STEEL MACHINERY GROUP

SMG Pipe Cold Cutting & Beveling Machine

Operators Manual

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PART 1 EQUIPMENT INSTRUCTION

We supply machines and equipment to diverse industries where process piping systems are essential to their operation but require divergent machine tool technology. From power and petrochemical to semiconductor, food and dairy, ours wide range of portable tools can be found on all pipe and tube types, sizes and wall thickness.

FEATURES

(1) Cold cutting and beveling

(2) Split frame

(3) Tool bits feed automatically

(4) Minimal axial and radial clearance

(5) Lightweight and compact design

(6) Easy set-up

(7) Pneumatic, electric or hydraulic driven

PACKAGE

The machine is placed into a portable plywood case with mail body, tool slide, expanding block, usual tool, beveling and cutting tools

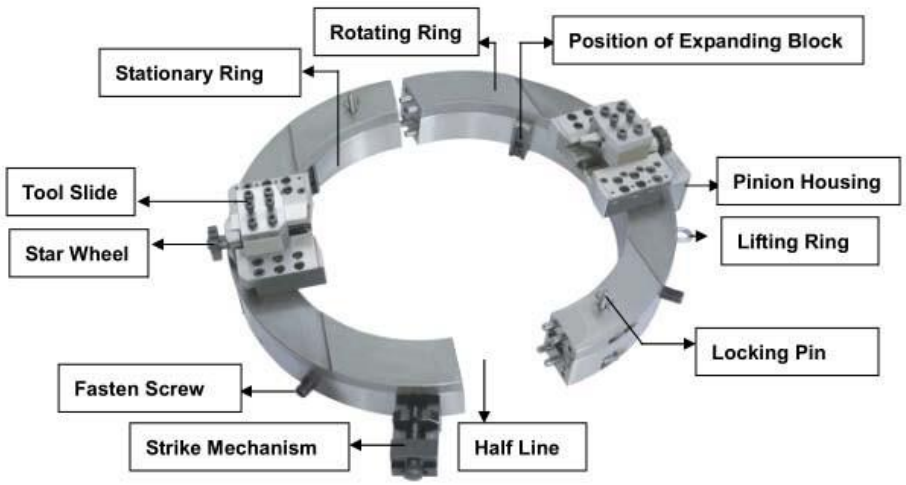
SPECIFICATION

Driven: Electric, Pneumatic or Hydraulic

Air Supply: 0.6-1.0MPa@1500-3000L/min

Electric supply: 220V-240V 1PH 50/60HZ

Hydraulic supply: 380-415V 3PH 50/60HZ 12.5MPa@2-60L/Min



PART 2 SAFTY INSTRUCTIONS

We take great pride in manufacturing safe, quality products. Please comply with the following safety rules and instructions before operating the equipment.

Read the following content before working

READ THE OPERATIONAL MANUAL

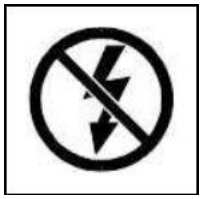
Before installing, you should read the manual, and make sure you understand all setup and operating instructions, it can help you save time and avoid injuring the operator and the machines.

INSPECT MACHINE & ACCESSORIES

Before starting the machine, look for loose bolts or nuts, leaking lubricant, and any other physical conditions that may affect operation. Properly maintaining the machine can greatly decrease the chances for injury.

ALWAYS READ SIGNS AND LABLES

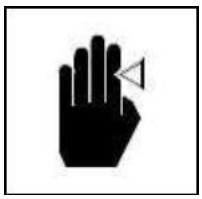
Please read the marks and signs. All the marks and signs should be clear and easy to read and you should carefully to keep them.



DANGER! ELECTRIC SHOCK

Always disconnect machine to power source before moving or removing motor.

Security of the electricity.



CAUTION INJURE HAND

Keep hands, arms and fingers clear of all moving parts

WEAR SAFETY GOGGLE

Eye protection required. When using equipment,

Please wear safety goggle. No goggle no work

PART 3 MACHINE SPECIFICATION

Electric-Driven

Model	SMG-89	SMG-159	SMG-168	SMG-230	SMG-275	SMG-325	SMG-377	SMG-426
Motor Power	1000W-2000W							
Voltage	220-240V							
Frequency	50 / 60 HZ							
Working Current	6A							
Max Wall Thickness	≤30mm (standard tool slide)							
Working Range in mm(ID-OD)	25-89	50-159	50-168	80-230	125-275	168-325	219-377	273-426
Working Range in inch (ID-OD)	3/4-3	2-5	2-6	3-8	5-10	6-12	8-14	10-16
Rotate Speed(r/min)	42	20	18	15	13	13	13	12
Weight (KG)	17	35	42	57	61	69	72	76

Model	SMG-457	SMG-508	SMG-610	SMG-762	SMG-830	SMG-914	SMG-1066	SMG-1230
Motor Power	1000W-2000W							
Voltage	220-240V							
Frequency	50 / 60 HZ							
Working Current	6A							
Max Wall Thickness	≤30mm (standard tool slide)							
Working Range in mm(ID-OD)	300-457	355-508	457-610	600-762	600-813	762-914	914-1066	1066-1230
Working Range in inch (ID-OD)	12-18	14-20	18-24	24-30	26-32	30-36	36-42	42-48
Rotate Speed(r/min)	12	11	11	10	10	10	8	6
Weight (KG)	85	89	124	156	164	172	192	226

Pneumatic-Driven

Model	SMG-89	SMG-159	SMG-168	SMG-230	SMG-275	SMG-325	SMG-377	SMG-426
Air Pressure	0.6-0.8Mpa (Tested at entrance to motor)							
Air Consumption	1500-2000L/min							
Max Wall Thickness	≤30mm (standard tool slide)							
Working Range in mm(ID-OD)	25-89	50-159	50-168	80-230	125-275	168-325	219-377	273-426
Working Range in inch (ID-OD)	3/4-3	2-5	2-6	3-8	5-10	6-12	8-14	10-16
Rotate Speed(r/min)	40	20	20	15	13	13	13	12
Weight (KG)	16	34	42	56	60	68	71	75

