GEARED HEAD MILLING & DRILLING MACHINE

MODEL 45 / 45N2F INSTRUCTION MANUAL

45/45N2F-090313-R4

⚠ WARNING !

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reprodrctive harm. Some examples of these chemical are:

- Lead from lead-based paints.
- Crystalline silica from bricks, cement and other masonry products.
- Arsenic and chromium from chemically-treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: Work in a well ventilated area, and word with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

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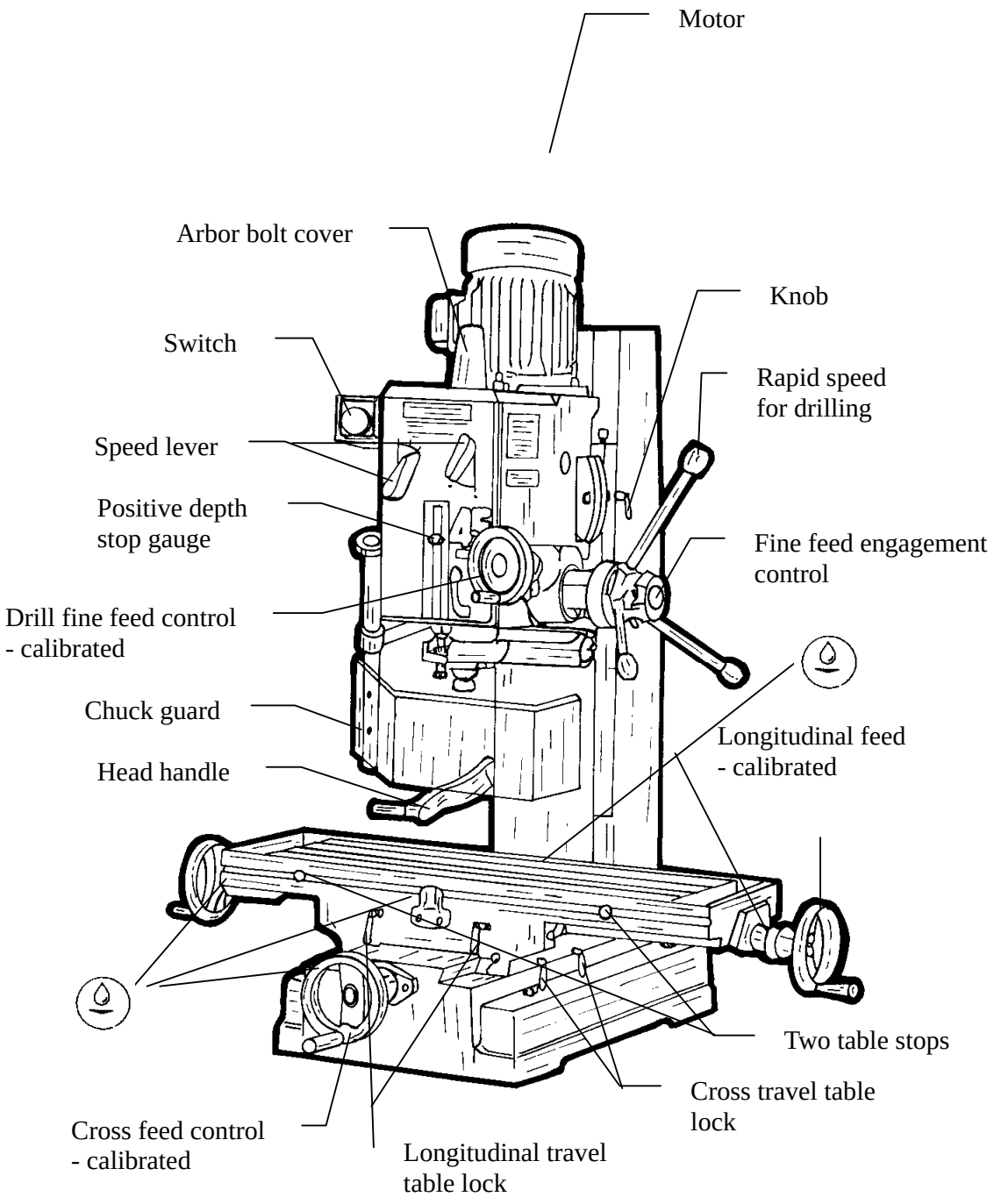
Overall Aspect



WARNING: FAILURE TO FOLLOW THESE RULES
MAY RESULT IN SERIOUS PERSONAL INJURY

As with all machinery there are certain hazards involved with operation and use of the machine. Using the machine with respect and caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.

This machine was designed for certain applications only. We strongly recommends that this machine NOT be modified and/or used for any application other than for which it was designed. If you have any questions relative to its application DO NOT use the machine until you contact with us and we have advised you.

Your machine might not come with a power socket or plug. Before using this machine, please Do ask your local dealer to install the socket or plug on the power cable end.

SAFETY RULES FOR ALL TOOLS

A. USER:

1. **WEAR PROPER APPAREL.** No loose clothing, gloves, rings, bracelets, or other jewelry to get caught in moving parts.
   Non-slip foot wear is recommended. Wear protective hair covering to contain long hair.
2. **ALWAYS WEAR EYE PROTECTION.** Refer to ANSLZ87.1 standard for appropriate recommendations.
   Also use face or dust mask if cutting operation is dusty.
3. **DON'T OVERREACH.** Keep proper footing and balance at all times.
4. **NEVER STAND ON TOOL.** Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.
5. **NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF.** Don't leave tool until it comes to a complete stop.
6. **DRUGS, ALCOHOL, MEDICATION.** Do not operate tool while under the influence of drug, alcohol or any medication.

B. USE OF MACHINE:

1. **DON'T FORCE TOOL.** It will do the job better and be safer at the rate for which it was designed.

2. **USE RIGHT TOOL.** Don't force tool or attachment to do a job for which it was not designed.
3. **SECURE WORK.** Use clamps or a vise to hold work when practical. It's safer than using your hand frees both hands to operate tool.
4. **USE RECOMMENDED ACCESSORIES.** Consult the owner's manual for recommended accessories. The use of improper accessories may cause hazards.
5. **AVOID ACCIDENTAL STARTING.** Make sure switch is in "**OFF"** position before plugging in power cord.

C. ADJUSTMENT :

MAKE all adjustments with the power off. In order to obtain the machine. precision and correct ways of adjustment while assembling, the user should read the detailed instruction in this manual.

D. WORKING ENVIRONMENT:

1. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.
2. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well-lighted.
3. **KEEP CHILEREN AND VISITIORS AWAY.** All children and visitors should be kept a safe distance from work area.
4. **DON'T** install & use this machine in explosive, dangerous environment.

E. MAINTENANCE

1. **DISCONNECT** machine from power source when making repairs.
2. **CHECK DAMAGED PARTS.** To read every details of trouble shooting, repair it very carefully and make sure the operator won't get injure and damage the machine.

Thank you for purchasing the **RF-45 (N2F) COMPLEX** Machine. If properly cared for and operated, this machine can provide you with years of accurate service. Please read this manual carefully before using your machine.

1.**SPECIFICATION**

Drilling capacity		T-Slot size	16 mm ($^{5}/_{8}$")
	32mm($1^{1}/_{4}$")	Working size	820mmx240mm (32"x($9^{3}/_{8}$")
Face mill capacity	100mm($3^{7}/_{8}$")	Working table longitudinal travel	520mm($20^{1}/_{2}$")
End mill capacity	20mm($^{3}/_{4}$")	Working table cross travel	210mm($8^{1}/_{4}$")
Swing	510mm($20^{1}/_{16}$")	Overall height W / O Stand	2065mm($81^{1}/_{4}$")

Max. distance spindle nose to table		460mm(18")	Length	925mm(36 $^{3}/_{8}$")
Spindle taper		R-8 or MT#3, NT#30 (Option)	Width	1190mm(46$^{3}/_{4}$")
Spindle stroke		130mm(5")	Vertical spindle motor	1ø 1$^{1}/_{2}$HP (4 Pole) 3ø 1HP
Quill diameter		75mm(3")	Packing	1 set / 1 case
Spindle speed (r.p.m)	6S	60Hz 65.130,220,480,925,1550(4P)	Weight (NW/GW)	330 kgs / 360 kgs
		50Hz 55,105,175,390,755,1260(4P)	Measurement	915mmx737mmx1270 mm(36"x29"x50")
Head tilt, & right		90° & 30°	Q'ty / 1x20' Container	18 sets

OPTIONAL ACCESSOIRES:

1. $^{1}/_{2}$" drill chuck	6. K-type milling vise
2. 52 pcs clamping kits	7. Face milling cutter
3. 3" "U" type vise	8. Tapping switch
4. Table power feed	Milling chuck (7 pcs / set)
5. Digital readout	

Tools selection & proper material range

Tool type	**Tool material**	**Work piece material**
End mill	HSS	Non-iron material steel iron
	TUNGSTEN CARBIDE	Cast iron non-iron material
Face mill	TUNGSTEN CARBIDE	Non-iron material steel iron Light material
Drilling	HSS	Non-iron material steel iron Light material
Tapping	HSS	Non-iron material steel iron Light material

2. FEATURES

(1) This machine has several uses, such as surface cutting, drilling, milling, and also can be equipped with an electric switch for tapping.

(2) This machine is of fine quality, can be operated easily, and it is not limited to skilled operators.

(3) The drilling and milling operation can be performed by two methods:

1). Hand operation, which makes quick drilling.

2). Worm gear feed operation, which makes slow milling.

(4) Bronze adjustable nuts, which adjust the thread clearance and reduce the wear. They also make screws rotated smoothly and increase the thread accuracy.

(5) Whole column which makes this machine strong, stable, and also keep the high accuracy.

(6) Head of tough cast ensures its accuracy lasting and enduring through the treatment of precise boring cylinder, grinding, and internal stress relief.

3. DELIVERY & INSTALLATION

Unpacking

1. Transportation to desired location before unpacking, please use lifting jack.(Fig. B)

2. Transportation after unpacking, please use heavy duty fiber belt to lift up the machine.

ALLWAYS KEEP PROPER FOOTING & BALANCE WHILE MOVING THIS MACHINE.

Fig. B

Installation:

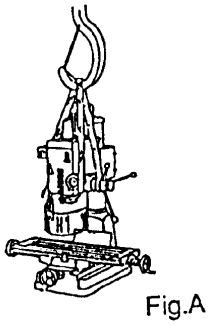


Fig.A

(1) **BE SURE** all locks of head-stock & column are tighten before operation.

(2) **ALWAYS** keep proper footing & balance while moving this 300kgs machine. And only use heavy duty fiber belt to lift the machine as per Fig. A.

(3) **KEEP** machine always out from sun, dust, wet, raining area.

(4) **POSITION** & tighten 4 bolts into base holes properly after machine in balance.

(5) **TURN OFF** the power before wiring & be sure machine in proper grounding. Overload & circuit breaker is recommended for safety wiring.

(6) **CHECK** carefully if main shaft in clockwise direction while running test. If not, reverse the wiring then, repeat the test till spindle direction is correct.

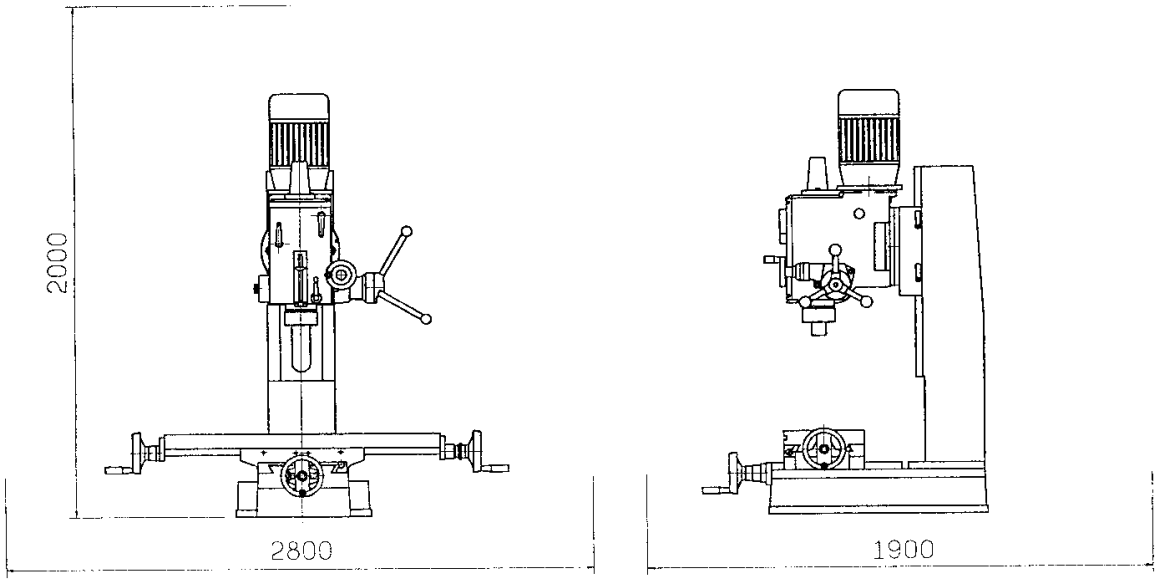
(7) **Finish** removing this wooden case/crate from the machine. Unbolt the machine from the crate bottom.

(8) **Carefully** lift the machine to a sturdy stand or work bench. For best performance, through bolt the machine to bench or stand.

(9) **Bolt** the stand legs to the floor, while using a sturdy stand.

Before Bolting The Machine To A Bench Or Stand Or Floor, The Unit Must Be Level In Both Directions.

4. MINIMUM ROOM SPACE FOR MACHINE OPERATION



5. USE OF MAIN MACHINE PARTS (See Fig. l)

(1) To raise and lower the head by head handle.

(2) Equipped with an electric switch for tapping operation clockwise or counterclockwise.

(3) To adjust the quick or slow feeding by feed handle.

(4) To adjust the table left and right travel by table handle wheel.

(5) To adjust the table fore and aft travel by table handle wheel.

(6) To operate the spindle handle wheel for micro feed.

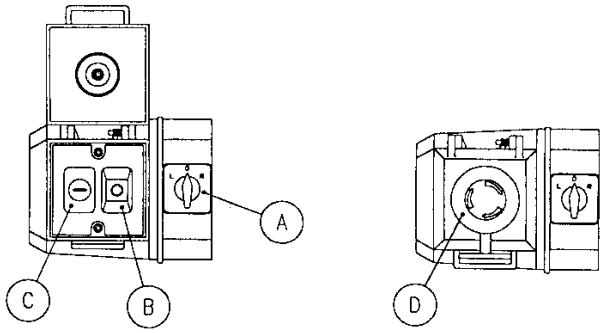
(7) To adjust the scale size according to working need.

(8) Switch button function description.

