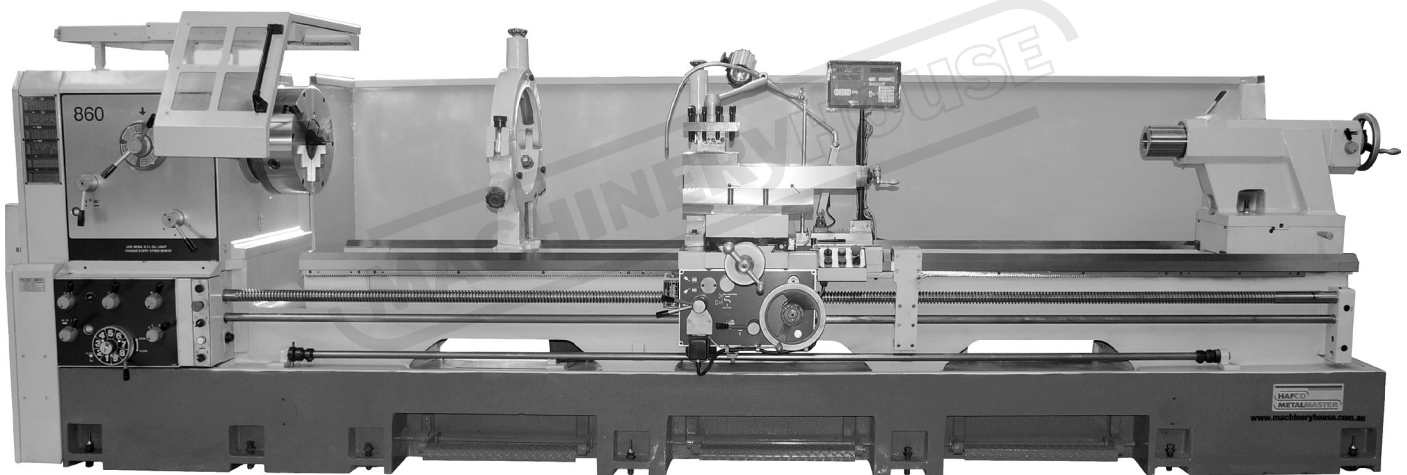


INSTRUCTION MANUAL

TM-33130HDX

Heavy Duty Centre Lathe - BIG BORE (415V)
860 x 3310mm - 153mm Bore



L645D



WARNING

General Machinery Safety Instructions

Machinery House
requires you to read this entire Manual before using this machine.

- 1. Read the entire Manual before starting machinery.** Machinery may cause serious injury if not correctly used.
- 2. Always use correct hearing protection when operating machinery.** Machinery noise may cause permanent hearing damage.
- 3. Machinery must never be used when tired, or under the influence of drugs or alcohol.** When running machinery you must be alert at all times.
- 4. Wear correct Clothing.** At all times remove all loose clothing, necklaces, rings, jewelry, etc. Long hair must be contained in a hair net. Non-slip protective footwear must be worn.
- 5. Always wear correct respirators around fumes or dust when operating machinery.** Machinery fumes & dust can cause serious respiratory illness. Dust extractors must be used where applicable.
- 6. Always wear correct safety glasses.** When machining you must use the correct eye protection to prevent injuring your eyes.
- 7. Keep work clean and make sure you have good lighting.** Cluttered and dark shadows may cause accidents.
- 8. Personnel must be properly trained or well supervised when operating machinery.** Make sure you have clear and safe understanding of the machine you are operating.
- 9. Keep children and visitors away.** Make sure children and visitors are at a safe distance for you work area.
- 10. Keep your workshop childproof.** Use padlocks, Turn off master power switches and remove start switch keys.
- 11. Never leave machine unattended.** Turn power off and wait till machine has come to a complete stop before leaving the machine unattended.
- 12. Make a safe working environment.** Do not use machine in a damp, wet area, or where flammable or noxious fumes may exist.
- 13. Disconnect main power before service machine.** Make sure power switch is in the off position before re-connecting.
- 14. Use correct amperage extension cords.** Undersized extension cords overheat and lose power. Replace extension cords if they become damaged.
- 15. Keep machine well maintained.** Keep blades sharp and clean for best and safest performance. Follow instructions when lubricating and changing accessories.
- 16. Keep machine well guarded.** Make sure guards on machine are in place and are all working correctly.
- 17. Do not overreach.** Keep proper footing and balance at all times.
- 18. Secure workpiece.** Use clamps or a vice to hold the workpiece where practical. Keeping the workpiece secure will free up your hand to operate the machine and will protect hand from injury.
- 19. Check machine over before operating.** Check machine for damaged parts, loose bolts, Keys and wrenches left on machine and any other conditions that may effect the machines operation. Repair and replace damaged parts.
- 20. Use recommended accessories.** Refer to instruction manual or ask correct service officer when using accessories. The use of improper accessories may cause the risk of injury.
- 21. Do not force machinery.** Work at the speed and capacity at which the machine or accessory was designed.
- 22. Use correct lifting practice.** Always use the correct lifting methods when using machinery. Incorrect lifting methods can cause serious injury.
- 23. Lock mobile bases.** Make sure any mobile bases are locked before using machine.
- 24. Allergic reactions.** Certain metal shavings and cutting fluids may cause an allergic reaction in people and animals, especially when cutting as the fumes can be inhaled. Make sure you know what type of metal and cutting fluid you will be exposed to and how to avoid contamination.
- 25. Call for help.** If at any time you experience difficulties, stop the machine and call you nearest branch service department for help.



Metal Lathe Safety Instructions

Machinery House
requires you to read this entire Manual before using this machine.

- 1. Maintenance.** Make sure the lathe is turned off and disconnect from the main power supply and make sure all moving parts have come to a complete stop before any inspection, adjustment or maintenance is carried out.
- 2. Lathe Condition.** Lathe must be maintained for a proper working condition. Never operate a lathe that has damaged or worn parts. Scheduled routine maintenance should be performed on a scheduled basis.
- 3. Leaving a Lathe Unattended.** Always shut the lathe off and make sure all moving parts have come to a complete stop before leaving the lathe. An unsupervised running lathe can cause serious injury.
- 4. Avoiding Entanglement.** Remove loose clothing, belts, or jewelry items. Tie up long hair and use the correct hair nets to avoid any entanglement with moving parts.
- 5. Chuck key safety.** Never let go of a chuck key while still in the chuck to prevent leaving the chuck key in the chuck. Chuck keys left in the chuck can cause serious injury.
- 6. Changing Chucks.** When changing large heavy chucks they become awkward to hold. Always get assistance when installing large chucks. Use a board or piece of plywood across the bedway when any install or removal of chucks to avoid any possible finger pinching between a loose chuck and edge of a bedway.
- 7. Tooling selection.** Always use the correct cutting tool for the job you are turning. Make sure it is sharp and held firmly in the tool post. Adjust the toolpost to provide proper support for the tool you will be using.
- 8. Mounting the workpiece.** Make sure the workpiece is properly mounted and secure before turning on the lathe. A loose workpiece can be thrown across the room and cause serious injury to you or a bystander.
- 9. Workpiece clearance.** Rotate the workpiece by hand to check for clearance with the tool post, compound slide and carriage before turning the lathe on.
- 10. Changing speeds and Reversing.** Turn the lathe off and make sure the lathe has come to a complete stop before changing speeds or reversing the spindle. Do not slow or stop the lathe chuck by using your hand.
- 11. Speed selection.** Select the appropriate speed for the type of work, material, and tool bit. Allow the lathe to reach full speed before beginning a cut.
- 12. Clearing chips.** Always use a brush to clear chips. Never clear chips when the lathe is running.
- 13. Power outage.** In the event of a power failure during use of the lathe, turn off all switches to avoid possible sudden start up once power is restored.
- 14. Clean work area.** Keep the area around the lathe clean from oil, tools and chips.
- 15. Call for help.** If at any time you experience difficulties, stop the machine and call your nearest branch service department for help.

PLANT SAFETY PROGRAM

NEW MACHINERY HAZARD IDENTIFICATION, ASSESSMENT & CONTROL

Metal Lathe

Developed in Co-operation Between A.W.I.S.A and Australia Chamber of Manufactures
 This program is based upon the Safe Work Australia, Code of Practice - Managing Risks of Plant in the Workplace (WHSA 2011 No10)

| Item No. | Hazard Identification | Hazard Assessment | Risk Control Strategies <small>(Recommended for Purchase / Buyer / User)</small> |
|----------|-------------------------------|-------------------|---|
| A | ENTANGLEMENT | HIGH | Eliminate, avoid loose clothing / Long hair etc. |
| C | CUTTING, STABBING, PUNCTURING | MEDIUM | Isolate power to machine prior to any checks or maintenance. Do not open or clean inside until the machine has completely stopped. |
| D | SHEARING | MEDIUM | Make sure all guards are secured shut when machine is on. Isolate power to machine prior to any checks or maintenance. |
| F | STRIKING | MEDIUM | Ensure workpiece is secured in chuck and tooling is locked tight in toolpost. Always wear safety glasses. Do not leave chuck key in chuck. Remove all loose objects around moving parts. |
| H | ELECTRICAL | MEDIUM | All electrical enclosures should only be opened with a tool that is not to be kept with the machine. |
| N | HIGH - TEMPERATURE | LOW | Machine should be installed & checked by a Licensed Electrician. |
| O | OTHER HAZARDS, NOISE. | LOW | Wear appropriate protective clothing to prevent hot swarf. Wear hearing protection as required. |

Plant Safety Program to be read in conjunction with manufactures instructions



www.machineryhouse.com.au



www.machineryhouse.co.nz

Authorised and signed by:
 Safety officer:

Manager:

Revised Date: 12th March 2012

HEAVY DUTY PRECISION LATHE

OPERATION MANUAL

X33

X37

X41

MACHINERYHOUSE

HIGH SPEED PRECISION LATHE

OPERATION MANUAL

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2-2 Electrical Equipment

2-3 Electrical Cautions

2-4 Circuit Diagram

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HIGH SPEED PRECISION LATHE

OPERATION MANUAL

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6-3 Gear box

6-4 Belt Tension Adjustment

6-5 Brake Belt Adjustment

6-6 Brake & Micro Switch Adjustment

6-7 Cutting Coolant Repair

7. PART LISTS

MACHINERYHOUSE

PREFACE

Thank you for adopting our lathe to be your producing tool. Before operating the lathe, it is necessary to study our manual. If operated correctly, the machine is efficient and easy-to-operate.

This manual consists of 12 chapters, mainly including operation, maintenance and list of spare parts. Please read the manual thoroughly from the first page to the last in order to be familiar with this machine, and work efficiently and accurately. Besides, based on safety consideration, the operator must be well trained according to all the instructions in the manual. Any damage of the machine and injure on the operator caused by mis-operation and disregard of our instruction is not under warranty.

In addition to the instructions listed in our manual, there are some matters needing attention as well:

1. Do not expose the machine outdoors in order to avoid any damage caused by the weather, besides, keep the machine away from cooling blower.
2. Lubricate the machine with recommended or appointed lubricant or grease.
3. Remove chips from time to time to keep the machine clean, this will make the machine live longer.
4. If the bed way is dented, do not move the carriage till the bed way is repaired.

1. Machine Assembly

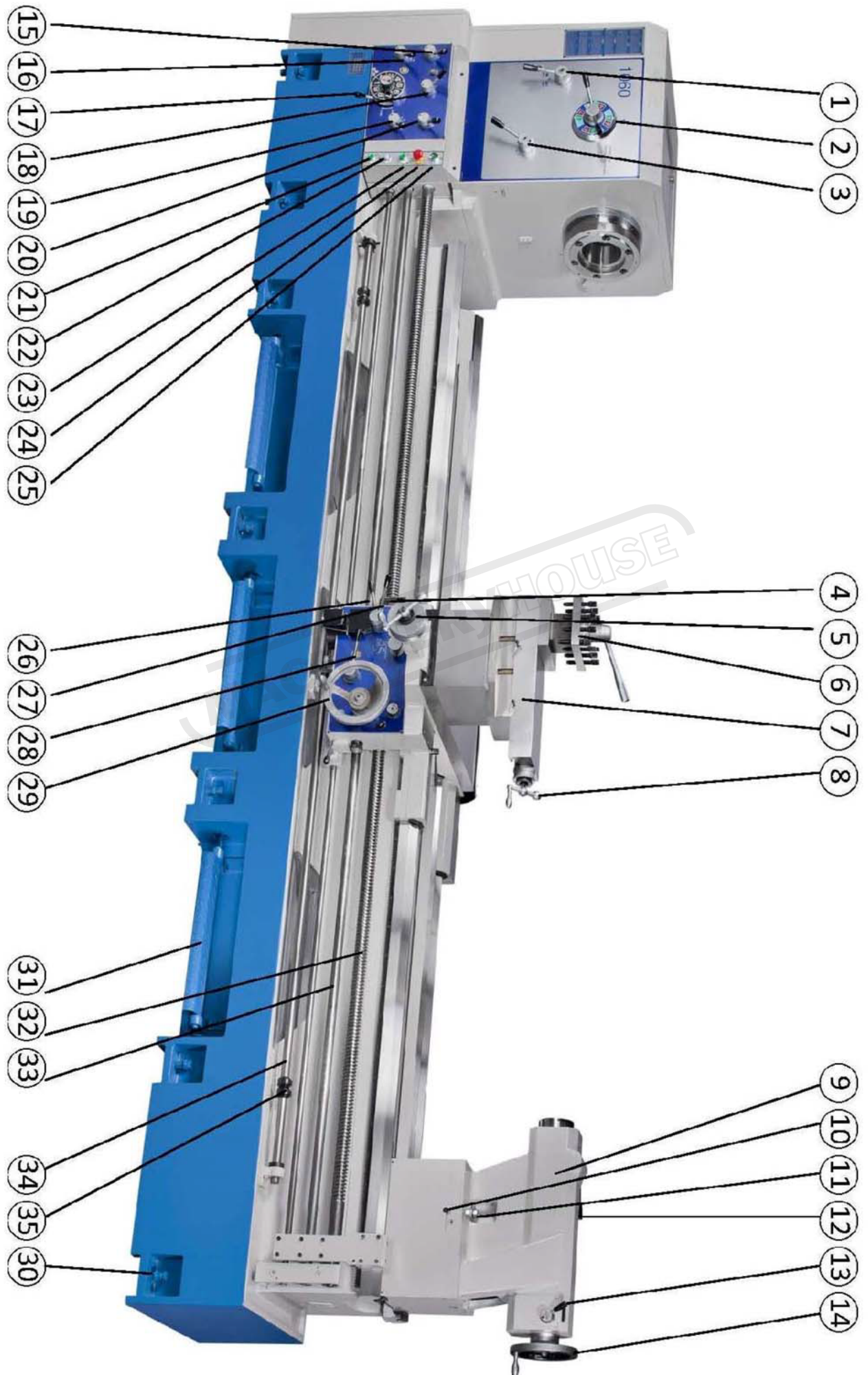


Fig. 1-1

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|--|------|----------------------------------|
| 1 | Forward/Reverse Shifting lever | 19 | 4 steps feed selection dial |
| 2 | Spindle speed shifting selection lever | 20 | Spindle speed W.M shifting lever |
| 3 | Spindle speed H/M/N/L shifting lever | 21 | Coolant control switch |
| 4 | Thread dial indicator | 22 | Power indicator |
| 5 | Cross feeding Handel | 23 | Power switch (Main switch) |
| 6 | 4 way tool post holder | 24 | Emergency stop |
| 7 | Compound rest | 25 | Intermittent button |
| 8 | Compound rest handle | 26 | Half nut engaged lever |
| 9 | Tailstock body | 27 | Longitudinal feed hand wheel |
| 10 | Tailstock set over adjusting Screw | 28 | Auto feeding engaged lever |
| 11 | Tailstock body Clamping lever | 29 | Apron hand-wheel |
| 12 | Tailstock spindle locking lever | 30 | Foundation adjusting bolt |
| 13 | Spindle speed shifting lever | 31 | Foot brake pedal |
| 14 | Tailstock hand wheel | 32 | Lead screw |
| 15 | Spindle speed A.B shifting lever | 33 | Auto-feed rod |
| 16 | MP&DP thread operate lever | 34 | Auto feed stop selection rod |
| 17 | 9 steps feed selection dial | 35 | Adjustable trip dog |
| 18 | Spindle speed C.D shifting lever | | |

2. ELECTRICAL CIRCUIT CONTROL

2-1 Electrical Wiring

1. The electrical control box can be found by opening its cover at the back side of bed. Connect the power source wire with the connecting points (R.S.T)

The wire between the power source and the connecting points must be over sectional area 8mm^2 (5.5mm^2 for 480 or 19" series).

2. The main switch between machine and power source also should be equipped with safety fuse. Besides, the machine must have a earth wire.