Model	SMG-457	SMG-508	SMG-610	SMG-762	SMG-830	SMG-914	SMG-1066	SMG-1230
Air Pressure	0.6-0.8Mpa (Tested at entrance to motor)							
Air Consumption	1500-2000L/min							
Max Wall Thickness	≤30mm (standard tool slide)							
Working Range in mm(ID-OD)	300-457	355-508	457-610	600-762	600-813	762-914	914-1066	1066-1230
Working Range in inch (ID-OD)	12-18	14-20	18-24	24-30	26-32	30-36	36-42	42-48
Rotate Speed(r/min)	12	10	10	9	9	9	8	6
Weight (KG)	82	88	120	152	164	170	192	226

Hydraulic-Driven

Model	SMG-89	SMG -159	SMG -168	SMG -230	SMG -275	SMG -325	SMG -377	SMG-426
Power Supply	380-415 V 3ph 50/60HZ							
Power	12.5 Mpa 2-60L/min							
Max Wall Thickness	≤30mm (standard tool slide)							
Working Range in mm(ID-OD)	25-89	50-159	50-168	80-230	125-275	168-325	219-377	273-426
Working Range in inch (ID-OD)	3/4-3	2-5	2-6	3-8	5-10	6-12	8-14	10-16
Rotate Speed(r/min)	40	20	20	15	13	13	13	12
Weight (KG)	16	34	42	56	60	68	71	75

Model	SMG -457	SMG -508	SMG -610	SMG -762	SMG -830	SMG -914	SMG -1066	SMG -1230
Power Supply	380-415 V 3ph 50/60HZ							
Power	12.5 Mpa 2-60L/min							
Max Wall Thickness	≤30mm (standard tool slide)							
Working Range in mm(ID-OD)	300-457	355-508	457-610	600-762	600-813	762-914	914-1066	1066-1230
Working Range in inch (ID-OD)	12-18	14-20	18-24	24-30	26-32	30-36	36-42	42-48
Rotate Speed(r/min)	12	10	10	9	9	9	8	6
Weight (KG)	82	88	120	152	164	170	192	226

The Power pack weight: 160 KG

PART 4 SET UP AND OPERATING PROCEDURES

SECTION I

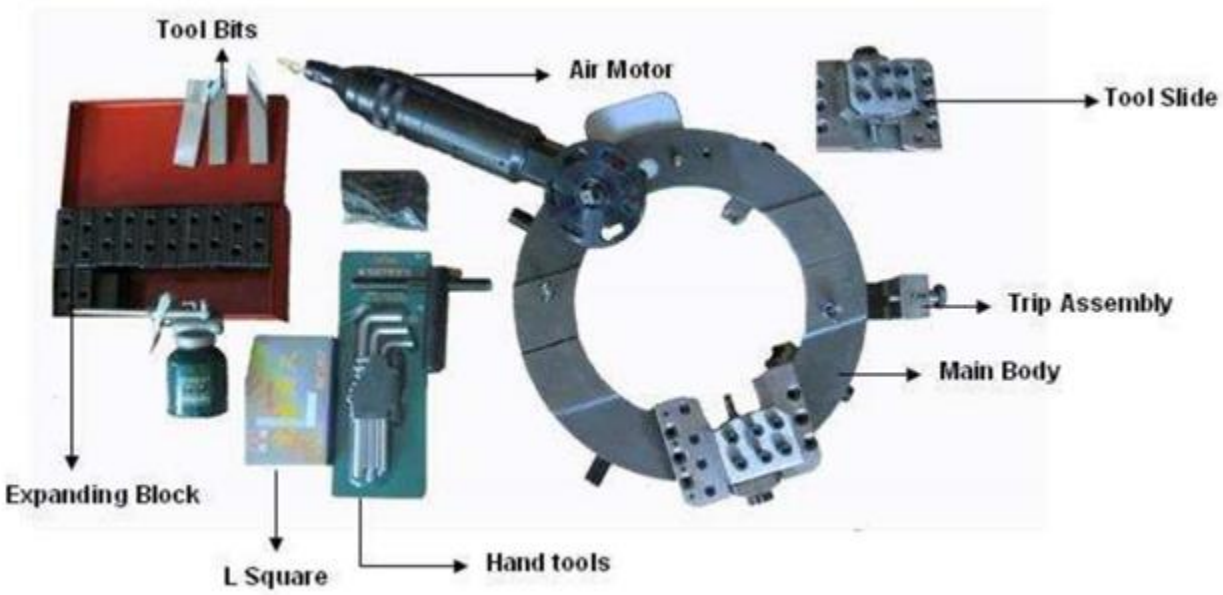
CHECK BEFORE SETTING UP

Mainframe

The equipment consists of one rotating ring and one stationary ring; every ring Splits into pieces, when assembled the rotating ring and stationary rings are integrated, and split apart simultaneously for mounting in line piping applications. These rings are preassembled and adjusted prior to dispatch the factory.

Before setting up, check the following parts in the case:

- Main body
- Tool slide
- Expanding block
- Tool feed structure
- Drive motor
- Hand tool
- Bevel & Cut tool bits



Tool Slide

Carrier of the cut and bevel tool in order to operation easier, we sort up the height of cutting tool bit 2mm higher than beveling tool bit on the slide.
Note: the setting to avoid the tool bits nipped.

Expanding Block

Necessary parts for install the equipment on the different size pipe firmly. We mark the range of use on the block. It's very easy for choose.

Tool Feed Structure

This structure is used for tool bir be fed automatically. It's easy operation. Once installed, no need to change when working with any size pipe.

The right illustration specifies to SMG-89, comprised of a trip base, trip pin and extension blocks. The trip can be engaged or disengaged depending upon feed requirements, by lowering or raising the trip pin. Refer to tool slide mounting location and trip assembly configuration.

Drive Motor

We supply eletric-driven, air-driven or hydraulic-driven type equipment. The certain size can be interchanged.

Hand Tool

One set of hand tools for setting and operating the equipment is included.

Bevel & Cut Tool Bits

Each unit comes with 2 pieces cutting tool bits and 2 pieces beveling tool bits. The beveling angle and seam (V or J-prep.) as your requirement.