(a) Before starting the machine turn the selection knob (A) to (right for clock wise running, left for counter clock vise)

(b) Push button (C) to start the machine.

(c) Push button (B) to stop the machine.



(d) When in emergency push button to stop the machine. after clearing the trouble, release emergency button, re-start the machine by pushing the start button.

6. PRECAUTION FOR OPERATION

Check all parts for proper condition before operation; if normal safety precautions are notice carefully, this machine can provide you withstanding of accurate service.

(1) Before Operation

(a) Fill the lubricant.

(b) In order to keep the accurate precision, the table must be free from dust and oil deposits.

(c) Check to see that the tools are correctly set and the work-piece is set firmly.

(d) Be sure the speed is not set too fast.

(e) Be sure everything is ready before use.

(2) After Operation

(a) Turn off the electric switch.

(b) Turn down the tools.

(c) Clean the machine and coat it with lubricant.

(d) Cover the machine with cloth to keep out the dust.

(3) Adjustment of Head

(a) To raise and lower the head, loosen the two heavy duty head lock nuts shown in Fig.l. Use the left side head handle to raise and lower the head on its rack and pinion mechanism. When the desired height is reached, tighten the bolts to avoid vibration.

(b) Unscrew 3 nuts while the work-piece needs to be bevel drilled turn to the degrees you wish on the scale, then screw the 3.

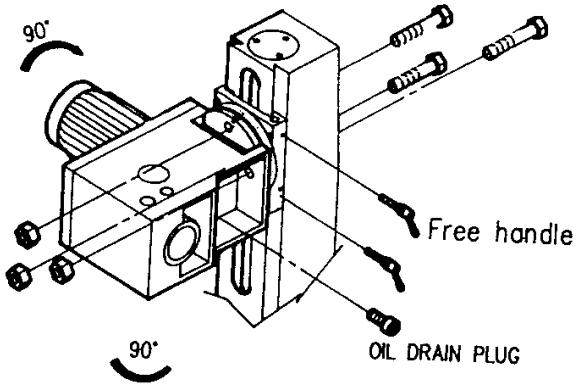


Fig. 1

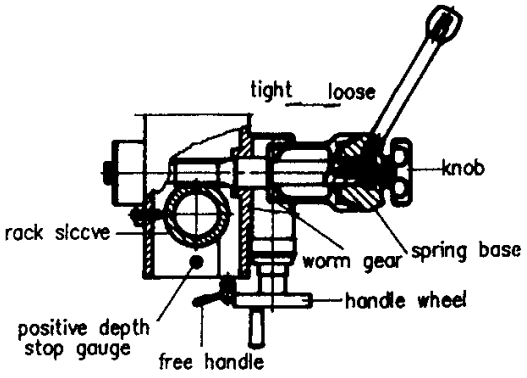


Fig 2

QUILL RETURN SPRING ADJUSTMENT:

Spring tension for return of spindle, after hole drilling, has been pre-set at the factory. No further adjustment should be attempted unless absolutely necessary. Adjustment will probably be required if a multiple drilling or tapping head is used. If adjustment is necessary, loosen lock screw while holding. Do not allow the housing to turn in your hand, or spring will unwind. Turn entire housing assembly clockwise the number of turns necessary to cause the quill to return to its up position. (NOTE. The flat of the spring housing pilot is lined up with the spring loading hole on the body of the spring housing.) Reset lock screw make sure point of screw mates to flat on the housing journal.

(4) Preparing for Drilling (see fig. 2)(Except addition power feed system).
Turn of the knob make loose the taper body of worm gear and spring base. Then we decide spindle stroke setting the positive depth stop gauge for drilling blind hole or free state for pass hole.

(5) Preparing for Milling (see fig. 2)(Except addition power feed system).
(a) Adjust the positive depth stop gauge to highest point position.
(b) Turn tight of the knob be use to taper friction force coupling the worm gear and spring base. Then turning the handle wheel by micro set the spindle of work piece machining height.
(c) Lock the rack sleeve at the desired height with fixed bolt.

7. ADJUSTING TABLE SLACK AND COMPENSATE FOR WEAR (see Fig. 3)

(1) Your machine is equipped with Jib strip adjustment to compensate for wear and excess slack on cross and longitudinal travel.
(2) Clockwise rotation the job strip bolt with a big screw for excess slack otherwise a little counter clockwise if too tight.
(3) Adjust the jib strip bolt until feel a slight drag when shifting the table.

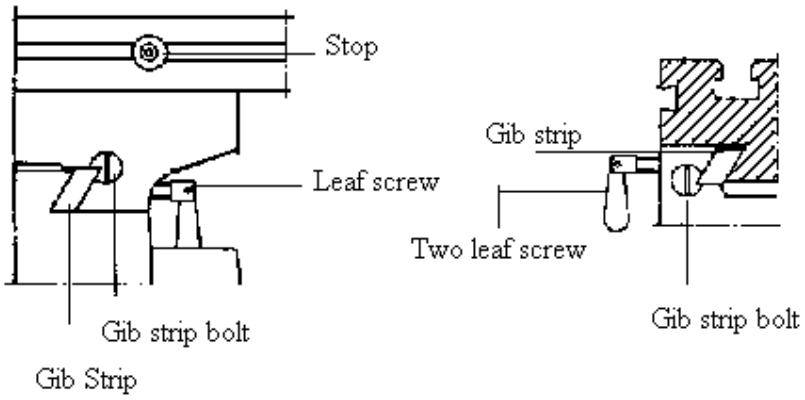


Fig. 3.

8. CLAMPING, TABLE BASE, AND MACHINE BASE (see Fig. 3)

(1) When milling longitudinal feed, it is advisable to lock the cross feed table travel to insure the accuracy of your work. To do this, tighten the small leaf screw located on the right side of the table base.

(2) To tighten the longitudinal feed travel of the table for cross feed milling, tighten the two small leaf screw on the front of the table base

(3) Adjustable travel stops are provided on the front of the table for control of cross travel and the desired milling length.

9. SPEED CHANGING (See Fig. 4)

(1) Turn power off.

(2) Select the suitable R.P.M. from speed charts of table 1.

(3) Turn the speed lever A and B to correct position.

(4) Turn on the power.

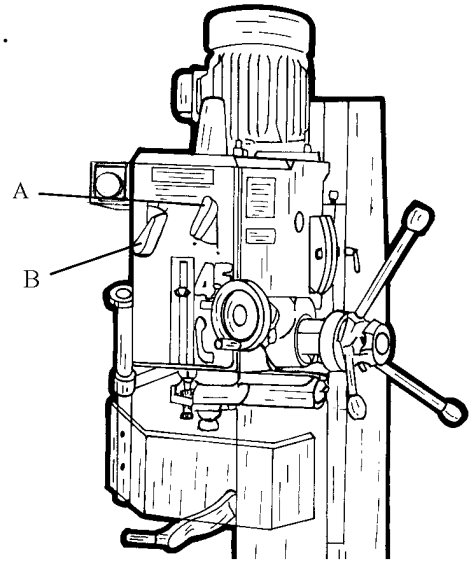


Fig.4

Caution for Switch:

When changing the running direction of the spindle, forward to reverse or reverse to forward, STOP THE MOTOR POWER first.
Absolutely do not change the spindle running direction when machine is running.
Improper operation of the switch may cause to the damage of switch, machine or the danger to operator.

WARING : CHANGE SPEED ONLY WHEN

MACHINE IS STOPPED

RPM / LEVERS	60HZ	50HZ
L1	55	65
L2	105	130
L3	175	220
H1	390	480
H2	755	925
H3	1260	1550

Table .1

10. TO CHANGE TOOLS

(1) Removing Face Mill or Drill Chuck Arbor

Loosen the arbor bolt (see fig. 4) at the top of the spindle shaft approximately 2 turns with a wrench. Rap the top of the arbor bolt with a mallet. After taper has been broken loose, holding chuck arbor on hand and turn detach the arbor bolt with the other hand.

(2) To Install Face Mill or Cutter Arbor

Insert cutter and cutter arbor into the taper of spindle. Tighten arbor bolt detach securely, but do not over-tighten.

(3) Removing Taper Drills

(a) Turn down the arbor bolt and insert the taper drill into the spindle shaft.

(b) Turn the rapid down handle rod down until the oblong hole in the rack sleeve appears. Line up this hole with the hole in the spindle. Insert key punch key through holes and strike lightly with a mallet. This will force the taper drill out.

11. ORDERING REPLACEMENT PARTS

Complete parts list is attached. If parts are needed, contact your local distributor.

12. EXTRA TOOLING AND ACCESSORIES

Each of machines is equipped with a MT # 3 spindle taper or a R8 spindle taper (examples below). Contact your local distributor or a major cutting tool distributor to obtain any of these accessories.

Taper Drills

Reamers

End Mills

Cutter Arbor

Taps

Collets

Adapters and Sleeves

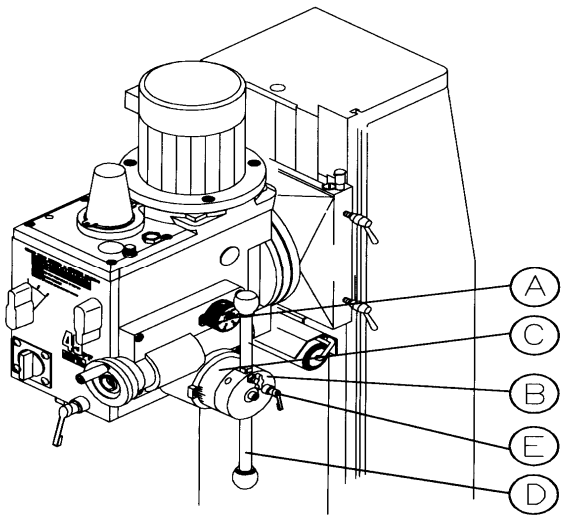
13. TAPPING EQUIPMENT

This machine can be equipped with an electric switch for tapping operation clockwise or counter-clockwise, and the working depth also can be adjusted by the limit switch. (Electric switch will be installed according to your requirement, and you must pay the cost only.)

14. SPINDLE POWER DOWN FEED OPERATION

1. Select profitable spindle speed and automatic feeding rate according to cutting condition.
   By adjusting the shift dial A you can obtain the feed rate you need.

2. **FEEDING DEPTH SETTING:**
   First release the dial fix-nut E and turn the indicating ring C to the depth needed. then reset E tightly again.
   CAUTION: DO NOT LET FEEDING DEPTH EXCEEDED SPINDLE STROKE.
3. **START FEEDING**
   Start the machine and push out the handle rod D, then the spindle will feed down automatically Until the end of stroke you set.
4. **END OF AUTO FEEDING**
   The spindle will return to top when reaching the end of stroke you set. when in emergency or Desire to stop the motion during feeding, push back the handle rod D to its original place.
5. **MICRO FEEDING BY MANUAL**
   Set the shift dial A to "0" position, and start feeding by turning F handle.
6. To prevent danger, when spindle power down feed is not in use, please lock the handle B well.



15. SPECIFICATION OF T-SOLT

The size of T-Solt on table as Fig 6:

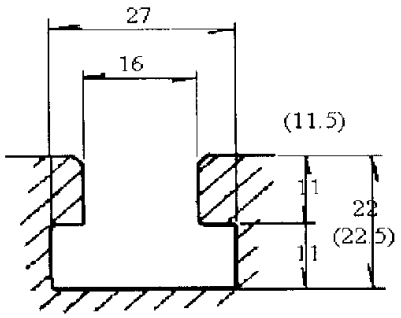


Fig. 6.

16. MAINTAINING

That's easier to keep machine in good condition or best performance by means of maintaining it at any time than remedy it after it is out of order.

(1) Daily Maintenance (by operator)

(a) Fill the lubricant before starting machine everyday.

(b) If the temperature of spindle caused over-heating or strange noise, stop machine immediately to cheek it for keeping accurate performance.

(c) Keep work area clean; release vise, cutter, work-piece from table; switch off power source; take chip or dust away from machine and follow instructions lubrication or coating rust proof oil before leaving.

(2) Weekly Maintenance

(a) Clean and coat the cross leading screw with oil.

(b) Check to see if sliding surface and turning parts lack of lubricant. If the lubricant is insufficient, fill it.

(3) Monthly Maintenance

(a) Adjust the accurate gap of slide both on cross and longitudinal feed.

(b) Lubricate bearing, worm, and worm shaft to avoid wear.

(4) Yearly Maintenance

(a) Adjust table to horizontal position for maintenance of accuracy.

(b) Check electric cord, plugs, switches at least once a year to avoid loosening or wearing.

17. CLEANING & LUBRICATING

(1) Your machine has been coated with a heavy grease to protect it in shipping. This coating should be completely removed before operating the machine. Commercial degreaser, kerosene or similar solvent may be used to remove the grease from the machine, but avoid getting solvent on belts or other rubber parts.

(2) After cleaning, coat all possible rusted surface with a light lubricant. Lubricate all points with a medium consistency machine oil.

18. CHANGING THE GEAR BOX OIL

Tilt the hard stock over as shown in fig.1. Open the oil drain plug to allow the oil to drain from the opening completely. Then lock the oil drain plug and turn the head to be upright position. Remove the oil filler plug fill the oil to the gear box until the oil lever reach the middle of oil fluid lever indicator. Then lock the plug.

LUBRICATION:

AII ball bearings in your mill/drill are sealed for life, requiring no lubrication. Points requiring lubrication are:

(1) Internal spline drive assembly. Keep this area well lubricated with a good grade non-hardening grease, such as Fiske Company "Lubriplate". insert grease in the hole at the top of spindle pulley spline driver. Lube twice yearly.

(2) A light film of oil applied to the quill and column will reduce wear, prevent rust, and assure ease of operation.

(3) Quill return spring should receive oil (SAE 20) once yearly. Remove cover plate and apply oil with squirt can or small brush.

(4) IMPORTANT: The gear box should be oiled with a lubricant such as SAE 68 oil in level. CHANGE OIL EVERY ONE YEAR.

(5) Apply Lubriplate To quill pinion every 90 days.
NOTE. Use extreme care when performing this operation and keep hands clear of pinch points. When using paraffin bar, do this only by turning the sheaves by turning the sheaves by hand. Do not apply with motor running.

19. TROUBLE SHOOTING

(1) No running after switch on:
- (a) Main switch interruption while volts irregular - Adjust input voltage and draw back the main switch.
- (b) Break down of fuse in switch box - Replace with new one.
- (c) In case of too much current, the overload relay jumps away automatically - Press the overload relay, and it will return to the correct position.

(2) Motor Overheat and No Power:
- (a) Overload - Decrease the load of feed.
- (b) Lower voltage - Adjust to accurate voltage.
- (c) Spoiled contact point of magnetic switch - Replace with new one.
- (d) Breakdown of overload relay - Connect it or replace with new one.
- (e) Motor is poor - Replace with new one.
- (f) Break down of fuse or poor contact with wire (it is easily, to spoil motor while short circuit) Switch off power source at once and replace fuse with new one.

