location, then fasten it to the foundation bolt or foundation plate (24B, 27B, 33B or 41B), and put the hubs and parts of the machine in the right place as per assembly drawing.

3. Stretching and straightening platform

Please put the stretching and straightening platform of preforms in the right place (19B, 22B, 24B, 27B, 33B or 41B) with reference to the foundation drawing. In case of 8B, 11B or 14B, please mount the stretching and straightening platform of preforms on the base.

4. Coil holder

Please weld and install the coil holder step by step as per drawing.

5. Electrical wiring

Please check whether the connection of the wiring is correct with reference to the mark number of the electrical wiring diagram.

6. After installation, please check it once again, and prepare for test run after confirmation.

★ Attention: The bearing capacity of the lifting fittings must be greater than twice the weight of the equipment, otherwise there is a hidden danger of life safety and equipment loss.

Chapter 3 Disassembly of Bearing Seat and Mold Components

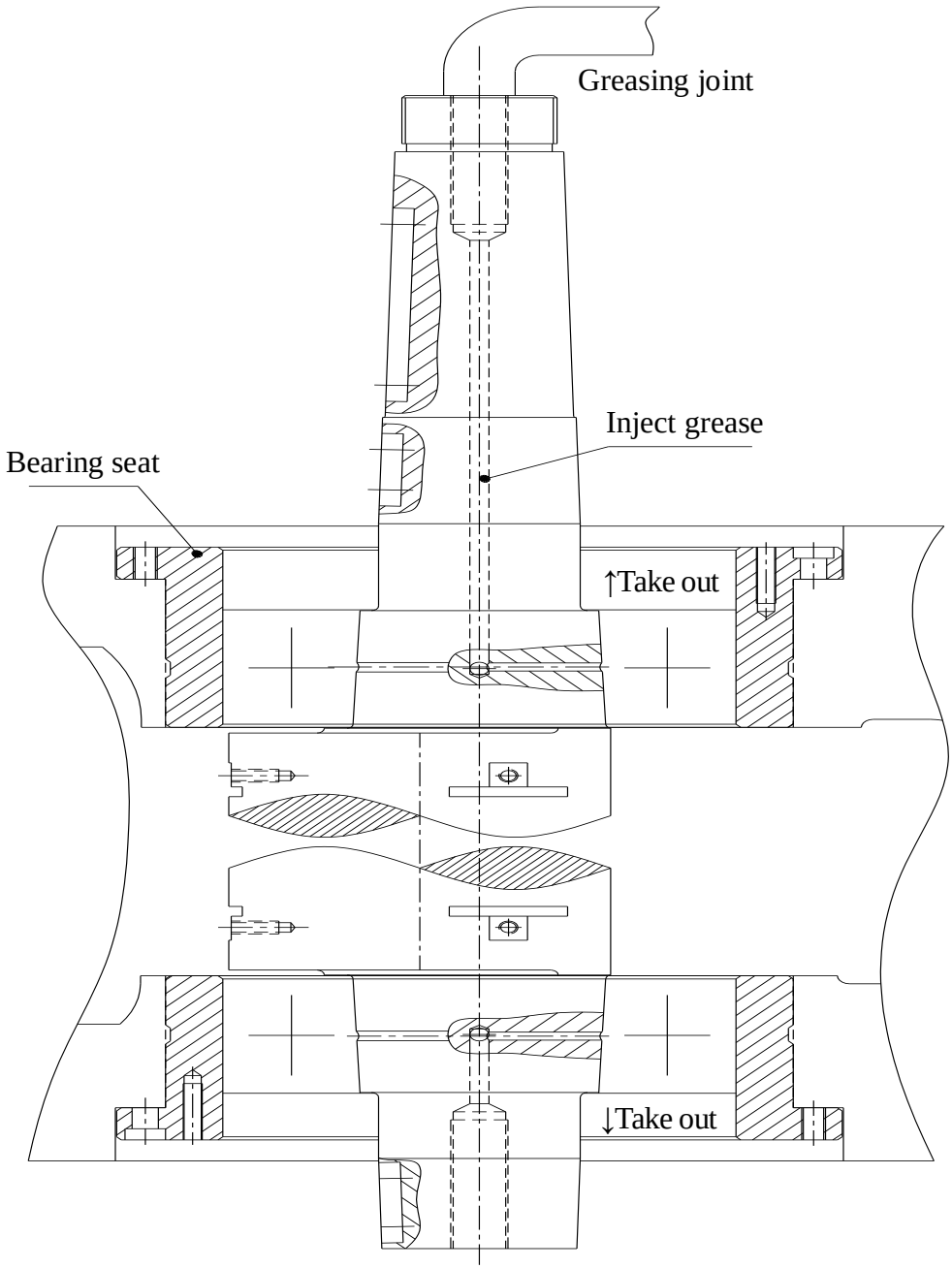
1. Disassembly of bearing seat
2. Mold mechanism
   2-1. Assembly Diagram of Die Set
   2-2. Front Stroke Diagram
   2-3. Diagram of Stroke Mold Component of Die Set
3. Introduction to mold components
   3-1. Diagram of Stroke Mold Component
   3-2. Diagram of Punching Mold Component
   3-3. Diagram of Ejection Component
   3-4. Punching Die
   3-5. Transfer Clamp
   3-6. Feed Ratchet
   3-7. Diagram of Outer Blade for Blanking

1. Disassembly of bearing seat

(1) Remove the bolts on the bearing seat.

(2) Use a hold plug and squeeze grease to separate the bearing seat from crankshaft.

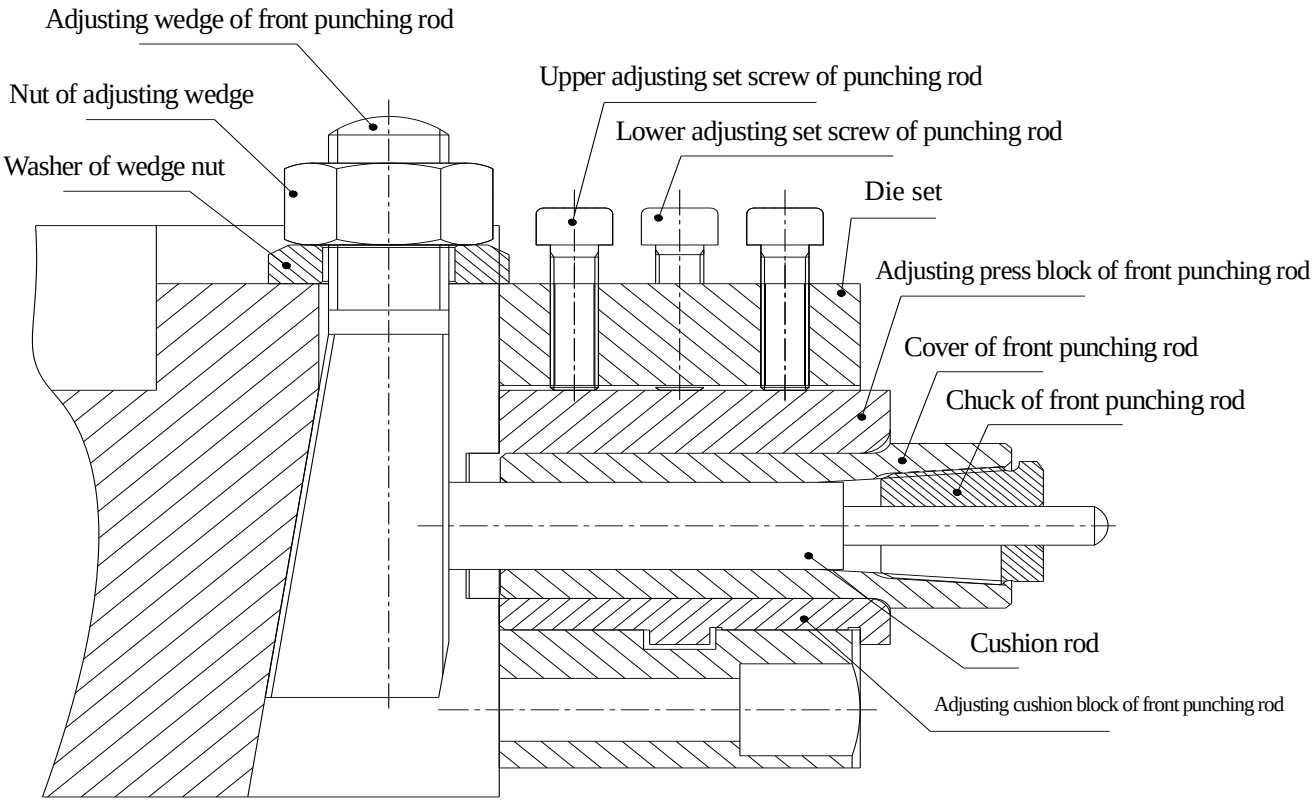
★ Attention: Prevent the bearing seat from falling during disassembly for fear of the loss of life and equipment damage.



(Figure)

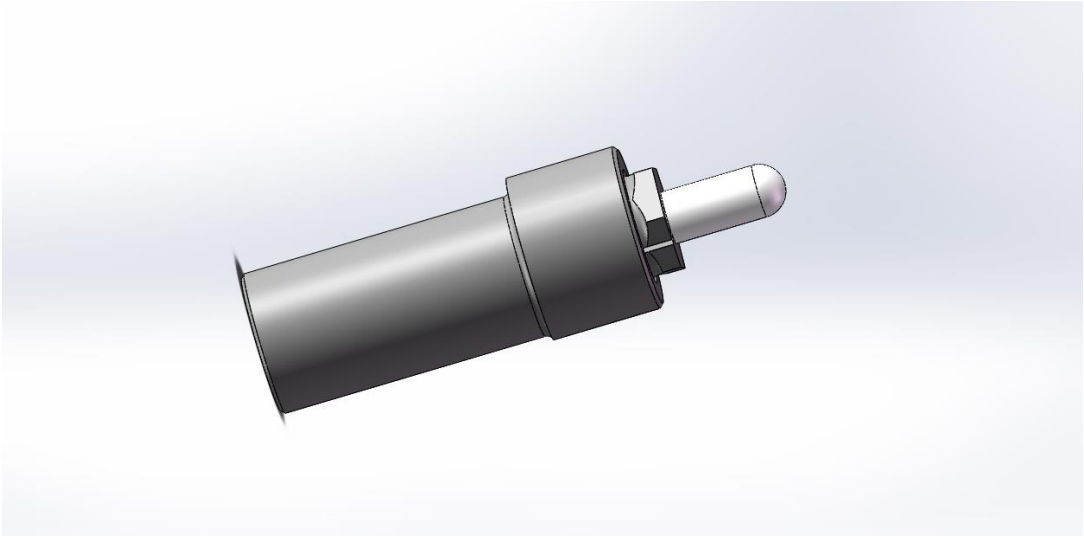
2. Mold mechanism:

2-1. Assembly Diagram of Die Set (As shown in Figure 1)

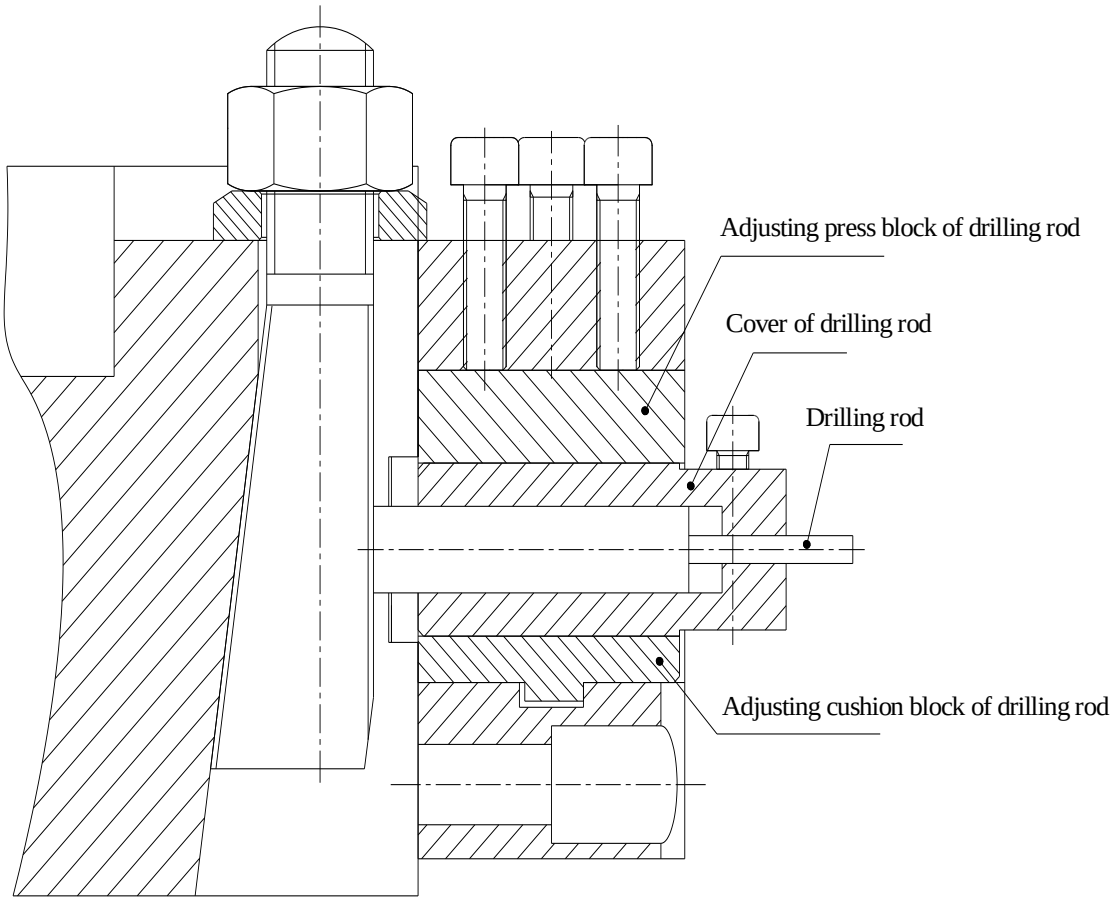


(Figure)

2-2. Front Stroke Diagram (as shown in Figure 2)



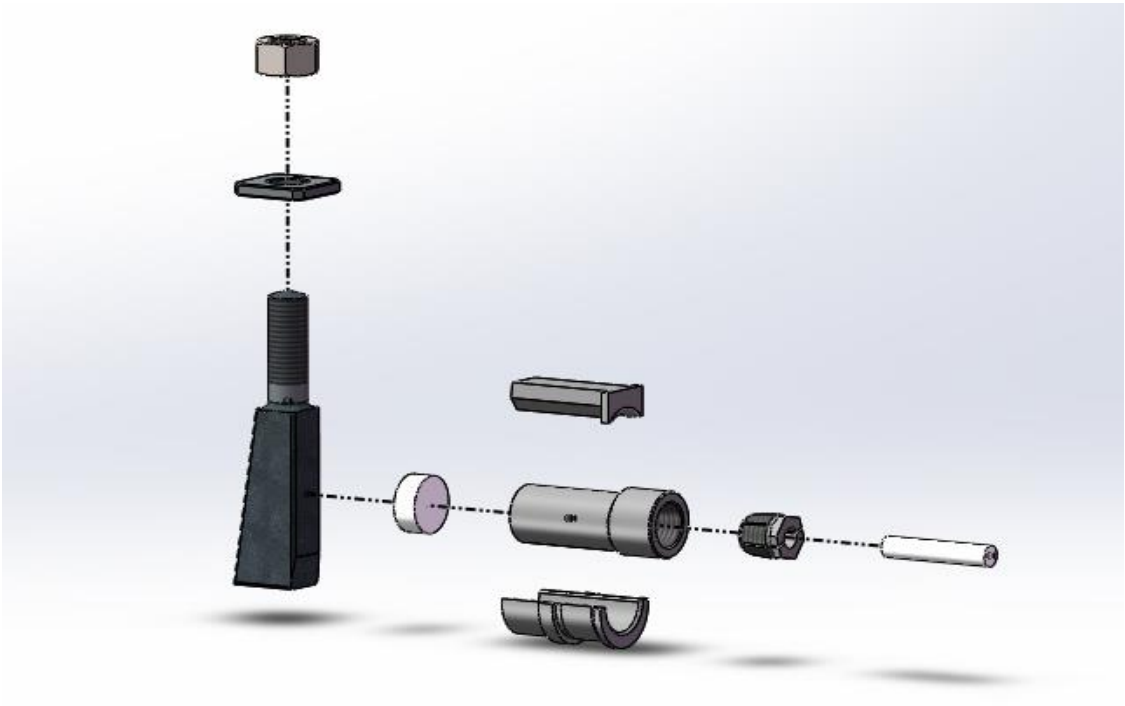
2-3. Diagram of Stroke Mold Component of Die Set (as shown in Figure 3)