Inside Beveling Tool Slide (Optional)

This part applied for inside beveling

Boring Tool Slide (Optional)

This part applied for inside beveling and counter boring

SECTION II
SET-UP PROCEDURES OF THE EQUIPMENT

1. **Take out the mainframe from case**
   Caution: Above the type 275, it's necessary to utilize additional personnel or use the lifting tool, in order to avoid injures the operator.

2. **Insert the locking pin into the mainframe ring**
   When the equipment should be installed on the in-line pipe, the locking pin can avoid the ring fall apart. (See picture below)

3. **Install the tool slide**
   On the back of tool slide, there are three holes and two fast pin in two rows, these three holes are the possible mounting positions: separately represent High / Mediate / low position
   Insert the lock pin in proper hole according the pipe diameter
   Tighten the four Hex. Screw, install the tool slide on the rotating ring

4. **Install the Tool Feed Structure**
   (See page 8: introduce for this structure)

5. **Install the cut tool and bevel tool on the tool holder**
   Tighten tool bits into position lightly; you will be positioning them for cutting later
   Caution: Make sure the blade of each tool bits are clockwise

6. **Install the cover of tool holder Tighten each Hex. Screw on the cover**

7. **After installing the cover, tighten the two inner Hex screw in the center of the cover**

8. **Measure the outer diameter of the pipe to see whether expanding blocks necessary (See part 8)**
   If expanding blocks are required, install them at this moment. Range of use marked on every block.
   Note: If the equipment will be installed on in-line pipe, come to step 11

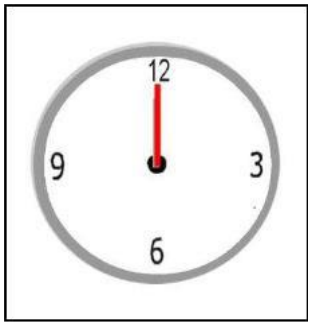
9. **Place the equipment to the end of pipe, maybe it's need hoist**
   Caution: When mounting machine to pipe, keep in mind clearances for the motor and trip assembly. Try to allow for easiest access to both of these.

10. **Come to step 12**

11. **Assemble Procedure for install the machine on in-line pipe**
    Loosen all screws on the ring
    Split the frame
    Install the upper half (the one with pinion housing) on the top of pipe
    Install another half to the bottom of pipe, using pins connect the two part
    Tighten one lock screw on the rotating ring, the tighten another one
    Caution: Tighten all screws equally

12. **After the equipment securely seated on the pipe, take away the locking pin**

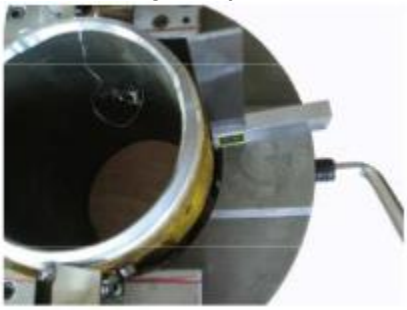
13. **When the position of expanding block point to 12 o'clock or close to 12 o'clock, start to tighten the screw till the distance between equipment top and bottom is almost equal**



14. **Adjust the expanding block position at 6 o'clock**

15. **Adjust the expanding block position at 3 and 9 o'clock. At this point the equipment should be fairly square.**

16. **Using the provided L-square to check the machine perpendicular to the pipe O.D (at 12, 3, 6, 9 o'clock position), make sure it's a right-angle between equipment and pipe.**
    Caution: The machine should still be able to move slightly at this time. If necessary, SLIGHTLY loosen the expanding block at the 3 and 9 o'clock positions and re-adjust as need. Also can use wooden mallet to beat the frame ring to adjust.



17. **Once the machine is square to the pipe, tighten the frame locking screw completely.**

18. **Centering**
    18.1 Rotate the cutting tool at 12 o'clock position manually (For the large size, use the tool provided)

Note: Use the tool rotate the machine

18.2 Lower the tool, 2mm above the pipe
18.3 Rotate the tool at 6 o'clock to see the distance between the pipes. If the tool more closer to the pipe at 6 o'clock than at the 12 o'clock position, loosen 12 o'clock expanding block screw SLIGHTLY and tighten the expanding block screw at 6 o'clock. This will move the tool away at 6 o'clock and closer at 12 o'clock further centering machine.

19. **Repeat the related step if necessary, make sure the distance between pipe and tool are nearly same at 12, 3, 6,9 o'clock position.**

20. **Adjust the tool bit to make sure it can run normally and avoid damage**
    The cutting tool bit should extend beyond the bottom of the tool holder a distance equal to the wall thickness +3mm
    The beveling tool bit should extend beyond the bottom of the tool holder a distance equal to the wall thickness pull out from the bottom of knife holder should be +2mm of pipe wall thickness
    Note: This setting let the cutting fed in firstly (See step 24)

21. **Secure tool bits in place**
    Tighten the four corner bolts on each tool holder cover
    Note: In the case of cutting tool, be sure that the gap between the cover plate and the tool holder is equal on either side of The cutting tool

22. **Adjust the tool feed structure**
    According to the pipe size locate the position of feed triangle.

23. **Install the driven motor**
    Begin by loosening the 2 bolts located on the back of the pinion housing. Align two of the bolts holes in the motor mounting flange with the 2 bolts in the pinion housing.

Note: The motor can be mounted in several different positions. The motor should be mounted in such a way as to allow the operator the easiest and safest accessing possible
The drive head on the motor must insert fully into the socket in the pinion housing. If need be, turn the rotating frame slightly by hand, back and forth, until the drive head seats itself properly.

24. **Verify tool bit clearance**
    Using the provided hex tool kit, rotate the part and beveling tool slide star wheel counter clockwise until the cutting tool bit is roughly 2mm apart from pipe surface and the beveling tool bit is 3mm apart from the pipe surface.
    Note: Setting the tool in this way, you will ensure that the cutting tool Penetrates the pipe wall firstly allowing for the beveling tool to perform its functions more effectively.