(g) If this machine with the tapping attachment, there is an aid plum screw fix on the motor mount in order to avoid the motor pulleys shake while turning.

(3) The temperature of spindle bearing is too hot:

(a) Grease is insufficient - Fill the grease.

(b) The spindle beating is fixed too tight - turning with no speed and feel the tightness with hand.

(c) Turning with high speed for a long time - Turn it to lightly cutting.

(4) Lack of power with main spindle revolving:

(a) Motor has burned out - Change a new motor.

(b) Fuse has burned out - Replace with new one.

(5) Table travel has not balanced:

(a) The gap of spindle taper too wide - Adjust bolt in proper.

(b) Loosening of leaf bolt - Turn and fasten in place.

(c) Feed too deep -Decrease depth of feed.

(6) Shake of spindle and roughness of working surface has taken place during performance:

(a) The gap of spindle bearing too wide - Adjust the gap in proper or replace bearing with new one.

(b) Spindle loosening up and down - Make two of inner bearing covers on the top tight each other. Do not over-tighten two inner bearing covers with the taper bearing; it is ok as long as no gap between them.

(c) The gap of taper sliding locate too wide - Adjust the tension of bolt in proper.

(d) Loosening of chuck - Fasten chuck.

(e) Cutter is dull – Re-sharpen it.

(f) Work-piece has not hold firmly - Be sure to tighten work-piece.

(7) Micro feed does not work smoothly:

(a) Loosening of clutch - Be sure to tighten it.

(b) Worm and worm shaft has worried out - Replace with new one.

(c) Loosening of hand-wheel fixed screw - Be sure to tighten it.

(8) Without accuracy in performance:

(a) The balance of the work-piece - must be considerated as the principle balance while holding work-piece.

(b) Often use of hammer to strike work-piece - Forbidden to use hammer to strike work-piece.

(c) Unaccurate horizontal table - Cheek and maintain table for keeping accurate horizontal after a period of use.

(9) Excessive vibration:

(a) Motor out-of-balance. – Balance or replace problem motor.

(b) Bad motor. – Replace motor.

(10) Motor stalls:

(a) Over feeding - Reduce feed rate.

(b) Dull drill – Sharpen drill and keep sharp.

(c) Motor not building up to running speed. – Replace or repair motor. Check fuses in all three legs on three phase motors and replace if necessary.

(d) Bad motor. – Replace motor.

(11) Noisy operation:

(a) Excessive vibration. – Check remedy under excessive vibration.

(b) Improper quill adjustment. – Adjust quill.

(c) Noisy spindle. – Lubricate spindle.

(d) Noisy motor. – Check motor bearings or for loose motor fan.

(12) Drill or Tool heats up or burns work:

(a) Excessive speed. – Reduce speed.

(b) Chips not clearing. – Use pecking operation to clear chips.

(c) Dull tool. – Sharpen tool or replace.

(d) Feed rate too slow. – Increase feed enough to clear chips.

(e) Rotation of frill incorrect. – Reverse motor rotation.

(f) Failure to use cutting oil or coolant (on steel). – Use cutting oil or coolant on steel.

(13) Drill leads off:

(a) No drill spot. – Center punch or center drill work-piece.

(b) Cutting lips on drill off center. – Regrind drill.

(c) Quill loose in head. – Tighten quill.

(d) Bearing play. – Check bearings and reseat or replace if necessary.

(14) Excessive drill run-out or wobble:

(a) Bent drill. – Replace drill. Do not attempt to straighten.

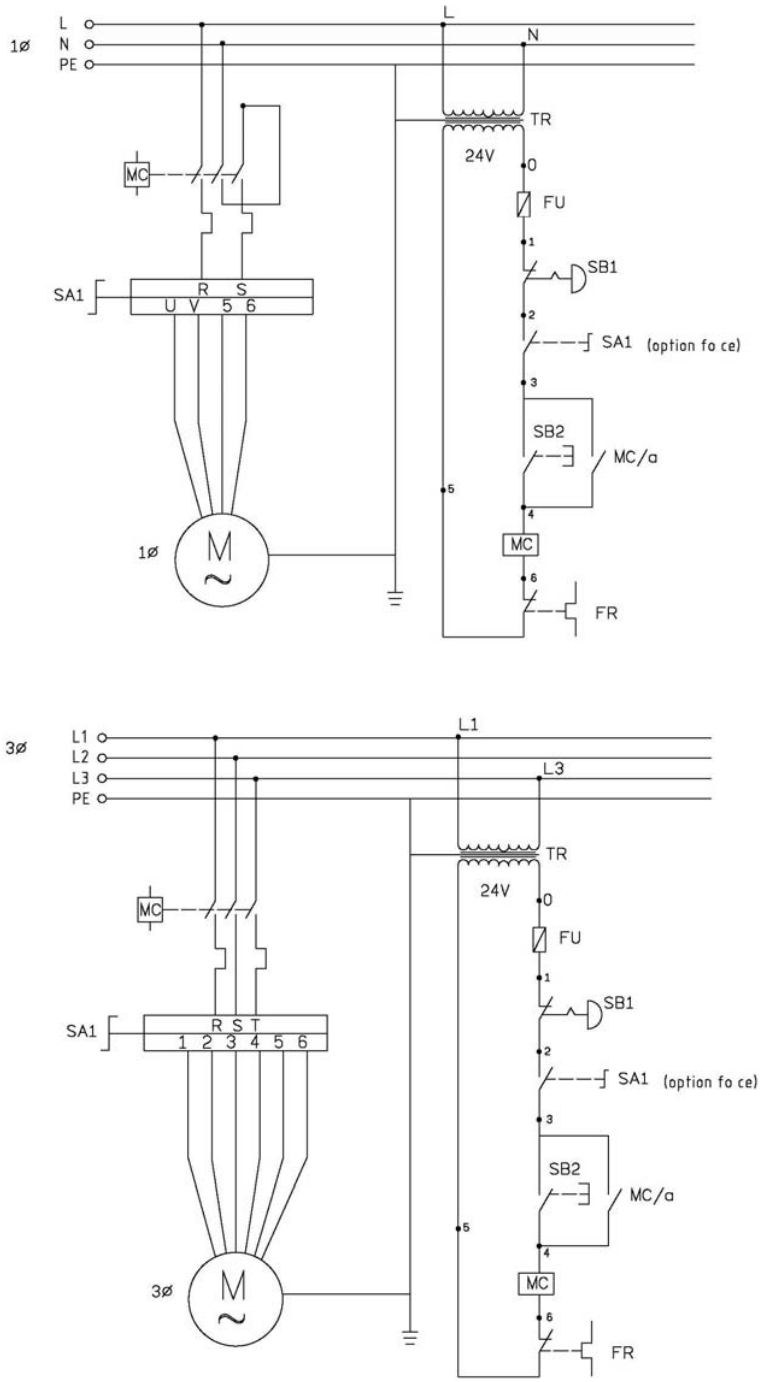
(b) Bearing play. – Replace or reseat bearings.

(c) Drill not seated properly in chucks. – Loosen, reseat and tighten chuck.

(15) Work or fixture comes loose or spins:

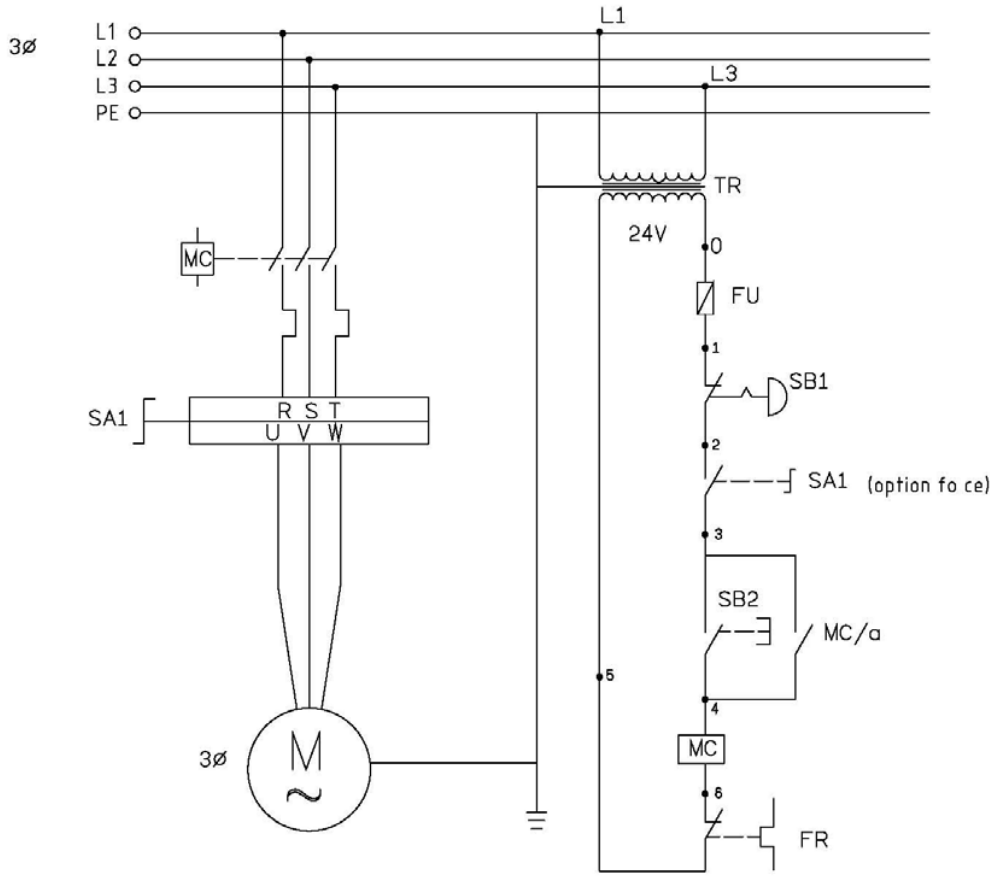
Failure to clamp work-piece or work holding device to table. – Clamp work-piece or work holding device to table surface.

CIRCUIT DIAGRAM



MC: Magnetic Contactor
FU: FUSE
SB1: Emergency Stop Switch
SB2: Push button Switch
SA1: 2/4P CAM Switch
FR: Overload
TR: Transformer

CIRCUIT DIAGRAM

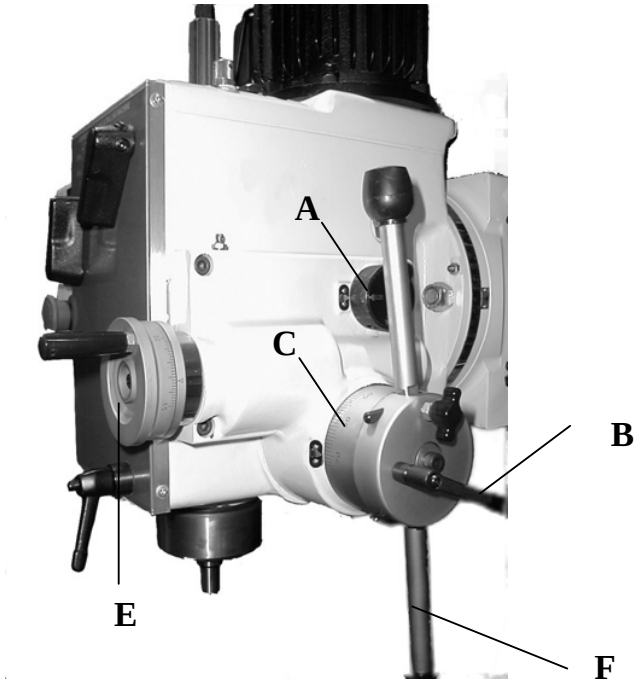


MC: Magnetic Contactor
FU: FUSE
SB1: Emergency Stop Switch
SB2: Push button Switch
SA1: Forward & Reverse Switch
FR: Overload
TR: Transformer

POWER DOWN FEED OPERATION:

1. Firs, check the proper feed speed for the object the cutter.
2. By adjusting the shift dial “A”(see Fig2), You can obtain the speed you need. The shift dial can be operated during the machine running or when the machine is stopped by turning it on clockwise or counter-clockwise.
3. Adjust the proper distance between the object and cutter and the feeding depth needed. When adjusting the feeding depth, first release the dial fix-nut “B”(see Fig.2)and turn the indicating ring “c” to the depth needed. Then reset “B” “tightly again.
4. Start the machine and push out the handle rod “F”(see Fig.2), then the spindle will feed down automatically until the end of stroke you set. It will go back automatically at the end of stroke.
5. If you want to set micro-adjustment, you should turn the shift dial “E”to “0” at fist.

CAUTION: The maximum spindle spindle for power down feed is 107 mm only When spindle power down feed motion is released, spindle will return automatically. Please watch out the handle rod turning.