(Figure)

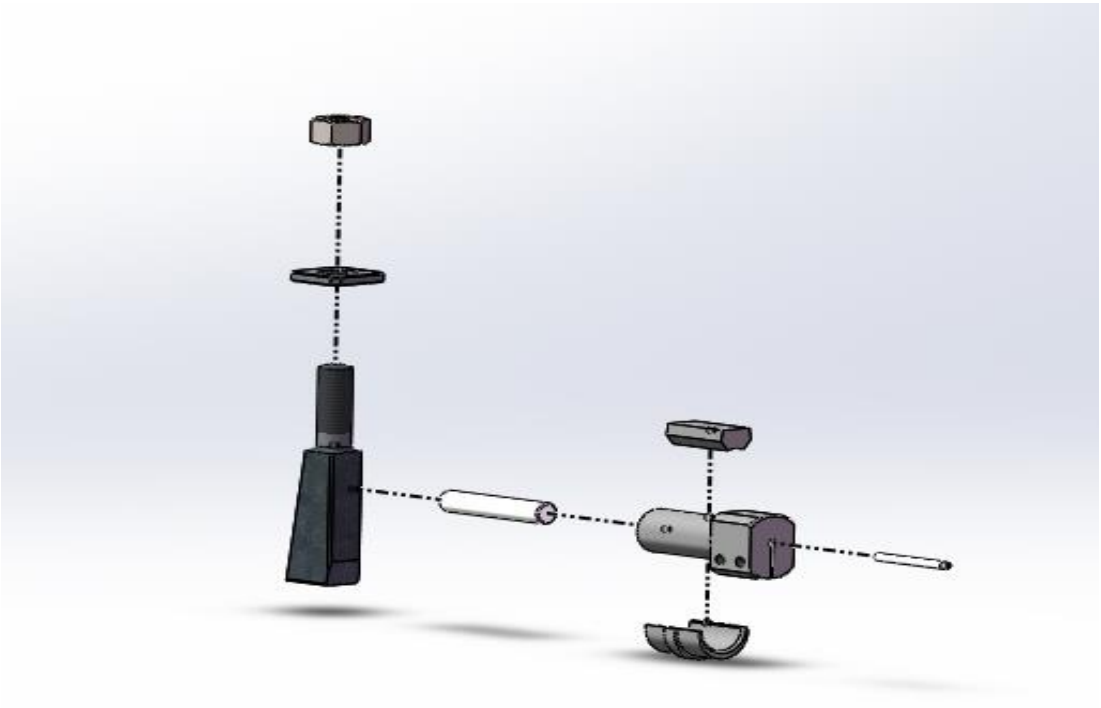
3. Introduction to mold components:

3-1. Diagram of Stroke Mold Component



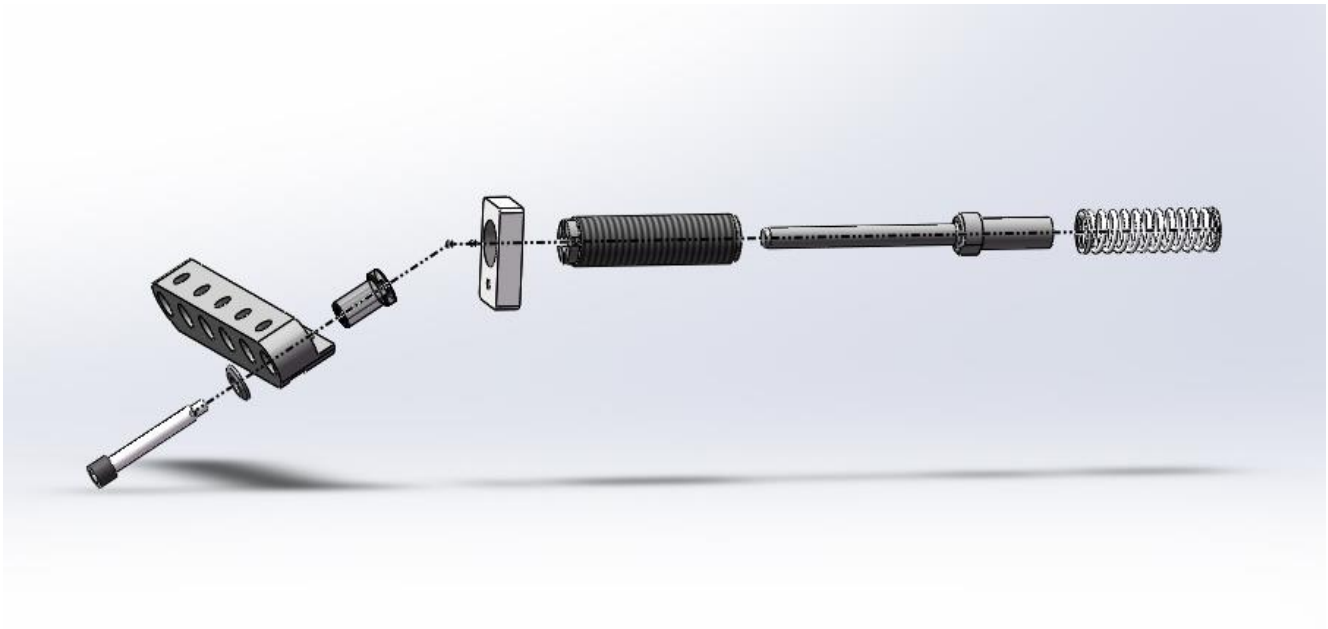
(Figure)

3-2. Diagram of Punching Mold Component



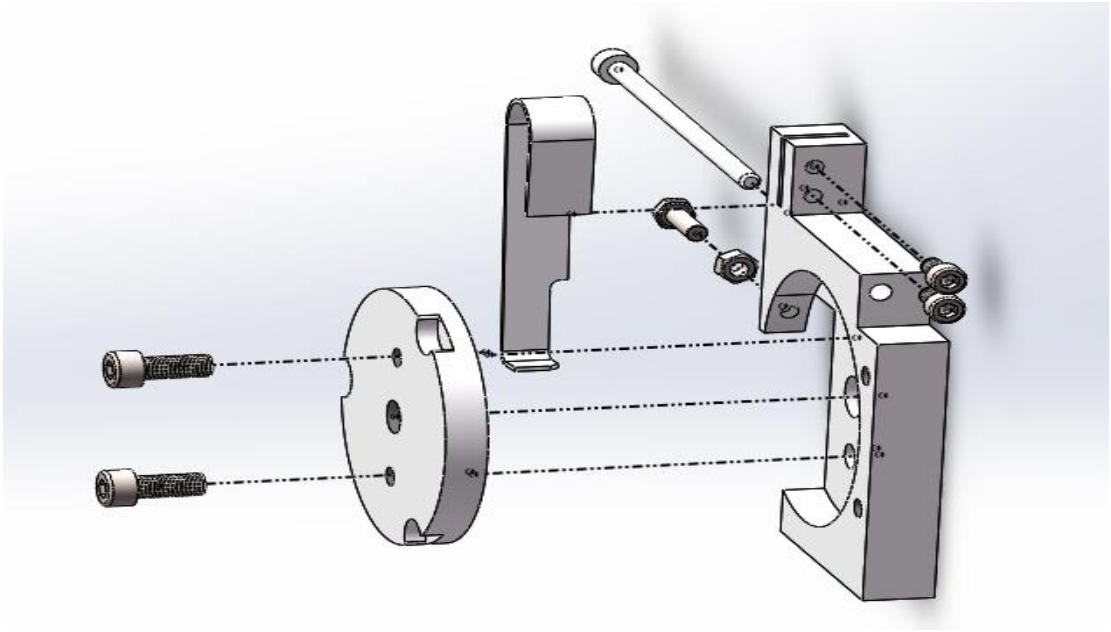
(Figure)

3-3. Diagram of Ejection Component



(Figure)

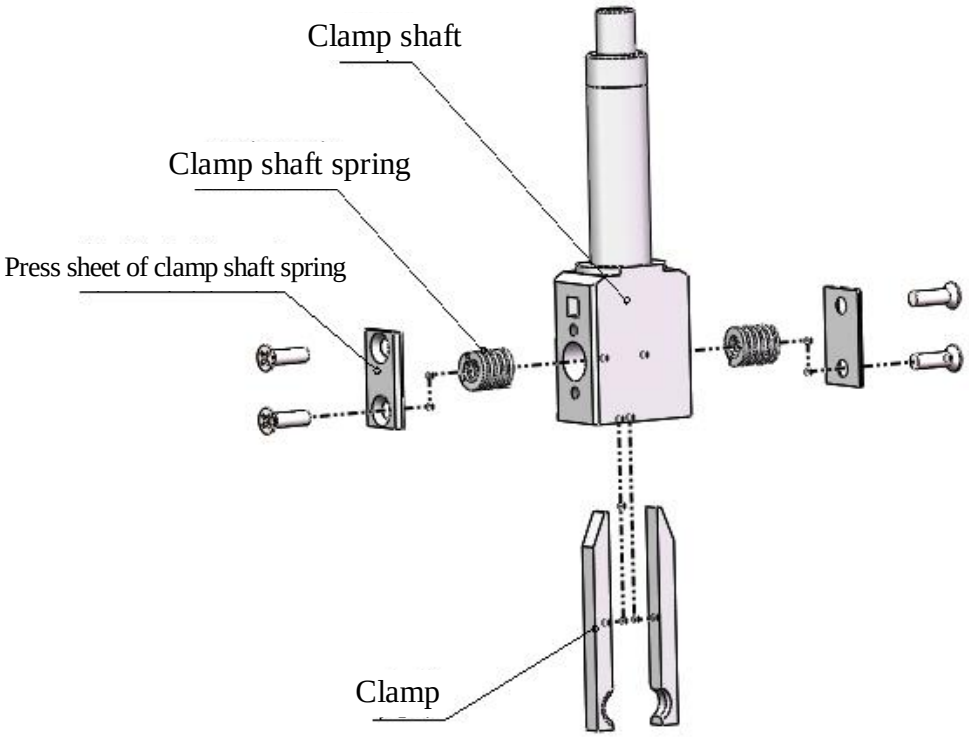
3-4. Diagram of Outer Blade for Blanking



(Figure)

3-5. Mandrel assembly

(1) Used for manufacture of common rod piece or rod material.



(Figure)

Chapter 4 Basic Operation Essentials of Forming Machine

1. Flywheel dial:

1-1. There is a dial on the spindle of the flywheel. On the dial, there is a mark for every 15°. Numbers are marked for every 30°.

1-2. “0” is set at the shortest distance between the main slider and the punching die.

1-3. Flywheel dial can make it easy for users to understand the relationships between different components.

(Figure)

2. Operating instructions:

(Identification Description Diagram)

2-1. F. Inching

When you press the button with your finger, the flywheel rotates clockwise; when your finger leaves the button, the flywheel stops rotating.

2-2. R.Inching

When you press the button with your finger, the flywheel rotates counterclockwise; when your finger leaves the button, the flywheel stops rotating.

2-3. Run

When you press the button with your finger, the flywheel rotates clockwise and the speed changes from slow to fast, which can be controlled at a fixed time interval within the electrical box.

2-4. Cool oil

When the arrow points at ON, cool oil ejects; when the arrow points at OFF, cool oil stops ejecting, and the machine stops running.

2-5. Feeding

When the arrow points at ON, start feeding; when the arrow points at OFF, stop feeding;

2-6. Speeds

When the arrow points at HIGH, the motor runs at a high speed (four poles).

When the arrow points at LOW, the motor runs at a low speed (eight poles).

2-7. Power

When the arrow points at ON, the power is on.

When the arrow points at OFF, the power is off.

2-8. Stop

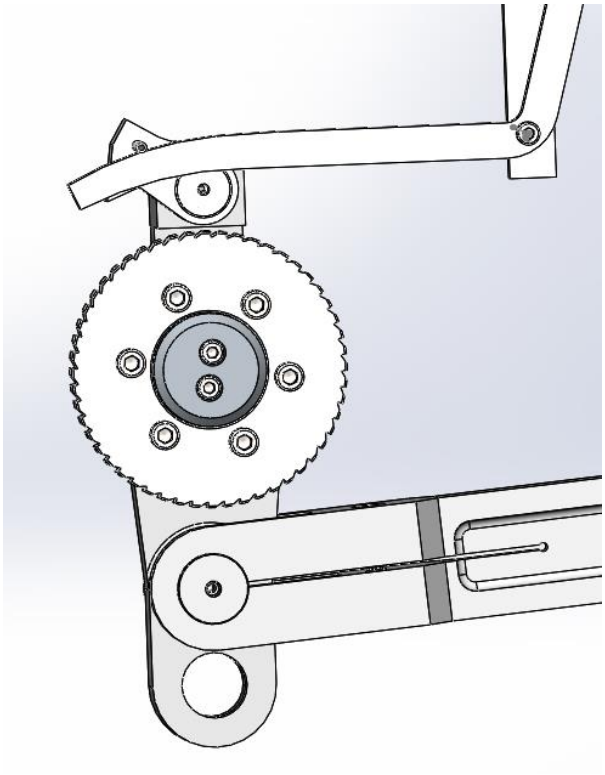
If it is necessary to stop during production, press the button to stop the machine.

Precautions:

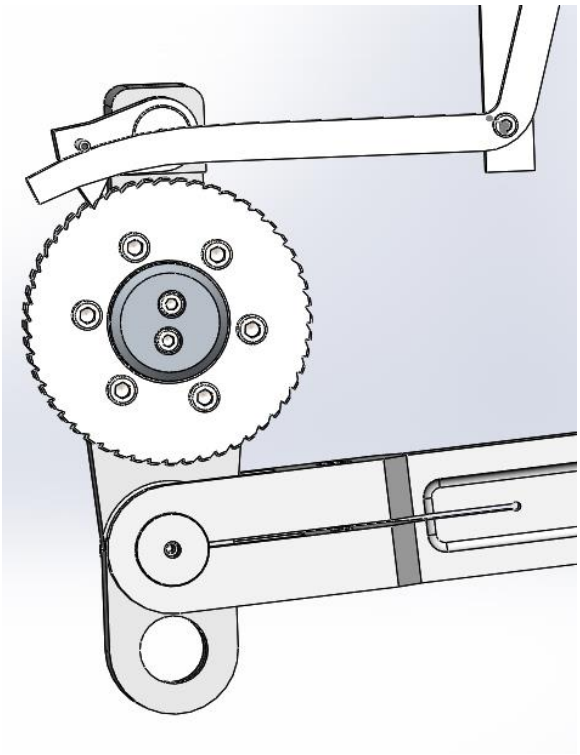
2-9. When you press the R. Inching button and the flywheel rotates counterclockwise, it should be noted that whether the molds will be in collision.

2-10. If it is necessary to stop during production, first press STOP and then switch COOL OIL button to OFF to turn off the mold cool oil.