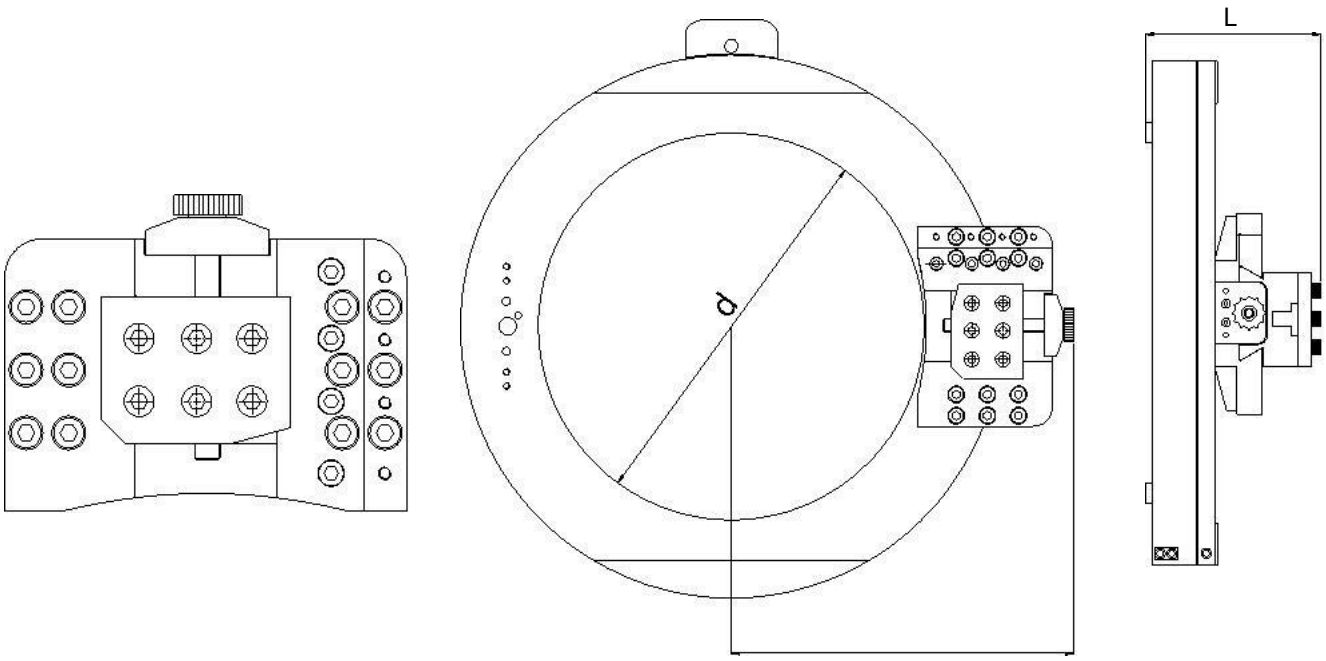
25. **Connect the air source / power supply**
    Note: a clean, dry air supply needed

26. **To begin the working, turn on the motor. The machine should initially rotate at 3-4 circles to verify proper starwheel setting.**
    Note: If starwheel does not mash the trip pin smoothly, stop machine immediately and follow step 22.

27. **Once the tool bits begin to get into material from the work piece, be sure to apply coolant for the duration of the machining process.**

28. **Machine removal**
    28.1 Retract the tool slides
    28.2 Disconnect power source and remove motor
    28.3 Loosen the four expanding blocks that hold the split frame in position
    28.4 Remove split frame from pipe
    Note: When the operations have been satisfactorily completed and the machine is ready for storage, be sure that it is free of debris such as metal chips and excess coolant. It's recommended that the machine halves be opened and the bearing race ways examined for metal

PART 5 AXIAL & RADIAL CLEARANCE



Model	d(mm)	h(mm)	L(mm)
89	94	147	159
159	165	216	171
168	185	226.5	171
230	236	253	171
275	281	275	171
325	331	290	171
377	386	330	171
426	432	345	172
457	464	370	172
508	515	395	181
610	618	447	182
762	770	523	185
830	840	555	187
914	924	602	194
1066	1077	683	194
1230	1248	775	207

PART 6 MAINTENANCE AND MACHINE ADJUSTMENTS

1. The power cable or air/hydraulic hose should be inspected for damage or wear out

2. Tool slide should be inspected for gib tension. If the tool slide is loosen, Gib adjustment will be needed.

Tension wedge bar's inner Hex. Screw to make it slightly resistant the tool slide

Re-Check tool slide tension by rotating starwheel. If there is a slight resistance the tool slide is properly tensioned.

3. Machine Lubrication

Tool slides

Lubricate all moving parts every 10 hours of operation

Pinion Housing

Lubricate the front needle bearing every 50 hours of operation.

Air Motor

Before every operation, lubricate the air motor blade (Lubricant oil added to air inlet, then start work)

4. Air Motor Maintenance

See the exploded view drawing for air motor in the part 10

After long time operation, the motor vanes may be damaged, use the suitable tool, disassembling air motor, change the new motor vane.

5. Bearing system

Do not move the bearings away its settled position, otherwise may damage the frame ring. After long time operation, it's required re-adjust; if there is a radial gap on the stationary ring, it's also required re-adjust the bearing system. All the adjustment, please contact us for the further assistance.

PART 7 DIAGRAM OF THE TOOL BITS

Sketch	Description	Part No.	Remark
	Cutting tool bit	43-702-01	Cut off
	Beveling tool bit	43-703-02	RH Beveling angle 30°
		43-704-02	RH Beveling angle 37.5°
		43-705-03	LH Beveling angle 37.5°
		43-706-04	Double V Beveling Tool

Note:

Each unit comes with 4 pieces of tool bits (2 pieces cutting tool,2 piece beveling tool) made by AISI M2, Work with carbon steel. We can supply tool bits made by AISI M42, can work with stainless steel.

Above is the standard tool bit, if need special tool bit, contact us.