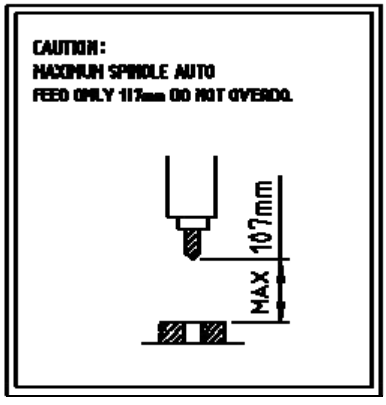
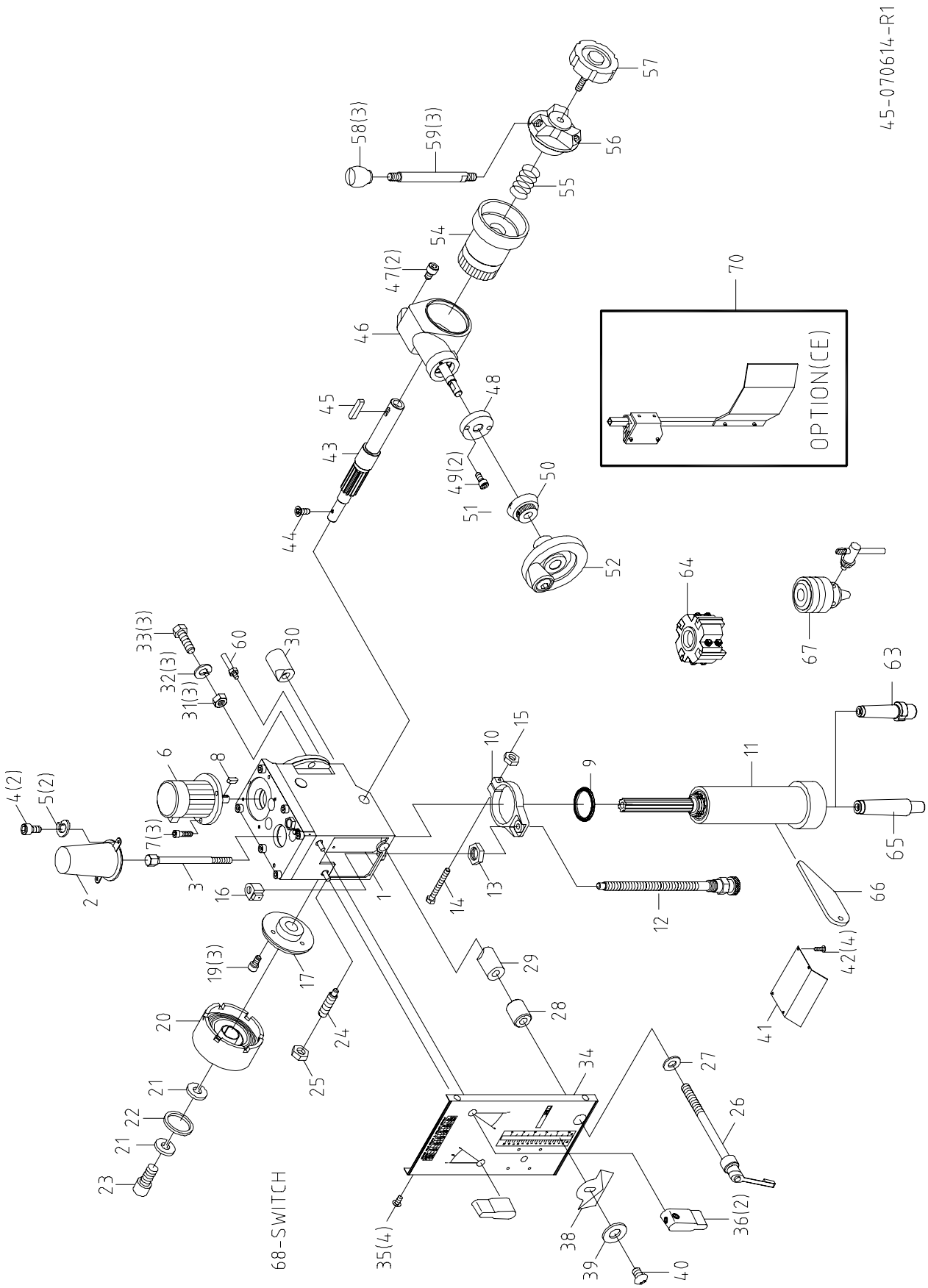
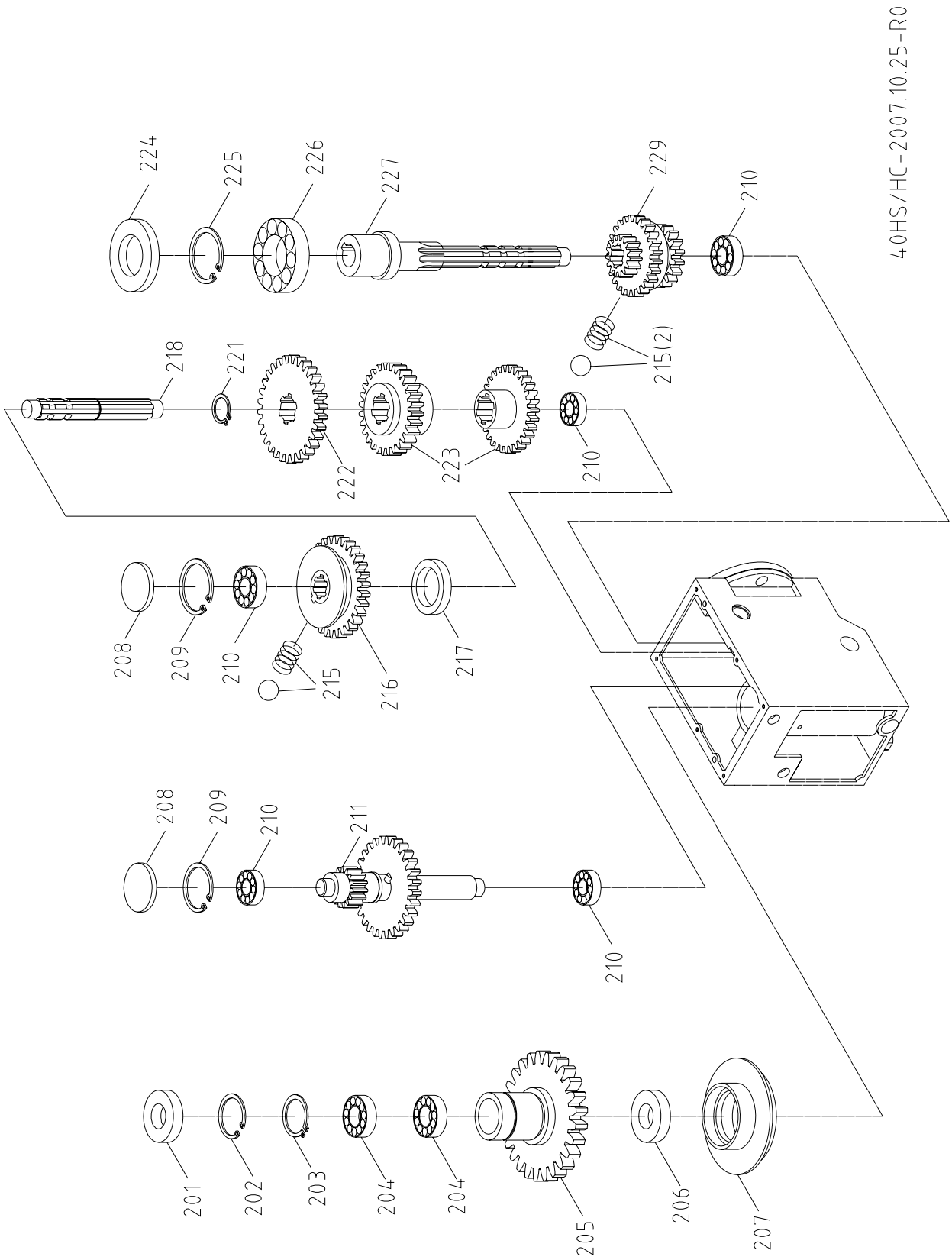
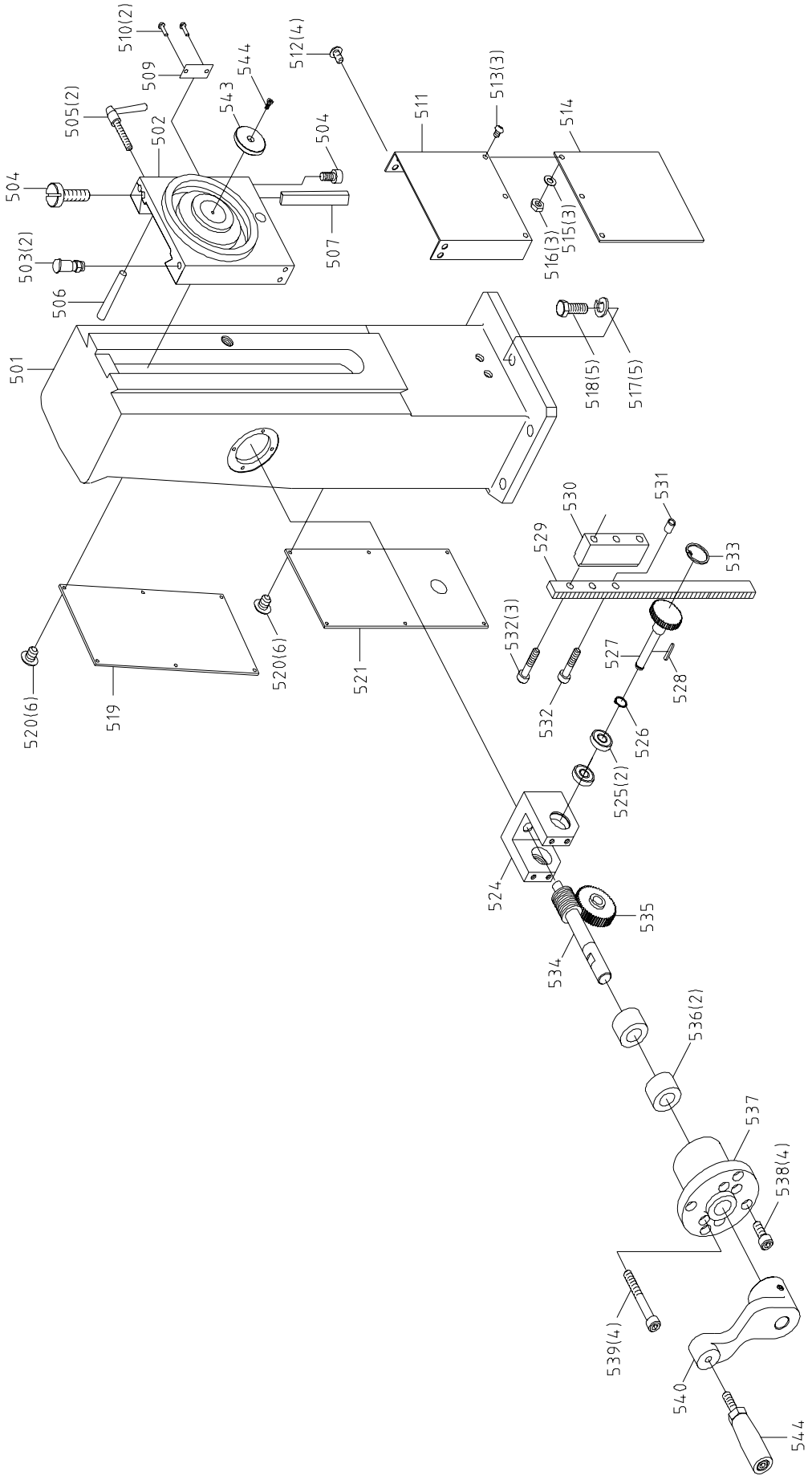
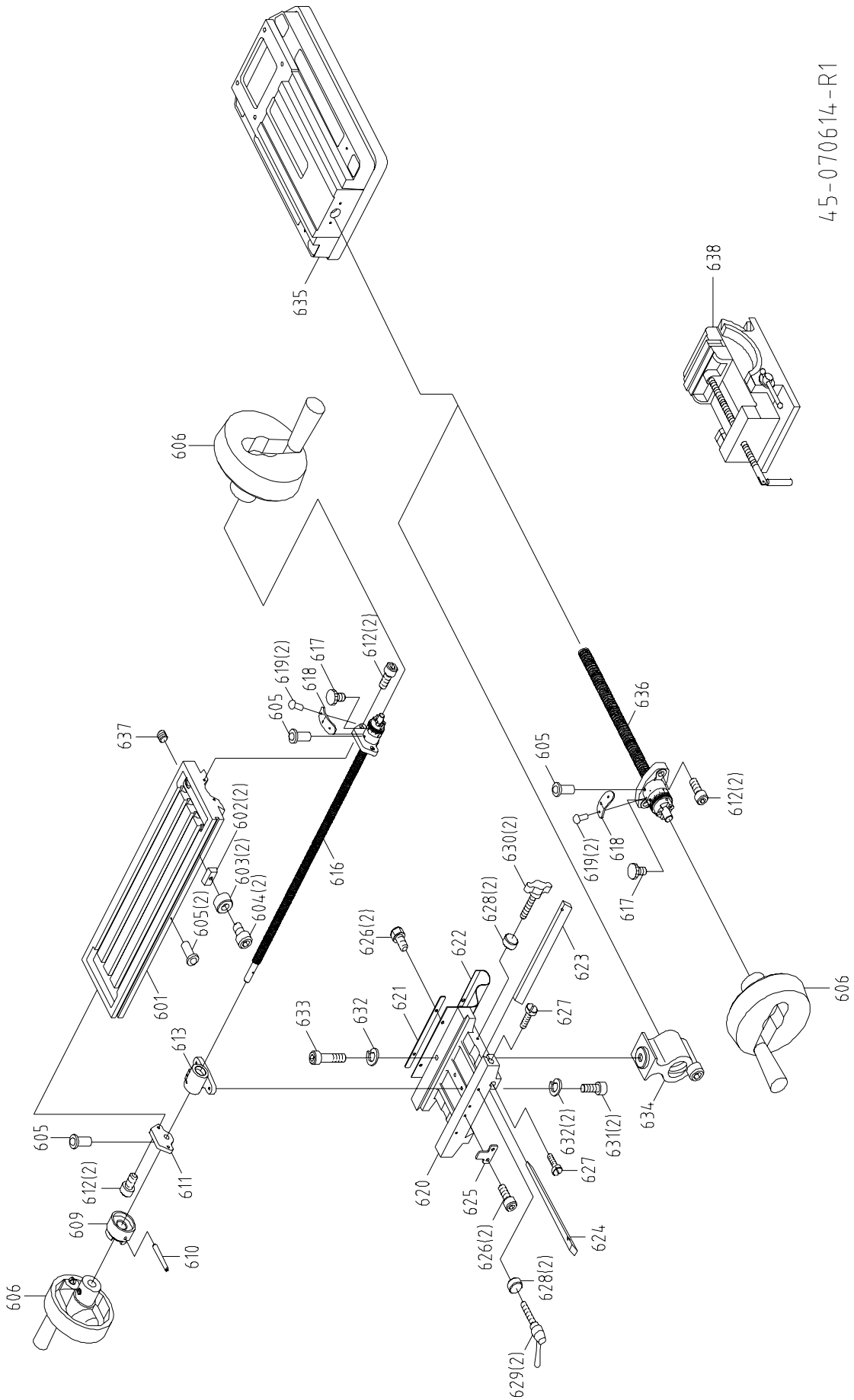