3. Stop feeding:



(Attached figure)



(Attached figure)

As shown in the figures above, switch “PAWL SWITCH” to “ON”, the pawl drops down and gets in touch with ratchet wheel, and start feeding. If “PAWL SWITCH” is switched to ON, the pawl lifts up and is no longer in touch with ratchet wheel, the feeding roller stops running, wire rod stops and no longer stretches out of the inner blade mold, in which case blank will no longer be cut out.

4. Wire change method:

4-1. In case of only a few coils for the wire rod on the coil holder, please check if the wire rod is twisted in the axial direction. If so, it shall be cut off.

4-2. If the wire rod only has a length of 10-20cm stretching out of the metal plate of the machine, the machine shall stop running.

4-3. Turn off mold cool oil.

4-4. Return the cutter to the near end, and the pointer points at 195° on the flywheel dial.

4-5. Loosen the locking bolts of the feeding platform.

4-6. Draw the wire end.

4-7. Check whether the new wire rod coil is in line with the specification as required.

4-8. Put the new wire rod coil in the coil holder, and make sure that the coil rotates counterclockwise. (it would be best to mark the wire end when drawing the wire and take it as the front end of feeding, of which wire end refers to the bottom part after rollover when wire is drawn.)

4-9. Straighten the wire end, penetrate it into the part between two stretching and straightening guide wheels of the stretching and straightening platform, and then adjust the clamp handle to clamp the wire rod.

4-10. Rotate the stretching and straightening guide wheels with a T-shaped box wrench, so that the wire rod can pass through five stretching and straightening wheels on the stretching and straightening platform.

4-11. After wire rod passes through the last stretching and straightening wheel for about 20cm, check whether there is any protruding part on the wire end. If so, trim it with a file.

4-12. Make the wire rod keep moving between feeding rollers. If the wire end is deviated from the center line of the roller guide for more than 20cm, adjust the last stretching and straightening wheel, and guide the wire end into the feed channel of the feeding roller.

4-13. Make the wire rod keep moving until the protruding part of the wire end is approximately level with the outer blade.

4-14. Fasten the pressing and locking bolts of the feeding platform.

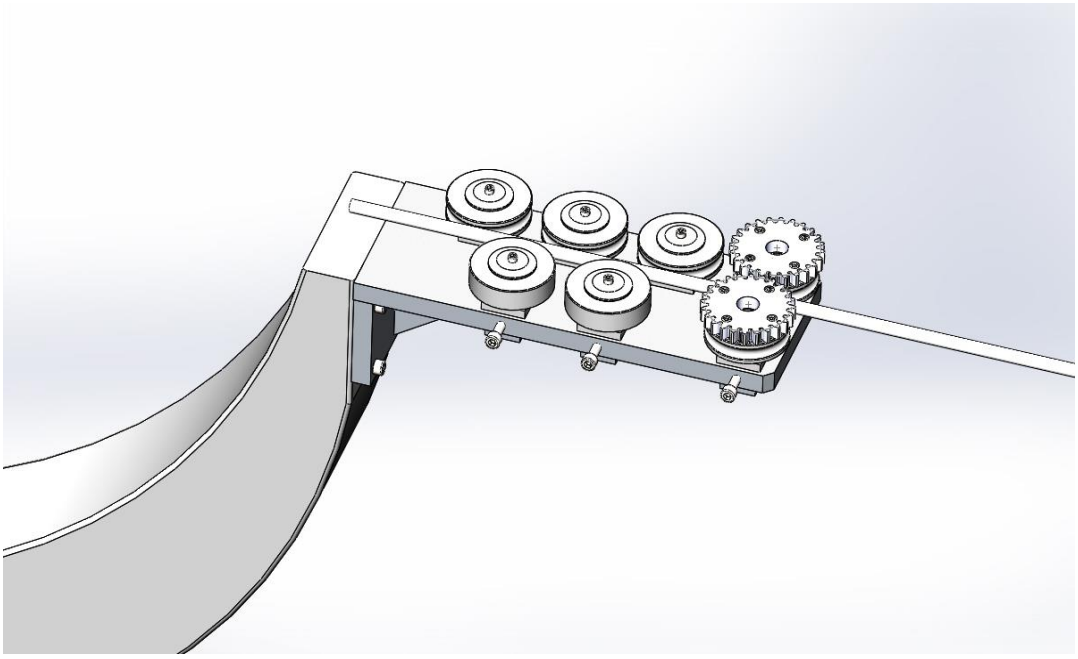
4-15. Loosen the clamp handle of the stretching and straightening platform.

4-16. Press R.Inching button, so that the outer cutter can exactly get in touch with wire rod.

4-17. Press F.Inching button again, cut off the wire end, and take out the blanking of the wire

4-18. Press F.Inching button, so that the cutter can cut out the first blank and the outer cutter can move to the part between the inner blade mold and the first punching die, then use a 0.04mm-thick gauge to insert it into the space between stop pin and outer blade clamp. If unable to pass through, check whether the cutter edge is worn or the stop pin is too long. If so, replace it.

4-19. Complete the operation of incoming line.



(Figure)

5. Replacement method of feeding wheel:

5-1. Open the rear punching cover.

5-2. Then open the window of the feeding wheel.

5-3. Remove the rear punching seat. (For the convenience of work)

5-4. Remove the feeding wheel by removing each bolt on the feeding wheel. (Before removing the feeding wheel, be sure to move the lower rolling shaft to the right side.

5-5. Repeat the same steps in reverse order to install back the new feed.

5-6. When replacing the feeding wheel, remember to remove any instrument mounted on the feed gear, otherwise it may damage the parts of the machine.

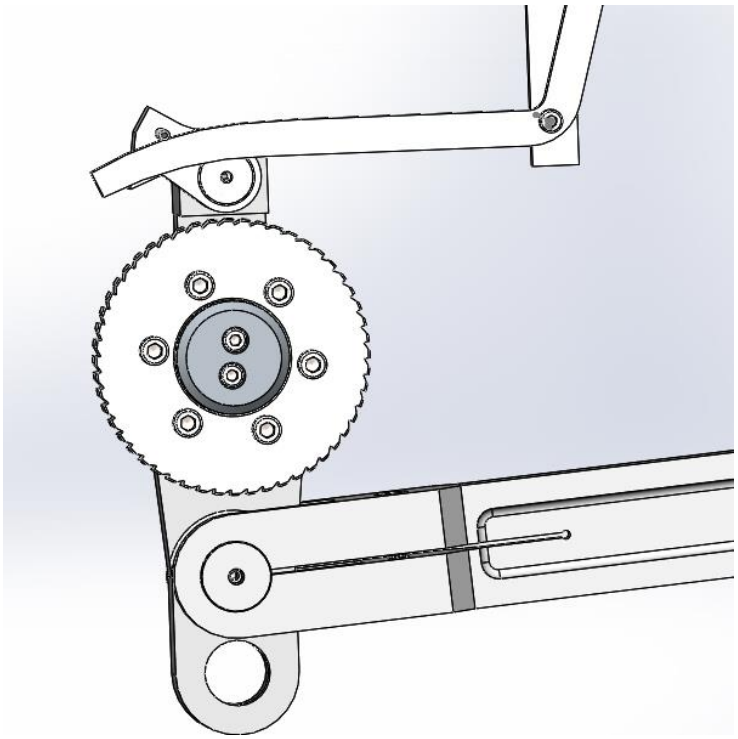
6. Replacement of feeding ratchet and push amplitude adjustment method of ratchet pawl:

6-1. Open the metal plate cover on the side of the machine.

6-2. Replace the feeding ratchet: (as shown in Figure 6-4)

6-2-1. Remove the ratchet by removing the locking bolts on the ratchet.

6-2-2. Install back the new ratchet, and make sure that the direction of the ratchet gear shall be the same as the original direction.



(Figure)

6-3. Adjust the push amplitude of the pawl:

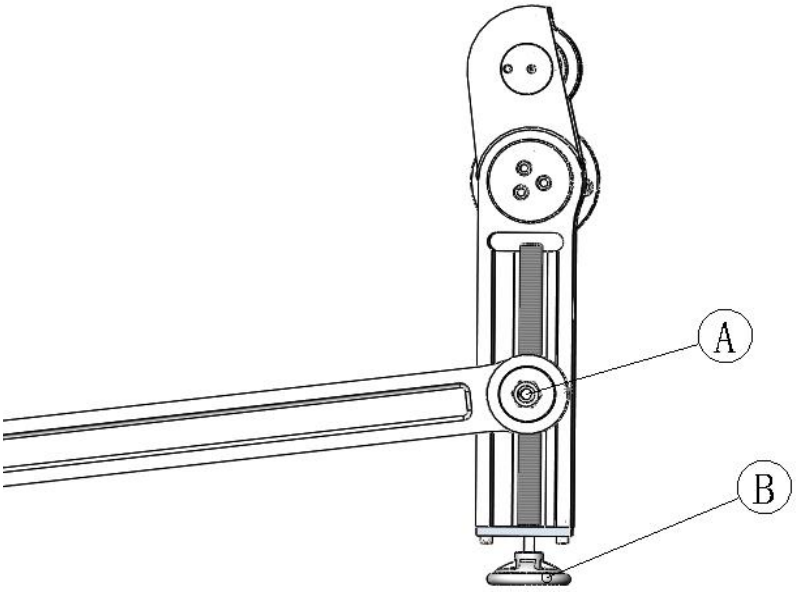
6-3-1. Adjust the wrench with a feeding rocker, and unscrew the fixed nut of the connecting rod. (As shown in Figure 6-5A)

6-3-2. Move the connecting rod up and down by unscrewing the lower hand wheel (as shown in Figure 6-5B), and lower the connecting rod if you want to increase the swing; raise the connecting rod if you want to reduce the swing.

6-3-3. During test run, check whether the push amplitude of the pawl is proper. If not, please repeat above adjustment.

6-3-4. In order to ensure accuracy, it is necessary to clamp the wire rod in the

feeding wheel when carrying out the adjustment test.



(Figure)

7. Replacement of the outer blade edge:

7-1. Switch PAWL SWITCH to OFF and stop feeding.

7-2. Return the cutter to the rear end (the flywheel dial registers 195°).

7-3. Remove the blank on the cutter edge.

7-4. Loosen the fastening bolt of the round outer blade on the cutter cylinder.

7-5. Dab the outer blade and make it rotate to another new blade edge.

7-6. As the outer blade edge aligns at the hole of the inner blade mold, slightly tighten the set bolt.

7-7. Switch PWL SWITCH of the cutter to ON.

7-8. First press R.Inching button for the outer blade, and then press F.Inching button to make the outer blade press hard against the wire rod. (Now, the wire rod has not

yet been cut off)

7-9. Tighten the set bolt.

7-10. Press F.Inching button to cut off the blank, take it out and check the blanking.

7-11. Complete the operation of blade edge replacement.

8. Replacement of the outer blade:

8-1. Stop the machine and turn off the pawl switch.

8-2. Turn the operation platform up.

8-3. Press F.Inching button to move the main slider to the bottom part (the flywheel dial registers 180°).

8-4. Remove the bolts on the cutter cylinder that are used to fix the cutter.

8-5. Press F.Inching button again to the position where the flywheel dial registers 270°.

8-6. Remove 2 bolts on the cutter cylinder that are used to fix the outer blade seat.

8-7. Remove the components of the entire outer blade and replace the outer blade.

8-8. Mount the new outer blade on the outer blade seat.

8-9. Put the outer blade components in the cutter cylinder, screw on the connecting bolt on the cutter box, but do not fasten it, and make sure that the two small bolts shall not protrude from the counterbore hole of the cutter cylinder in order not to hinder the interaction of cutter cylinder.

8-10. Return the outer blade to the rear end, i.e. the flywheel dial registers 180°.

8-11. Make the outer blade straight with hands to make it approximately align at the inner blade.

8-12. Slightly press R.Inching button to make the outer blade edge move forward

approximately ahead of the edge of the inner blade mold, and turn on the pawl switch.

8-13. Press F.Inching button to make the outer blade press hard against the wire rod.

8-14. Fasten the large bolt.

8-15. Press F.Inching button to the position where the flywheel dial registers 270°.

8-16. Fasten the small bolt and take out the outer blade to cut off the blank.

8-17. Press F.Inching button again to make the outer cutter press hard against the wire rod.

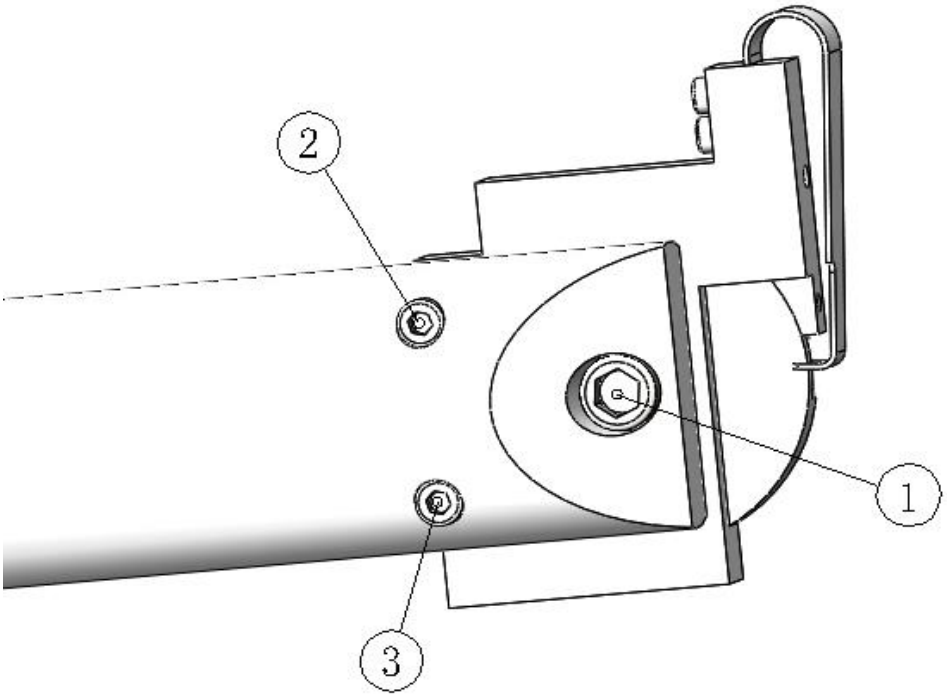
8-18. Fasten the large bolt again.

8-19. Press F.Inching button to cut off the wire rod (the flywheel dial registers 270°), and take out the blank of the cutter.

8-20. Press F.Inching button again to make the cutter return to the near end, i.e. the flywheel dial registers 180°.

8-21. Check whether the gap between the inner blade mold and the outer blade is 0.1-0.2mm.

8-22. Finally check the first front punching rod and cutter to make sure that there is no collision.



(Figure)

9. Adjustment of front punching rod:

9-1. Caption:

9-1-1. As shown in the figure below, (1) and (2) are the set bolts on the cover of the front punching rod, which are used to compress the front punching rod.