PART 8 DIAGRAM OF THE EXPANDING BLOCK

Model	89	159	230	275	325	377	426
No block	89	159	230	273	325	377	426
	59	129	200	243	295	347	396
60-508-1 MA	59	129	200	243	295	347	396
15MM X	25	99	170	213	265	317	366
60-508-02 MA	-	99	170	213	265	317	366
30MM X		69	140	183	235	287	336
60-508-03 MA	-	69	140	183	235	287	336
45MM X		39	110	153	205	257	306
60-508-04 MA	-	-	-	153	205	257	306
60MM X				123	175	227	276
-	-	-	-	-	175	227	276
					145	197	246

Model	457	508	610	762	914	1066	1230
No block	457	508	610	762	914	1066	1230
	427	478	580	732	884	1036	1200
60-508-1 MAX	427	478	580	732	884	1036	1200
15MM MIN	397	448	550	702	854	1006	1170
60-508-05 MAX	397	448	550	702	854	1006	1170
15MM MIN	367	418	520	672	824	976	1140
60-508-06 MAX	367	418	520	672	824	9765	1140
15MM MIN	337	388	490	642	794	946	1110
60-508-07 MAX	337	388	490	642	794	946	1110
15MM MIN	307	358	460	612	764	916	1080
	307	358	460	612	764	916	1080
	277	328	430	582	734	886	1050

Note: The range of use marked on the expanding blocks.

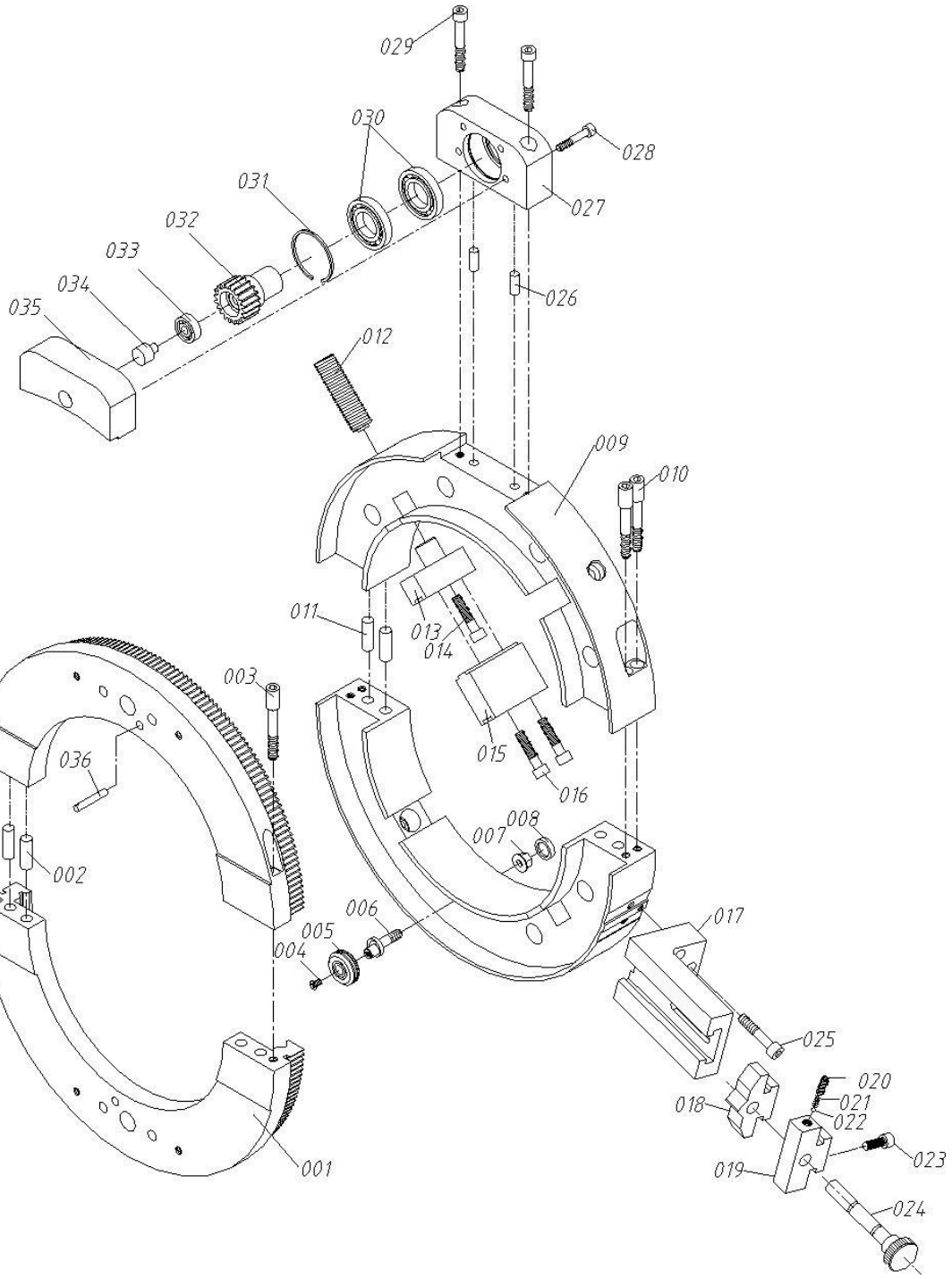
PART 9 TROUBLE SHOOTING

Trouble	Possible Reason	Remedy
Machine doesn't work	Locking pin not removed Power supply not on	Remove pins Check the power supply
Machine wave when working	The expansion structure is not fastened or the expanding block wrongly choose	Check the expansion screw or change a proper expanding block
Working face not good	The bevel tool bit is blunt or damaged	Edge the tool bit or replace with new tool bits
Machine chatters during working	Cutting speed too fast (Hydraulic type)	Slow down the cutting speed
Tool bit broken	Machine not perpendicular to pipe	Refer to installation step 16
Reducer Driven gear and Driving gear shaft damaged	Tool bits blunt; Machine not perpendicular to pipe	Edge the tool bit or replace with new tool bits Refer to installation step 16
Air Motor weak	The motor vane(blade)wear	Replace with new motor vane
Air Motor does not work	Dirt jam Parts rust	Clean the air motor and adopt the air treatment (air filter / regulator / lubricator) for compressed air
Electric motor abnormal sound	Check the carbon brush or the motor bearing 628Z	Replace with new carbon brush or bearing 628Z
Electric motor burnt	Scrap-iron or water goes into Unsteady power voltage Tool bit blunt, result in high load	Replace with new motor rotor or stator; Replace complete motor

Note: If a problem not listed in the chart, stop operation and contact us for additional instructions.