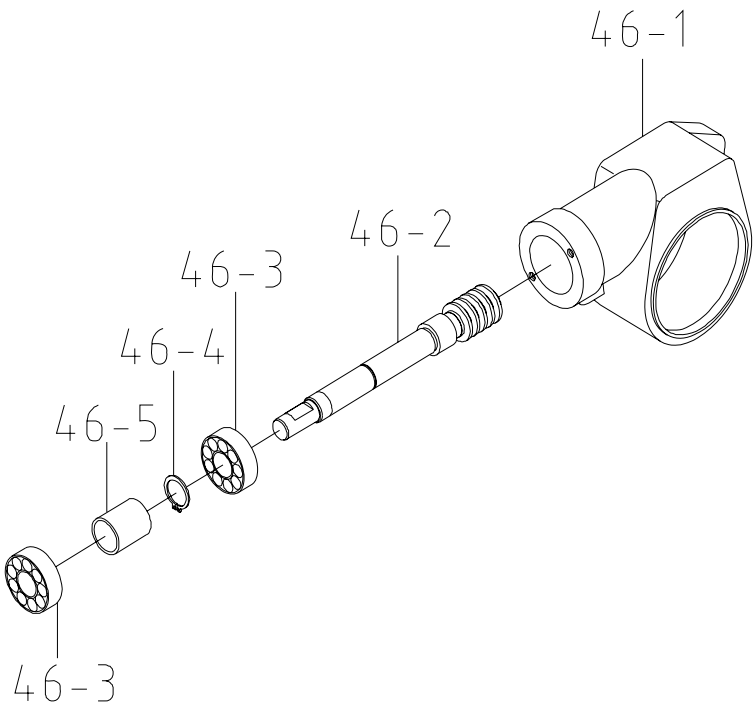
Fig.2

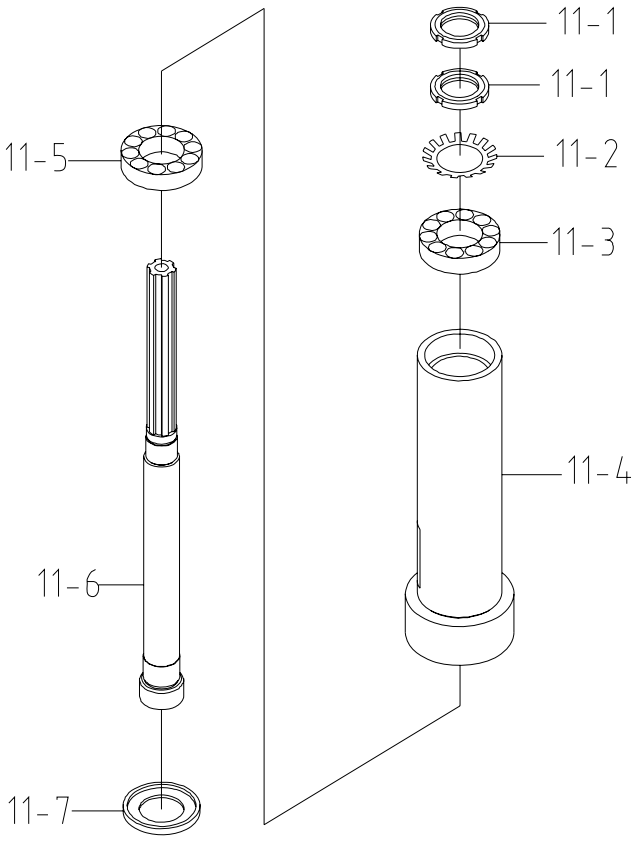












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PARTS LIST

MODEL NO. 45

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
1	2401011S	Head Body Set		1	
2	2401001-2	Main Shaft Cover		1	
3	6101	Chuck Arbor Bolt	MT3 M10xP1.5	1	
3	6101-1	Chuck Arbor Bolt	MT3 M12xP1.75	1	
3	6101-2	Chuck Arbor Bolt	MT3 W3/8"-16	1	
3	6101-3	Chuck Arbor Bolt	MT3 W1/2"-12	1	
3	6101-4	Chuck Arbor Bolt	R8 W7/16"-20	1	
3	6101-5	Chuck Arbor Bolt	NT30 M12xP1.75	1	
3	6101A	Chuck Arbor Bolt	MT4	1	
4	HS207	Hex. Socket Head Screw	M4x0.7Px6L	2	For CE Only
5	HW102	Spring Washer	M4	2	For CE Only
6		Motor		1	
7	S409	Hex. Socket Head Screw	3/8"-16UNCx1"L	3	
8	HK027	Key	6x6x30L	1	
9	6112	Rubber Flange		1	
10	6513	Feed Base		1	
11	6116-2S	Pinion Asbly	MT3	1	
11	6116-3S	Pinion Asbly	MT3 Heat treatment	1	
11	6116-6S	Pinion Asbly	R8	1	
11	6116BS	Pinion Asbly	R8 Heat treatment	1	
11	6116-2NS	Pinion Asbly	NT30	1	
11	6116-2SS	Pinion Asbly		1	Optional
11	6116-2BS	Pinion Asbly	MT4	1	
11-1	6114	Locknuts		2	
11-2	HW205	Washer	AW06 § 30	1	
11-3	CA30206J	Taper Roller Bearing	E30206J	1	
11-4	6116-2	Rack Sleeve	MT3	1	
11-4	6116-3	Rack Sleeve	MT3 Heat treatment	1	
11-4	6116-6	Rack Sleeve	R8	1	
11-4	6116B	Rack Sleeve	R8 Heat treatment	1	
11-5	CA30207J	Taper Roller Bearing	30207J	1	
11-6	6117	Spindle Shaft	MT3	1	
11-6	6117-1	Spindle Shaft	MT3 Heat treatment	1	
11-6	6117-2	Spindle Shaft	R8	1	
11-6	6117-3	Spindle Shaft	NT30	1	
11-6	6117-6	Spindle Shaft	R8 Heat treatment	1	
11-6	2401017B	Spindle Shaft	MT4 Heat treatment	1	
11-7	6119	Bearing Cap	MT3\MT4\R8	1	
11-7	6119-1	Bearing Cap	NT30	1	
12	6554S	Graduated Rod Set		1	

PARTS LIST

MODEL NO. 45

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
13	6193	Hex. Socket Headless Screw		1	
14	S008	Hex. Head Screw	1/4"x2"L	1	
15	N003	Hex. Nut	1/4"	1	
16	6192	Position Set Bracket		1	
17	61105S	Spring Base Set		1	
19	S732	Cross Round Head Screw	3/16"x3/4"L	3	
20	61103S	Spring Cover Set		1	
21	W202	Spring Washer	1/4"x1"x1.5t	2	
22	W003	Washer	1/4"	1	
23	6185	Plum Screw		1	
23	S471	Hex. Socket Head Screw	1/4"x5/8L	1	
24	6127	Screw Key	3/8"-16UNC-38L	1	
25	N005	Hex. Nut	3/8"	1	
26	2421003	Handle Rod		1	
27	W002	Washer	1/2"x7/8"x2t	1	
28	6125-2	Fixed Tight Collar		1	
29	6125A	Fixed Tight Collar		1	
30	6126A	Fixed Tight Collar		1	
31	N008	Hex. Nut	5/8"-11UNC	3	
32	W019	Washer	5/8"×25×t1	3	
33	2402056	Fixed Bolt		3	
34	2401072	Name Plate		1	
35	S708	Cross Round Head Screw	3/16"-24UNCx3/8"L	4	
36	2401075S	Speed Lever Set		2	
38	61102	Limit Plate		1	
39	W032	Washer	1/8"	1	
40	S705	Cross Round Head Screw	1/8"x1/4"L	1	
41	2401085	Dust Plate		1	
41	2401085A	Dust Plate		1	Optional
42	S708	Cross Round Head Screw	3/16"-24UNCx3/8"L	4	
43	2401106	Pinion Shaft		1	
44	S307	Flat Cross Head Screw	3/16"x1/2"L	1	
45	HK042	Key	7x7x20L	1	
46	61108S	Bearing Cover Set		1	
46-1	61108	Bearing Cover		1	
46-2	6147	Worm Shaft		1	
46-3	CA6202ZZ	Ball Bearing	6202ZZ	2	
46-4	HCS04	C-Retaniner Ring	S15	1	
46-5	6135	Washer	§ 34x § 27.5x30L	1	
47	S419	Hex. Socket Head Screw	5/16"x3/4"L	2	

PARTS LIST
MODEL NO. 45

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
48	6145	Worm Cover		1	
49	S470	Hex. Socket Head Screw	3/16"x3/8"L	2	
50	6144S	Micro Adjusting Indicator Set	Metric	1	
50	6144-1S	Micro Adjusting Indicator Set	Inch	1	
52	6142-2S	Handwheel Assembly		1	
52	6142-2AS	Handwheel Assembly		1	
54	61107	Worm Gear		1	
55	61115	Spring		1	
56	61110	Handle Base		1	
57	6138	Blade Adjustable Knob		1	
58	290086	Plastic Round Knob		3	
59	6139A	Knob W/Shaft		3	
60	HP309S	Miter Pin Set		1	
63	6120	Cutter Arbor	25.4 M10xP1.5	1	
63	6120-1	Cutter Arbor	25.4 M12xP1.75	1	
63	6120-2	Cutter Arbor	25.4 W3/8"-16	1	
63	6120-3	Cutter Arbor	25.4 W1/2"-12	1	
63	6120-4	Cutter Arbor	25.4 W7/16"-20+D182	1	
63	6120-7	Cutter Arbor	27 M12xP1.75	1	
63	6120-9	Cutter Arbor	R8	1	
63	6120-10	Cutter Arbor	27 M10xP1.5	1	
63	6122D	Cutter Arbor	MT3 M12- § 22	1	
63	6122	Cutter Arbor	NT30	1	
63	6120A	Cutter Arbor	MT4 M12xP1.75 § 25.4	1	
63	2401194	Cutter Arbor	MT4 M12xP1.75 § 22	1	Optional
64	6186	Milling Cutter	§ 25.4	1	Optional
64	6186A	Milling Cutter	§ 25.4	1	
64	6186C	Cutter	§ 22	1	
64	6186D	Cutter	§ 27	1	
65	6121	Chuck Arbor	MT3 M10xP1.5	1	
65	6121-1	Chuck Arbor	MT3 M12xP1.75	1	
65	6121-2	Chuck Arbor	MT3 W3/8"-16	1	
65	6121-3	Chuck Arbor	MT3 W1/2"-12	1	
65	6121-4	Chuck Arbor	R8 W7/16"-20	1	
65	6121-5	Chuck Arbor	R8 7/16"-20 JT3	1	
65	6121-7	Chuck Arbor	MT3 M12-B16	1	
65	6121-9	Chuck Arbor	MT3 M12 B18	1	
65	6122-3	Chuck Arbor	NT30	1	
65	2401096	Chuck Arbor	MT4 M12xP1.75 JT6	1	
65	2401096A	Chuck Arbor	MT4 M12xP1.75 B16	1	

PARTS LIST
MODEL NO. 45

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
66	6168	Punch Key		1	
67	6187-1	Chuck	1/2-B16	1	
67	6187	Chuck	JT6	1	
68		Switch		1	
70	260616S	Chuck Guard Asbly		1	For CE Only
70	260616AS	Chuck Guard Asbly	**Optional**	1	For CE Only
601	6628-1	Table	30L	1	
602	6229	Fixed Block		2	
603	6230	Movable Fixed Ring		2	
604	S402	Hex. Socket Head Screw	1/4"x1/2"L	2	
605	HB111	Oil Ball	1/4"	5	
606	6601BS	Table Handle Wheel		3	
609	6620	Table Clutch	§ 17	1	
610	HP022	Pin	§ 5x38L	1	
611	6222	Left Flange	§ 17	1	
612	S414	Hex. Socket Head Screw	5/16"x1"L	6	
613	6223S	Table Nut Set	31\31L Metric	1	
613	6223-1S	Table Nut Set	31\31L Inch	1	
616	6224-2S	Table Screw Asbly	31L Metric	1	
616	6224-3S	Table Screw Asbly	31L Inch	1	
617	6602-3	Link Screw		2	
618	61121	Limit Plate		2	
619	HH001	Rivet	§ 2	4	
620	6616-1	Center Base	30L	1	
621	6217	Antidust Plate		1	
622	6218S	Antidust Plate		1	
623	6627-1	Gib Strip	30L	1	
624	6607	Gib Strip		1	
625	6214	Movable Fixed Block		1	
626	S018	Hex. Socket Head Screw	5/16"x1/2"L	4	
627	6212	Gib Strip Bolt		2	
628	6630	Bushing		4	
629	6213-1	Grip		2	
629	6213-2	Grip		2	
630	6151-1	T Screw		2	
630	6213	Thumb Screw		2	
631	S414	Hex. Socket Head Screw	5/16"x1"L	2	
632	W205	Spring Washer	5/16"	3	
633	S418	Hex. Socket Head Screw	5/16"x2-1/4"L	1	
634	6215S	Acme Nut Asbly	Metric	1	