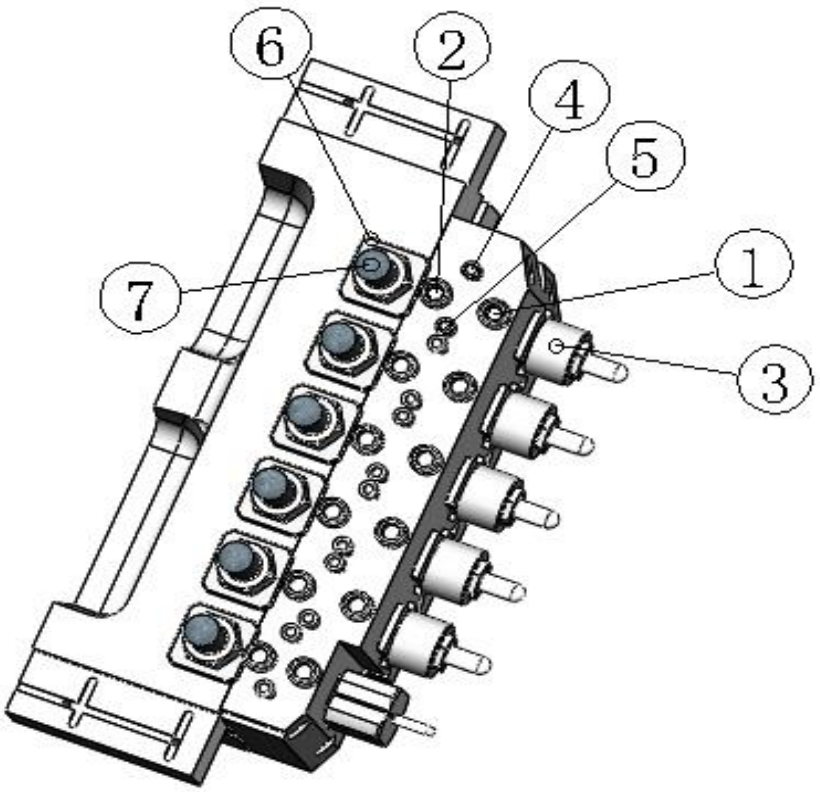
9-1-2. (3) shown in the figure is the cover of the punching rod, and the center of the rod can be adjusted up and down by rotating it.

9-1-3. (4) and (5) shown in the figure are the adjusting bolts under the cover of the front punching rod, and the position of the front punching rod can be adjusted from left to right. If you want to rotate, screw on one bolt first (loosen) and then screw off

another.

9-1-4. (6) shown in the figure is the adjusting angle pin nut of the front punching rod.

9-1-5. (7) in the figure is the adjusting angle pin of the front punching rod.



(Figure)

9-2. Essentials for aligning front punching rod with the center of the punching die hole:

9-2-1. Loosen bolts (1) and (2).

9-2-2. Remove the transfer clamp from the center shaft, take a sheet of PE plastic film with a thickness of about 0.1mm, smear oil on it and stick it to the surface of the

die hole.

9-2-3. Make the front punching rod slowly move to the place about 2-3mm from the rod head, push the punching rod to the die hole by hand, but make sure that the punching rod shall not be separated from the cover of the punching rod, press F.Inching button and keep the punching rod moving to the rear end. (The flywheel dial registers 0°)

9-2-4. Tighten bolts (1) and (2).

9-2-5. Withdraw the front punching rod from the die hole, and take out PE plastic film.

9-2-6. Take another new sheet of PE plastic film and stick it to the die hole, and slowly insert the front punching rod into the die hole, but make sure that it will not reach the rear end.

9-2-7. Press R.Inching button to make the punching rod withdraw from the die hole, take out PE plastic film, check the marks on the film, and the interrupt of the marks can point out the deviation direction of the punching rod. If the front punching rod is eccentric with the die hole, there are uniform continuous marks only on the PE plastic film.

9-2-8. Adjust the punching rod by marks

For example: If the interrupt of the marks is in the first quadrant (in the upper right), adjust according to following steps:

(a) Unscrew bolts (1) and (2).

(b) Slightly rotate the cover of the punching rod counterclockwise.

(c) Unscrew bolt (5) and tighten bolt (4).

(d) Tighten bolts (1) and (2).

9-2-9. Repeat steps 7 and 8 until alignment with the center.

9-3. Adjust the front punching rod back and forth:

Loosen the cover head of the front punching rod, unscrew bolt (1) and tighten nut (6), and raise angle pin (7) of the punching rod. That is, move forward the front punching rod; unscrew nut (6), and knock down the angle pin, and move forward the blank of the compression die, in which case it may move backward the front punching rod. When adjusting the movement backward, it is not necessary to loosen the cover of the front punching rod and bolt (1). Tighten the cover of the punching rod and bolt (1) when checking the blank is punched properly, in which case it is deemed as an adjustment.

10. Align the first front punching rod with the hexagonal punching rod

10-1. When doing this work, it must be done under following conditions:

10-1-1. Each stroke mold has been located.

10-1-2. The second punching rod has been installed properly, and the center is adjusted to align with the center of the stroke die properly.

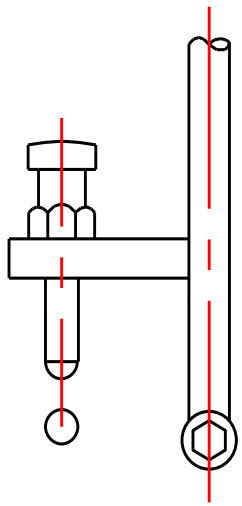
10-1-3. The center of the first hexagonal punching rod is aligned with the hexagonal stroke mold, and its alignment essentials are the same as those given in Item 9.

10-1-4. After alignment, insert the first punching rod with a specially set wrench, and then adjust the bolt on the wrench to make it slightly touch the surface of the second punching rod.

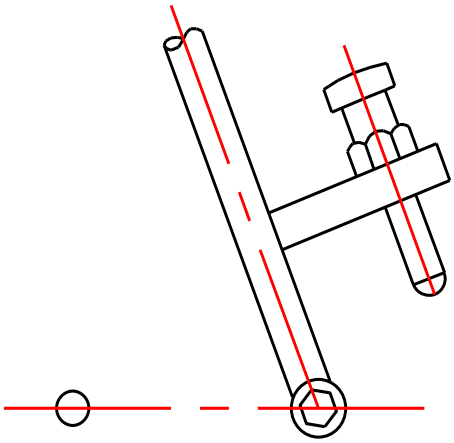
10-2. If the punching rod is slightly deviated from the direction of the cutter cylinder (right), and cover the set wrench until the bolt that is rotated counterclockwise (left)

to the set wrench touches the second punching rod. (As shown in Figure 4)

10-3. If the punching rod deviates too much to the extent that the wrench cannot be covered, it can be reversely covered and slightly adjusted (as shown in Figure 5), and then re-adjust as per 2.



(Figure 4)



(Figure 5)

11. Replacement of front punching rod:

11-1. Stop the machine and turn off the pawl switch.

11-2. Press F.Inching button to withdraw the front punching rod from the punching die, so as to make the slider retreat from the rear end. (The flywheel dial registers 180°)

11-3. Take out the blank inside the transfer clamp.

11-4. Disassemble the wrench by the cover head of the front punching rod, and take out the punching rod by disassembling and taking down the cover of the front

punching rod.

11-5. Check if the length of the new punching rod is the same as that of the old one, and whether the mold numbers are the same.

11-6. If the same, insert the cover head and tighten the cover of the front punching rod.

11-7. If the new punching rod is too long, first lower and adjust the angle pin, then install the punching rod, and then adjust the position of the punching rod, so that the printed blank is properly punched.

11-8. If the new punching rod is slightly short, raise the angle pin after installing the punching rod until the printed blank is properly punched.

11-9. The replacement method for the punching rod of square punching cover head is the same as that stated in 12-4.

12. Replacement of punching rod:

12-1. As for various adjustment method of the punching rod, except that the punching rod is fastened with bolt instead of cover head, others are the same as those of the front punching rod.

12-2. Assembly sequence:

12-2-1. Install the punching die according to the essentials of the assembly punching die. If the punching die is not a tungsten steel die, first install the die seat, and then install the die shell and upper mold core.

12-2-2. Install the punching rod, and follow the centering adjustment method as mentioned above to align the punching rod with the center of the punching die.

12-2-3. Install the stripper plate and adjust it to make the hole center align with the

center of the punching rod as much as possible, that is, when the punching rod stretches in, there are residual gaps everywhere, which shall be the same as much as possible.

12-3. Precautions:

12-3-1. Before replacing the punching rod, first check whether the alignment of the punching rod with the center of the punching die is kept correct, and whether the stripper plate is still firm without looseness.

12-3-2. If the above three are still accurate, the punching rod can be replaced.

12-3-3. If there is any deviation among the three, adjust according to the method stated in 12-2.

12-3-4. It should be noted that whether the length of the new punching rod during assembly is the same as that in use. If not, adjust back and forth according to the essentials.

12-4 Replacement of punching rod:

12-4-1. Stop the machine and press “F.Inching button” to move the main slider to the farthest end. (The flywheel dial registers 180°)

12-4-2. Unscrew the 2 bolts on the cover of the punching rod and cushion on the cover of the punching rod, and compress the bolt near the punching die end.

12-4-3. Take out the punching rod.

12-4-4. Properly install the new punching rod in reverse order.

13. Replacement of rear punching rod:

13-1. Stop the machine and press “F.Inching button” to separate the rear punching bolt from the rear punching main rod. (The flywheel dial registers 270°)

13-2. Remove any set bolt on the rear punching seat, and take down the rear punching seat.

13-3. Loosen the rear punching rod and fasten the angle pin nut with a wrench, dab the angle pin rod with a hammer, and take out the lock nut, washer and locking angle pin of the rear punching rod

13-4. Take out the entire rear punching screw with a T-shaped box wrench (as shown in the figure).

13-5. Take out the rear main rod. (Component of rear punching rod)

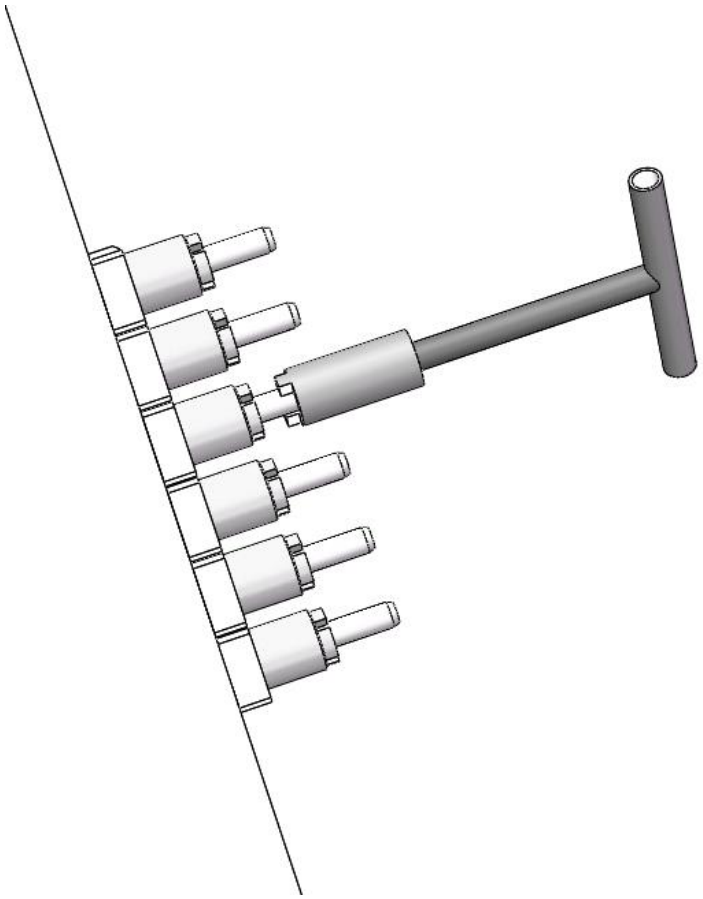
13-6. Clamp the rear punching main rod to the vise.

13-7. Remove the cover head of the rear punching rod with a wrench, and take out the rear punching rod.

13-8. Install the new rear punching rod in reverse order, and install back the adjusting angle pin, washer, lock nut and rear punching seat of the rear punching main rod.

13-9. During test run, properly adjust the position of the rear punching screw according to the punching degree of the blank.

13-10. After adjusting the rear punching screw in place, adjust the nut by hand in place, and then fasten the fixed nut of packing angle pin with a wrench, in which case the replacement is deemed completed. (The packing angle pin must be at the lowest end)



(Figure)

14. Replacement of stripper plate:

14-1. Move the main slide to the rear end. (The flywheel dial registers 180°)

14-2. Unscrew the bolt at the center of the stripper plate, and take out the bolt nearby.

14-3. Rotate the stripper plate by hand and make sure that the correct hole aligns with the punching rod (the mark on the stripper plate represents the diameter of the end of punching rod cover).

14-4. Lock the two bolts as mentioned in 14-2.

14-5. Align the hole on the stripper plate with the punching rod.

14-6. Press “F.Inching button” to make the punching rod pass through the hole on

the stripper plate slowly, then check whether there is gap between the punching rod and hole with a mirror, and adjust to make the gap uniform.

14-7. Lock the two bolts after adjustment.

14-8. When replacing the entire stripper plate, remove the two bolts, take out the stripper plate, then load the stripper plate, lock the bolts, and adjust according to Steps 14-3~14-7, in which case the replacement can be completed.

15. Replacement of punching die:

15-1. Remove the components of the rear punching rod according to the essentials given in Section 13 of this chapter, and take out the compression spring of the rear punching rod.

15-2. Turn the transfer clamp platform up with reference to the essentials of Section 17.

15-3. Use an L-shaped hexagonal wrench especially designed for removing punching die to remove the set bolt of the punching die, and taken down the punching die.

15-4. Install the new punching die.

15-5. Put a steel ruler above each die for adjustment, make sure that the new die and other dies are on the same straight line and then fasten all bolts.

15-6. Install back the components of the rear punching rod.

15-7. Properly adjust the punching procedure for blank forming.

15-8. Put back the transfer clamp platform, in which case the replacement of die is deemed completed.

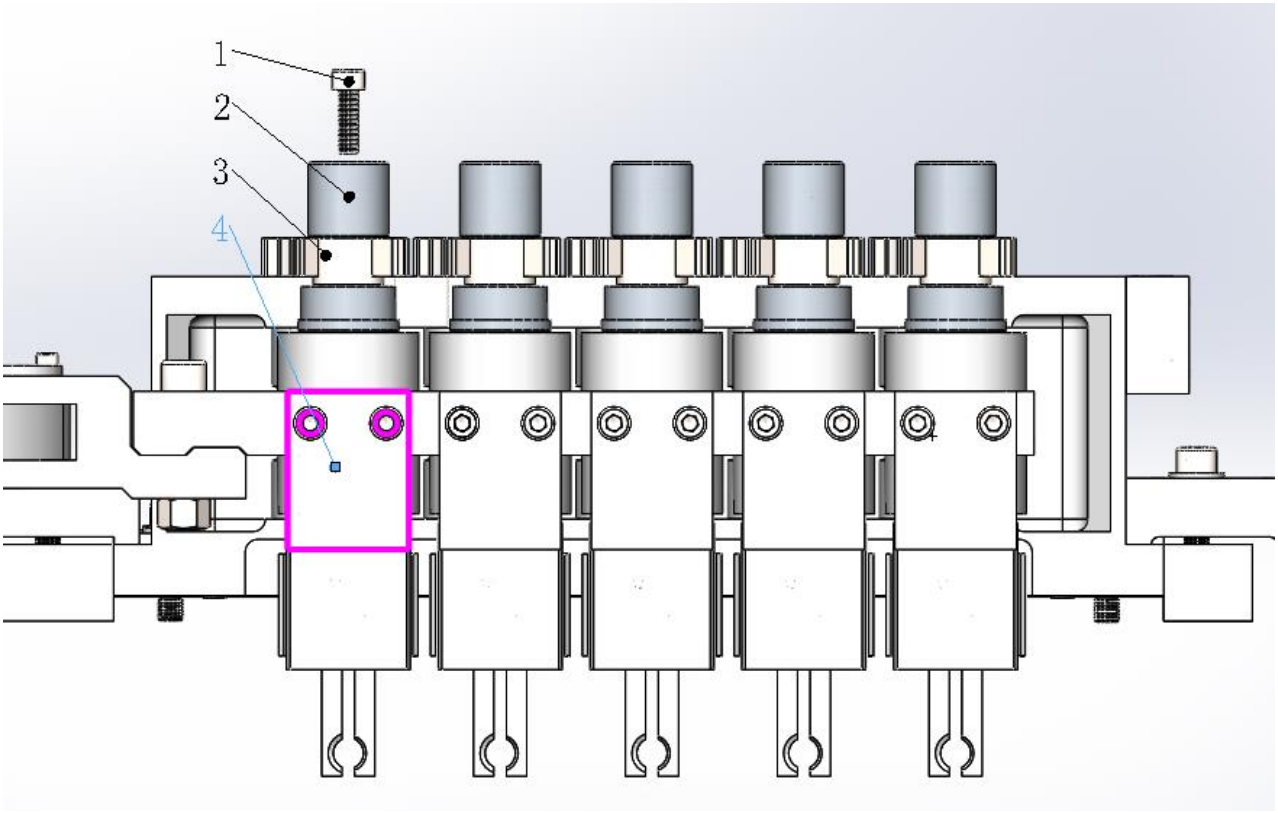
16. Rollover control of forming blank:

16-1. Remove bolt (1).