Fig. 2-1

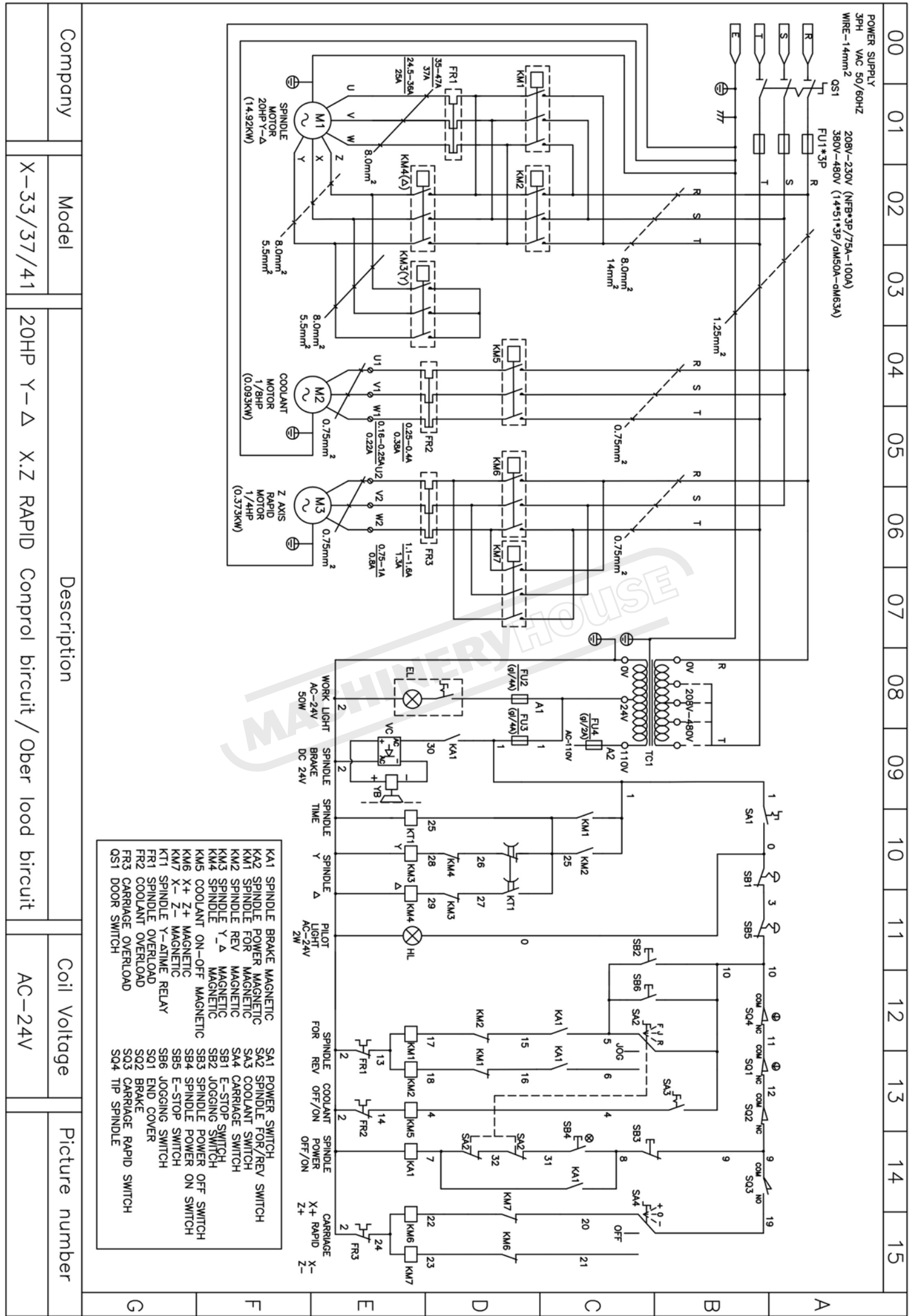
2-2 Electrical Equipment

1. The electrical control box is also equipped with overload circuit breaker and electric magnetic contactor to protect motor from burning out by overload.
2. The forward/reverse switch is connected with micro switch.
3. The foot brake is connected with micro switch. Stepping the footbrake is quicker to stop the lathe than turning off the switch. The spindle can only revolute again by re-operating the spindle operation control lever after using the foot brake.
4. The spindle will rotate continuously as long as the intermittent switch on the top of the electrical control box is pressed.

2-3 Electrical Cautions

1. After wiring, check the rotation of the spindle of the spindle. Turn the main switch “ON” and make sure the safety of spindle. Then push intermittent button (T) momentarily. The correction direction of the spindle rotation is counter clockwise. (looking from tailstock for a downward movement of the spindle operation control lever.) Wrong direction of rotation can be rectified by interchanging any two of the three phase lines (R.S.T.) in the power source.
2. Checking each lubrication system with oil.
3. Checking each handle with normal function.
4. Checking belt Tension Adjustment in good condition.
5. Read and understand for each constructor well before operation.
6. When power indicator “ON”, overload circuit breaker and electric magnetic contactor to protect motor from burning out by overload, please reset the circuit breaker by press the recover plate and lathe will resume to available. (The electric wiring attached at chapter 2-4)

MACHINERYHOUSE



00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15

Company Model Description Coil Voltage Picture number






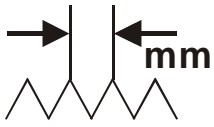










X-33/37/41

20HP Y-Δ X.Z RAPID Control bircuit / Ober lood bircuit

AC-24V

G F E D C B A

2-5 Operation Symbols

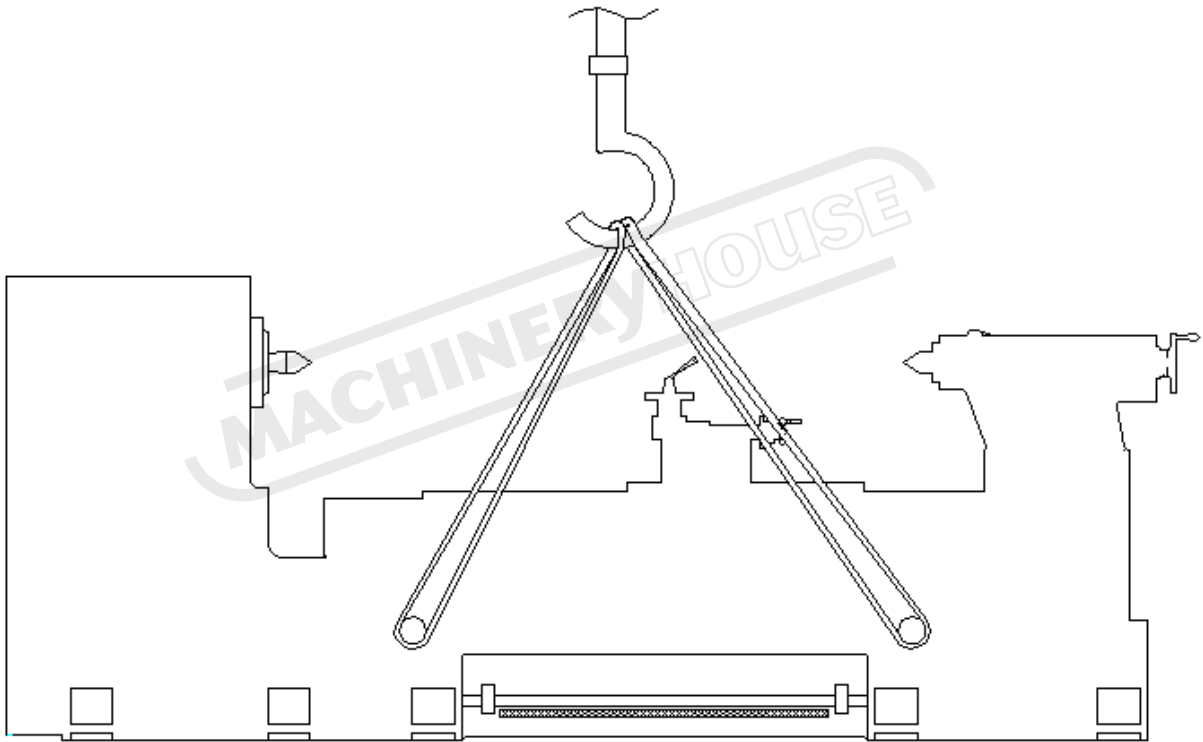
| | | | | | |
|----|---|-----------------------|----|--|---|
| 1 | HIGH | High speed revolution | 11 |  | Variable adjustment (pressure) Clockwise: pressure increase Counterclockwise: pressure decrease |
| 2 | LOW | Low speed revolution | 12 |  | Electrical control box |
| 3 |  | Forward revolution | 13 |  | Imperial threads |
| 4 |  | Neutral gear | 14 |  | Metric threads |
| 5 |  | Reverse revolution | 15 |  | Auto feeding rate per revolution |
| 6 |  | Feeding | 16 |  | Pump |
| 7 |  | Intermittent | 17 |  | Power switch- ON |
| 8 |  | Cross feeding | 18 |  | Power switch-OFF |
| 9 |  | Longitudinal feeding | 19 | OIL | Oil inlet (hole) |
| 10 |  | Cone clutch | | | |

3. UNPACKING & MACHINE INSTALLATION

3-1 Unpacking & Lifting

When the machine is arrived, first, check if the wooden case is damaged or not, secondly, open the case and inspect the machine for any damage or short supply of parts. If so, please contact our company or insurance company immediately in order to get the best solution or refund; otherwise our company or the insurance company will not be in the position to compensate for the damage.

Please refer to below picture for machine unloading from the truck & moving:



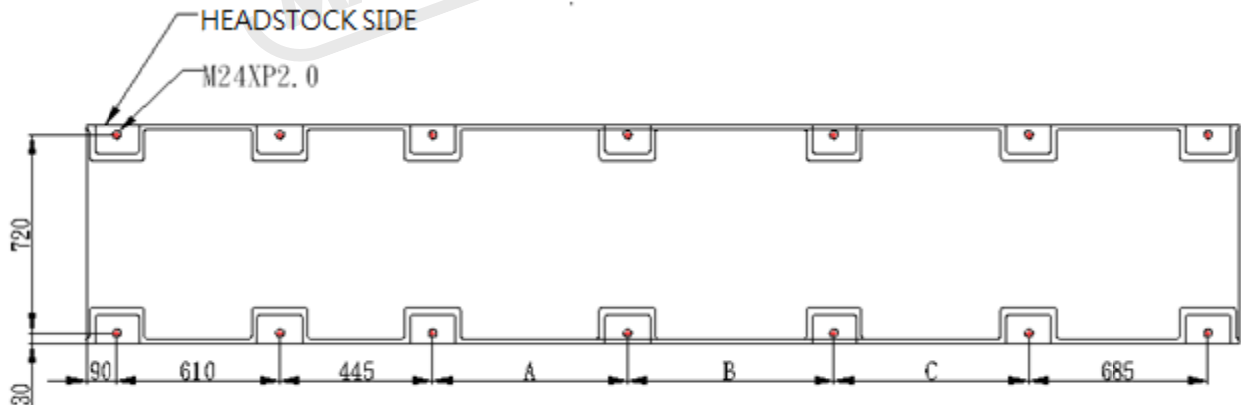
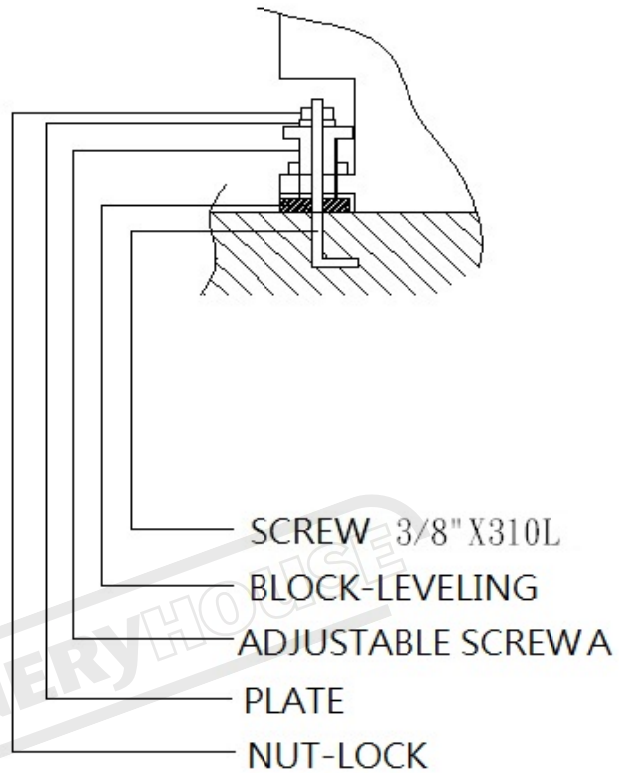
The steps of lifting the lathes are:

- (1) Clamp the bed way with a special made hanger and bars (through the base holes) , which consists of a clamp and an iron chain.
- (2) Raise the lathe a little bit with crane, then check if the lathe is balanced. If not, move apron and cross slide back or forth to make the machine is balanced.
- (3) While the machine arrives at the location, put down the machine slowly to avoid any inaccuracy of the machine caused by bumps or crash.
- (4) For adjusting the electrical cabinet, the machine should be located allowing sufficient area, min. over 600mm from wall at back and tailstock end.

3 - 2 Basic Foundation

With the common usage of tungsten carbide cutting tools nowadays, heavy cutting and quicker spindle speed are therefore reinforced. This may cause the vibration easily. In order to ascertain the best cutting condition it is necessary to build a sound & good floor basic.

Adjust the leveling by adjustable screw and and nut-lock and fix the angled bolt within concrete.

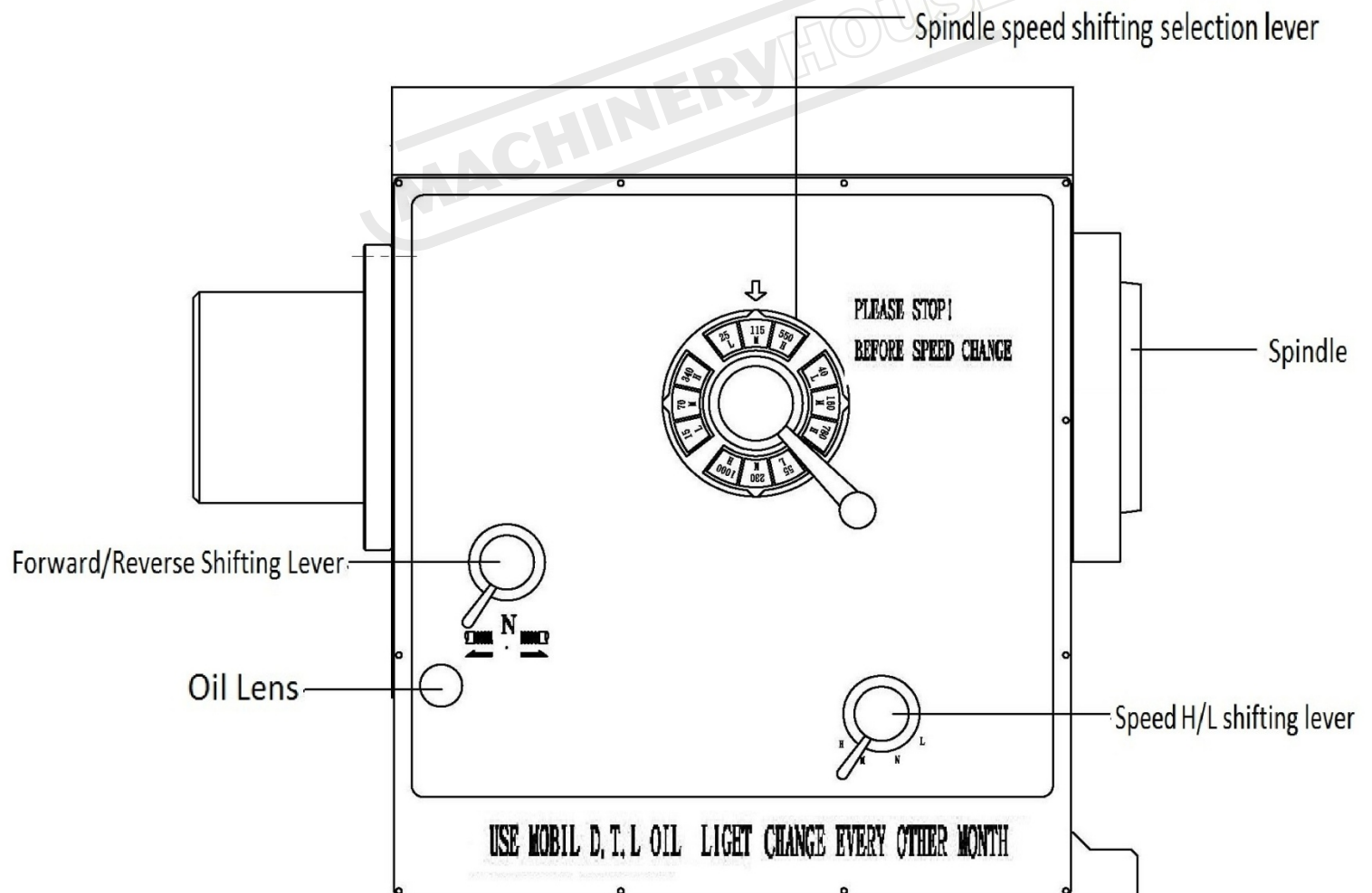


| Model | A | BxN | C | Model | A | BxN | C |
|-------|------|--------|-----|-------|-----|--------|-----|
| 3370 | 1430 | 0 | 0 | 33210 | 965 | 1000x3 | 965 |
| 3390 | 965 | 0 | 965 | 33250 | 965 | 1000x4 | 965 |
| 33130 | 965 | 1000x1 | 965 | 33290 | 965 | 1000x5 | 965 |
| 33170 | 965 | 1000x2 | 965 | 33330 | 965 | 1000x6 | 965 |