PARTS LIST

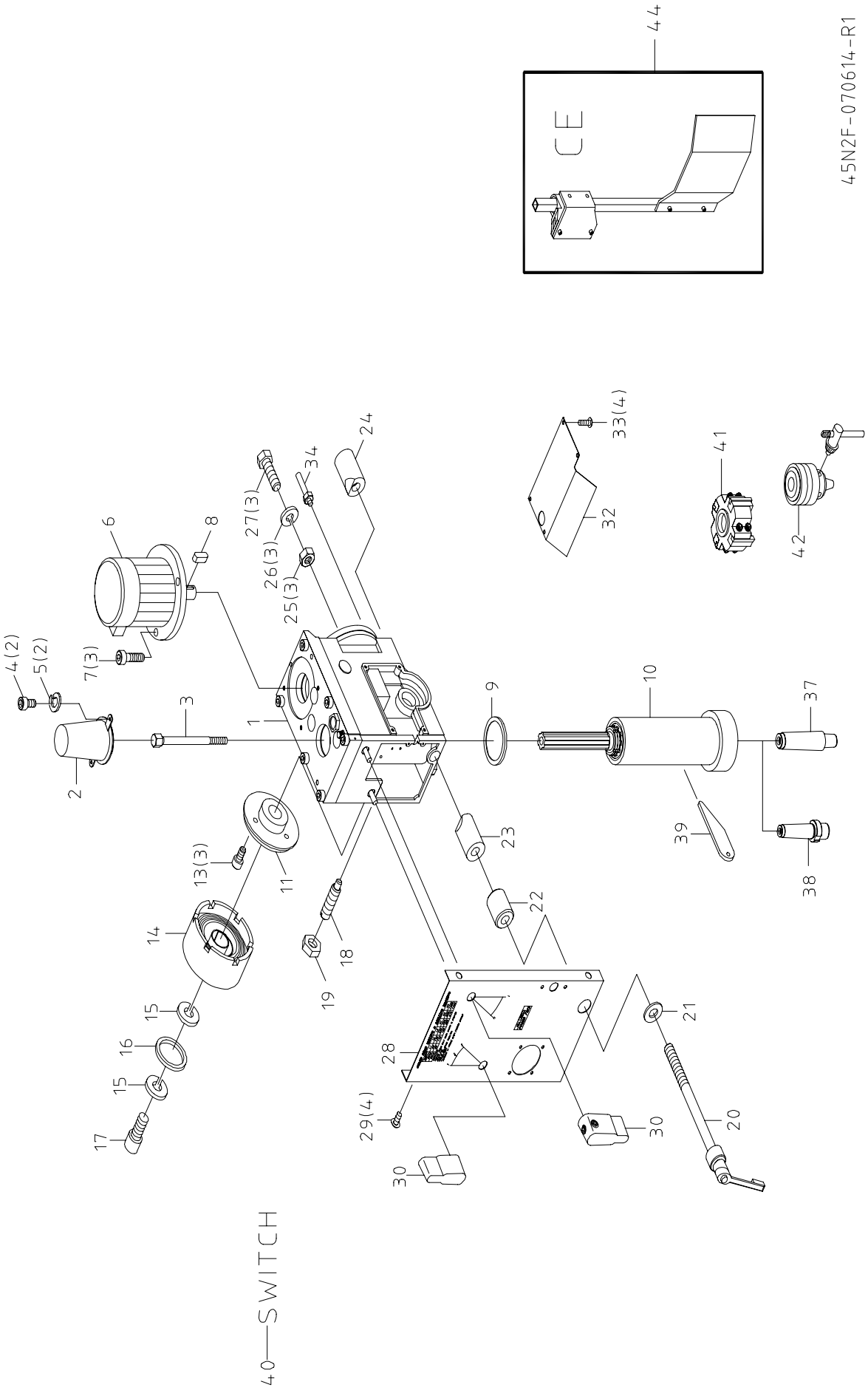
MODEL NO. 45

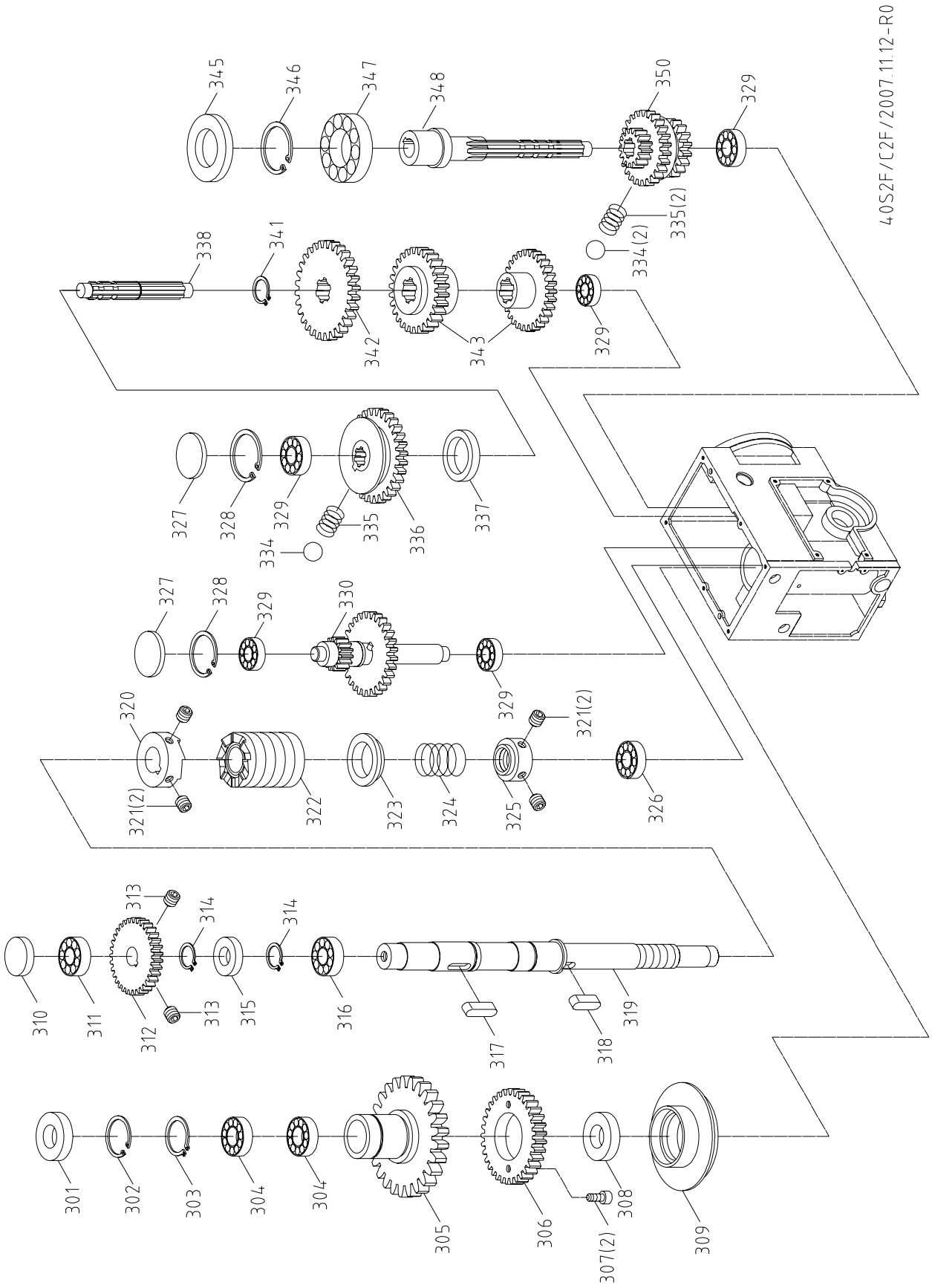
CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
634	6215-1S	Acme Nut Asbly	Inch	1	
635	2423001	Swivel Base		1	
636	2402005S	Acme Screw Asbly	Metric	1	
636	2402005AS	Acme Screw Asbly	Inch	1	
637	HD103	Plug	PT1/4"x3/8"L	1	
638	6241A	Vise		1	
501	2422001	Vertical Square Column		1	
502	2422016	Headstock Swivel Base		1	
503	HB109	Oil Bowl	PT1/8"	2	
504	6212	Adjustable Screw		2	
505	2422029	Grip		2	
506	HP303	Miter Pin	M6x50L(1:48)	1	
507	2422044	Gib Strip Bolt		1	
509		Index		1	
510	HH001	Rivet	§ 2-5L	2	
511	2422021	Antidust Plate		1	
512	HS519	Cross Round Head Screw	M5x10L	4	
513	HS518	Cross Round Head Screw	M5x6L	3	
514	2422033	Antidust Plate		1	
515	HW003	Washer	M5	3	
516	HN004	Hex. Nut	M5	3	
517	HW109	Spring Washer	M20	5	
518	HS149	Hex. Head Screw	M20x60L	5	
519	2422018	Steel Plate		1	
520	HS519	Cross Round Head Screw	M5x10L	12	
521	2422019	Steel Plate		1	
524	2422027	Bracket		1	
525	CA6003ZZ	Bearing	6003ZZ	2	
526	HCS06	C-Retaniner Ring	S17	1	
527	2422028	Gear Shaft		1	
528	HK010	Key	5x5x28L	1	
529	2422023	Rack		1	
530	2422035	Bushing		1	
531	2422036	Bushing		1	
532	HS291	Hex. Socket Head Screw	M12x85L	4	
533	HCR04	C-Retaniner Ring	R35	1	
534	2422024	Worm Shaft		1	
535	2422026	Worm Gear		1	
536	2422030	Bearing		2	
537	2422025	Support Flange		1	