16-2. Take out gear cover (2) and remove gear (3).

16-3. Press the clamp shaft through fixed pulling plate (4) of bolt.

(Note) The rollover control of forming blank means that transfer clamp action is a mode of rotation or translation.



(Figure)

17. Replacement of transfer clamp:

17-1. Press “F.Inching button” to rotate flywheel for 120°.

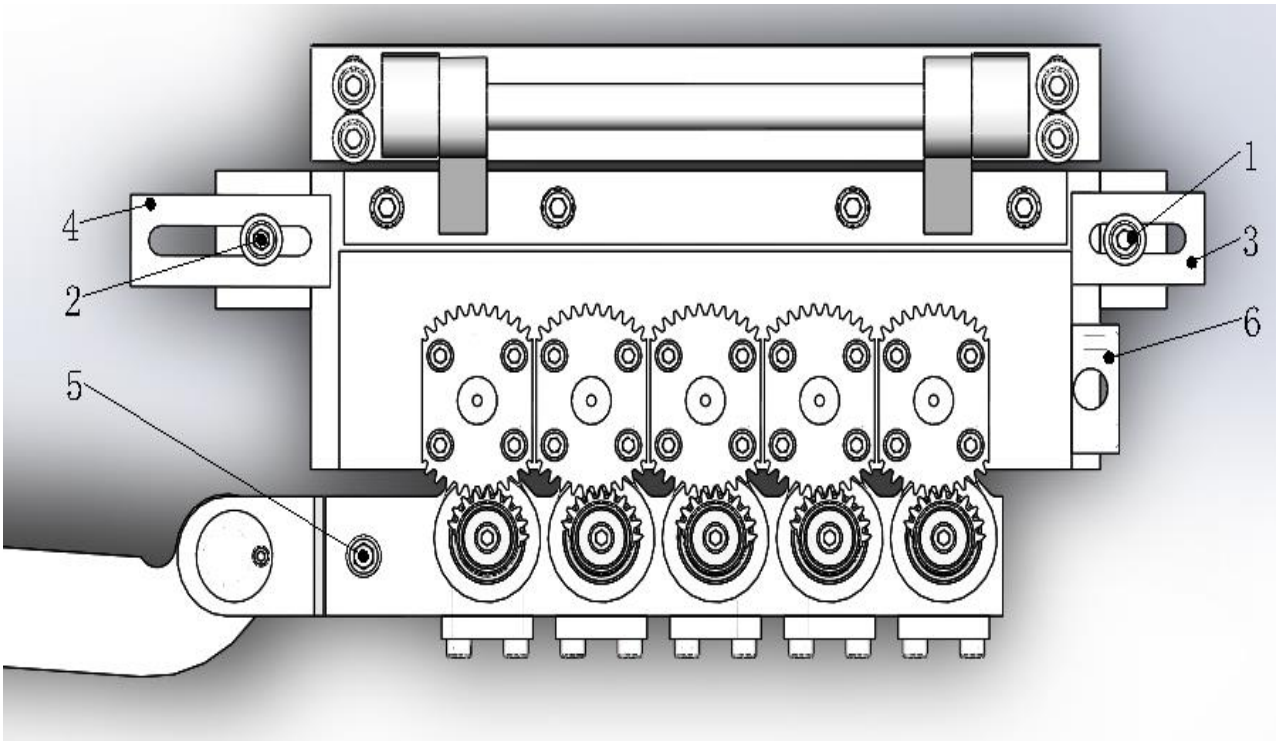
17-2. Unscrew the bolts (1) and (2) shown in Figure 17-11.

17-3. Move the fixed plates (3) and (4) shown in the figure to both sides.

17-4. Remove bolt (5).

17-5. When turning the transfer clamp platform up, insert into hole (6) with an iron

rod and be careful with the rollover clamp platform.



(Figure)

17-6. Turn the transfer clamp platform up:

(A) Cover the “wrench for the hinge pin of clamp platform” on the square head of the clamp platform spindle, and the wrench is tilted to the left now.

(B) Rotate the wrench to the right (lower than the wall of the machine), and raise the clamp platform now.

(C) Insert the iron rod specially designed for rollover into hole (1).

(D) Rotate the iron rod to the right, and turn the clamp platform up and make it lean against supporting block (2), in which case the turnover is deemed completed.

(E) The work of turning down is carried out in reverse order, but it should be noted that be sure to press the wrench and make it press hard against the wall of the machine when rolling over the clamp platform with an iron rod, so as to prevent cranking up.

17-7. As shown in Figure 17-12, take out the operation clamps on the left and right sides by removing bolts (a) and (b).

17-8. Select a right transfer clamp (check the mark on the lower end) and spring piece (whose sharp end aligns with the small groove of the operation clamp).

17-9. Load the operation clamp and spring piece into the clamp shaft hole, and dab to make sure that spring piece actually presses hard against the groove.

17-10. Locate the transfer clamp by fastening bolts (a) and (b).

17-11. Turn back the clamp platform in reverse order and fasten it with the connecting rod.

18. Adjustment of blank push stroke for rear punching rod:

18-1. Each hole on the rear punching seat has a rear punching bolt, the length of the protruding sleeve is fixed by its nut, and the protruding length of the rear punching bolt determines the push stroke of the punching rod. Therefore, after the rear punching bolt is adjusted to make the blank pushed by the punching rod out of the punching die, it is clamped in place by the transfer clamp.

18-2. During adjustment, there shall be blank within the punching die.

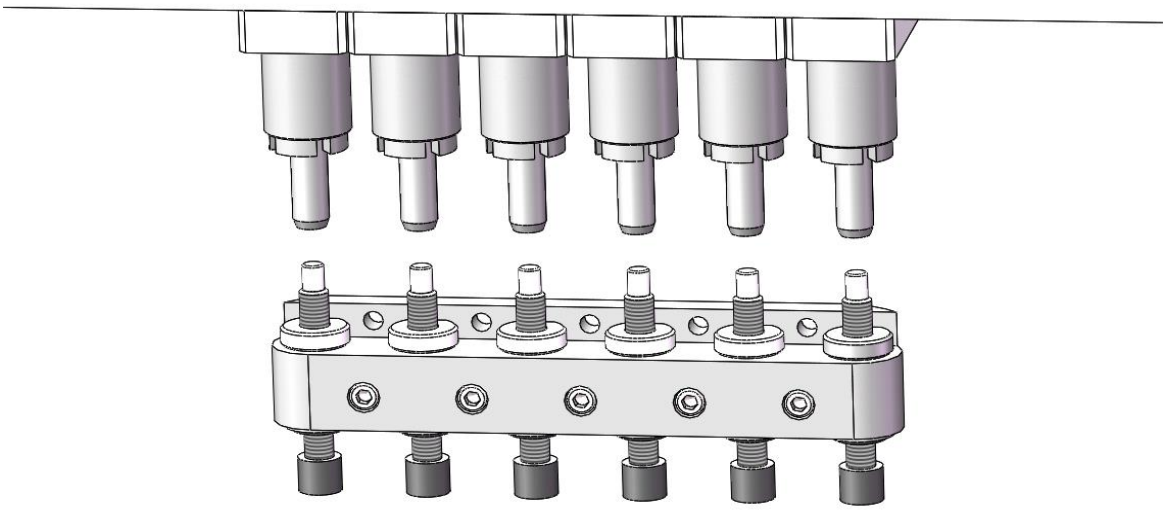
18-3. Press “F.Inching button” to rotate the flywheel to 180°.

18-4. Unscrew the fixed nut of the rear punching bolt.

18-5. Adjust the rear punching bolt, and make sure that the blank pushed out can be pushed in the right place of the transfer clamp.

18-6. The so-called “right place” means that after the blank is pushed out, there is a certain gap between its bottom and the punching die face.

18-7. After adjustment, fasten the fixed nut.



(Figure)

19. Eccentric adjustment for connecting rod of clamp platform:

19-1. The adjustment is usually not implemented easily.

19-2. Due to serious collision or blocking in the process of connecting rod transfer, it will lead to a positional deviation in the connecting rod of the clamp platform, which may bend the transfer clamp in serious cases. In case of positional deviation in the connecting rod, it is necessary to make adjustment.

19-3. How to judge the deviation in the connecting rod of clamp platform:

19-3-1. When the punching rod is aligned with the center of the punching die, but the hole of the nut is eccentric, while the fourth transfer clamp of the connecting rod is not bent, and there are scratches of the same direction on each forming blank in each die.

19-3-2. Make the flywheel at the position of 180° and 0°, and use a ruler to get close

to the plane of each transfer clamp shaft. If the clamp spindle planes are not parallel and level and tilted to the same direction, you'll know what is the problem.

19-4. Essentials of adjustment:

19-4-1. Turn off the pawl switch.

19-4-2. Press F.Inching button to rotate the flywheel to 210°.

19-4-3. Remove the blank within the cutter and each stroke die.

19-4-4. Unscrew the four bolts (2) on the eccentric adjustment seat.

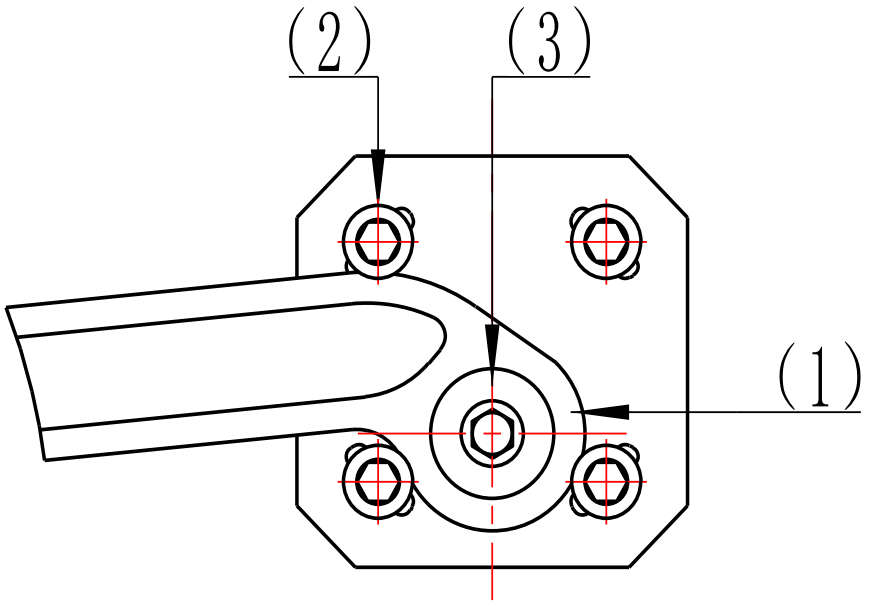
19-4-5. Unscrew the bolt on the clamp platform that is used to fix the guide gear.

19-4-6. Press F.Inching button until the flywheel dial registers 0° (make sure that the punching rod shall not collide with the transfer clamp).

19-4-7. Adjust the plane of the transfer clamp with a steel ruler.

19-4-8. Fasten the guide gear.

19-4-9. Fasten the four bolts.



(Figure)

20. Adjustment of the controller within electrical box:

20-1. Adjust the delay time from low speed to high speed: (as shown in the figure below) extend the delay time by rotating the knob clockwise to and shorten the delay time by rotating the knob counterclockwise, and the delay time of the cold heading forming machine is usually set to 5s).

20-2. Set the time of auto-transformer compensator (whose adjuster is the same as that of delay time): It is usually twice the delay time (10s). If the time is adjusted too short, the transformer compensator is almost useless when the motor is started, in which case the motor may be easily damaged; if the time is adjusted too long (over 60s), the motor will be started feebly.

(Figure)

20-3. Fault detector: (whose adjuster is shown in the figure below)

20-3-1. In normal operation, the light in the upper left corner is off; in case of a fault, the light will be on and the machine will automatically stop.

20-3-2. The detector is related with the output of the forming machine. In case of a change in the production rate, adjustment is necessary.

20-3-3. Adjustment method:

(A) Make preparations for production operations. (Adjustment must be made during production operations. In case of empty running, there is no monitor signal)

(B) Make the value slightly higher by rotating the knob clockwise.

(C) First press “F.Inching button” and then press RUN button to operate. (Do not release the hand)

(D) slowly rotate the knob counterclockwise until the light in the upper left corner is

on, and then slightly rotate the knob clockwise to make the light off.

(E) If the value of the fault detector is adjusted too high, the fault detector is useless. On the contrary, the machine cannot run if the value is adjusted too low.

(Figure)

21. Usage of the counter on electrical box:

21-1. Digital display meter (1) shows the output at that time.

21-2. Preset counter (2) can preset the desired output, and the machine will automatically stop when the output reaches the value.

21-3. Press reset button (4) to reset the value of the digital display meter.

21-4. Switch (5) provides three options: N, C and R

N: When the count reaches the preset number and the machine automatically stops, the digital display meter will be reset by pressing reset button (4) manually.

C: When the counter reaches the preset number and the machine stops, the digital display meter will be automatically reset without delay.

R: Same as C, but it will be automatically reset after 0.2~0.5SEC.

21-5. Regardless of the position of RNC switch (5), after the count reaches the preset number and the machine stops, the machine can be re-started only by re-pressing RUN button.

(Figure)

22. Switch handle of power box:

22-1. When the handle switch points at “ON”, the no-fuse switch is powered on.

22-2. If the arrow points at “OFF”, the power is cut off.

22-3. When the arrow is switched from “OFF” to “OPEN”, the door of the electrical cabinet can be opened, and the power has been cut off now.

22-4. Insert a special key into the hole of “LOCK”, press it in and turn it right, in which case the handle can be locked and it is unable to open the door of the electrical cabinet.

22-5. When the handle is locked, the electrical cabinet can be opened by unscrewing (3) Re Iease with a slot type screwdriver in case of emergency.

(Figure)

23. Adjustment of thermal relay:

The thermal relay inside the power box has been well adjusted before leaving factory, which shall not be adjusted at will, so as not to affect electrical performance and safety. If necessary, please adjust according to those listed below:

(1) OL1 adjustment value

(2) OL2 adjustment value

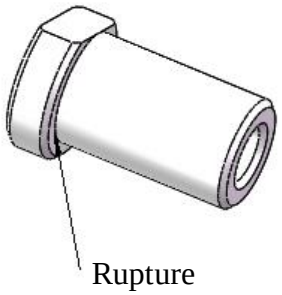
(3) OL3 adjustment value

(4) OL4 adjustment value

24. Function of rear punching bolt sleeve:

In design, the main function means that if there is any collision during forming, the rear punching system intends to push the blank out of the die plane and damage it

by producing overload because two or more than two blanks are squeezed to supersaturation in the forming die, such as rear punching roller, bearing rupture, rear punching shaft bending and deformation of rear punching rocker arm. However, such design can achieve automatic rupture in case of overload, so as to prevent damages to the above rear punching system.



(Figure)

Chapter 5 Preparations for Operation

1. Turn on the power.

2. Check whether each oil valve is opened, and turn the arrow button of RUN CONTOIL switch to ON.

3. Turn on die cool oil and machinery oil, check whether there are sufficient oil ways in each part, and start the two oil pumps on the oil tank.