4. MAJOR CONSTRUCTION

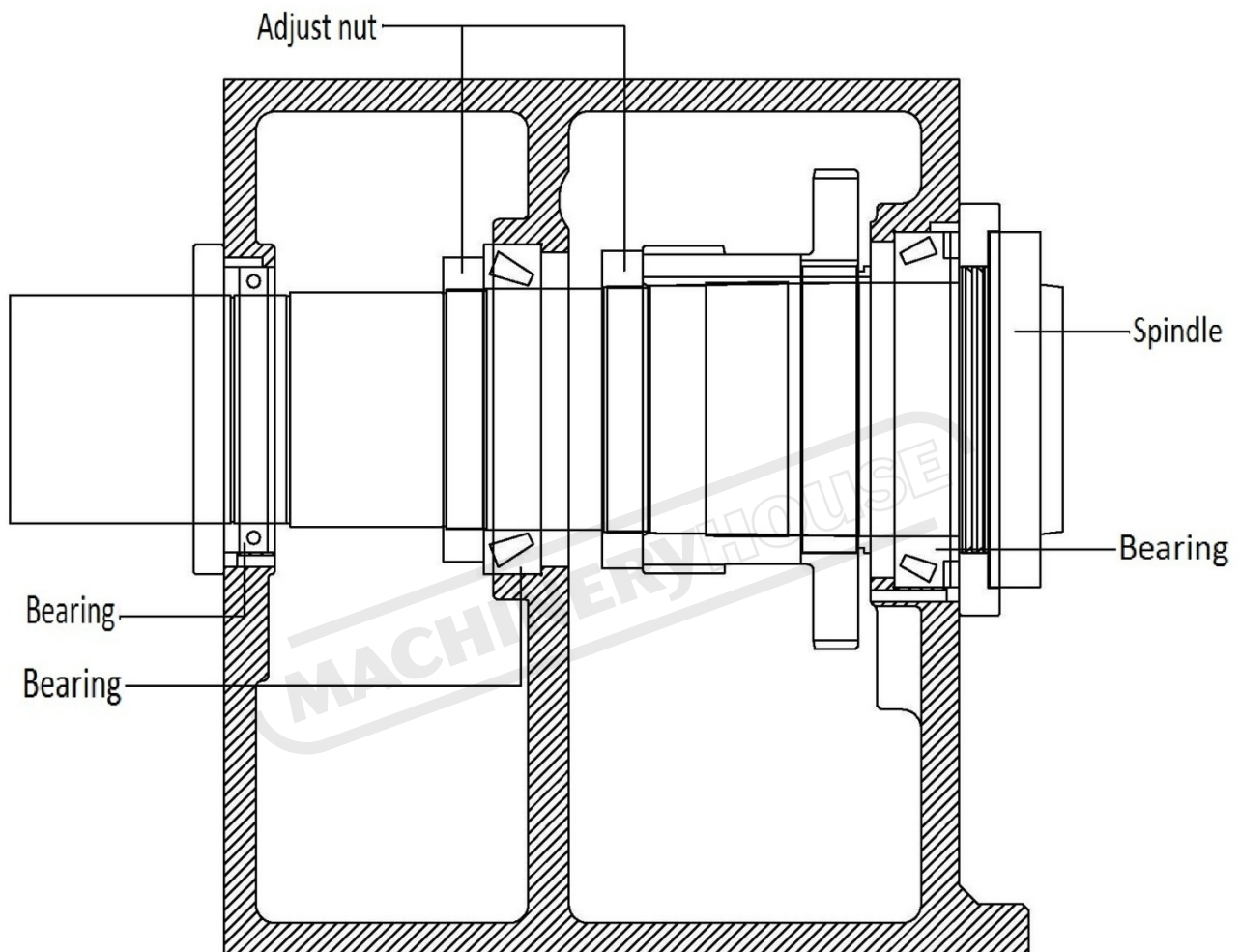
4-1 HEADSTOCK

1. With high tensile durable cast iron material, which can stand the higher loads, the internal gears are made of chrome molybdenum alloy steel, made after carburizing and quenching treatment and precision grinding, friction, wear-resistant, and low noise.
2. Spindle speed with 12 steps speed change, the device included circular speed plate, three section shift lever, and the shift lever control reversed and forward. Ensure you change the spindle speed after stopping spindle. Otherwise the gears will be damaged. Resulting in noise and vibration of the lathe and reduction of accuracy and life.



4-2 SPINDLE

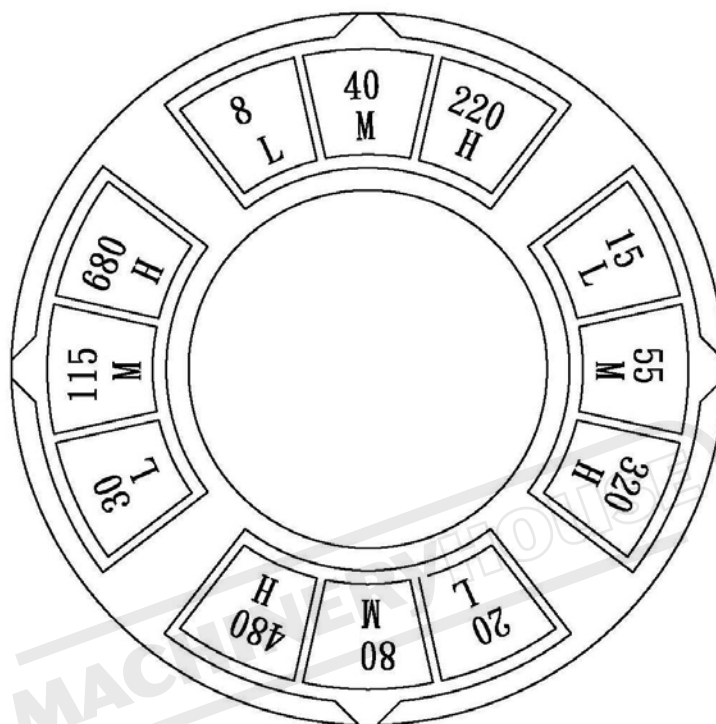
1. Entire spindle build by forged, precision cutting and grinding.
2. Spindle design as a three-point support device, the front-end of two ultra-precision taper bearings and back-end using a deep groove ball bearing can withstand heavy-duty and for heavy cutting and precision cutting purposes.
3. To adjust two taper bearing clearance, please loosen the adjustment nut screw first. To adjust it.



Spindle structure

4-3 Spindle Speed Selection

1. Operation of the spindle speed, please refer to spindle speed table ,
Select the speed range “L”, ”M” or “H”. : To select 680 rpm, first to operate the control shaft to “H” position , and then rotate the shift lever to position to the “680”.
2. To operate the speed lever easier push the intermittent button.

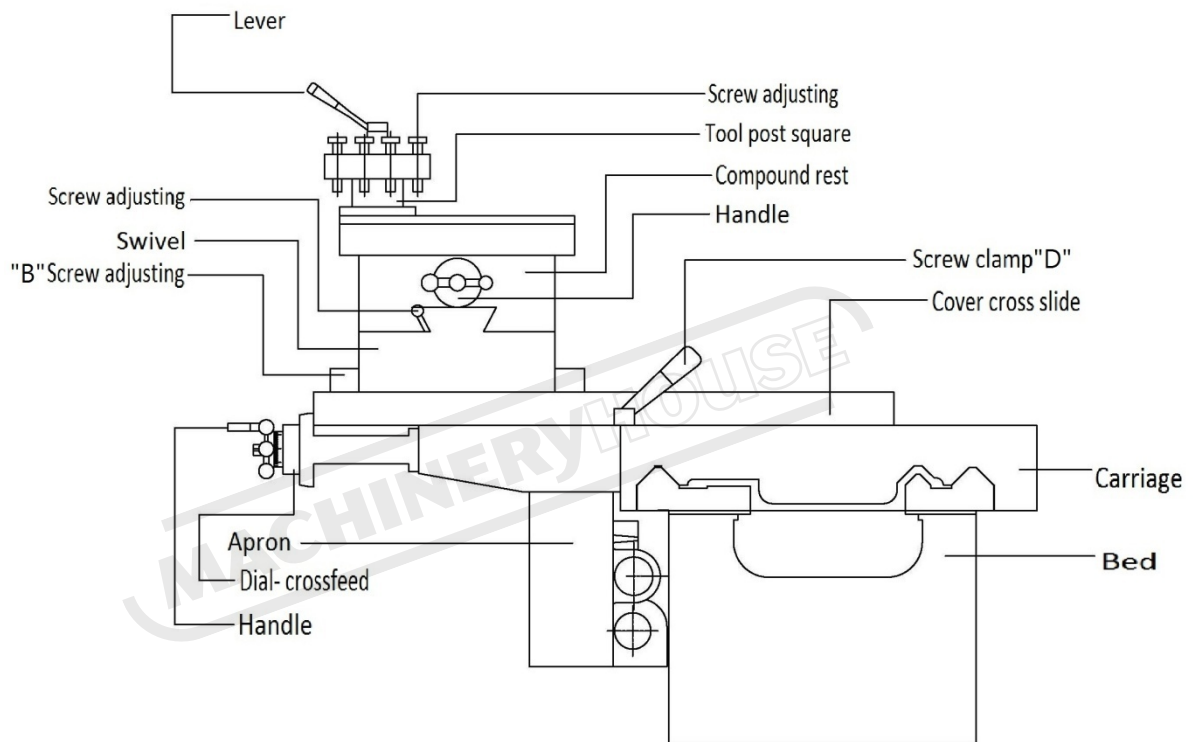


4-4 Slide

1. Slide is the saddle-shaped casting on the lathe bed, the main structure are the saddle-shaped slide body, compound slide and the 4-way tool post. Main function of slide is for compound slide and tool holder mounted and fixed tool for cross and longitudinal feed operation.

2. Cutting in the longitudinal feed

Cutting in the longitudinal feed, in order to avoid the slide moving backwards, leading to the cutting surface being uneven. It has a locking screw D on the slides.



3. Slope cutting

Cross carriage inscribed with the mark-indicator, when do the slope cutting, please loosen the locking Screw B, and rotating the compound rest by angle you need, and then fixed it tightly.

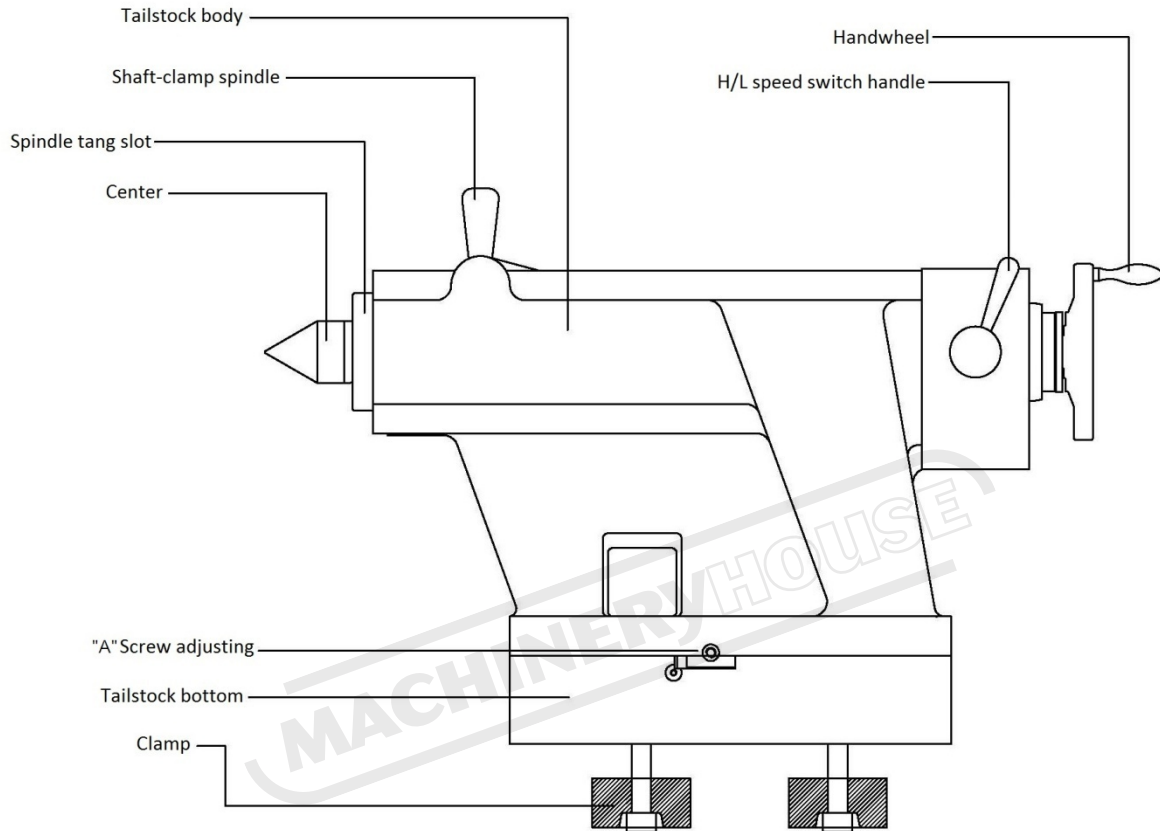
4. Adjustment of the gibs

To avoid the gap caused by the long period wearing and tearing of sliding surface, a gib for possible adjustments to eliminate the gap in each carriage; To adjust, please loosen the end locking screw and tighten adjustment screw A first, and adjust the wedge to maintain proper clearance, then tighten the screws.

5. Indicator The indicator moves forward 10mm revolution, could be divided into 250, 0.04mm per graduation. When reset to zero, please loosen the screw then fix after adjustment.

4-5 Tailstock

1. The main structure of the tailstock: the tailstock body, tailstock base plate, the tailstock sleeve, and speed control box. The tailstock sleeve and spindle are in the same level center position, also support the longitudinal movement on the bed and the spindle support the work material, cutting and drilling of two ends.

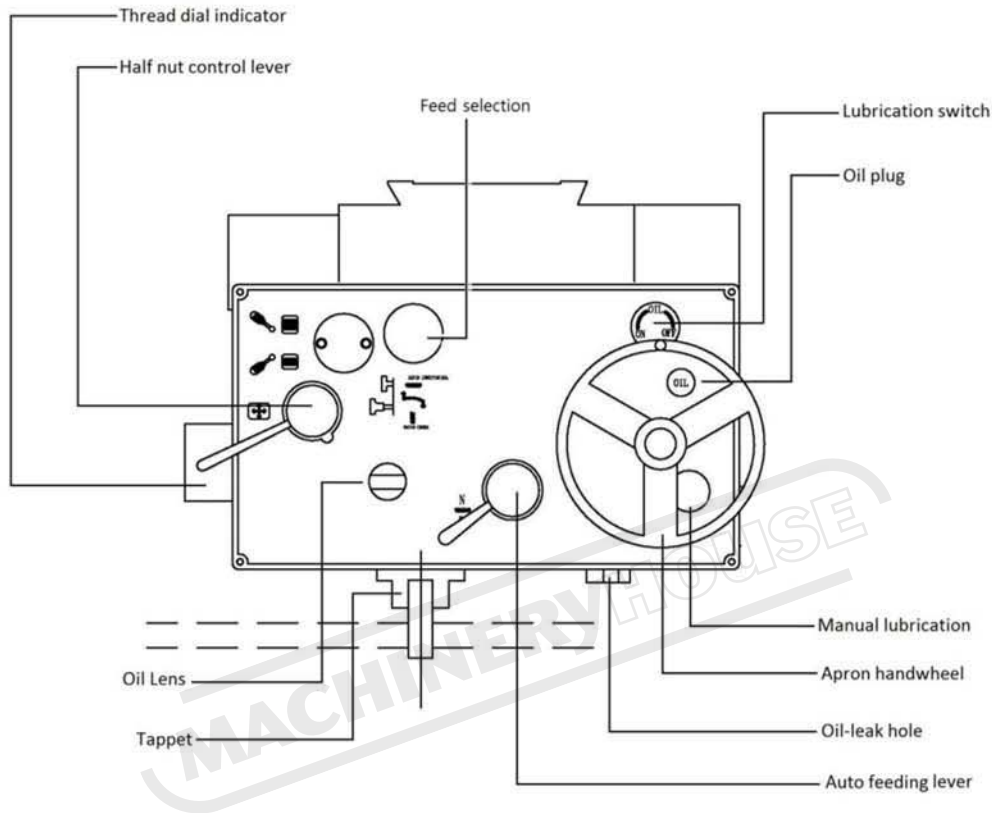


2. Operation

- 2-1. The tailstock hand wheel is located next to the speed control box, please operate transmission shift handle, and then turning the hand wheel tailstock spindle to do 1 to 1 or 1 to 4 fast-slow moving for drilling feed and backward.
- 2-2. Shaft-clamp spindle fixed the tailstock center.
- 2-3. Clamping plate for fix the tailstock tightly on lathe bed.
- 2-4. When the center of tailstock center sleeve and spindle are not on the same level line, please loosen and tight the screw by both adjust screw A. This adjustment is also available on tailstock center and spindle center horizontal adjustment for cutting of between center.