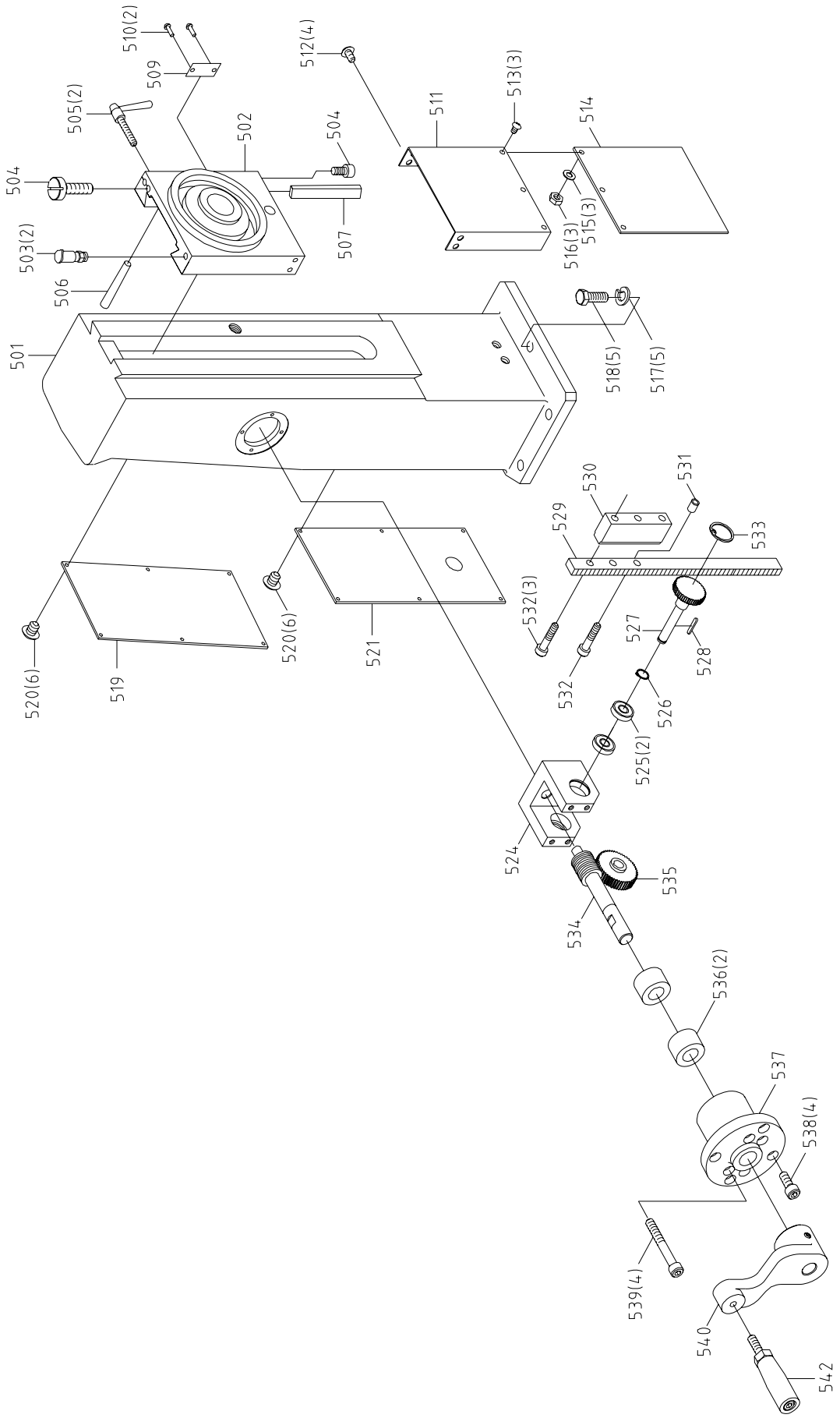
PARTS LIST

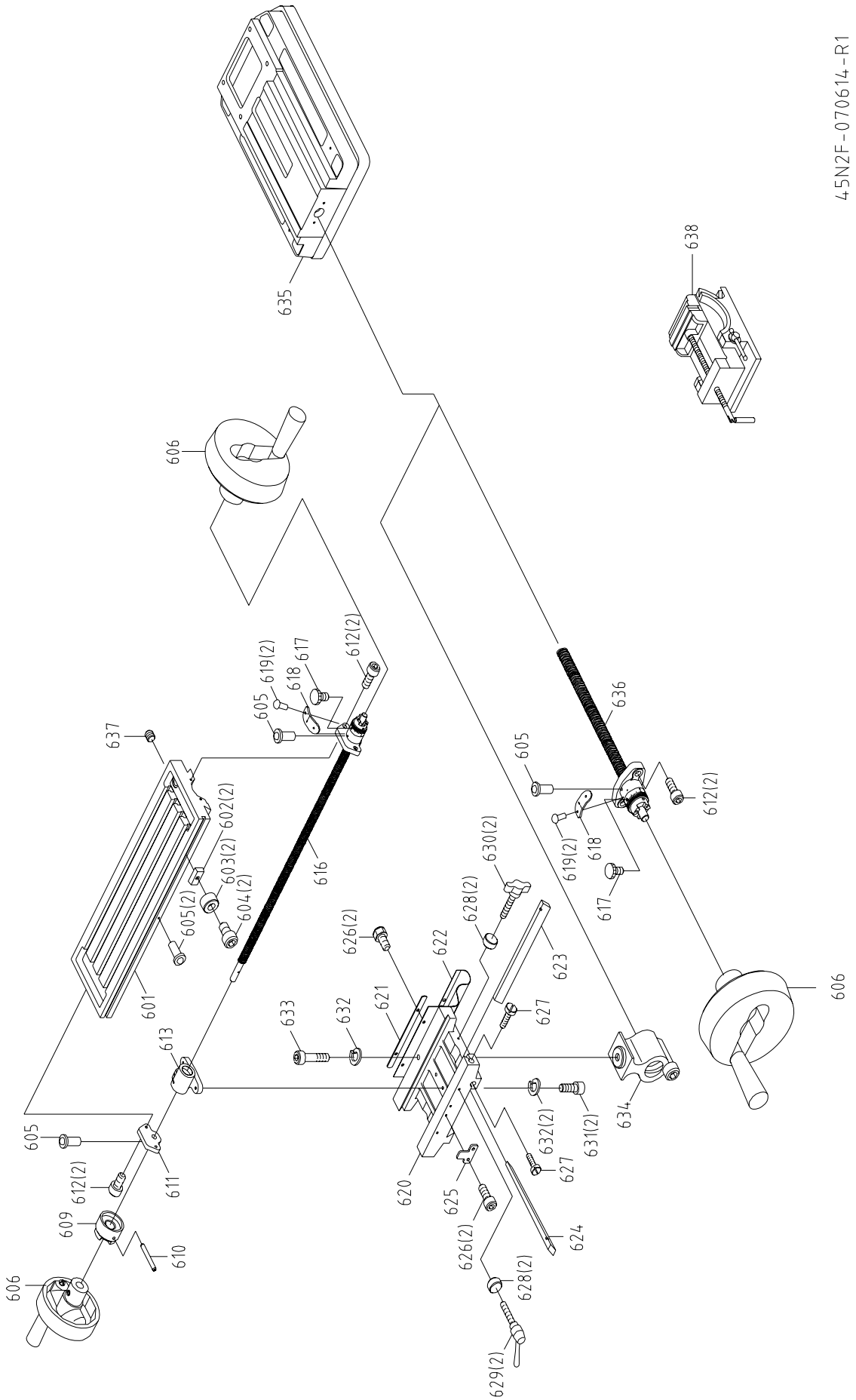
MODEL NO. 45

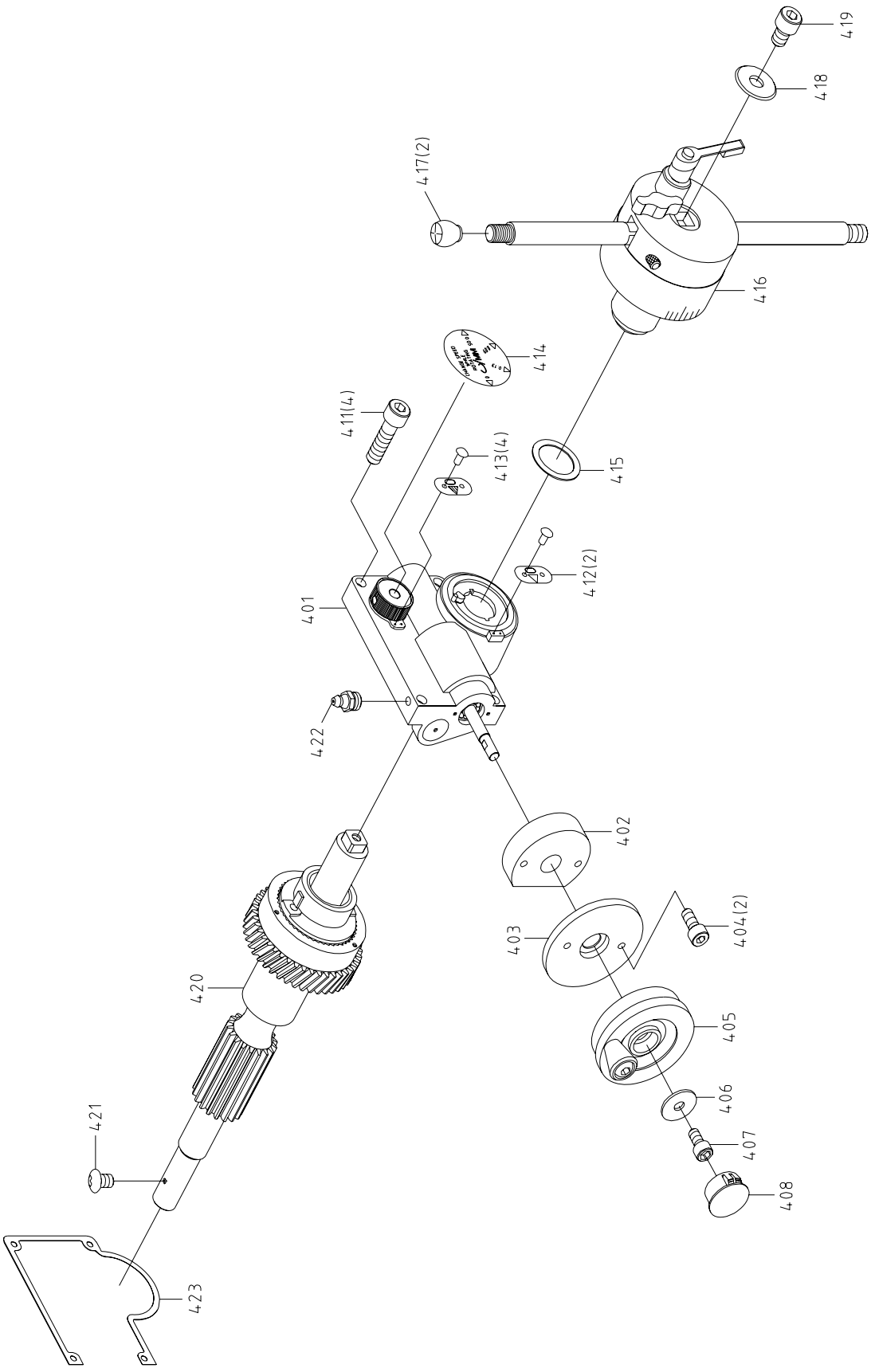
CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
538	HS243	Hex. Socket Head Screw	M8x25L	4	
539	HS250	Hex. Socket Head Screw	M8x60L	4	
540	6158S	Head Handle Set		1	
542	6027-1S	Clamp Handle		1	
543	2422045	Slide Base Flange		1	
544	HD511	Hex. Socket Flat Head Scvew		1	
201	HG005	Oil Seal	§ 40x § 68x8t	1	
202	HCR09	C-Retaniner Ring	R68	1	
203	HCS23	C-Retaniner Ring	S40	1	
204	CA6008ZZ	Ball Bearing (6008ZZ)	6008ZZ	2	
205	2401006	Gear		1	
206	HG003	Oil Seal	§ 35x § 45x8t	1	
207	2401008	Oil Seal Ring		1	
208	HB302	Dust Cover	§ 35	2	
209	HCR04	C-Retainer ring	R35	2	
210	CA6202ZZ	Ball Bearing (6002ZZ)	6202ZZ	5	
211	2401020S	Gear Shaft		1	
215	HB001	Steel Ball/Spring	§ 5/16" , § 0.8x7L	3	
216	2401029S	Gear Set		1	
217	2401192A	Bushing		1	
218	2401031B	Gear Shaft		1	
219	HK014	Key	5x5x50L	1	
220	HK036	Key	6x6x75L	1	
221	HCS07	C-Retaniner Ring	S18	1	
222	2401055	Gear		1	
223	2401037S	Gear Set		1	
224	HG004	Oil Seal	§ 35x § 62x8t	1	
225	HCR08	C-Retaniner Ring	R62	1	
226	CA6007ZZ	Ball Bearing (6007ZZ)	6007ZZ	1	
227	2401043B	Gear Shaft		1	
228	HK020	Key	5x5x80L	1	
229	2401049S	Gear Set		1	

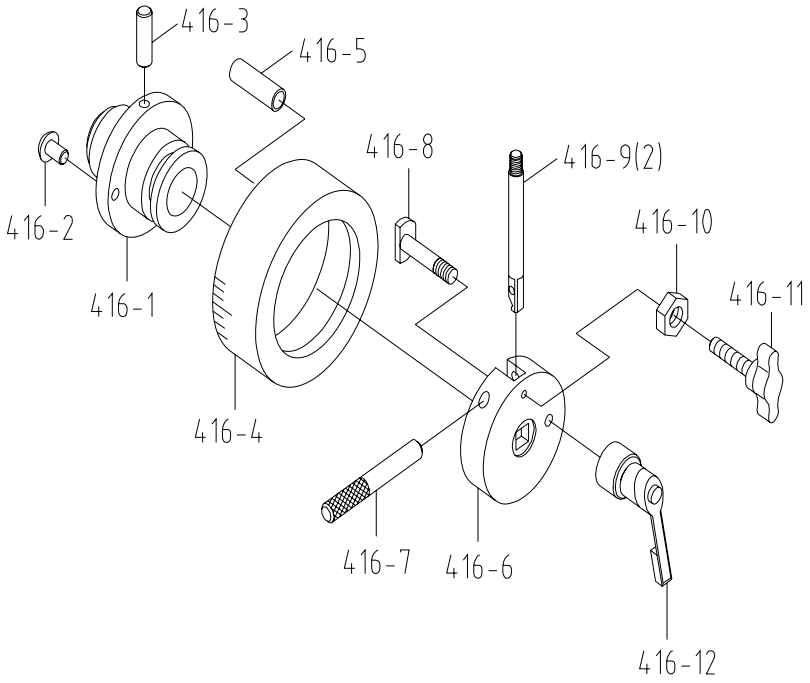


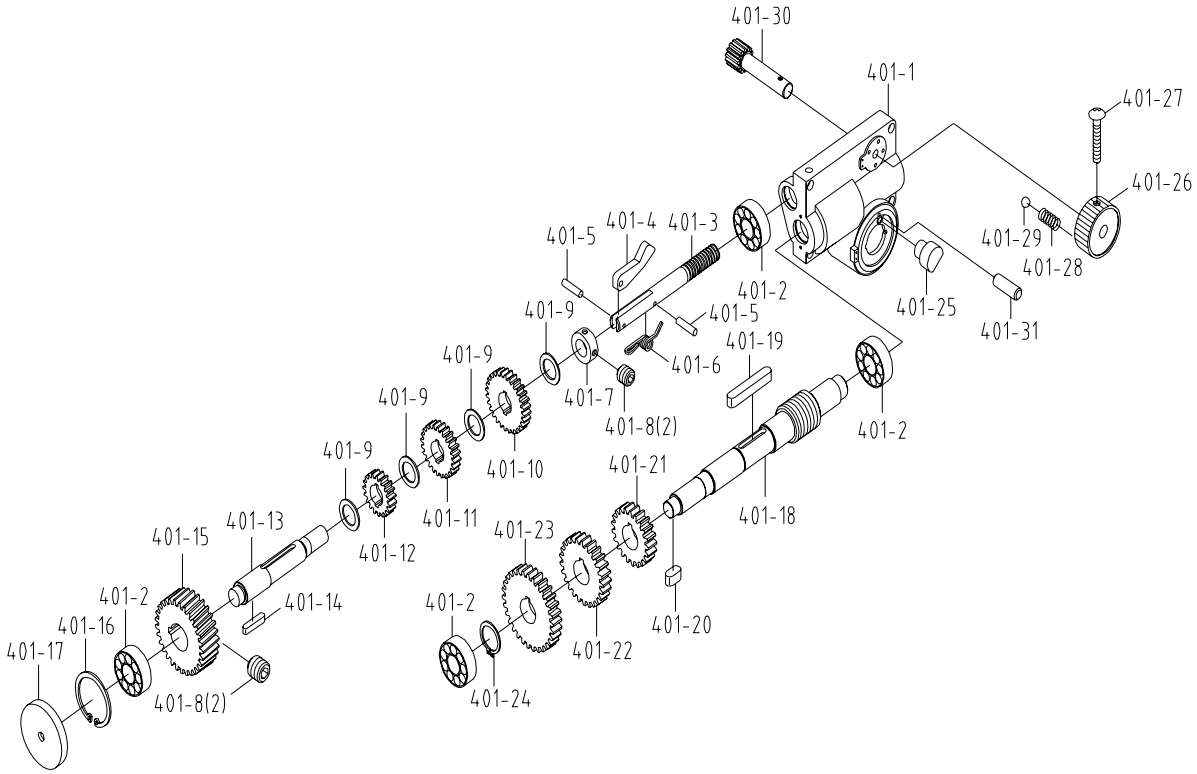












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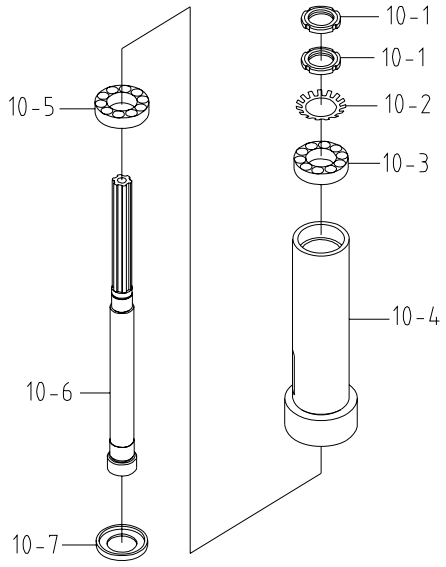

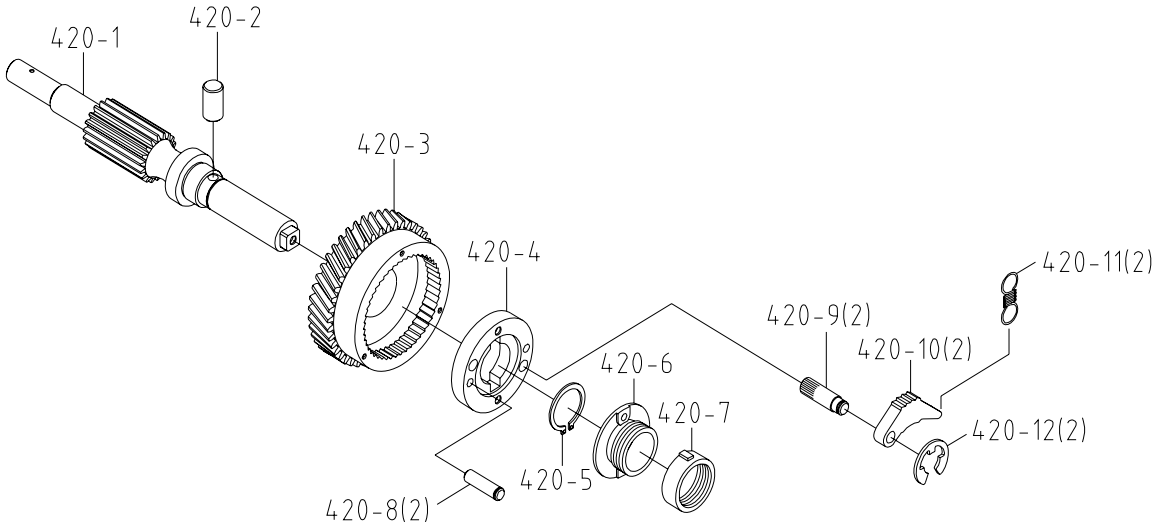

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PARTS LIST

MODEL NO. 45N2F

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
1	2450002S	Head Body Set		1	
2	2401001-2	Main Shaft Cover		1	
3	6101	Chuck Arbor Bolt	MT3 M10xP1.5	1	
3	6101-1	Chuck Arbor Bolt	MT3 M12xP1.75	1	
3	6101-2	Chuck Arbor Bolt	MT3 W3/8"-16	1	
3	6101-3	Chuck Arbor Bolt	MT3 W1/2"-12	1	
3	6101-4	Chuck Arbor Bolt	R8 W7/16"-20	1	
3	6101-5	Chuck Arbor Bolt	NT30 M12xP1.75	1	
3	6101A	Chuck Arbor Bolt	MT4	1	
4	HS207	Hex. Socket Head Screw	M4x0.7Px6L	2	For CE Only
5	HW102	Spring Washer	M4	2	For CE Only
6		Motor		1	
7	S409	Hex. Socket Head Screw	3/8"-16UNCx1"L	3	
8	HK027	Key	6x6x30L	1	
9	6112	Rubber Flange		1	
10	6116-2S	Pinion Asbly	MT3	1	
10	6116-3S	Pinion Asbly	MT3 Heat treatment	1	
10	6116-6S	Pinion Asbly	R8	1	
10	6116BS	Pinion Asbly	R8 Heat treatment	1	
10	6116-2NS	Pinion Asbly	NT30	1	
10	6116-2SS	Pinion Asbly		1	Optional
10	6116-2BS	Pinion Asbly	MT4	1	
10-1	6114	Locknuts		2	
10-2	HW205	Washer	AW06 § 30	1	
10-3	CA30206J	Taper Roller Bearing	E30206J	1	
10-4	6116-2	Rack Sleeve	MT3	1	
10-4	6116-3	Rack Sleeve	MT3 Heat treatment	1	
10-4	6116-6	Rack Sleeve	R8	1	
10-4	6116B	Rack Sleeve	R8 Heat treatment	1	
10-5	CA30207J	Taper Roller Bearing	30207J	1	
10-6	6117	Spindle Shaft	MT3	1	
10-6	6117-1	Spindle Shaft	MT3 Heat treatment	1	
10-6	6117-2	Spindle Shaft	R8	1	
10-6	6117-3	Spindle Shaft	NT30	1	
10-6	6117-6	Spindle Shaft	R8 Heat treatment	1	
10-6	2401017B	Spindle Shaft	MT4 Heat treatment	1	
10-7	6119	Bearing Cap	MT3\MT4\R8	1	
10-7	6119-1	Bearing Cap	NT30	1	
11	61105S	Spring Base Set		1	
13	S732	Cross Round Head Screw	3/16"x3/4"L	3	