4. Turn COOL OIL button to OFF (namely to turn off die cool oil).

5. Clean and tidy up the tools on the machine and put them on the tool stand.

6. Raise the ratchet pawl (such as the operation of stopping feeding).

7. Operate on the flywheel by 180° (namely to move the main slider to the rear end).

8. Take out the cutter and blank in the die.

9. Remove the sundries in the oil groove between the punching rod and die.

10. Check whether the die in each part is solid.

11. Press F.Inching button to check whether there is any abnormality in each part.

12. Cover the die with a dust cap.

13. Turn COOL OIL switch to ON (namely to turn on die cool oil).

14. First press F.Inching button (tap and hold) to observe whether there is any abnormality. If any, release the hand; if everything is normal, release the button, press F.Inching button and then press RUN (machine) to make it run at a low speed, and then release RUN button if everything is alright after a period of time.

Chapter 6 Operating Procedures for Specification Change

1. List of specification change

2. Die disassembly procedure for specification change

3. Die assembly procedure for specification change

1-1 List of specification change: The symbol @ means that the die components must be changed during specification change.

Name	Wire diameter change	Thickness change	Opposite side (angle) change
First front punching rod			@
Second front punching rod	@	@	@
Third front punching rod	@	@	@
Fourth front punching rod	@	@	@
Fifth front punching rod	@	@	@
Punching rod	@		
Punching rod cover	Depending on the diameter of the punching hole		
Cover head of first front punching rod			@
Cover head of second front punching rod			@
Cover head of third front punching rod			@
Cover head of fourth front punching rod			@
Cover head of fifth front punching rod			@
First rear punching rod			@
Second rear punching rod			@
Third rear punching rod	@		@
Fourth rear punching rod	@		@
Fifth rear punching rod	@		@
Cover head of first rear punching rod			@

Cover head of second rear punching rod			@
Cover head of third rear punching rod	Depending on the diameter of the rear punching hole		@
Cover head of fourth rear punching rod	Depending on the diameter of the rear punching hole		@
Cover head of fifth rear punching rod	Depending on the diameter of the rear punching hole		@
Inner blade die			@
First stroke die			@
Second stroke die		@	@
Third stroke die	@	@	@
Fourth stroke die	@	@	@
Fifth stroke die	@	@	@
Stripper plate			
Outer blade			@
Outer blade box			@
Ratchet	@	@	@
Clamp spindle			@
Feeding wheel			Refer to the specification table
Stretching and straightening wheel			Refer to the specification table
Upper punching core			
Lower punching core	Depending on the outer diameter of upper core		
Punching die	Depending on the outer diameter of upper core		

2. Die disassembly procedure for specification change

2-1. Turn off the switch of the ratchet pawl and shut down the machine.

2-2. Turn off the operation control switch and the switch of die cool oil.

2-3. Open the dust cap of the die.

2-4. Press F.Inching button until the flywheel is at 150°.

2-5. Remove the ratchet.

2-6. Loosen the set bolt of the feeding roller and draw out the wire rod.

2-7. Turn the clamp platform up.

2-8. Take out the transfer clamp.

2-9. Remove the rear punching rod.

2-10. Press F.Inching button until the flywheel is at 180°.

2-11. Remove the front punching rod and its cover.

2-12. Remove the stripper plate and punching die.

2-13. Remove the punching die.

2-14. Remove the outer blade clamp and outer blade seat, including bumper pin and outer blade.

2-15. Remove the inner blade die.

2-16. Remove the feeding roller.

2-17. Remove the stretching and straightening guide wheel.

2-18. Precautions:

2-18-1. Disassembly procedure for all replacements above

2-18-2. Dies that do not need to be replaced may not be removed.

2-18-3. The bolts shall be immediately replaced if they are going to be damaged.

2-18-4. The parts and dies to be repaired shall be repaired.

2-18-5. The parts inside and outside the machine shall be thoroughly cleaned.

3. Operating procedure for specification change and assembly

3-1. Install the slotted stretching and straightening guide wheel.

3-2. Install the feeding wheel according to the essentials.

3-3. Install the inner blade die and dies 1, 2, 3, 4 and 5 (screw in the screws by hand).

3-4. Use a ruler to check the upper end of the punching die is level, and then fasten the set screw of the punching die.

3-5. Install the first front punching rod according to the essentials (which must be corrected).

3-6. Install the ratchet according to the essentials (check the swing of the ratchet pawl).

3-7. Install the wire rod and adjust the stretching and straightening platform (according to the essentials for wire change).

3-8. Press F.Inching button until the flywheel is at 180°.

3-9. Install the ratchet according to the essentials (make sure that the bumper pin shall be installed properly).

3-10. Turn off the pawl switch.

3-11. Install the second, third, fourth and fifth front punching rods (which must be corrected).

3-12. In case of 1P hexagonal punching rod, set the 1P hexagonal direction and manually adjust the bolt to make the direction correct, the bolt is exactly in touch with the 2P surface now, so as to adjust the 1P hexagonal direction.

3-13. Install the punching die according to the essentials (including the stripper plate).

3-14. Install the rear punching rod according to the essentials.

3-15. Operate on the flywheel until it is at 150° (install the rear punching seat).

3-16. Install the outer blade clamp.

3-17. Adjust the forming method of each die in order (from 1 to 5).

3-18. Operate on the flywheel until it is at 120°.

3-19. Install the transfer clamp and transfer platform according to the essentials.

3-20. Check whether the rear punching screw of the rear punching seat is in place.

3-21. Start the machine slowly to check whether the transfer clamp runs normally.

3-22. Cover the die with the dust cap, and turn on the switch of die cool oil and operation control switch.

3-23. Start the machine to check the forming parts.

3-24. Precautions:

3-24-1. Before installing all dies, be sure to check whether the specifications are the same and wipe clean the dirt on the dies.

3-24-2. Standard for fastening the bolt: Be sure to stop the machine after starting it for 3-5h and fasten the screw again, stop the machine 1-3 days after fastening the screw and starting the machine again, and then fasten the screw again.

3-24-3. For above operation details, please refer to relevant chapters and sections.

Chapter 7 Adjustment of Forming Procedure

Description of forming adjustment for common hexagonal nut:

1. Cutting station:

1-1. Function: Cut the wire rod into particles as required.

1-2. Adjustment: The gap between the inner blade die and outer blade is fixed, which cannot be adjusted. When the flywheel is at 180°, i.e. the cutter cylinder returns to the proximal end, the measurement gap is about 0.05-0.2mm.

1-3. Attention: In case of no-load running, as there is no blank within the outer blade clamp, it is slightly bent inward, and it should be noted that whether the first punching rod will collide with the outer blade clamp.

2. First station:

2-1. Function: Cut the deformed and uneven blank and shape it to facilitate the forming of subsequent stations.

2-2. Adjustment:

2-2-1. The first rear punching rod is located at the contact between the die bottom taper and the rear hole.

2-2-2. Move forward the first front punching rod until the upper part of the blank is flattened while the bottom is not completely covered. (Ideally, it is about 95% covered).

2-2-3. After the first rear punching rod is pushed out of the blank, make sure that the front end of the blank is close to the chamfer of the transfer clamp.

2-3. Attention: The first front punching rod shall be gradually adjusted from shallow to deep. If moving forward too much, the blank may be excessively covered and even have curly burrs. In addition, the outer die core is under greater stress, making it easy for the die core to protrude, in which case the service life of the die hub may be

reduced.

3. Second station:

3-1. Function: Further shape the blank and strengthen the flattening and full angle function of first station.

3-2. Adjustment: Make the punching head of the second rear punching rod exactly go into the die bottom (the blank may display how the rear punching rod moves back and forth at this station), adjust the second front punching rod and make it return to the bottom of the blank until about 95% covered, and the adjustment shall be gradually carried out in the same way as the first front punching rod.

4. Third station:

4-1. Function: Squeeze the blank again, so that the fourth station can be completely formed into nut.

4-2. Adjustment:

4-2-1. The third front punching rod goes deep into 30% of the blank thickness, and the outer diameter of the contacted bearing surface shall reach 90-95% of the opposite side width S (-0.025/-0.3) of the semi-finished product.

4-2-2. The third rear punching rod goes deep into 20% of the blank thickness, and the blank bottom is squeezed to a nearly flat plane at the second station. At the third station, it can be pre-formed at the bottom, so the outer diameter of its bearing surface can be as greater as 85-88% of the nominal width S (-0.025/-0.3) of the opposite side.

5. Fourth station:

5-1 Function: Completely form the nut and control the thickness of the scrap iron, so as to adjust the thickness of the nut.

5-2. Adjustment:

5-2-1. Adjust the movement of the punching rod back and forth, and make sure that the bearing surface of the blank is in line with the standard value.

5-2-2/1. If the upper bearing surface of the blank is not large enough, following adjustments shall be made:

a. Move forward the fourth front punching rod, and if the upper bearing surface is too large:

a1. Move forward the fourth rear punching rod, but shall take into account the thickness of the nut and scrap iron (the thickness of scrap iron shall not be below 25% of the thickness of the nut).

a2. Move backward the third punching rod to reduce the bearing surface of the blank, but the outer diameter of the bearing surface shall not be below 80% of the opposite side width.

b. Move backward the third front punching rod, and then move forward the rear punching rod, so as to increase the bearing surface of the third die button, and make it easy to form a bearing surface for the fourth punching rod.

5-2-2/2. When the upper bearing surface is too large, move backward the third front punching rod slightly.

5-2-3. The fourth front punching rod goes deep into the blank for about 40% of the thickness of the nut, and the formed bearing surface is about 92-98% of the opposite side width of the nut.

5-2-4. Use the fourth rear punching rod to control the changes in the thickness of scrap iron, so as to adjust the thickness of the nut, and the depth as the fourth rear

punching rod goes into is about 35-40% of the thickness of the nut.

6. Punching station:

6-1. Function: Punch the completely formed blank, and make sure that the punched scrap iron goes into the lower core of punching die, so as to complete nut forming.

6-2. Adjustment

6-2-1. The punching rod goes into the punching die for about 2-2.5mm, and make sure that the punching rod is aligned with the center of the punching die.

6-2-2. Push the scrap iron (diameter: +0.20/+0.15) produced by the punching rod (diameter: 0.2mm) into the punching die (diameter: +0.09/+0.07), so that the diameter of the die hole is expanded to +0.12/+0.10, in which case the punching rod will not be in contact with the wall of the punching die.

6-2-3. When the punching rod is worn, i.e. the outer diameter becomes smaller, so does the outer diameter of the punched scrap iron, if the die hole becomes larger due to wear, the die core now may be brought out of the die by the punching rod because it cannot clamp the scrap iron, so that it will be mixed into the collecting tank together with semi-finished nuts.

6-2-4. When replacing the punching rod, it is necessary to release the punching die and make sure that its hole diameter will expand, so as to avoid friction between the punching rod and the punching die.

7. Precautions:

7-1. In the forming process, the rear punching rod will be compressed a lot due to the pressure of the front punching rod. Therefore, it is necessary to adjust the rear punching rod when adjusting the front punching rod, in which case the expected

adjustment effect can be obtained. That is to say, as the front punching rod moves forward, the rear punching rod shall also move forward slightly to offset its amount f compression. As the front punching rod moves backward, the rear punching rod shall also move backward slightly, so as not to excessively go deep into the blank.

7-2. As the rear punching rod is adjusted, the front punching rod is not affected.

7-3. As for the front and rear punching rods of die 4, except for controlling the bearing surface, it is also necessary to control the thickness of parts. Therefore, actions shall be coordinated in order to meet the requirements of finished products. If it is unable to obtain by adjusting die 4, it is necessary to adjust die 3, die 2 and die 1 for coordination.

Chapter 8 Equipment Maintenance

1. Foreword:

This chapter gives an introduction of care and maintenance, which will be described in detail later. Here, some terms for our own use will be defined as follows:

Standard value: It refers to the measured value of the machine obtained after 6h test run by the factory, which will be used as the basis for follow-up checks.

Critical value: It is expressed in x-y. The first value x represents that when the check value is smaller than x, the mechanism is normal, and there is no need for adjustment or repair. When the check value is greater than x but smaller than y, the machine shall be frequently checked. When the check value is greater than y, the machine shall be immediately stopped for maintenance.

Check cycle: It is recommended that the machine shall be checked at regular intervals.

2. Wear check for the bearing of cutter cylinder

A. Standard value:

(a) Distance from the cutter cylinder to the platform wall: _____mm.

(b) B value in Figure 3: 160(+0.04/-0.11).

(3) Outer diameter of the roller of cutter cylinder: 70（0/-0.03).

B. Critical value: 0.3-0.35 mm。

C. Check cycle: 6 months.

D. Check method:

(a) Make the main slider retreat to the most distant place from the platform surface.

(b) Take a hole separation card.

(c) Measure the distance from the cutter cylinder to the platform wall. (as shown in

Figure 2)

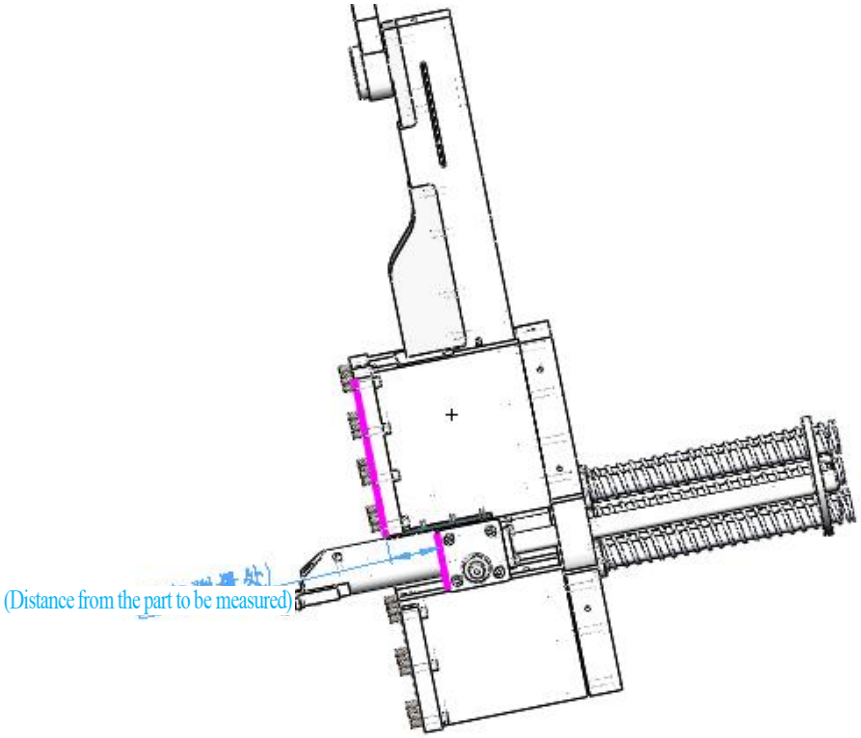


Figure (2)

E. Description:

(a) Check value is affected by following factors:

1. Wear of the roller bearing of the cutter cylinder.

2. Wear of the roller of the cutter cylinder.

3. Wear of the guide plate.

4. Wear of the eccentric slider.

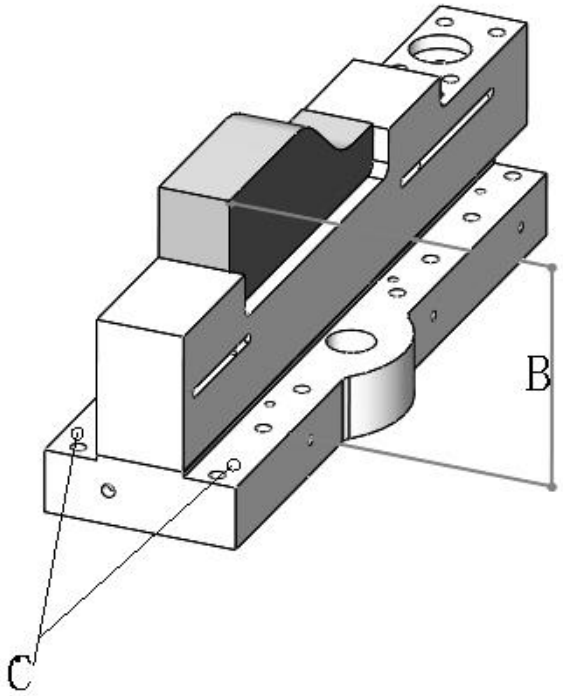
5. Wear of the side plate of the eccentric slider.