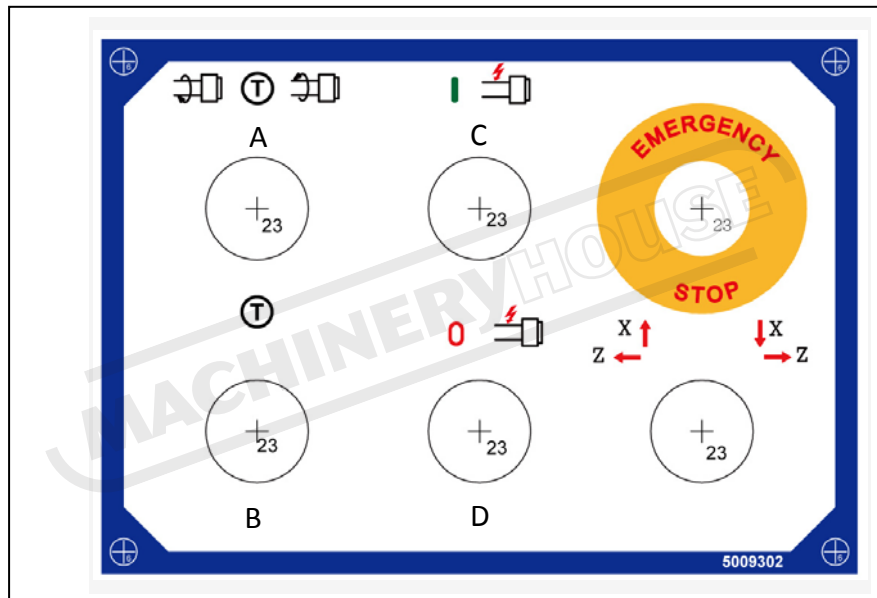
4-6 Apron

1. The main function of the apron is moving backward and forward, the feed slide auto-feeding and thread cutting auto-feeding; the feed device are: thread indicator, the half nut control lever, auto-feeding lever ,tappet, longitudinal feeding hand wheel.

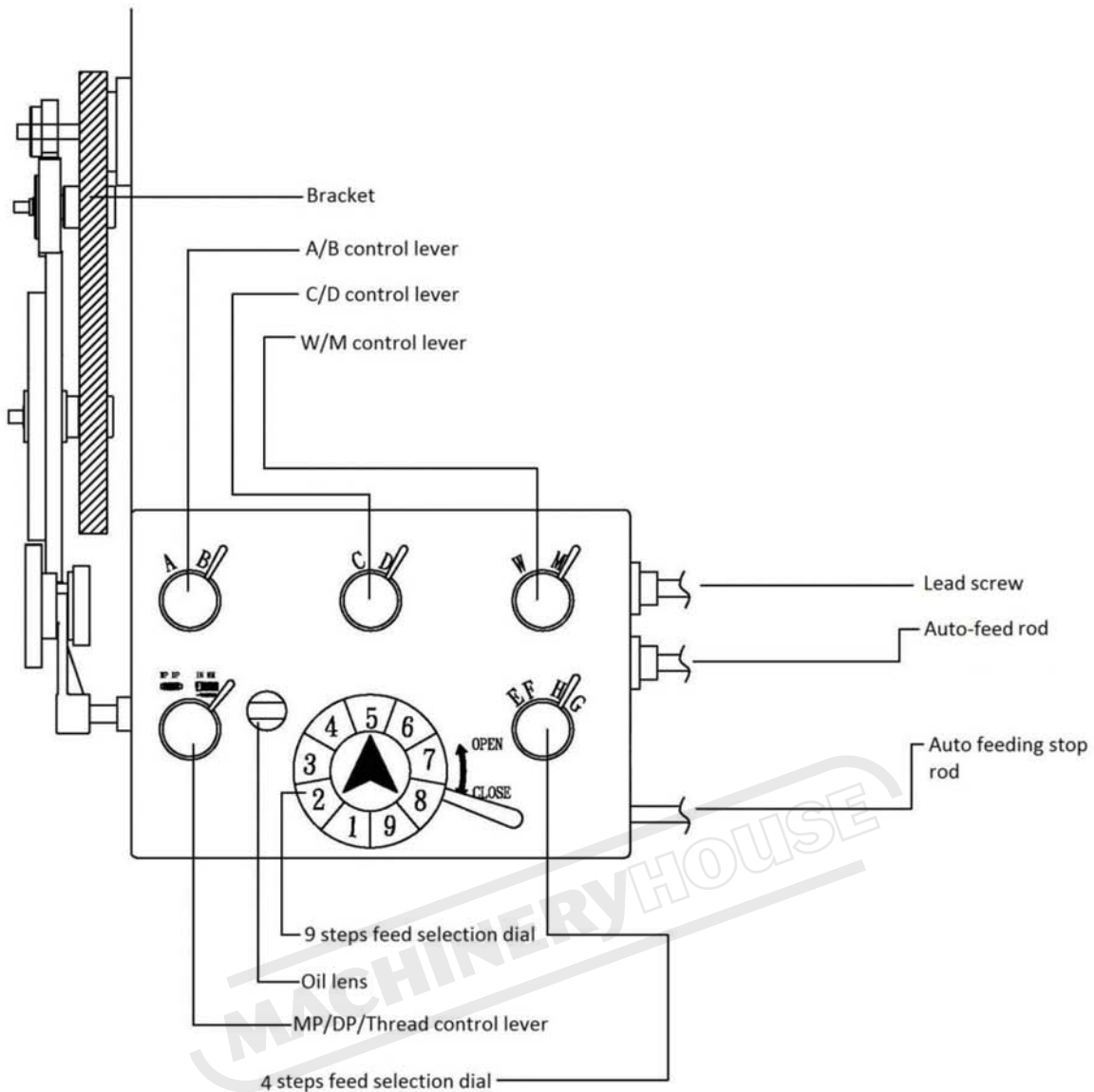


2. Apron with two auto feeding direction, cross-feed and longitudinal feed, according to the instructions of the nameplates first select operation required (pull - turn or push -turn knob) , then operate the automatically feed lever down to engage the feed. There is protection stop device under the apron of longitudinal feeding to automatically stop. To adjust the distance, loosen the stop feeding ring on the mounting screws, move the stop feeding ring to the desired position, and then fix.
3. Thread cutting drive
When doing the split nut lever down operation, split nut will combine with the lead screw and thread cutting up operation. Stop thread cutting, nursing bed inside safety bar to prevent thread cutting and automatically feed not both simultaneously to ensure safety.

4. Lubrication switch on Apron is for the control oil lubrication supply to slide. To turn off the lubrication, please turn clockwise to the end. Turn counterclockwise to start lubrication supply. Lubrication has 3 steps, from minimum to maximum only works on the process of apron moving.
5. There is a operation box at the right hand side of the apron.
6. Each button on the operation box are spindle few & back and Intermittent button for "A" .To control the spindle Intermittent run for "B", press the start button for "C" the start cutting. If want to stop the cutting, press the stop button for "C". For emergency stop ,to press the emergency button on the right hand side button of the plate to stop.



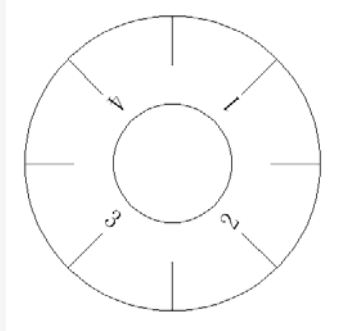
4-7 Gearbox



1. Transmission of Gearbox is from Headstock's forward&reverse mechanism to rear side gear change up mechanism. And then via two 2 steps and one 3 steps speed change mechanism in gear box to 9 steps speed change mechanism. Finally through feeding change mechanism to lead crew and auto-feed rod
2. Gearbox main function is thread cutting and automatic feed for cutting metric thread, but still can be cut DP and Module thread without changing any gear.
3. The thread cutting , please follow the instructions thread cutting chart of various gear lever placed in the appropriate position in order to cut the require thread pitch.
4. Automatic feed , please follow the thread cutting table indicates, depending on the desired feeding rate of the various shift lever in the proper position, then go to feed lever position, then can be automatically feeding operation.

4-8 thread indicator

Indicator means engaging with the screw thread, in accordance with the attached front table, thread pitch can be found, the exchange of these worm gear and engage the lead screw, the upper indicator with the rotation of the lead screw rotates.



Inch with 8T the worm gear:

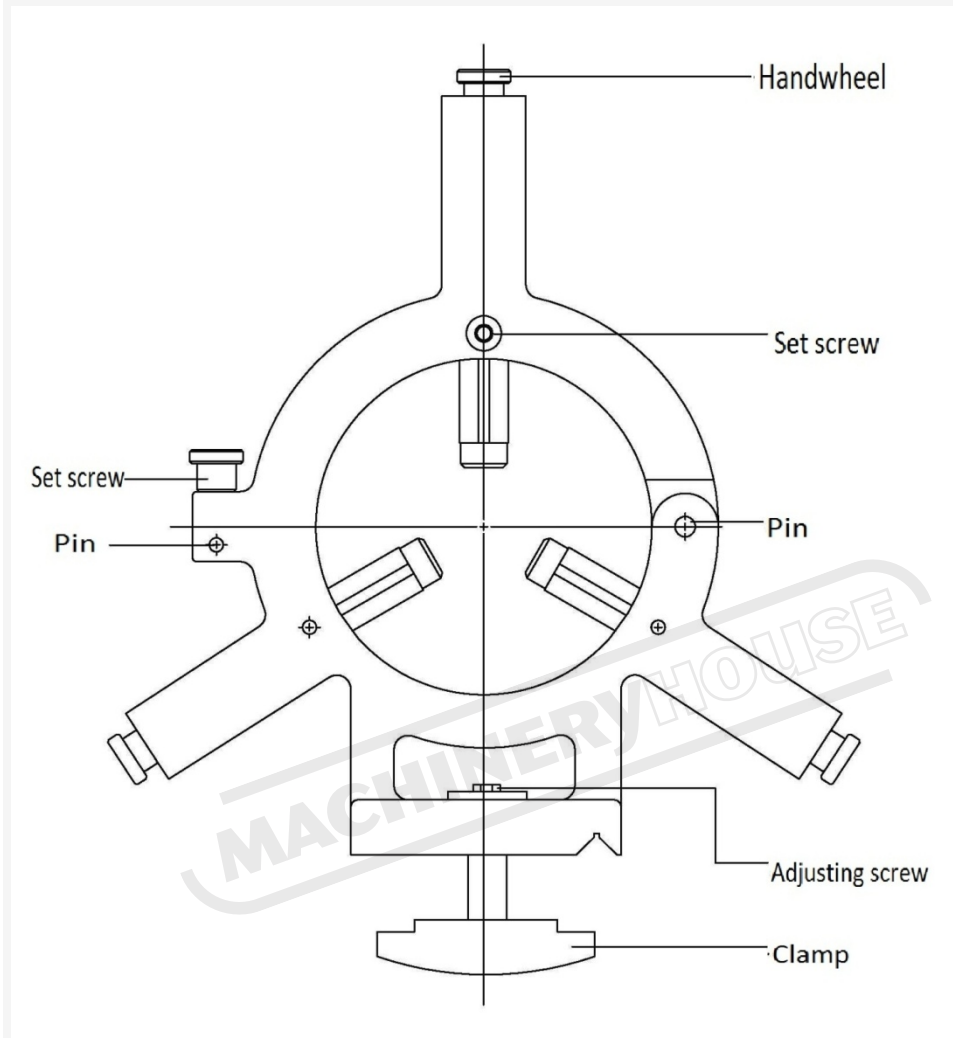
1. Thread cutting with $1/4$ of the pitch time, only the alignment mark with a single, repeated cutting of the original single point until complete as $2-1/4$ $2-3/4$, $2-7/8$, total one time.
2. Cutting thread $1/2$ of the pitch, the angle may be aligned either of two symmetrical scale line, such as the first target 1, the second 3 can be aligned, or aligned with the first 2, the second can be aligned with 4, 2 times.
3. Odd thread cutting teeth, you can align the mark of any four angles, such as 1,2,3,4, , total 4 times
4. Cutting thread is even thread, may be aligned at an angle of any tick of 8 times.

Metric with 10T, 11T, 12T, 13T, 14T of the Worm gear:

1. Cutting thread of 0.8,1.0,1.2 table data, use the worm gear 12T, any angle can be aligned with the mark, total 8 times.
2. Cutting thread of 0.9,2.25 table data, use the worm gear 12T, any angle can be aligned with any four angles of the mark, such as 1,2,3,4, total 4 times.
3. Cutting thread is 1.4,1.75,3.5 of table data, use the worm gear 14T can be aligned with any two symmetrical angles scale line, such as the first aligned with second time can be aligned with three, total 2 times.
4. Cutting thread is 1.25,2.5,5.0 of table data, use the worm gear 10T can be aligned either two symmetrical angles scale line, such as the first aligned with a second time can be aligned with 3, total 2 times.
5. Cutting thread is 8.0, please use the worm gear 12T can be aligned with any two symmetrical angles scale line, such as the first aligned with a second time can be aligned with 3, total 2 times.
6. Cutting thread is 1.1,2.75,5.5 of table data, use worm gear 11T can be aligned with a single mark, repeat the original single-point cutting until done only once.
7. Cutting thread of 1.3,3.25 table data, use the worm gear 13T can be aligned with single mark, repeat the original single-point cutting until done only once.

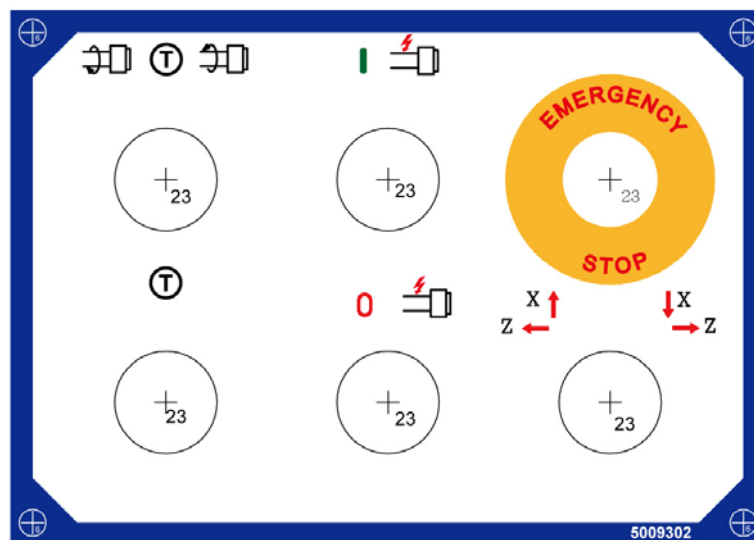
4-9 Steady rest

The function for steady rest is to fix center when clamping long and not rigidity work piece. Please tighten block-clamp to proper position, loosen screw A, rotate hand wheel to 3 quills to required position. Then after tighten screw A, please lubricate any time due to roller type tip.



4-10 Brake system

To Please press Emergency button, the power supply will cut off immediately and motor Pulley stop running.



We offer pedal for brake (Distance between 3 meters), above distance between centers 3 meters we do not offer. After step pedal, the power will cut off immediately and brake lining and motor pulley will stop running.

MACHINERYHOUSE

5. LUBRICATION

5-1 Headstock Lubrication

Headstock lubrication is splash injection type. Oil grooves are equipped around the headstock to provide lubricant flowing from oil grooves to spindle, then finally reach the bottom of the headstock. To add oil, take off the oil plug on the top of the headstock cover, fill to the centerline of oil sight glass. Oil drain hole is located on the left bottom side of the headstock.

Before operating the lathe, be sure the headstock is filled with oil. If not, add Shell Tellus #32. Exchange oil after three months use for the first time. Thereafter every six months.