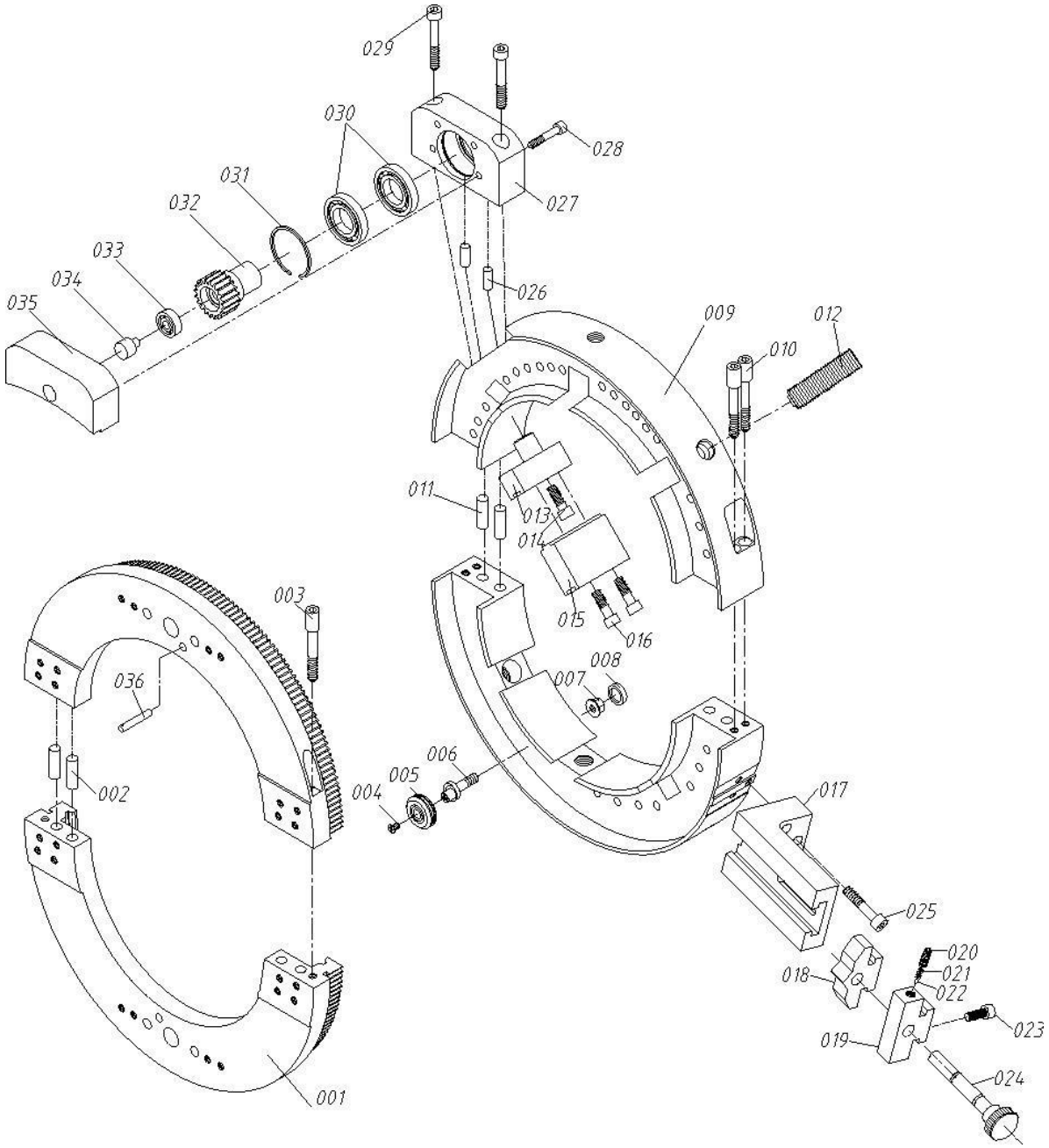
PART 10 PARTS LISTS AND EXPLODED VIEWS

Model-159 Mainframe Graph



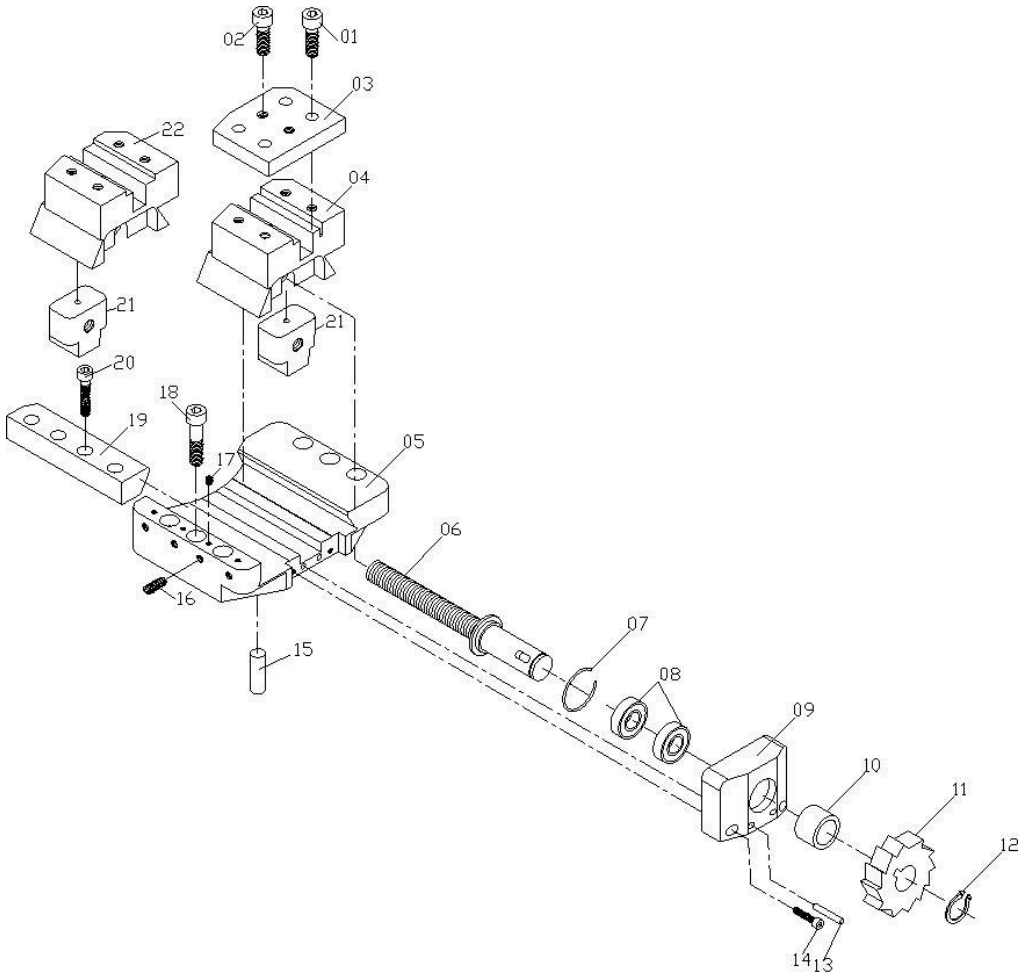
Part No	Qty	Description	Part No	Qty	Description
1	1	Rotary ring	20	1	Allen screw
2	4	Locating pin	21	1	Spring
3	2	Rotary ring locking screw	22	1	Steel ball
4	8	Bearing fastening screw	23	1	Allen Screw
5	8	Bearing	24	1	Pin
6	8	Bearing regulating shaft	25	3	Allen screw
7	8	Cage nut	26	2	Housing locating pin
8	8	Gland	27	1	Pinion housing(lower)
9	1	Stationary ring	28	4	Allen screw
10	4	Stationary ring locking screw	29	2	Allen crew
11	4	Locating pin	30	1	Deep groove ball Bearing
12	4	Clamping screw	31	1	Internal circlips
13	4	Clamping claw	32	1	Driving gear
14	4	8mm Allen screw	33	1	Deep groove ball Bearing
15	4	Expanding block	34	1	Lock pin
16	8	8mm Allen screw	35	1	Pinion Housing(Upper)
17	1	Feed structure pedestal	36	2	Locking pin