(b) If the check value is greater than 0.35 mm, the cutter cylinder cannot be moved to the normal position, so is the blank, so that the blank will be scratched by die 1 as the first front punching rod is impacted.

(c) If the check is greater than 0.35 mm, it is necessary to first check the guide plate, eccentric slider and the side plate of the eccentric slider. If the B value in

Figure 3 is quite different from the standard value, it means that the friction surface of the guide plate, eccentric slider or the side plate of the eccentric slider is seriously worn, in which case it is necessary to grind the two C surfaces of the eccentric slider, so as to make sure that B value is the same as the standard value.

(d) If the B value is close to the standard value, the error of distance A might be caused by the wear of cutter cylinder roller and the roller bearing of the cutter cylinder. Therefore, it is necessary to remove the roller of the cutter cylinder, measure its outer diameter. In case of wear in the outer diameter, it is necessary to replace the roller of the cutter cylinder; if the outer diameter of the roller is correct, it is necessary to replace the roller bearing of the cutter cylinder.



(Figure 3)

3. Clearance check between holder and cutter cylinder:

A. Standard value: _____--_____mm.

B. Critical value: _____--_____mm.

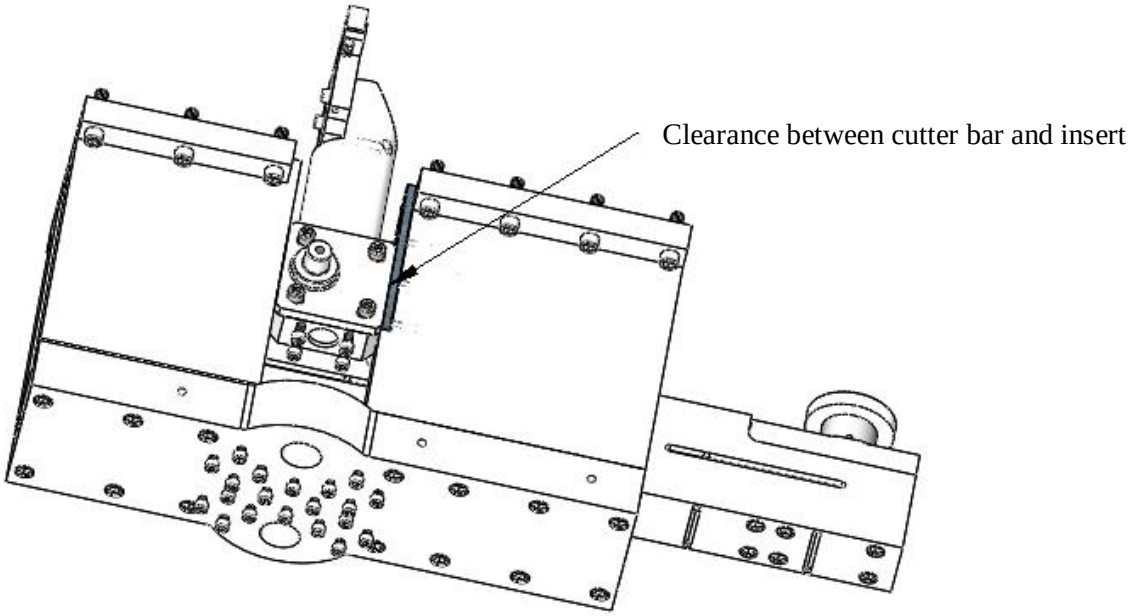
C. Check cycle: _____ months.

D. Check method:

(a) Press F.Inching button of the machine to make the cutter cylinder move forward about 3-5mm from the most distant end (i.e. the cutter moves from inner blade to die 1).

(b) Due to the action of the guide plate and six return springs, the cutter cylinder will slide along the side of the holder, thus forming a clearance between the cutter cylinder and the left side of the holder, which is called the clearance between the holder and the cutter cylinder.

(c) Take a thickness gauge to measure the clearance. (as shown in Figure 4)



(Figure 4)

E. Description:

The right holder is installed with another sliding plate. When the clearance exceeds 0.18mm, it means that the sliding plate has been worn, which must be replaced.

4. Clearance check between eccentric slider and holder:

A. Standard value: 0.06-0.08 mm.

B. Critical value: 0.15-0.20 mm.

C. Check cycle: 6 months.

D. Check method:

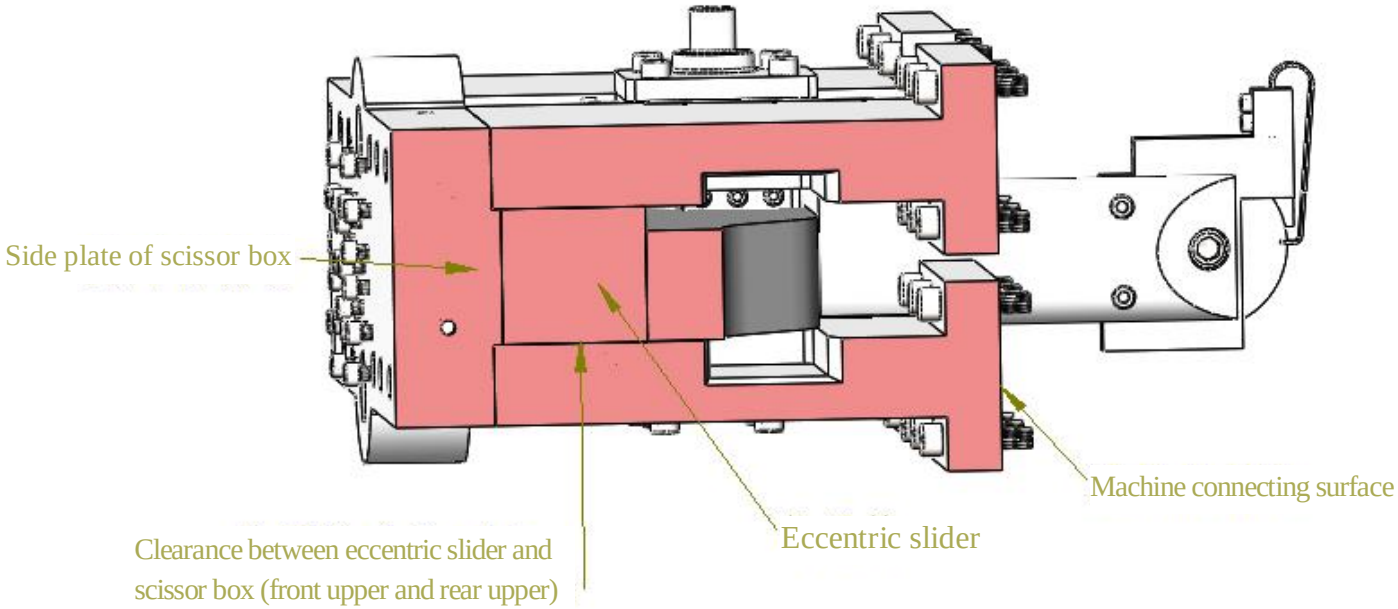
(a) Press F.Inching button of the machine to move the eccentric slider to the center of the holder. (as shown in Figure 5)

(b) Due to gravity, there is a clearance between the eccentric slider and the upper holder.

(c) Take a thickness gauge to measure the clearance. (as shown in Figure 6)

E. Description:

If the clearance between the eccentric slider and the holder exceeds ____mm, it means that the contact surface of the eccentric slider and the lower holder is worn, and the lower holder shall be repaired by wear, while the eccentric slider must be replaced.



(Figure)

5. Wear check of feed roller bearing:

A. Check cycle: 6 months.

B. Measurement method: Visual check.

C. Check method:

If the pin roller inside the bearing is found to have defects, such as corrosive concave hole, the bearing shall be immediately replaced.

6. Wear check of ratchet rocker pin:

A. Standard value: 0.05-0.08 mm.

B. Critical value: 0.23-0.28 mm.

C. Check cycle: 12 months.

D. Check method:

(a) The pin and the pin hole are loosely coordinated, and the initial value of the

clearance is defined as the standard value when checking.

(b) Use an inside micrometer to measure the diameter of the pin hole.

(c) Use an outside micrometer to measure the diameter of the pin.

(d) Use an inside micrometer and an outside micrometer to measure the dimensions of the copper cover.

(d) Measured value of hole diameter-measured value of outer diameter=check value, which is also compared with the critical value.

E. Description:

If the check value exceeds 0.28 mm, the bearing inside the pin hole must be replaced.

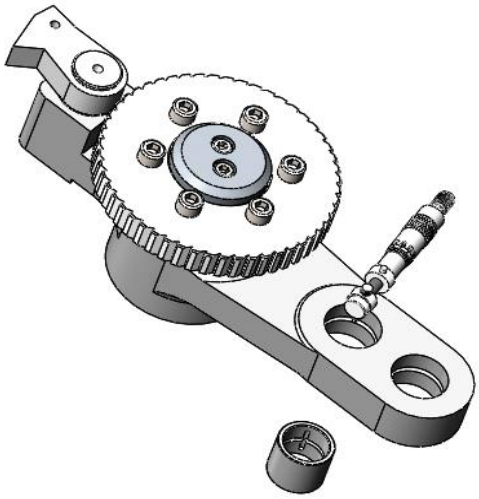


Figure (9)

Figure (10)

7. Wear check of feed roller bearing:

A. Standard value: Upper bearing: 5 mm.

Lower bearing: 30.5（+0.08/0） mm.

B. Standard value: Upper bearing: 0.5-0.8 mm.

Lower bearing: 0.4-0.7 mm.

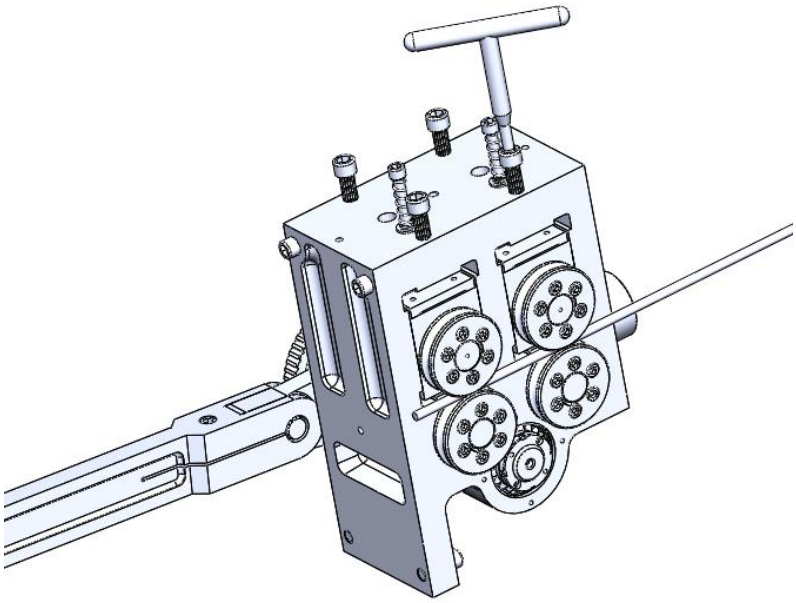
C. Check cycle: 6 months.

D. Check method:

(a) Upper bearing:

1. Fix the wire rod between the upper and lower feed rollers, and fasten the bolts. (as shown in Figure 11)

2. Measure the vertical distance from the outer diameter of the roller to that of the bearing. (as shown in Figure 12)



(Figure 11)

(b) Lower bearing:

1. Remove two groups of upper feed roller seats. (as shown in Figure 12)

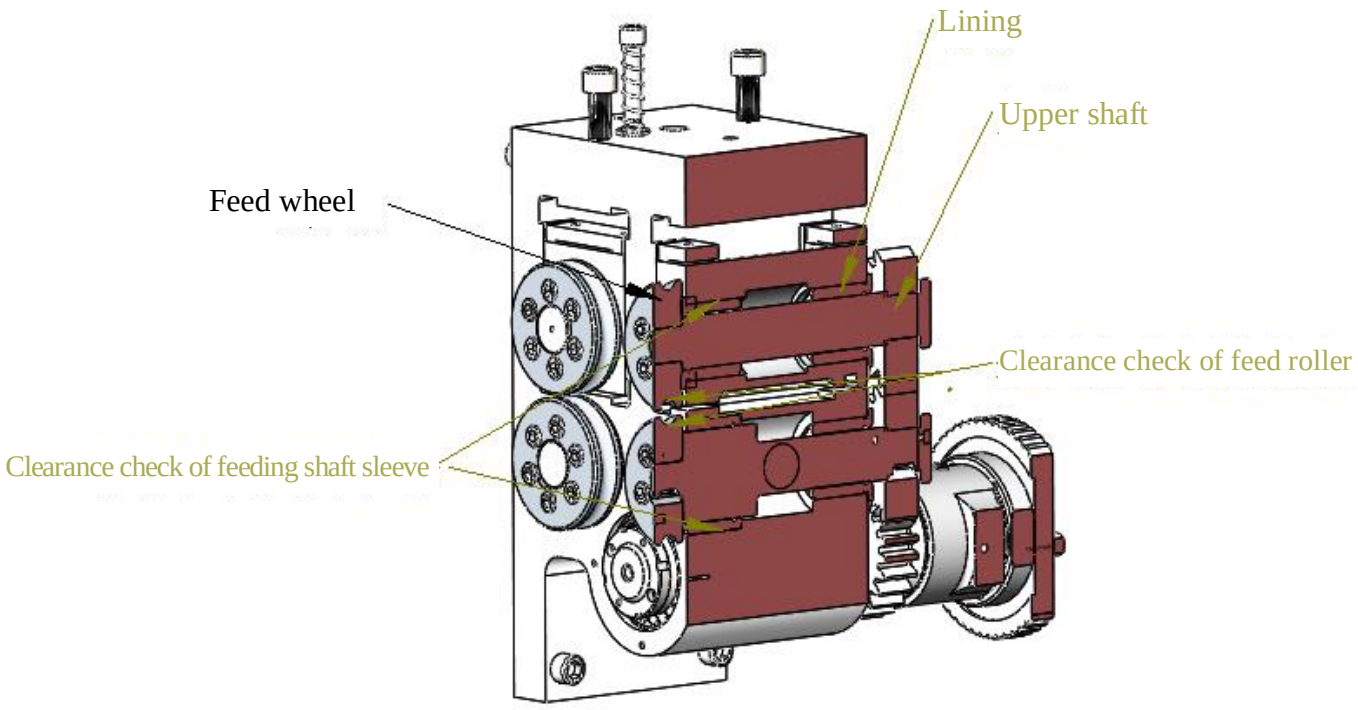
2. Press down the two feed rollers by hand, and measure the vertical distance as shown in Figure 12.

3. Measured value-standard value=check value, which is also compared with the

critical value.

E. Description:

If the check value exceeds __0.8__mm (upper bearing) or __0.7__mm (lower bearing), the bearing shall be replaced.



(Figure 12)

8. Wear check of rear punching roller bearing:

A. Check cycle: __6__ months.

B. Measurement method: Visual check.

C. Check method:

If the pin roller inside the bearing is found to have defects, such as corrosive concave hole, the bearing shall be immediately replaced.

9. Wear check of rear punching rocker pin:

A. Standard value: 0.06-0.08 mm

B. Critical value: 0.03-0.28 mm.

C. Check cycle: 12 months.

D. Check method:

Please refer to Section 6 “Wear check of ratchet rocker pin”.

E. Description:

The same as above.