5-2 Gear Box & Apron Lubrication

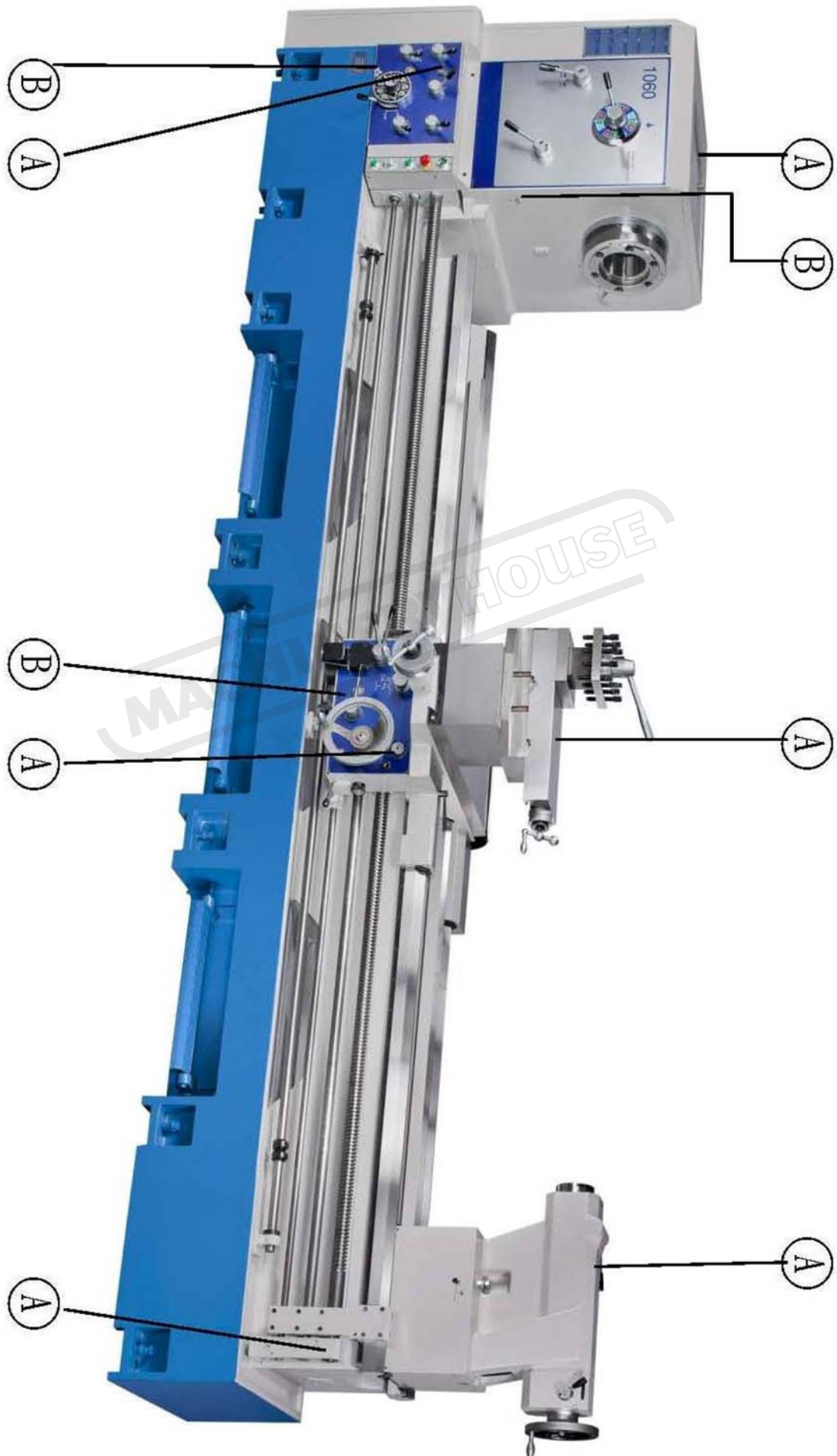
1. Gear box is reservoir oil bath type. To ensure the long service life of gear box and bedways, exchange the oil of gear box every six months.
2. Apron is also reservoir oil bath type. Add the oil as soon as the oil is lower than the center line of the oil sight glass.

5-3 Lubrication Charts

| No. | Location | Methods | Oil amount | Oil time | Exchange time | Recommend oil type |
|-----|------------------|---|-------------|--------------|--|------------------------|
| 1 | Headstock | Loosen the oil input hole screw on the left top side of the headstock cover | Center line | | One month at the beginning, thereafter once three months | Shell Tellus #32 |
| 2 | Gear Box | Open the top cover and loosen the oil input hole screw. | Center line | | Every six months | Shell Tellus Omala 150 |
| 3 | Apron | Loosen the oil input hole screw | Center line | Once per day | | Shell Tellus T-68 |
| 4 | Compound rest | Add oil with oil gun | As required | Once per day | | |
| 5 | Auto Feeding rod | Add oil with oil gun | As required | Once per day | | |
| 6 | Tailstock | Add oil with oil gun | As required | Once per day | | |
| 7 | Leadscrew | Add oil with oil gun | As required | Once per day | | |
| 8 | Bedway | Auto lubrication | | | | |

A: Oil input hole

B: Oil drain hole



6. MAINTENANCE & ADJUSTMENT

Please refer to following items for machine problem solution and maintenance for obtaining the best function and the long service life of the lathe.

6-1 Headstock

1. To avoid the headstock cover oil leaking: Once the headstock cover is opened, use cloth to clean the connecting surface and apply some grease sealant, then can close the cover and tighten the set screw.
2. To avoid the returning oil route being blocked: There are two reasons which cause the oil leaking from headstock front cover; one is over oiled; the other is that the returning oil route is blocked. It should take off the headstock cover. Then blow air to the small hole, which is on the top of the front bearing, by air gun several times. And rotate the spindle at the same time to clean up the blocked returning oil route.
3. Spindle bearing adjustment: The front and middle bearings of the spindle is precision taper roller type. It requires to adjust the bearings to have suitable preload for maintaining the high accuracy and the best rotating functions. After long use the locking nut may be loose a little bit and result in uneven cutting surface. For adjustment, loosen the setscrew by hexagon wrench. Then tighten the locking nut to obtain the suitable preload. Do not over-tighten as over-preload will make the bearings hot, damage the rotating surface of the bearings and lower down the bearing motion functions. After adjustment, be sure to tighten the locking screw completely. Please also use dead blow hammer to hit the two sides of spindle to prevent spindle bearing damage if tilt.

6-2 Apron & Saddle

1. Apron lubrication location: on the right top side of the saddle base, the oil inlet plug marked "OIL" is the oil inlet hole.
2. Apron drain hole located on the bottom cover of the apron.
3. Oil brand and oil exchange time: Use Shell Tellus #32 and exchange the oil half a year.
4. To adjust the half nut engaged lever: After long use, the lever may be loosened and needed to be adjusted. First, take off the thread dial indicator and find the 4 gib strip adjusting screws. Second, while pressing the lever, also adjust the 4 gib strip adjusting screws until they are properly tightened. Afterwards, replace the thread dial indicator.
5. Adjustment for the longitudinal & cross auto feeding overload:
Please stop the machine before doing adjustment. The cone clutch on the right hand side of the apron is an overload device.
To Adjust, first push down feed engagement lever on the front of Apron to engage feed mechanism in apron. This will allow the clutch to be adjusted.



Tighten clockwise, the overload will increase; Tighten anticlockwise, the overload will then decrease. Disengage feed lever when done.



6-3 Gear Box

1. Lubrication location: Below the top cover of the apron, take off the top cover to find the oil plug marked "OIL", the oil inlet hole.
2. Drain hole: On the left bottom side of the 10-step feed selection dial. The screw with hexagon nut is the oil drain hole .
3. Oil brand and oil exchange time: Use Shell Tellus Omala 150 and exchange the oil half a year.

6-4 Belt Tension Adjustment

After long use, the belt will stretch and require periodic tension adjustment.

1. Take off the cover on the left back side of the lathe.
2. Loosen adjusting nut **A** and lower down the suitable height until the desired belt tension is achieved.
3. After adjustment, be sure to tighten the adjusting nut securely.



Fig 6-4

6-5 Brake Belt Adjustment

If the brake belt is worn out and cause the brake band tool loosen, it is time to adjust the nut **H** of the brake band. Remove the side rear cover, loosen the nuts on the top firstly and tighten the nuts on the bottom to the appropriate height. Then tighten the nuts on the top to complete the adjustment. After adjustment, replace the side rear cover.

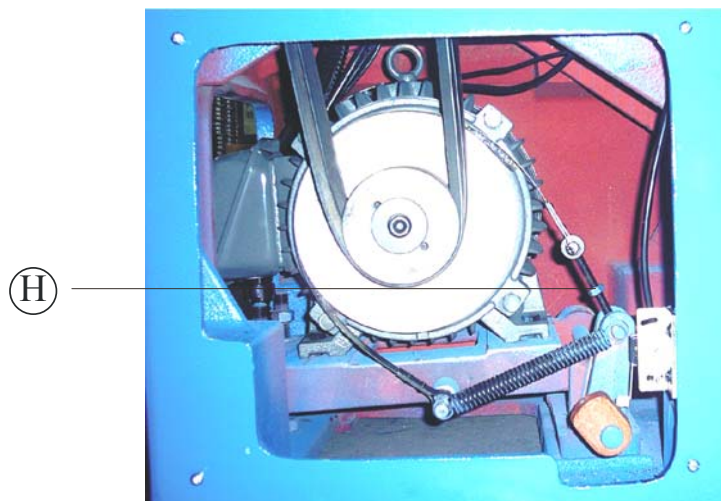


Fig 6-5

6-6 Brake & Micro Switch Adjustment

The foot brake is connected with the micro switch. It should have 0-1mm end play between the brake arm and the touching, head of the micro switch. The correct brake action should cut off the electricity first, then brake to avoid the brake belt being worn out. After stepping the foot brake, needs to re-operate the spindle operation control lever to make the spindle revolute again.

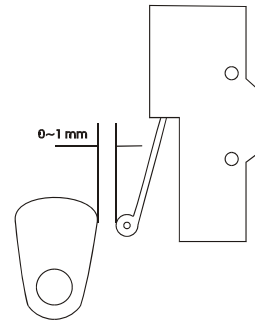
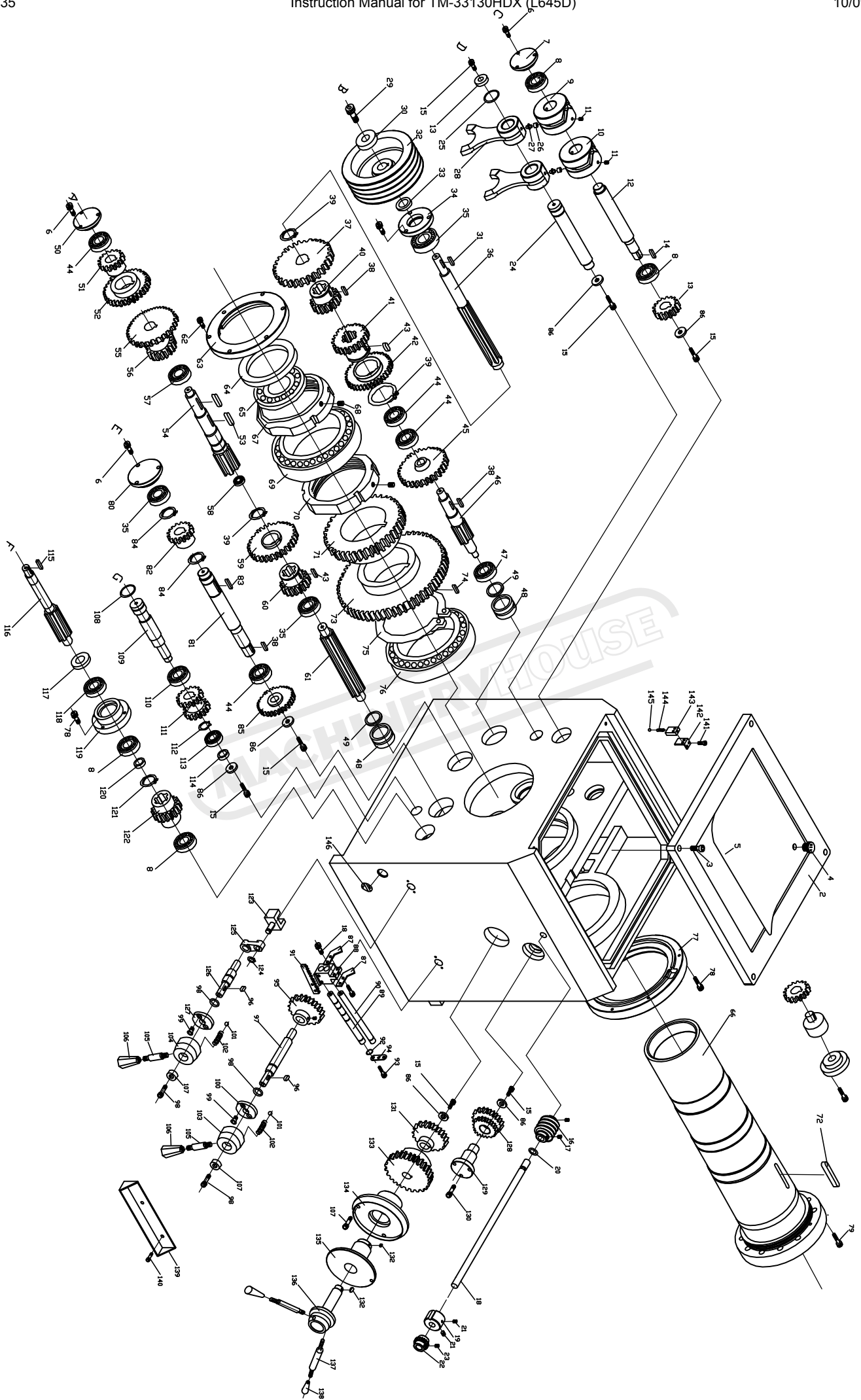


Fig. 6-6

6-7 Cutting Coolant Repair

If there is no coolant coming out after the pump switch is turned on, check the pump motor is working or not. If yes, check and see if the coolant in the tank is over the pump or not, If not, add the coolant, then turn on the switch, If there is still no coolant, the pump must be blocked. Take off the pump to clean up for repair.

MACHINERYHOUSE



9-1 HEADSTOCK

HEADSTOCK ASSMBLY (spindle bore :150mm/ 6")

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|--|-----------|------------------------|------------------------|------------------------|
| 1 | Head stock | 1 | 5001001-033 | 5001001-037 | 5001001-041 |
| 2 | Head stock cover | 1 | 5001002 | 5001002 | 5001002 |
| 3 | Hexagon socket screw, M10xP1.25x35L | 4 | 91111035 | 91111035 | 91111035 |
| 4 | Oil plug | 1 | 5001004 | 5001004 | 5001004 |
| 5 | Blanket | 1 | 5001005 | 5001005 | 5001005 |
| 6 | Hexagon socket screw, M6xP1.0x12L | 18 | 91110612 | 91110612 | 91110612 |
| 7 | Cover | 1 | 5001007 | 5001007 | 5001007 |
| 8 | Ball bearing , 6206 | 4 | 91301021 | 91301021 | 91301021 |
| 9 | Cam | 1 | 5001009 | 5001009 | 5001009 |
| 10 | Cam | 1 | 5001011 | 5001011 | 5001011 |
| 11 | Set screw, M10xP1.25x30L | 8 | 91121030 | 91121030 | 91121030 |
| 12 | Cam shaft | 1 | 5001008 | 5001008 | 5001008 |
| 13 | Worm gear 12T | 1 | 5001013 | 5001013 | 5001013 |
| 14 | Square key ,6x6x25L | 1 | 91610625 | 91610625 | 91610625 |
| 15 | Hexagon socket screw, M10xP1.25x25L | 6 | 91111025 | 91111025 | 91111025 |
| 16 | Worm bearing adjuster | 1 | 5001016 | 5001016 | 5001016 |
| 17 | Set screw, M8xP1.25x6L | 2 | 91120806 | 91120806 | 91120806 |
| 18 | Hob | 1 | 5001018 | 5001018 | 5001018 |
| 19 | Locating ring | 1 | 5001019 | 5001019 | 5001019 |
| 20 | O-RING P16 | 1 | 9151P016 | 9151P016 | 9151P016 |
| 21 | Set screw, M8xP1.25x12L | 2 | 91120812 | 91120812 | 91120812 |
| 22 | Worm gear gear 20T | 1 | 5001022 | 5001022 | 5001022 |
| 23 | Set screw, M8xP1.25x6L | 3 | 91120806 | 91120806 | 91120806 |
| 24 | Radius arm axis | 1 | 5001024 | 5001024 | 5001024 |
| 25 | O-RING P29 | 1 | 9151P029 | 9151P029 | 9151P029 |
| 26 | Bushing | 2 | 5001026 | 5001026 | 5001026 |
| 27 | Pin | 2 | 5001027 | 5001027 | 5001027 |
| 28 | Radius arm | 2 | 5001028 | 5001028 | 5001028 |
| 29 | Hexagon socket screw, M12x25L | 1 | 91111225 | 91111225 | 91111225 |
| 30 | Spring-washer M12 | 1 | | | |
| 31 | Square key ,10x10x55L | 1 | 91611055 | 91611055 | 91611055 |
| 32 | Pulley wheel | 1 | 5001032 | 5001032 | 5001032 |
| 33 | Seal-oil, TC 34x52x11 | 1 | 91523452 | 91523452 | 91523452 |
| 34 | Cover | 1 | 5001034 | 5001034 | 5001034 |
| 35 | Ball bearing , 6307 | 3 | 61306307 | 61306307 | 61306307 |
| 36 | Shaft-B | 1 | 5001036 | 5001036 | 5001036 |
| 37 | Gear 59T | 1 | 5001037 | 5001037 | 5001037 |
| 38 | Square key ,10x10x30L | 3 | 91611030 | 91611030 | 91611030 |
| 39 | Snap ring, S55 | 3 | 9171S055 | 9171S055 | 9171S055 |
| 40 | Gear 41T | 1 | 5001040 | 5001040 | 5001040 |
| 41 | Gear 32T | 1 | 5001041 | 5001041 | 5001041 |