18	1	Tripper			
19	1	Pin mounting bracket			

Model-610 Mainframe Graph



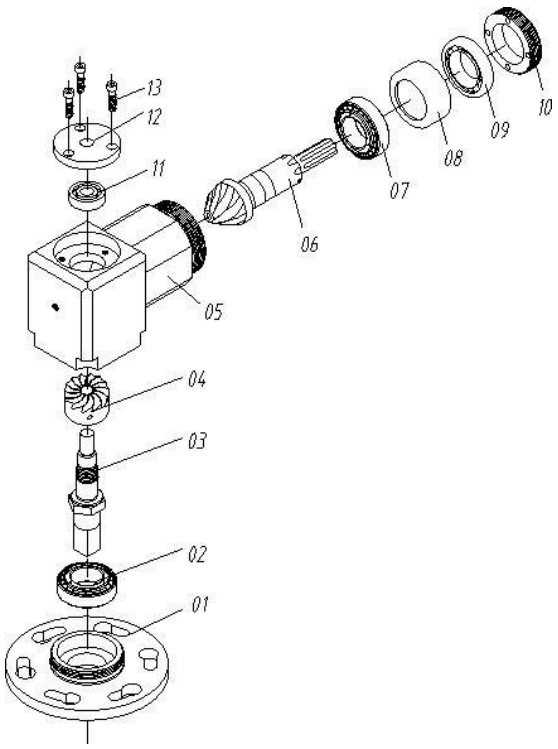
Part No	Qty	Description	Part No	Qty	Description
1	1	Rotary ring	20	1	Allen screw
2	4	Locating pin	21	1	Spring
3	2	Rotary ring locking screw	22	1	Steel ball
4	30	Bearing fastening screw	23	1	Allen Screw
5	30	Bearing	24	1	Pin
6	30	Bearing regulating shaft	25	3	Allen screw
7	30	Cage nut	26	2	Housing locating pin
8	30	Gland	27	1	Pinion housing(lower)
9	1	Stationary ring	28	4	Allen screw
10	4	Stationary ring locking screw	29	2	Allen crew
11	4	Locating pin	30	1	Deep groove ball Bearing
12	4	Clamping screw	31	1	Internal circlips
13	4	Clamping claw	32	1	Driving gear
14	4	8mm Allen screw	33	1	Deep groove ball Bearing
15	4	Expanding block	34	1	Lock pin
16	8	8mm Allen screw	35	1	Pinion Housing(Upper)
17	1	Feed structure pedestal	36	2	Locking pin
18	1	Tripper			
19	1	Pin mounting bracket			