10. Clearance check between main slider and side plate of slider:

A. Standard value: 0.05-0.07 mm.

B. Critical value: 0.08-0.10 mm.

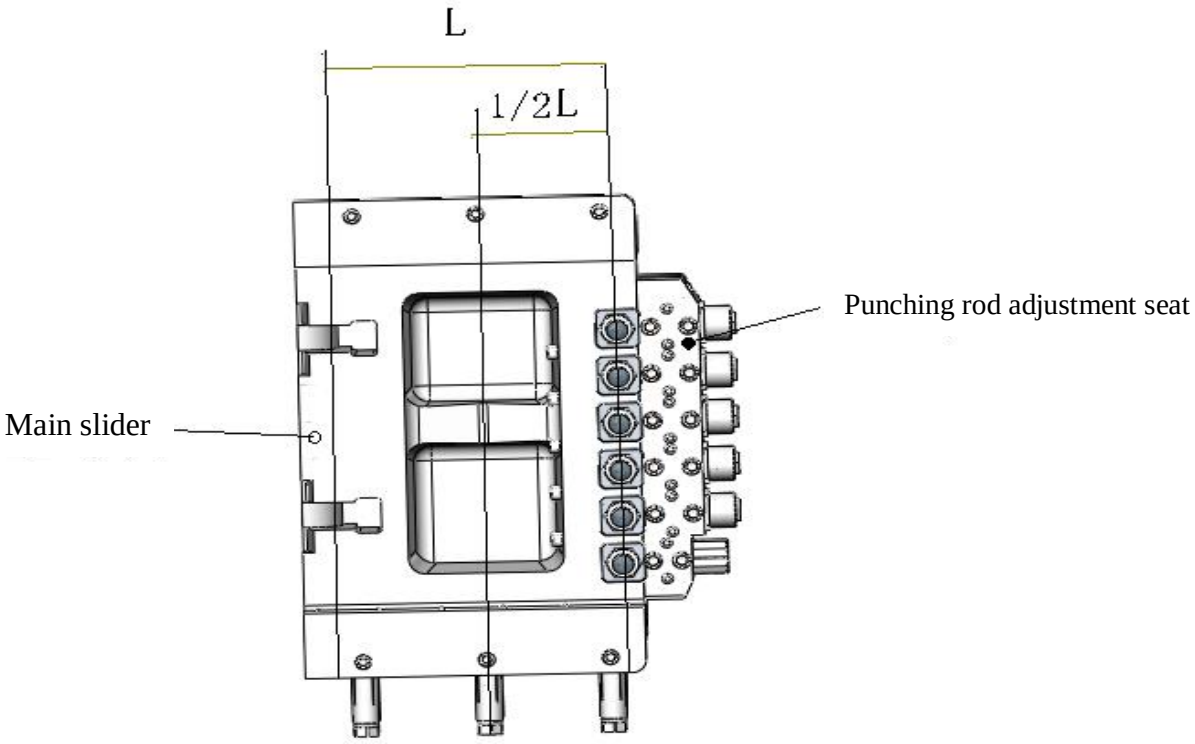
C. Check cycle: 6 months.

D. Check method:

(a) Press F.Inching button of the machine to move the contact surface of the main slider to the center of the side plate of the slider. (as shown in Figure 16)

(b) Use clearance adjustment tools to push the main slider to the fixed clamp plate and get close to the fixed clamp plate. (as shown in Figure 17)

(c) Use a thickness gauge to measure the clearance between the main slider and the movable clamp plate.


L
1/2L
Punching rod adjustment seat
Main slider

(Figure)

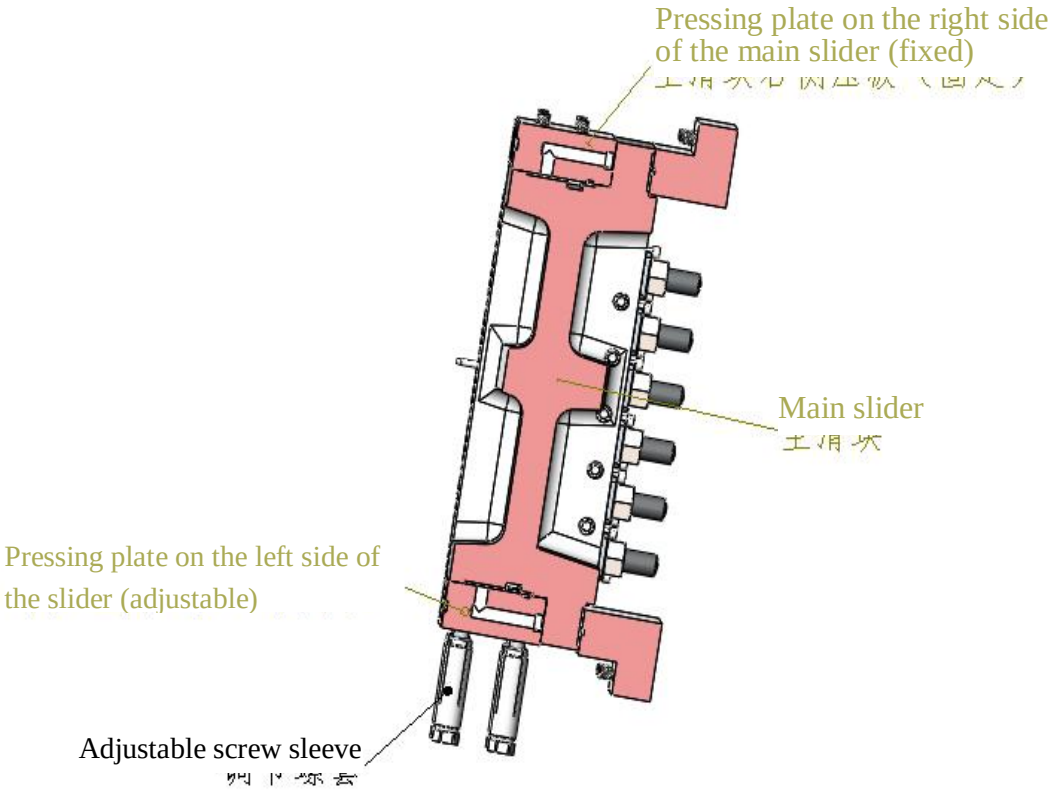

Pressing plate on the right side of the main slider (fixed)
Main slider
Pressing plate on the left side of the slider (adjustable)
Adjustable screw sleeve

Figure (16)

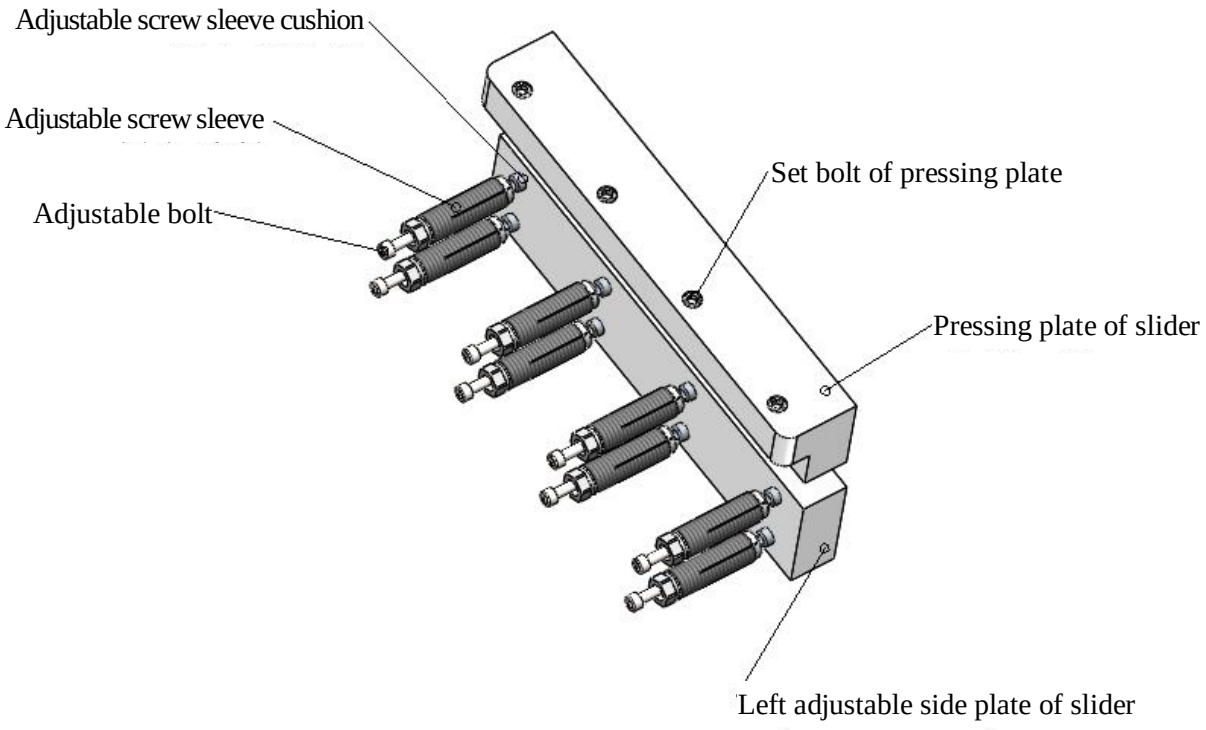
E. Description:

(a) There is a side plate of slider each on both sides of the main slider (on the side of the cutter cylinder and the flywheel) guiding the main slider to move forward and backward, of which the side plate of the slider on the side the cutter cylinder is fixed to the platform, which is called “fixed side plate”, while the clamp plate on the side of the flywheel can be connected to four adjusting bolts and move up and down, thus forming a “movable side plate”.

(b) If the clearance between the main slider and the side plate exceeds 0.15 mm, it is necessary to slightly loosen the mounting bolts on the movable side plate.

(c) There are four “adjustable bolts” on the movable side plate, of which two “spiral lifting bolts” are used to lift the clamp plate, while another “compression bolts” are used to press down the clamp plate (as shown in Figure 18). It is necessary to slightly unscrew the two spiral lifting bolts slowly and fasten the two compression bolts until the clearance between the main slider and clamp plate is in line with the standard value.

(d) Tighten the mounting bolts on the side of the clamp plate, and then fasten the four adjusting bolts.



11. Wear check of bearing of punching connecting rod:

A. Check cycle: 6 months.

B. Measurement method: Visual check:

C. Check method:

If the pin roller inside the bearing is found to have defects, such as corrosive concave hole, the bearing shall be immediately replaced.

12. Wear check of main crankshaft bearing:

A. Check cycle: 6 months.

B. Measurement method: Visual check.

C. Check method:

Same as that given in Section 11 “Wear check of punching connecting rod bearing”.

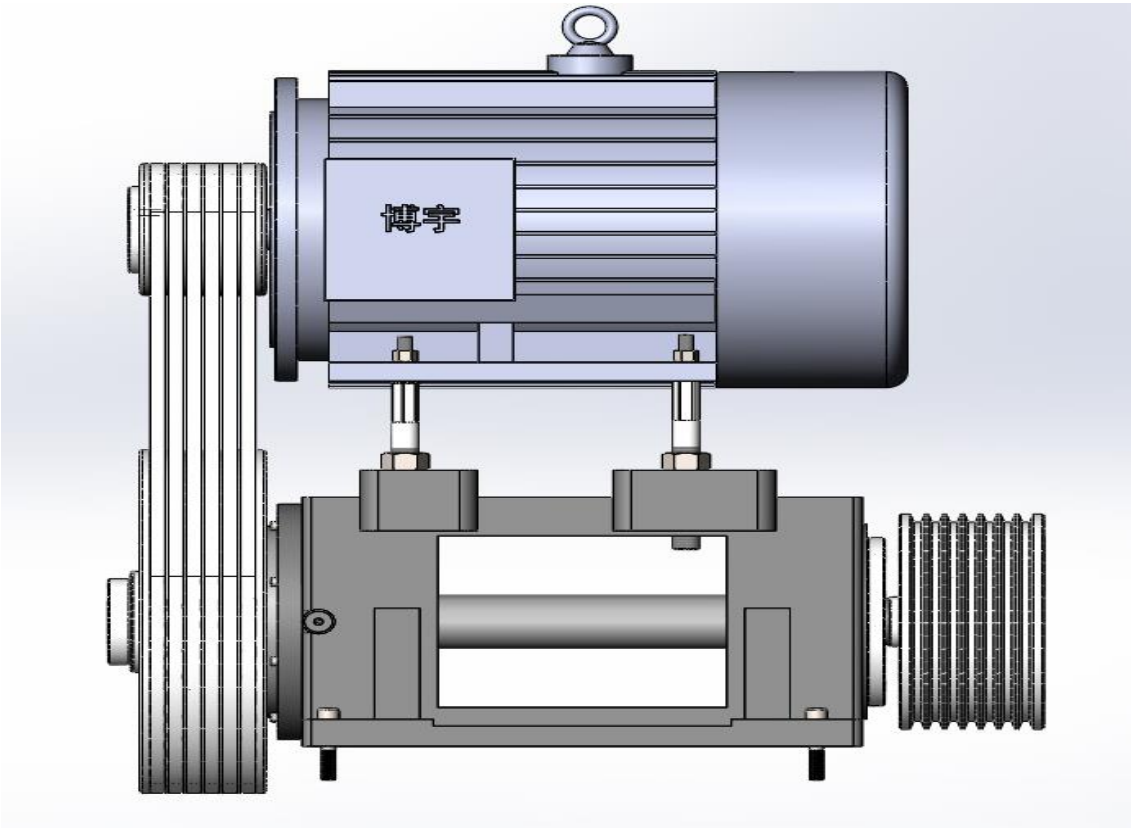
13. Electrical maintenance:

Fault	Fault cause	Troubleshooting method
Δ The motor suddenly	1. The punching rod is damaged.	Replace the punching rod

stops during operation	2. The lubricating oil pressure is too low.	Increase the lubricating oil pressure above 0.3Kg/cm²
	3. The thermal relay trips.	Recover the thermal relay
	4. The no-fuse switch trips.	Turn on the no-fuse switch again
	5. The fuse blows out.	Replace the fuse
	6. The power supply is interrupted.	Turn on the power again
Δ The motor cannot be started	1. The power is not on.	Turn on the power
	2. The fault display is not adjusted properly.	Recover the thermal relay
Δ The motor is unable to continue to run	1. The lubricating oil pressure is too low.	Increase the lubricating oil pressure to 0.3Kg/cm²
	2. The fault display is not adjusted properly.	Adjust the fault monitor correctly
	3. Bottom of the stripper plate	Clean the bottom of the stripper plate
Δ The counter cannot work	1. The conductor is broken.	Connect the conductor
	2. The counter is damaged.	Replace the counter
Δ The air brake of the motor fails	1. The air pressure is too low.	Increase the air pressure to 4.5-5.5 Kg/cm²
	2. The fuse blows out (solenoid valve cannot be started).	Replace the fuse
	3. The brake block is worn.	Replace the brake block
	4. The brake block is stained with oil.	Clean the brake block
	5. The air compressor generates no pressure.	Check the air compressor

14. Motor:

There are four oil nozzles in total on both sides of the motor and the gear shift seat, which must be greased every three months. (as indicated by the arrow)



(Figure)

15. Spring:

Unit of specification: (mm)

Wire diameter X inner diameter X number of turns X free height

	Cutter cylinder spring	Rear punching spring	Feed spring	Spring of rear punching main rod
11B6S	6X29X22X230	10X36X11X165	9X37X10X145	3.2X20X14X80
12B6S	SVL50X34X250L	TM60X175	TM60X175	5X24.5X10X85
14B6S	8.5X38X29X400	10X39X11X160	12X55X11X210	6.5X31X11X125
17B6S	8.5X51.5X20X340	16X64X11X250	16X75X9.5X230	7.5X39X11X185
19B6S	11X62X25X450	16X68X11X280	18X80X12X305	9X49X12X210
22B6S	13X73X25X560	18X90X10X300	19X102X10X340	11X66X10X247
27B6S	25X155X10X445	5X31.5X9X100	25X120X13X490	11X69X13X290
33B6S				