HEADSTOCK ASSMBLY (spindle bore :150mm/ 6")

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|---------------------------------------|-----------|------------------------|------------------------|------------------------|
| 42 | Gear 51T | 1 | 5001042 | 5001042 | 5001042 |
| 43 | Square key ,10x10x25L | 2 | 91611025 | 91611025 | 91611025 |
| 44 | Ball bearing , 6207 | 4 | 91306207 | 91306207 | 91306207 |
| 45 | Gear 58T | 1 | 5001045 | 5001045 | 5001045 |
| 46 | Gear sahft 23T | 1 | 5001046 | 5001046 | 5001046 |
| 47 | Ball bearing , 6208 | 1 | 91306208 | 91306208 | 91306208 |
| 48 | Plug A&B | 2 | 5001048 | 5001048 | 5001048 |
| 49 | O-RING P70 | 2 | 9151P070 | 9151P070 | 9151P070 |
| 50 | Cover | 1 | 5001050 | 5001050 | 5001050 |
| 51 | Gear 43T | 1 | 5001051 | 5001051 | 5001051 |
| 52 | Gear 61T | 1 | 5001052 | 5001052 | 5001052 |
| 53 | Square key ,10x10x90L | 2 | 91611090 | 91611090 | 91611090 |
| 54 | Gear sahft 27T | 1 | 5001054 | 5001054 | 5001054 |
| 55 | Gear 70T | 1 | 5001055 | 5001055 | 5001055 |
| 56 | Gear 51T | 1 | 5001056 | 5001056 | 5001056 |
| 57 | Ball bearing , 6209 | 1 | 91306209 | 91306209 | 91306209 |
| 58 | Ball bearing , NJ205 | 1 | 9131J205 | 9131J205 | 9131J205 |
| 59 | Gear 27T/62T | 1 | 5001059 | 5001059 | 5001059 |
| 60 | Gear 22T | 1 | 5001060 | 5001060 | 5001060 |
| 61 | Shaft | 1 | 5001061 | 5001061 | 5001061 |
| 62 | Hexagon socket screw, M6xP1.0x25L | 8 | 91110625 | 91110625 | 91110625 |
| 63 | Cover | 1 | 5001063 | 5001063 | 5001063 |
| 64 | Seal-oil, TC 180x210x15 | 1 | 91521802 | 91521802 | 91521802 |
| 65 | Ball bearing , 6836 | 1 | 91306836 | 91306836 | 91306836 |
| 66 | Spindle (A2-11) | 1 | 5001066 | 5001066 | 5001066 |
| 67 | Lock-nut | 1 | 5001067 | 5001067 | 5001067 |
| 68 | Set screw, M12xP1.25x20L | 6 | 91121220 | 91121220 | 91121220 |
| 69 | Taper roller bearing , 32938 | 1 | 91332938 | 91332938 | 91332938 |
| 70 | Lock-nut | 1 | 5001070 | 5001070 | 5001070 |
| 71 | Gear | 1 | 5001071 | 5001071 | 5001071 |
| 72 | Square key ,15x15x80L | 1 | 91611580 | 91611580 | 91611580 |
| 73 | Gear | 1 | 5001074 | 5001074 | 5001074 |
| 74 | Square key ,12x12x40L | 1 | 91611240 | 91611240 | 91611240 |
| 75 | Snap ring, S220 | 1 | 9171S220 | 9171S220 | 9171S220 |
| 76 | Taper roller bearing , 32940 | 1 | 91332940 | 91332940 | 91332940 |
| 77 | Cover | 1 | 5001077 | 5001077 | 5001077 |
| 78 | Hexagon socket screw, M6xP1.0x35L | 10 | 91110635 | 91110635 | 91110635 |
| 79 | Hexagon socket screw, M20xP2.5x55L | 11 | 91112055 | 91112055 | 91112055 |
| 80 | Cover | 1 | 5001080 | 5001080 | 5001080 |
| 81 | Shaft | 1 | 5001081 | 5001081 | 5001081 |
| 82 | Gear | 1 | 5001082 | 5001082 | 5001082 |
| 83 | Square key ,10x10x45L | 1 | 91611045 | 91611045 | 91611045 |
| 84 | Snap ring, S38 | 2 | 9171S038 | 9171S038 | 9171S038 |
| 85 | Gear 42T | 1 | 5001085 | 5001085 | 5001085 |
| 86 | Lap | 5 | 5001086 | 5001086 | 5001086 |

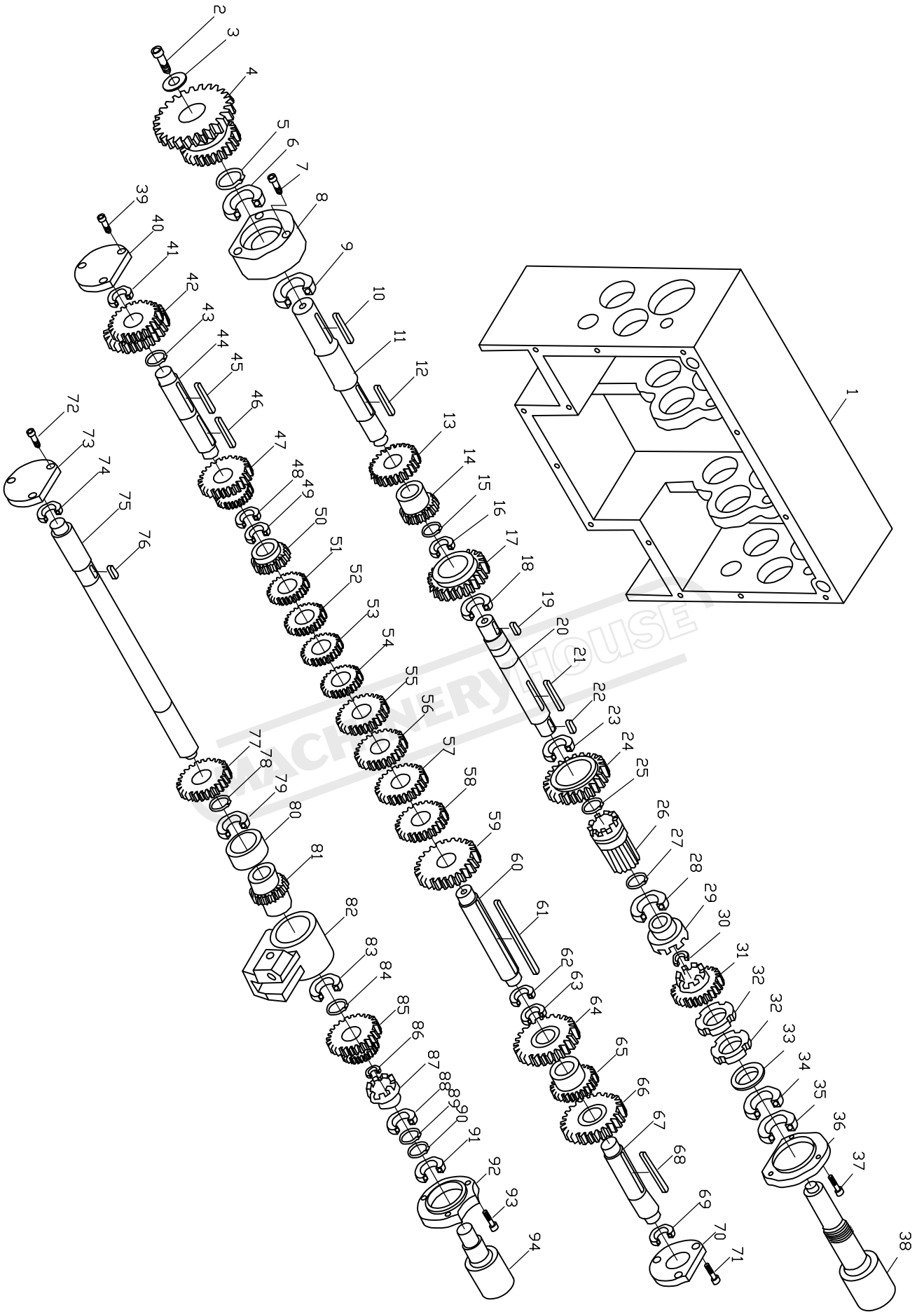
HEADSTOCK ASSMBLY (spindle bore :150mm/ 6")

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|---------------------------------------|-----------|------------------------|------------------------|------------------------|
| 87 | Dials the fingernail | 2 | 5001087 | 5001087 | 5001087 |
| 88 | Speed change slide | 1 | 5001088 | 5001088 | 5001088 |
| 89 | Localization axis | 1 | 5001089 | 5001089 | 5001089 |
| 90 | Guide rod | 1 | 5001090 | 5001090 | 5001090 |
| 91 | Change speed gear 36T | 1 | 5001091 | 5001091 | 5001091 |
| 92 | O-RING P21 | 3 | 9151P021 | 9151P021 | 9151P021 |
| 93 | Hexagon socket screw, M6xP1.0x20L | 3 | 91110620 | 91110620 | 91110620 |
| 94 | Files piece | 1 | 5001094 | 5001094 | 5001094 |
| 95 | Change speed gear | 1 | 5001095 | 5001095 | 5001095 |
| 96 | Square key ,5x5x15L | 2 | 91610501 | 91610501 | 91610501 |
| 97 | Shaft | 1 | 5001097 | 5001097 | 5001097 |
| 98 | O-RING P18 | 1 | 9151P018 | 9151P018 | 9151P018 |
| 99 | Screw , M6xP1.0x14L | 4 | | | |
| 100 | Detent plate | 1 | 5001100 | 5001100 | 5001100 |
| 101 | Ball steel , $\phi 5/16"$ | 3 | 91820516 | 91820516 | 91820516 |
| 102 | Spring, D8xd0.8x25L | 3 | | | |
| 103 | Hub | 1 | 5001103 | 5001103 | 5001103 |
| 104 | Hub | 1 | 5001104 | 5001104 | 5001104 |
| 105 | Lever | 2 | 3001114 | 3001114 | 3001114 |
| 106 | Knob | 2 | 3001115 | 3001115 | 3001115 |
| 107 | Washer | 2 | | | |
| 108 | O-RING P29 | 1 | 9151P029 | 9151P029 | 9151P029 |
| 109 | Shaft -G | 1 | 5001109 | 5001109 | 5001109 |
| 110 | Ball bearing , 6006 | 1 | 91301013 | 91301013 | 91301013 |
| 111 | Gear | 1 | 5001111 | 5001111 | 5001111 |
| 112 | Snap ring, R48 | 1 | 9171R048 | 9171R048 | 9171R048 |
| 113 | Ball bearing , 6005 | 1 | 91306005 | 91306005 | 91306005 |
| 114 | Retainer G | 1 | 5001114 | 5001114 | 5001114 |
| 115 | key ,6x6x25L | 1 | 91620625 | 91620625 | 91620625 |
| 116 | Output shaft | 1 | 5001116 | 5001116 | 5001116 |
| 117 | Seal-oil, TC 30x50x8 | 1 | 91523050 | 91523050 | 91523050 |
| 118 | Ball bearing , 6906 | 1 | 91306906 | 91306906 | 91306906 |
| 119 | Lever | 1 | 5001119 | 5001119 | 5001119 |
| 120 | Retainer F | 1 | 4001010 | 4001010 | 4001010 |
| 121 | Snap ring, S38 | 1 | 9171S038 | 9171S038 | 9171S038 |
| 122 | Gear | 1 | 5001122 | 5001122 | 5001122 |
| 123 | Dials the block | 2 | 5001123 | 5001123 | 5001123 |
| 124 | Snap ring, S10 | 1 | 9171S010 | 9171S010 | 9171S010 |
| 125 | Rocking shaft | 1 | 3501117 | 3501117 | 3501117 |
| 126 | Work driving arm F | 1 | 5001126 | 5001126 | 5001126 |
| 127 | Detent plate F | 1 | 5001127 | 5001127 | 5001127 |
| 128 | Gear 60T/80T | 1 | 5001128 | 5001128 | 5001128 |
| 129 | Left fixed stand | 1 | 5001129 | 5001129 | 5001129 |
| 130 | Hexagon socket screw, M10xP1.5x15L | 3 | 91111015 | 91111015 | 91111015 |
| 131 | First change speed gear A 40T | 1 | 5001131 | 5001131 | 5001131 |
| 132 | Square key ,6x6x12L | 2 | 91610601 | 91610601 | 91610601 |
| 133 | First change speed gear B 60T | 1 | 5001133 | 5001133 | 5001133 |

HEADSTOCK ASSMBLY (spindle bore :150mm/ 6")

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|-----------------|--------------------------------------|------------------|--------------------------------|--------------------------------|--------------------------------|
| 134 | Speed change fixed stand | 1 | 5001134 | 5001134 | 5001134 |
| 135 | Speed change kneading board | 1 | 5001135 | 5001135 | 5001135 |
| 136 | Speed change hand | 1 | 5001136 | 5001136 | 5001136 |
| 137 | Lever | 2 | 3003017 | 3003017 | 3003017 |
| 138 | Knob | 2 | 3003018 | 3003018 | 3003018 |
| 139 | Sets at the frame | 1 | 5001139 | 5001139 | 5001139 |
| 140 | Hexagon socket screw, M5xP0.8x15L | 2 | 91110515 | 91110515 | 91110515 |
| 141 | Hexagon socket screw, M5xP0.8x25L | 2 | 91110525 | 91110525 | 91110525 |
| 142 | Base support | 1 | 5001141 | 5001141 | 5001141 |
| 143 | Locates the base | 1 | 5001140 | 5001140 | 5001140 |
| 144 | Ball steel | 1 | | | |
| 145 | Spring | 1 | | | |
| 146 | Lenz-oil , ϕ 29 | 1 | 92552001 | 92552001 | 92552001 |