Tool slide Graph



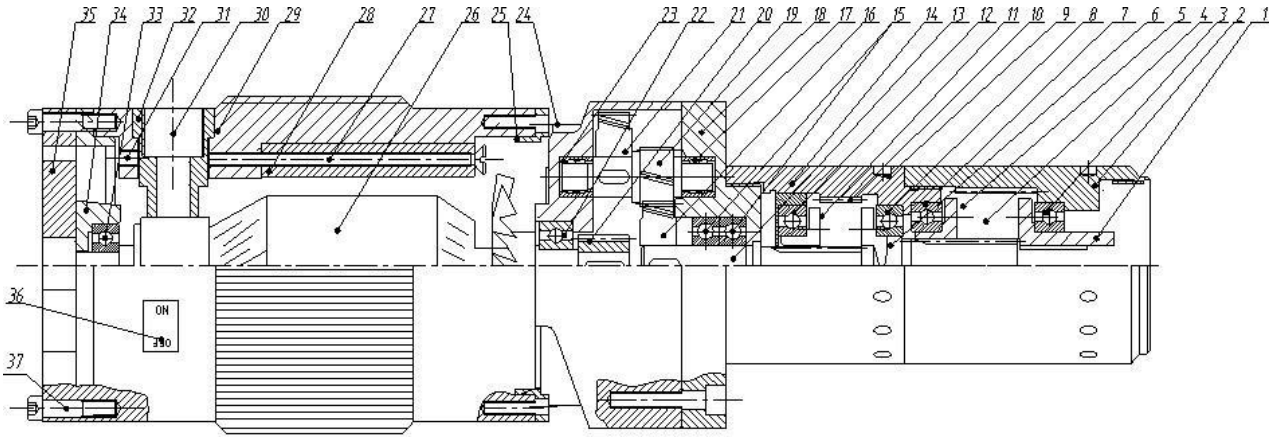
No	Description	Qty	No	Description	Qty
1	8mm Allen screw	4	12	Circlips	1
2	8mm Allen screw	2	13	Location pin	2
3	Tool cover	1	14	5mm Allen screw	3
4	Cutting tool slide	1	15	Location pin	1
5	Tool carrier	1	16	Spacer adjusting screw	4
6	Tool feed lead screw	2	17	Fasten adjusting screw	4
7	Circlips	1	18	8mm Allen screw	1
8	Bearing	2	19	Spacer	1
9	Lead screw mounting bracket	1	20	6mm Allen screw	4
10	Lead screw bush	1	21	Copper nut	2
11	Tool feed wheel	1	22	Beveling tool slide	1

T-shape Part Graph



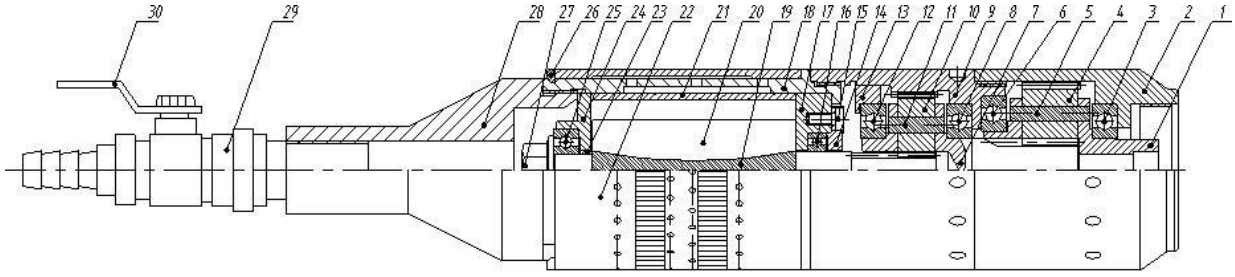
Part No	Qty	Name	Part No	Qty	Name
1	1	Flange	8	1	gasket
2	1	Conical roller bearing	9	1	Deep groove ball bearing
3	1	Output shaft	10	1	Check nut
4	1	Driven helical bevel gear	11	1	Deep groove ball bearing
5	1	Reducer elbow	12	1	Gland
6	1	Driving helical bevel gear	13	3	Screw
7	1	Conical roller bearing			

Electric Motor Graph



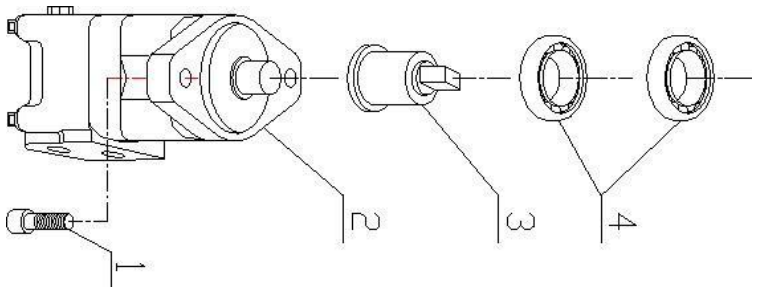
Part No	Qty	Name	Part No	Qty	Name
1	1	2 class Planet carrier	20	2	Bevel wheel
2	1	2 class Ring gear	21	1	Bevel wheel
3	1	Bearing	22	1	Bearing
4	3	2 class Planet gear	23	2	Needle bearing
5	3	Pin	24	2	M6 screw
6	1	1 class Planet carrier	25	2	Spacer
7	1	Bearing	26	1	Rotor
8	1	Bearing	27	1	Bolt
9	1	1 class Ring gear	28	1	Stator
10	3	1 class Planet gear	29	1	Motor shell
11	1	Pin	30	4	Carbon brush
12	1	Bearing	31	1	Bolt
13	1	Gear shaft	32	1	Carbon brush carrier
14	1	1 class Bushing	33	1	Bearing
15	2	Bearing	34	1	Cover
16	1	Bevel wheel	35	1	Ventilation cover
17	1	Needle bearing	36	3	Switch
18	1	Reducer	37	1	Bolt
19	1	Bevel wheel shaft			

Air Motor Graph



Part No.	Qty	Name	Part No.	Qty	Name
1	1	2 class Planet carrier	16	1	Bearing
2	1	2 class Ring gear	17	1	Bearing seat
3	1	Bearing	18	1	Motor casing 1
4	3	2 class Planet gear	19	1	Motor shaft
5	3	Pin	20	5	Motor blade
6	1	Bearing	21	1	Eccentric bushing
7	1	1 class Planet carrier	22	1	Motor casing 2
8	1	Bearing	23	1	Copper bush
9	1	1 class Ring gear	24	1	Bearing seat
10	3	1 class Planet gear	25	1	Bearing
11	1	Pin	26	1	Rubber band
12	1	Bearing	27	1	Nut
13	1	1 class Bushing	28	1	inlet suction port
14	1	Bearing cover	26	1	Quick coupling
15	3	Bearing	30	1	Valve

Hydraulic Motor Graph



Part No	Qty	Name	Part No	Qty	Name
1	1	Screw	4	2	Deep groove ball bearing
2	1	Motor	5	1	Contact flange
3	1	Transmission shaft			

Tool Feed Structure