PARTS LIST

MODEL NO. 45N2F

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
14	61103S	Spring&Spring Cover		1	
15	W202	Spring Washer	1/4"x1"x1.5t	2	
16	W003	Washer	1/4"	1	
17	S471	Hex. Socket Head Screw	1/4"x5/8L	1	
18	6127	Screw Key	3/8"-16UNC-38L	1	
19	N005	Hex. Nut	3/8"	1	
20	2421003	Handle Rod		1	
21	W002	Washer	1/2"x7/8"x2t	1	
22	6125-2	Fixed Tight Collar		1	
23	6125A	Fixed Tight Collar		1	
24	6126A	Fixed Tight Collar		1	
25	HB809	Nut	5/8"-11UNC	3	
26	W019	Washer	5/8"	3	
27	2402056	Fixed Bolt		3	
28	2450056	Name Plate		1	
28	2450056A	Name Plate		1	
29	S708	Cross Round Head Screw	3/16"-24UNCx3/8"L	4	
30	2401075S	Speed Lever Set		2	
32	2450069	Dust Plate		1	
33	S708	Cross Round Head Screw	3/16"-24UNCx3/8"L	4	
34	HP309S	Miter Pin Set		1	
37	6121	Chuck Arbor	MT3 M10xP1.5	1	
37	6121-1	Chuck Arbor	MT3 M12xP1.75	1	
37	6121-2	Chuck Arbor	MT3 W3/8"-16	1	
37	6121-3	Chuck Arbor	MT3 W1/2"-12	1	
37	6121-4	Chuck Arbor	R8 W7/16"-20	1	
37	6121-5	Chuck Arbor	R8 7/16"-20 JT3	1	
37	6121-7	Chuck Arbor	MT3 M12-B16	1	
37	6121-9	Chuck Arbor	MT3 M12 B18	1	
37	6122-3	Chuck Arbor	NT30	1	
37	2401096	Chuck Arbor	MT4 M12xP1.75 JT6	1	
37	2401096A	Chuck Arbor	MT4 M12xP1.75 B16	1	
38	6120	Cutter Arbor	25.4 M10xP1.5	1	
38	6120-1	Cutter Arbor	25.4 M12xP1.75	1	
38	6120-2	Cutter Arbor	25.4 W3/8"-16	1	
38	6120-3	Cutter Arbor	25.4 W1/2"-12	1	
38	6120-4	Cutter Arbor	25.4 W7/16"-20+D182	1	
38	6120-7	Cutter Arbor	27 M12xP1.75	1	
38	6120-9	Cutter Arbor	R8	1	
38	6120-10	Cutter Arbor	27 M10xP1.5	1	

PARTS LIST

MODEL NO. 45N2F

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
38	6122D	Cutter Arbor	MT3 M12- § 22	1	
38	6122	Cutter Arbor	NT30	1	
38	6120A	Cutter Arbor	MT4 M12xP1.75 § 25.4	1	
38	2401194	Cutter Arbor	MT4 M12xP1.75 § 22	1	Optional
39	6168	Punch Key		1	
40		Switch		1	
41	6186	Milling Cutter	§ 25.4	1	Optional
41	6186A	Milling Cutter	§ 25.4	1	
41	6186C	Milling Cutter	§ 22	1	
41	6186D	Milling Cutter	§ 27	1	
42	6187	Chuck	1/2"-JT6	1	
42	6187-1	Chuck	1/2-B16	1	
44	260616S	Chuck Guard Asbly		1	For CE Only
44	260616AS	Chuck Guard Asbly	**Optional**	1	For CE Only
601	6628-1	Table	30L	1	
602	6229	Fixed Block		2	
603	6230	Movable Fixed Ring		2	
604	S402	Hex. Socket Head Screw	1/4"x1/2"L	2	
605	HB111	Oil Ball	1/4"	5	
606	6601BS	Table Handle Wheel Set		3	
609	6620	Table Clutch	§ 17	1	
610	HP022	Pin	§ 5x38L	1	
611	6222	Left Flange	§ 17	1	
612	S414	Hex. Socket Head Screw	5/16"x1"L	6	
613	6223S	Table Nut Set	31\31L Metric	1	
613	6223-1S	Table Nut Set	31\31L Inch	1	
616	6224-2S	Table Screw Asbly	31L Metric	1	
616	6224-3S	Table Screw Asbly	31L Inch	1	
617	6602-3	Link Screw		2	
618	61121	Limit Plate		2	
619	HH001	Rivet	§ 2	4	
620	6616-1	Center Base	30L	1	
621	6217	Antidust Plate		1	
622	6218S	Antidust Plate Set		1	
623	6627-1	Gib Strip	30L	1	
624	6607	Gib Strip		1	
625	6214	Movable Fixed Block		1	
626	S018	Hex. Socket Head Screw	5/16"x1/2"L	4	
627	6212	Gib Strip Bolt		2	
628	6630	Bushing		4	

PARTS LIST

MODEL NO. 45N2F

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
629	6213-1	Grip		2	
629	6213-2	Grip		2	
630	6151-1	T Screw		2	
630	6213	Thumb Screw		2	
631	S414	Hex. Socket Head Screw	5/16"x1"L	2	
632	W205	Spring Washer	5/16"	3	
633	S418	Hex. Socket Head Screw	5/16"x2-1/4"L	1	
634	6215S	Acme Nut Asbly	Metric	1	
634	6215-1S	Acme Nut Asbly	Inch	1	
635	2423001	Swivel Base		1	
636	2402005S	Acme Screw Asbly	Metric	1	
636	2402005AS	Acme Screw Asbly	Inch	1	
637	HD103	Plug	PT1/4"x3/8"L	1	
638	6241A	Vise		1	
401	2450068S	Gear Box Assembly		1	
401-1	2450068	Gear Box		1	
401-2	CA6003ZZ	Bearing	6003ZZ	4	
401-3	2450082A	Change Gear Lever		1	
401-4	2450083A	Speed-Changing Key		1	
401-5	HP006	Pin	§ 3x10L	2	
401-6	2450084B	Twisted Spring		1	
401-7	2450089A	Bushing Bracket		1	
401-8	HS421	Hex. Socker Headless Screw	M6x6L	4	
401-9	2450074A	Bushing		4	
401-10	2450072A	Gear		1	
401-11	2450071A	Gear		1	
401-12	2450070A	Gear		1	
401-13	2450073A	Worm Shaft		1	
401-14	HK010	Key	5x5x28L	1	
401-15	2450008	Worm Gear		1	
401-16	HCR04	C-Retainer ring		1	
401-17	2450014	Cover		1	
401-18	2450078A	Transmission Worm Shaft		1	
401-19	HK011	Key	5x5x32L	1	
401-20	HK001	Key	4x4x10L	1	
401-21	2450075A	Gear		1	
401-22	2450076A	Gear		1	
401-23	2450077A	Gear		1	
401-24	HCS08	C-Retainer ring		1	
401-25	2450020	Release Block		1	

PARTS LIST

MODEL NO. 45N2F

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
401-26	2450079	Speed Lever		1	
401-27	HS512	Cross Round Head Screw	M4x0.7x25L	1	
401-28	290089	Spring		1	
401-29	HB001	Steel Ball	§ 8 or 5/16"	1	
401-30	2450081A	Gear Shaft		1	
401-31	2450051	Pin		1	
402	2450085A	Bearing Spacer		1	
403	2450088A	Graduated Bottom Plate		1	
404	HS222	Hex. Socket Head Screw	M5x30L	2	
405	2450047S	Handwheel Assembly	Metric	1	
405	2450047DS	Handwheel Assembly	Inch	1	
406	HW004	Washer	M6	1	
407	HS229	Hex. Socket Head Screw	M6x12L	1	
408	HD101	Plug	7/8"	1	
411	S416	Hex. Socket Head Screw	5/16"x1-1/4"L	4	
412	2450060	Scale		2	
413	HH001	Rivet	§ 2x4L	4	
414	2450059	Speed Scale	Metric	1	
414	2450059A	Speed Scale	Inch	1	
415	2450100	Washer		1	
416	2450087AS	Clutch Bushing Set		1	
416-1	2450087A	Clutch Bushing		1	
416-2	2450031	Bushing Stop		1	
416-3	2450030	Bushing Pin		1	
416-4	2450032A	Scale Base	Inch	1	
416-4	2450032B	Scale Base	Metric	1	
416-5	HP017	Pin	§ 5	1	
416-6	2450037	Handle Body		1	
416-7	2450039	Handle Rod Pin		2	
416-8	2450033	Scale Base Set Screw		1	
416-9	2450038	Knob W/Shaft		2	
416-10	N007	Hex. Nut	5/16"	1	
416-11	2450098	T Screw	5/16"x3/4"L	1	
416-12	2450063	Graduated Base Fixed Grip		1	
417	290086	Plastic Round Knob		2	
418	HW005	Washer	M8x23x2t	1	
419	HS241	Hex. Socket Head Screw	M8x12L	1	
420	2450086AS	Pinion Shaft Set		1	
420-1	2450086A	Pinion Shaft		1	
420-2	2450022	Key		2	

PARTS LIST

MODEL NO. 45N2F

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
420-3	2450023	Worm Gear		1	
420-4	2450024	Clutch Key Base		1	
420-5	HCS13	C-Retainer ring		1	
420-6	2450096	Cluth Screw		1	
420-7	2450095	Cluth Nut		1	
420-8	2450027	Spring Pin		2	
420-9	2450097	Clutch Key Pin		2	
420-10	2450026	Clutch Key		2	
420-11	2450028	Spring		2	
420-12	HE008	E-Ring	E5	2	
421	S303	Flat Cross Head Screw	3/16"x3/8"L	1	
422	HB501	Oil Nozzle	1/8"	1	
423	2450109	Rubber Plate		1	
501	2422001	Vertical Square Column		1	
502	2422016	Headstock Swivel Base		1	
503	HB109	Oil Seal	PT1/8"	2	
504	6212	Gib Strip Bolt		2	
505	2422029	Grip		2	
506	HP303	Miter Pin	M6x50L(1:48)	1	
507	2422044	Gib Strip		1	
509		Plate		1	
510	HH001	Rivet	§ 2-5L	2	
511	2422021	Antidust Plate		1	
512	HS519	Cross Round Head Screw	M5x10L	4	
513	HS518	Cross Round Head Screw	M5x6L	3	
514	2422033	Antidust Plate		1	
515	HW003	Washer	M5	3	
516	HN004	Hex. Nut	M5	3	
517	HW109	Spring Washer	M20	5	
518	HS149	Hex. Head Screw	M20x60L	5	
519	2422018	Steel Plate		1	
520	HS519	Cross Round Head Screw	M5x10L	12	
521	2422019	Steel Plate		1	
524	2422027	Bracket		1	
525	CA6003ZZ	Bearing	6003ZZ	2	
526	HCS06	C-Retaniner Ring	S17	1	
527	2422028	Gear Shaft		1	
528	HK010	Key	5x5x28L	1	
529	2422023	Rack		1	
530	2422035	Bushing		1	

PARTS LIST

MODEL NO. 45N2F

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
531	2422036	Bushing		1	
532	HS291	Hex. Socket Head Screw	M12x85L	4	
533	HCR04	C-Retaniner Ring	R35	1	
534	2422024	Worm Shaft		1	
535	2422026	Worm Gear		1	
536	2422030	Bearing		2	
537	2422025	Support Flange		1	
538	HS243	Hex. Socket Head Screw	M8x25L	4	
539	HS250	Hex. Socket Head Screw	M8x60L	4	
540	6158S	Head Handle Set		1	
542	6027-1S	Clamp Handle		1	
543	2422045	Slide Base Flange		1	
544	HD511	Hex. Socket Flat Head Scvew		1	
301	HG005	Oil Seal	§ 40x § 68x8t	1	
302	HCR09	C-Retaniner Ring	R68	1	
303	HCS23	C-Retaniner Ring	S40	1	
304	CA6008ZZ	Ball Bearing (6008ZZ)	6008ZZ	2	
305	2401006C	Gear		1	
306	2450003	Gear		1	
307	HS219	Hex. Socket Head Screw	M5x12L	2	
308	HG003	Oil Seal	§ 35x § 45x8t	1	
309	2401008	Oil Seal Ring		1	
310	HB302	Pust Cover	§ 35	1	
311	CA6202ZZ	Bearing	6202ZZ	1	
312	2450005	Gear		1	
313	HS421	Hex. Socker Headless Screw	M6x6L	2	
314	HCS06	C-Retainer ring	S17	2	
315	HG002	Oil Seal	§ 17x § 35x8t	1	
316	CA6003ZZ	Bearing	6003ZZ	1	
317	HK007	Key	5x5x16L	1	
318	HK006	Key	5x5x10L	1	
319	2450004	Transmission Worm		1	
320	2450053	Clutch Block		1	
321	HS413	Hex. Socker Headless Screw	M5x5L	4	
322	2450052	Worm Shaft		1	
323	2450057	Bushing		1	
324	2450054	Spring		1	
326	CA6001ZZ	Bearing	6001ZZ	1	
327	HB302	Dust Cover	§ 35	2	
328	HCR04	C-Retainer ring	R35	2	

PARTS LIST

MODEL NO. 45N2F

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
329	CA6202ZZ	Ball Bearing	6202ZZ	5	
330	2401020S	Gear Shaft		1	
334	HB003	Steel Ball	§ 3/8"	3	
335	HD001	Spring	§ 0.8x7L	3	
336	2401029S	Gear Set		1	
337	2401192A	Bushing		1	
338	2401031B	Gear Shaft		1	
341	HCS07	C-Retaniner Ring	S18	1	
342	2401055	Gear		1	
343	2401037S	Gear		1	
345	HG004	Oil Seal	§ 35x § 62x8t	1	
346	HCR08	C-Retaniner Ring	R62	1	
347	CA6007ZZ	Ball Bearing (6007ZZ)	6007ZZ	1	
348	2401043B	Gear Shaft		1	
350	2401049S	Gear Set		1	

MANUFACTURER:
ADDRESS:
SERIAL No.:

PLEASE WRITE DOWN THE SERIAL NO. ON THIS BLOCK FROM THE NAME PLATE AFTER YOU RECEIVE THIS MACHINE.