MACHINERYHOUSE



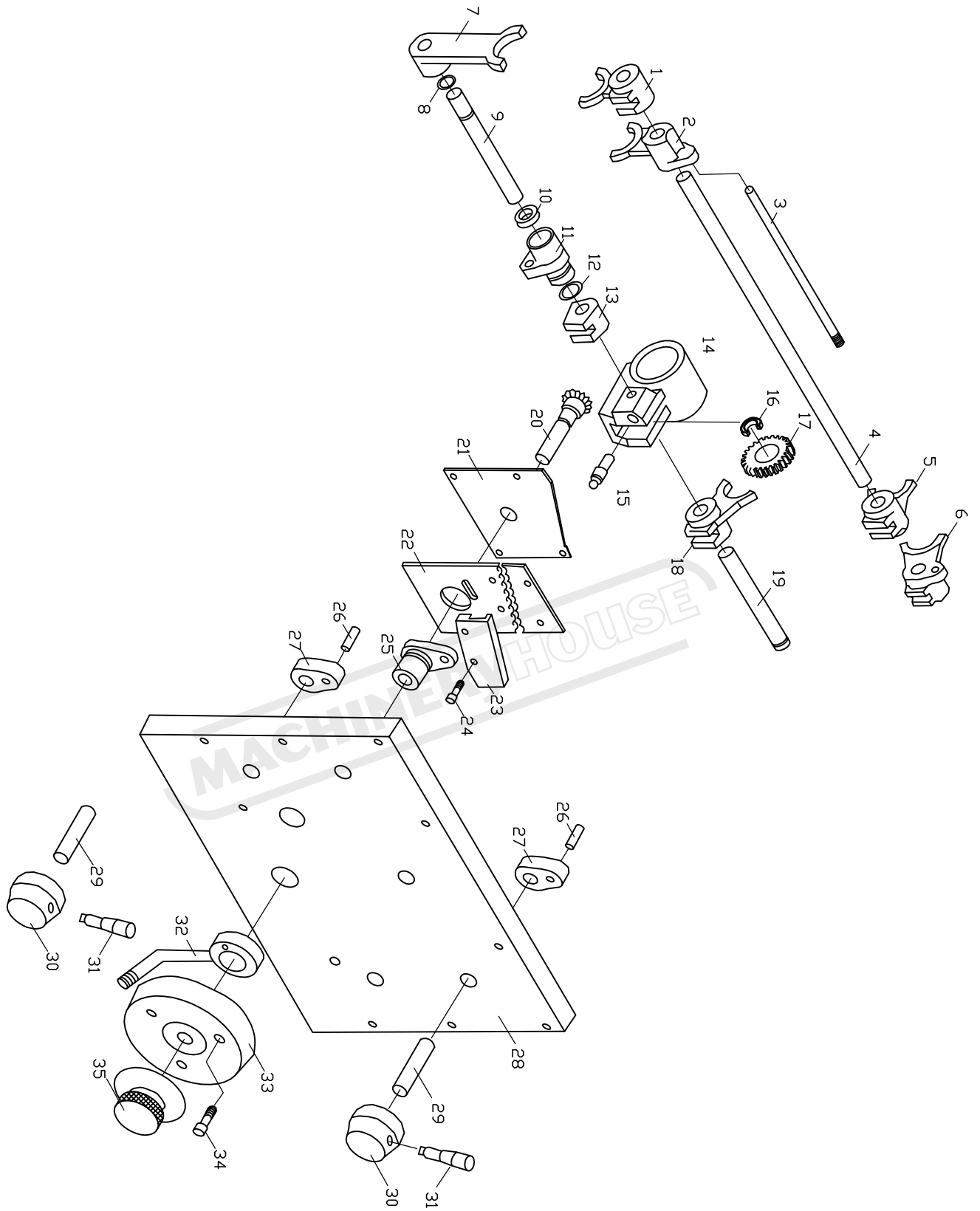
9-2-1 Gear Box

GEAR BOX ASSEMBLY

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|---------------|-----------|------------------------|------------------------|------------------------|
| 1 | GEAR BOX | 1 | 5002001 | 5002001 | 5002001 |
| 2 | BOLT M8X25L | 1 | 91110825 | 91110825 | 91110825 |
| 3 | WASHER | 1 | | | |
| 4 | GEAR | 1 | 5002004 | 5002004 | 5002004 |
| 5 | SNAP RING | 1 | | | |
| 6 | BEARING 6006 | 1 | | | |
| 7 | BOLT M6X50L | 3 | 91110650 | 91110650 | 91110650 |
| 8 | COVER | 1 | 5002008 | 5002008 | 5002008 |
| 9 | BEARING 6206 | 1 | | | |
| 10 | KEY 6X6X55L | 1 | | | |
| 11 | SHAFT | 1 | 5002011 | 5002011 | 5002011 |
| 12 | KEY 6X6X50L | 1 | | | |
| 13 | GEAR | 1 | 5002013 | 5002013 | 5002013 |
| 14 | GEAR | 1 | 5002014 | 5002014 | 5002014 |
| 15 | SNAP RING | 1 | | | |
| 16 | BEARING 6203 | 1 | 91301016 | 91301016 | 91301016 |
| 17 | GEAR | 1 | 5002017 | 5002017 | 5002017 |
| 18 | BEARING 6205 | 1 | | | |
| 19 | KEY 6X6X20L | 1 | | | |
| 20 | SHAFT | 1 | 5002020 | 5002020 | 5002020 |
| 21 | KEY 6X6X50L | 1 | | | |
| 22 | KEY 6X6X20L | 1 | | | |
| 23 | BEARING 6005 | 1 | 91301010 | 91301010 | 91301010 |
| 24 | GEAR | 1 | 5002024 | 5002024 | 5002024 |
| 25 | SNAP RING | 1 | | | |
| 26 | GEAR | 1 | 5002026 | 5002026 | 5002026 |
| 27 | SNAP RING | 1 | | | |
| 28 | BEARING 6006 | 1 | | | |
| 29 | CLUTEH | 1 | 5002029 | 5002029 | 5002029 |
| 30 | BEARING 6002 | 1 | | | |
| 31 | GEAR | 1 | 5002031 | 5002031 | 5002031 |
| 32 | NUT | 2 | | | |
| 33 | WASHER | 1 | | | |
| 34 | BEARING 30206 | 1 | | | |
| 35 | BEARING 30206 | 1 | | | |
| 36 | COVER | 1 | 5002036 | 5002036 | 5002036 |
| 37 | BOLT M6X25L | 1 | 91110625 | 91110625 | 91110625 |
| 38 | SHAFT | 1 | 5002038 | 5002038 | 5002038 |
| 39 | BOLT M6X16L | 3 | 91110616 | 91110616 | 91110616 |
| 40 | COVER | 1 | 5002040 | 5002040 | 5002040 |
| 41 | BEARING 6204 | 1 | 91301018 | 91301018 | 91301018 |
| 42 | GEAR | 1 | 5002042 | 5002042 | 5002042 |
| 43 | SNAP RING | 1 | | | |
| 44 | SHAFT | 1 | 5002044 | 5002044 | 5002044 |
| 45 | KEY 6X6X55L | 1 | | | |
| 46 | KEY 6X6X55L | 1 | | | |
| 47 | GEAR | 1 | 5002047 | 5002047 | 5002047 |
| 48 | BEARING 6204 | 1 | 91301018 | 91301018 | 91301018 |
| 49 | BEARING 6204 | 3 | 91301018 | 91301018 | 91301018 |

GEAR BOX ASSEMBLY

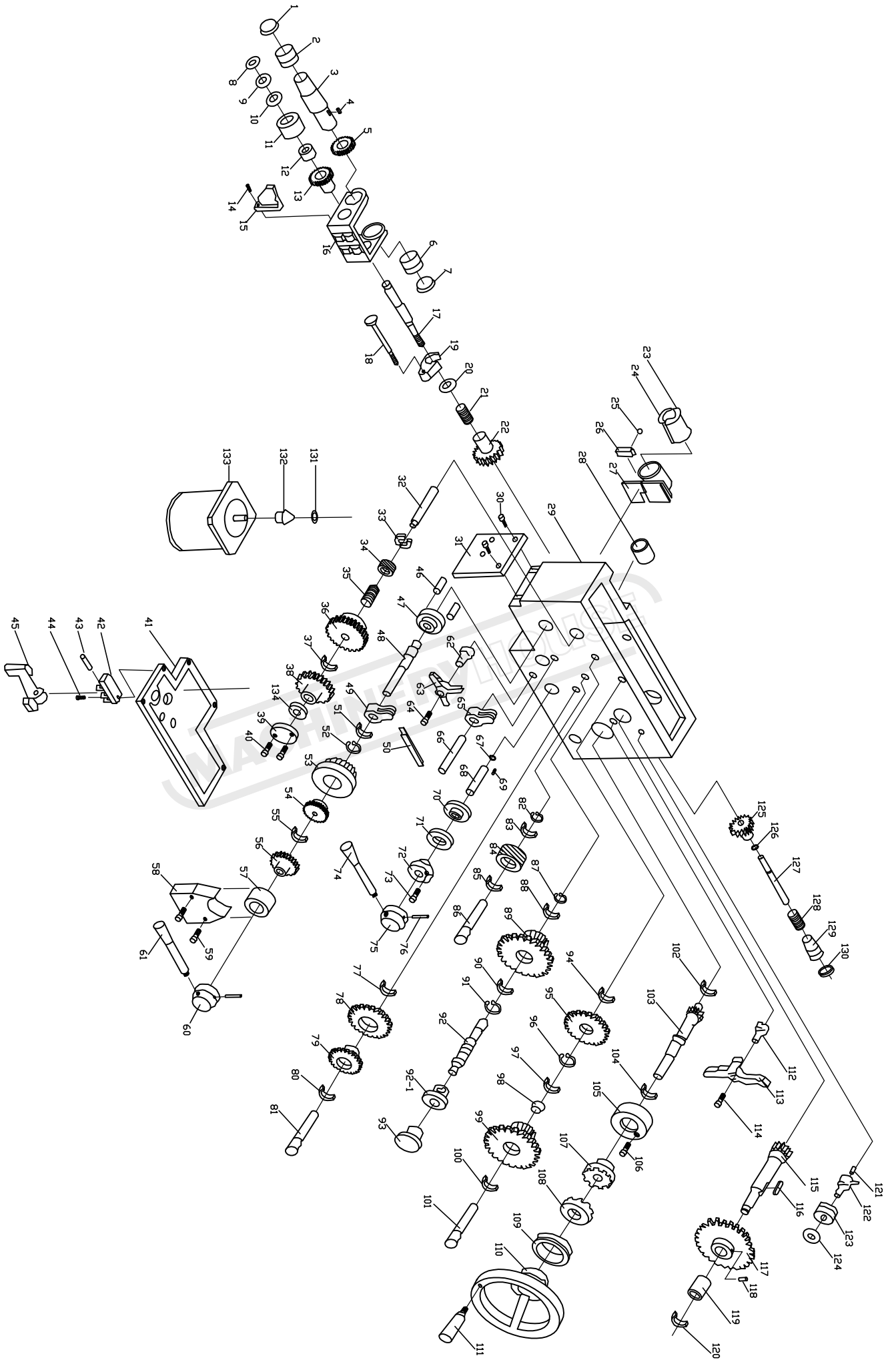
| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|--------------|-----------|------------------------|------------------------|------------------------|
| 50 | GEAR | 1 | 5002050 | 5002050 | 5002050 |
| 51 | GEAR | 1 | 5002051 | 5002051 | 5002051 |
| 52 | GEAR | 1 | 5002052 | 5002052 | 5002052 |
| 53 | GEAR | 1 | 5002053 | 5002053 | 5002053 |
| 54 | GEAR | 1 | 5002054 | 5002054 | 5002054 |
| 55 | GEAR | 1 | 5002055 | 5002055 | 5002055 |
| 56 | GEAR | 1 | 5002056 | 5002056 | 5002056 |
| 57 | GEAR | 1 | 5002057 | 5002057 | 5002057 |
| 58 | GEAR | 1 | 5002058 | 5002058 | 5002058 |
| 59 | GEAR | 1 | 5002059 | 5002059 | 5002059 |
| 60 | SHAFT | 1 | 5002060 | 5002060 | 5002060 |
| 61 | KEY 6X6X130L | 1 | | | |
| 62 | BEARING 6204 | 1 | 91301018 | 91301018 | 91301018 |
| 63 | BEARING 6204 | 1 | 91301018 | 91301018 | 91301018 |
| 64 | GEAR | 1 | 5002064 | 5002064 | 5002064 |
| 65 | GEAR | 1 | 5002065 | 5002065 | 5002065 |
| 66 | GEAR | 1 | 5002066 | 5002066 | 5002066 |
| 67 | KEY 6X6X70L | 1 | | | |
| 68 | SHAFT | 1 | 5002068 | 5002068 | 5002068 |
| 69 | BEARING 6204 | 1 | 91301018 | 91301018 | 91301018 |
| 70 | COVER | 1 | 5002070 | 5002070 | 5002070 |
| 71 | BOLT M6X16L | 3 | 91110616 | 91110616 | 91110616 |
| 72 | BOLT M6X16L | 3 | 91110616 | 91110616 | 91110616 |
| 73 | COVER | 1 | 5002073 | 5002073 | 5002073 |
| 74 | BEARING 6204 | 1 | 91301018 | 91301018 | 91301018 |
| 75 | SHAFT | 1 | 5002075 | 5002075 | 5002075 |
| 76 | KEY 6X6X20L | 1 | | | |
| 77 | GEAR | 1 | 5002077 | 5002077 | 5002077 |
| 78 | SNAP RING | 1 | | | |
| 79 | BEARING 6205 | 1 | | | |
| 80 | WASHER | 1 | 5002080 | 5002080 | 5002080 |
| 81 | GEAR | 1 | 5002081 | 5002081 | 5002081 |
| 82 | GEAR BOD | 1 | 5002082 | 5002082 | 5002082 |
| 83 | BEARING 6205 | 1 | | | |
| 84 | SNAP RING | 1 | | | |
| 85 | GEAR | 1 | 5002085 | 5002085 | 5002085 |
| 86 | BEARING 6002 | 1 | | | |
| 87 | CLUTEH | 1 | 5002087 | 5002087 | 5002087 |
| 88 | BEARING 6006 | 1 | | | |
| 89 | SNAP RING | 1 | | | |
| 90 | SNAP RING | 1 | | | |
| 91 | BEARING 6005 | 1 | 91301010 | 91301010 | 91301010 |
| 92 | COVER | 1 | 5002092 | 5002092 | 5002092 |
| 93 | BOLT M6X16L | 3 | 91110616 | 91110616 | 91110616 |
| 94 | SHAFT | 1 | 5002094 | 5002094 | 5002094 |



9-2-2 Gear Cover

GEAR BOX ASSEMBLY

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|--------------------|-----------|------------------------|------------------------|------------------------|
| 1 | Claw-shifter | 1 | 5002101 | 5002101 | 5002101 |
| 2 | Claw-shifter | 1 | 5002102 | 5002102 | 5002102 |
| 3 | SHAFT | 1 | 5002103 | 5002103 | 5002103 |
| 4 | SHAFT | 1 | 5002104 | 5002104 | 5002104 |
| 5 | Claw-shifter | 1 | 5002105 | 5002105 | 5002105 |
| 6 | Claw-shifter | 1 | 5002106 | 5002106 | 5002106 |
| 7 | Claw-shifter | 1 | 5002107 | 5002107 | 5002107 |
| 8 | SNAP RING | 1 | | | |
| 9 | SHAFT | 1 | 5002109 | 5002109 | 5002109 |
| 10 | O-RING TC16267 | 1 | | | |
| 11 | COVER | 1 | 5002111 | 5002111 | 5002111 |
| 12 | O-RING | 1 | | | |
| 13 | Claw-shifter | 1 | 5002113 | 5002113 | 5002113 |
| 14 | GEAR BOD | 1 | 5002114 | 5002114 | 5002114 |
| 15 | SHAFT | 1 | 5002115 | 5002115 | 5002115 |
| 16 | BEARING 6200 | 1 | | | |
| 17 | GEAR | 1 | 5002117 | 5002117 | 5002117 |
| 18 | Claw-shifter | 1 | 5002118 | 5002118 | 5002118 |
| 19 | SHAFT | 1 | 5002119 | 5002119 | 5002119 |
| 20 | GEAR SHAFT | 1 | 5002120 | 5002120 | 5002120 |
| 21 | SLIDE PLATE | 1 | 5002121 | 5002121 | 5002121 |
| 22 | SETTING PLATE | 1 | 5002122 | 5002122 | 5002122 |
| 23 | COVER | 1 | 5002123 | 5002123 | 5002123 |
| 24 | BOLT | 1 | | | |
| 25 | Shifter | 1 | 5002125 | 5002125 | 5002125 |
| 26 | SAFT | 5 | 5002126 | 5002126 | 5002126 |
| 27 | Shifter | 5 | 5002127 | 5002127 | 5002127 |
| 28 | GEAR COVER | 1 | 5002128 | 5002128 | 5002128 |
| 29 | Shaft-shifter | 5 | 5002129 | 5002129 | 5002129 |
| 30 | HUB | 5 | 5002130 | 5002130 | 5002130 |
| 31 | Handle | 5 | 5002131 | 5002131 | 5002131 |
| 32 | Handle | 1 | 5002132 | 5002132 | 5002132 |
| 33 | Seat-gear shifting | 1 | 5002133 | 5002133 | 5002133 |
| 34 | BOLT M8X35L | 3 | 91110835 | 91110835 | 91110835 |
| 35 | CHANGE SPEED DISK | 1 | 5002135 | 5002135 | 5002135 |



APRON ASSEMBLY

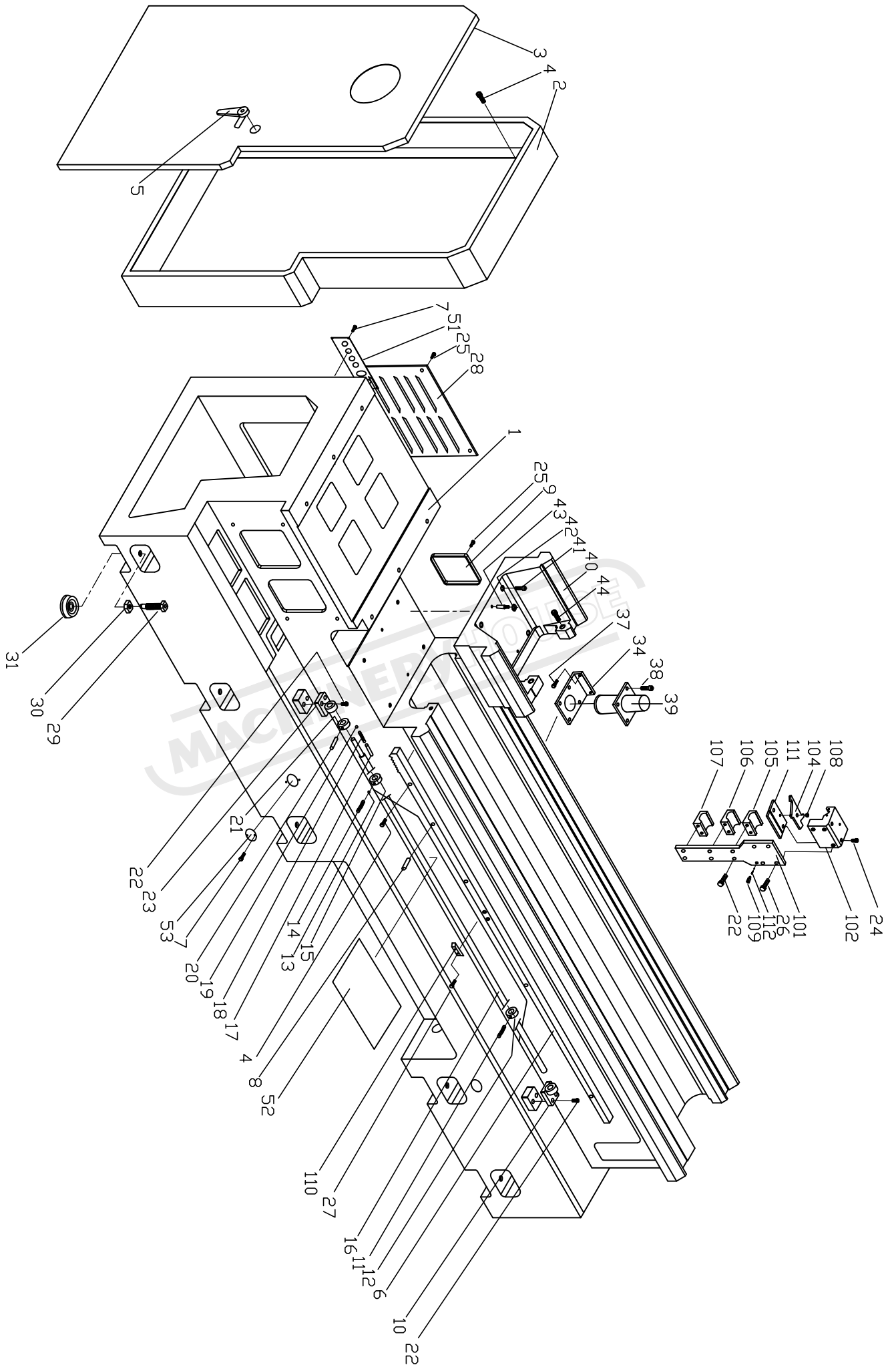
| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|----------------|-----------|------------------------|------------------------|------------------------|
| 1 | OIL SEAL 40528 | 1 | | | |
| 2 | BUSHING | 1 | 5003002 | 5003002 | 5003002 |
| 3 | SHAFT | 1 | 5003003 | 5003003 | 5003003 |
| 4 | KEY 6X6X20L | 1 | | | |
| 5 | GEAR | 1 | 5003005 | 5003005 | 5003005 |
| 6 | BUSHING | 1 | 5003006 | 5003006 | 5003006 |
| 7 | OIL SEAL 40528 | 1 | | | |
| 8 | NUT AN03 | 1 | | | |
| 9 | BEARING 51103 | 1 | | | |
| 10 | BEARING 51103 | 1 | | | |
| 11 | Worm gear | 1 | 5003011 | 5003011 | 5003011 |
| 12 | BUSHING | 1 | 5003012 | 5003012 | 5003012 |
| 13 | GEAR | 1 | 5003013 | 5003013 | 5003013 |
| 14 | SCREW M6X16L | 2 | 91110616 | 91110616 | 91110616 |
| 15 | RACK | 1 | 5003015 | 5003015 | 5003015 |
| 16 | Seat-worm | 1 | 5003016 | 5003016 | 5003016 |
| 17 | Shaft-worm | 1 | 5003017 | 5003017 | 5003017 |
| 18 | SHAFT | 1 | 5003018 | 5003018 | 5003018 |
| 19 | BRACKET | 1 | 5003019 | 5003019 | 5003019 |
| 20 | BEARING 51103 | 1 | | | |
| 21 | SPRING | 1 | 5003021 | 5003021 | 5003021 |
| 22 | GEAR | 1 | 5003022 | 5003022 | 5003022 |
| 23 | Nut-half | 1 | 5003023 | 5003023 | 5003023 |
| 24 | Nut-half | 1 | 5003024 | 5003024 | 5003024 |
| 25 | SCREW M6X20L | 2 | 91110620 | 91110620 | 91110620 |
| 26 | REUULATOR | 1 | 5003026 | 5003026 | 5003026 |
| 27 | BRACKET | 1 | 5003027 | 5003027 | 5003027 |
| 28 | SLEEVE | 1 | 5003028 | 5003028 | 5003028 |
| 29 | APRON BOX | 1 | 5003029 | 5003029 | 5003029 |
| 30 | SCREW M6X16L | 2 | 91110616 | 91110616 | 91110616 |
| 31 | COVER | 1 | 5003031 | 5003031 | 5003031 |
| 32 | SHAFT | 1 | 5003032 | 5003032 | 5003032 |
| 33 | BEARING 51103 | 1 | | | |
| 34 | GEAR | 1 | 5003034 | 5003034 | 5003034 |
| 35 | SPRING | 1 | 5003035 | 5003035 | 5003035 |
| 36 | GEAR | 1 | 5003036 | 5003036 | 5003036 |
| 37 | BEARING 6003 | 1 | | | |
| 38 | GEAR | 1 | 5003038 | 5003038 | 5003038 |
| 39 | COVER | 1 | 5003039 | 5003039 | 5003039 |
| 40 | SCREW M6X16L | 2 | 91110616 | 91110616 | 91110616 |
| 41 | COVER | 1 | 5003041 | 5003041 | 5003041 |
| 42 | Seat-tappet | 1 | 5003042 | 5003042 | 5003042 |
| 43 | Shaft-tappet | 1 | 5003043 | 5003043 | 5003043 |
| 44 | SCREW M6X16L | 2 | 91110616 | 91110616 | 91110616 |
| 45 | Tappet | 1 | 5003045 | 5003045 | 5003045 |
| 46 | PIN | 1 | | | |
| 47 | SHAFT | 1 | 5003047 | 5003047 | 5003047 |
| 48 | SHAFT | 1 | 5003048 | 5003048 | 5003048 |

APRON ASSEMBLY

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|---------------|-----------|------------------------|------------------------|------------------------|
| 49 | BRACKET | 1 | 5003049 | 5003049 | 5003049 |
| 50 | SHAFT | 1 | 5003050 | 5003050 | 5003050 |
| 51 | BEARING 6003 | 1 | | | |
| 52 | SNAP RING S40 | 1 | 9171S040 | 9171S040 | 9171S040 |
| 53 | GEAR | 1 | 5003053 | 5003053 | 5003053 |
| 54 | GEAR | 1 | 5003054 | 5003054 | 5003054 |
| 55 | BEARING 6003 | 1 | | | |
| 56 | GEAR | 1 | 5003056 | 5003056 | 5003056 |
| 57 | COVER | 1 | 5003057 | 5003057 | 5003057 |
| 58 | COVER | 1 | 5003058 | 5003058 | 5003058 |
| 59 | SCREW M6X35L | 2 | 91110635 | 91110635 | 91110635 |
| 60 | HUB | 1 | 5003060 | 5003060 | 5003060 |
| 61 | HANDLE | 1 | | | |
| 62 | SHAFT | 1 | 5003062 | 5003062 | 5003062 |
| 63 | BRACKET | 1 | 5003063 | 5003063 | 5003063 |
| 64 | SCREW M12X35L | 1 | 91111235 | 91111235 | 91111235 |
| 65 | BRACKET | 1 | 5003065 | 5003065 | 5003065 |
| 66 | SHAFT | 1 | 5003066 | 5003066 | 5003066 |
| 67 | SNAP RING S16 | 1 | 9171S016 | 9171S016 | 9171S016 |
| 68 | SHAFT | 1 | 5003068 | 5003068 | 5003068 |
| 69 | KEY 5X5X10L | 1 | | | |
| 70 | LEVER | 1 | 5003070 | 5003070 | 5003070 |
| 71 | LEVER | 1 | 5003071 | 5003071 | 5003071 |
| 72 | COVER | 1 | 5003072 | 5003072 | 5003072 |
| 73 | SCREW M6X16L | 3 | 91110616 | 91110616 | 91110616 |
| 74 | HANDLE | 1 | 5003074 | 5003074 | 5003074 |
| 75 | HUB | 1 | 5003075 | 5003075 | 5003075 |
| 76 | PIN | 1 | 5003076 | 5003076 | 5003076 |
| 77 | BEARING 6203 | 1 | | | |
| 78 | GEAR | 1 | 5003078 | 5003078 | 5003078 |
| 79 | GEAR | 1 | 5003079 | 5003079 | 5003079 |
| 80 | BEARING 6203 | 1 | | | |
| 81 | SHAFT | 1 | 5003081 | 5003081 | 5003081 |
| 82 | SNAP RING S17 | 1 | 9171S017 | 9171S017 | 9171S017 |
| 83 | BEARING 6003 | 1 | | | |
| 84 | GEAR | 1 | 5003084 | 5003084 | 5003084 |
| 85 | BEARING 6203 | 1 | | | |
| 86 | SHAFT | 1 | 5003086 | 5003086 | 5003086 |
| 87 | SNAP RING | 1 | | | |
| 88 | BEARING 6003 | 1 | | | |
| 89 | GEAR | 1 | 5003089 | 5003089 | 5003089 |
| 90 | BEARING 6003 | 1 | | | |
| 91 | SNAP RING S20 | 1 | 9171S020 | 9171S020 | 9171S020 |
| 92 | SHAFT | 1 | 5003092 | 5003092 | 5003092 |
| 93 | HANDLE | 1 | 5003093 | 5003093 | 5003093 |
| 94 | BEARING 6003 | 1 | | | |
| 95 | GEAR | 1 | 5003095 | 5003095 | 5003095 |
| 96 | SNAP RING R35 | 1 | 9171R035 | 9171R035 | 9171R035 |

APRON ASSEMBLY

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|------------------|-----------|------------------------|------------------------|------------------------|
| 97 | BEARING 6003 | 1 | | | |
| 98 | WASHER | 1 | 5003098 | 5003098 | 5003098 |
| 99 | GEAR | 1 | 5003099 | 5003099 | 5003099 |
| 100 | BEARING 6003 | 1 | | | |
| 101 | SHAFT | 1 | 5003101 | 5003101 | 5003101 |
| 102 | BEARING 6203 | 1 | | | |
| 103 | GEAR SHAFT | 1 | 5003103 | 5003103 | 5003103 |
| 104 | BEARING 6005 | 1 | | | |
| 105 | COVER | 1 | 50031105 | 50031105 | 50031105 |
| 106 | SCREW M6X16L | 3 | 91110616 | 91110616 | 91110616 |
| 107 | Coupling | 1 | 5003107 | 5003107 | 5003107 |
| 108 | Coupling | 1 | 5003108 | 5003108 | 5003108 |
| 109 | Dial-rack | 1 | 5003109 | 5003109 | 5003109 |
| 110 | HAND WHEEL | 1 | 5003110 | 5003110 | 5003110 |
| 111 | HANDLE | 1 | 5003111 | 5003111 | 5003111 |
| 112 | SHAFT | 1 | 5003112 | 5003112 | 5003112 |
| 113 | BEACKET | 1 | 5003113 | 5003113 | 5003113 |
| 114 | SCREW M12X30L | 1 | 91111230 | 91111230 | 91111230 |
| 115 | GEAR SHAFT | 1 | 5003115 | 5003115 | 5003115 |
| 116 | KEY 8X8X30L | 1 | | | |
| 117 | GEAR | 1 | 5003117 | 5003117 | 5003117 |
| 118 | SCREW M16X12L | 1 | 91111612 | 91111612 | 91111612 |
| 119 | BUSHING | 1 | 5003119 | 5003119 | 5003119 |
| 120 | BEARING 6203 | 1 | | | |
| 121 | PIN | 1 | | | |
| 122 | SHAFT | 1 | 5003122 | 5003122 | 5003122 |
| 123 | HANDLE | 1 | 5003123 | 5003123 | 5003123 |
| 124 | COVER | 1 | 5003124 | 5003124 | 5003124 |
| 125 | GEAR | 1 | 5003125 | 5003125 | 5003125 |
| 126 | SNAP GING S12 | 1 | 9171S012 | 9171S012 | 9171S012 |
| 127 | SHAFT | 1 | 5003127 | 5003127 | 5003127 |
| 128 | SPRING | 1 | 5003128 | 5003128 | 5003128 |
| 129 | SHAFT | 1 | 5003129 | 5003129 | 5003129 |
| 130 | OIL SEAL 13246 | 1 | | | |
| 131 | CONVEX TOP PLATE | 1 | 5003131 | 5003131 | 5003131 |
| 132 | GEAR | 1 | 5003132 | 5003132 | 5003132 |
| 133 | MOTOR | 1 | | | |

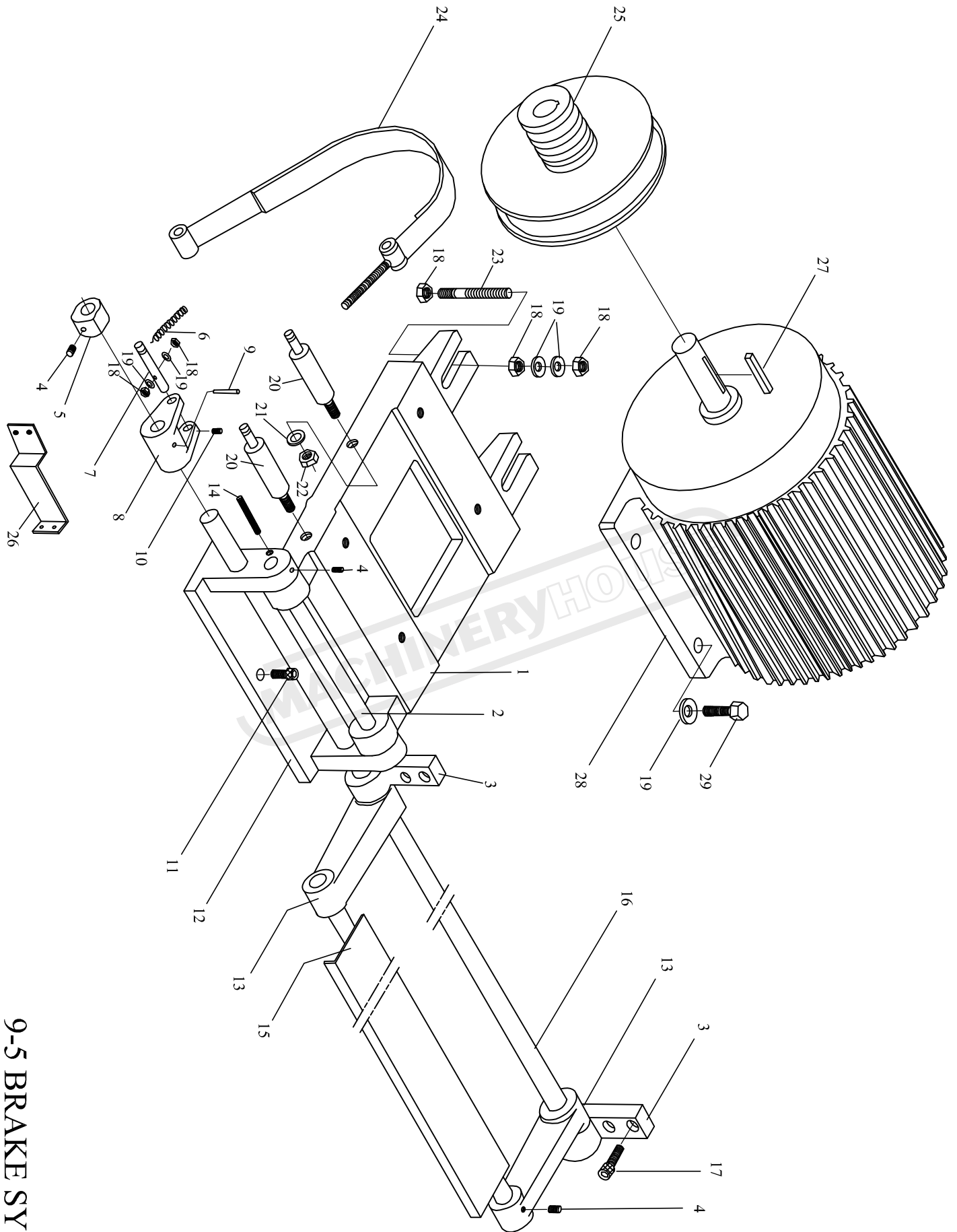


BED AND BASE ASSEMBLY

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|--|-----------|------------------------|------------------------|------------------------|
| 1 | Bed & Base | 1 | | | |
| | (8 feet) | | 5004001-008 | 5004001-008 | 5004001-008 |
| | (10 feet) | | 5004001-010 | 5004001-010 | 5004001-010 |
| | (15 feet) | | 5004001-015 | 5004001-015 | 5004001-015 |
| 2 | Cover | 1 | 5004002-033 | 5004002-037 | 5004002-041 |
| 3 | Cover-end | 1 | 5004003-033 | 5004003-037 | 5004003-041 |
| 4 | Hexagon socket screw, M6xP1.0x25L | 8 | 91110625 | 91110625 | 91110625 |
| 5 | Handle | 1 | | | |
| 6 | Rack (8 feet) | 1 | 5004006-008 | 5004006-008 | 5004006-008 |
| | (10 feet) | 1 | 5004006-010 | 5004006-010 | 5004006-010 |
| | (15 feet) | 1 | 5004006-015 | 5004006-015 | 5004006-015 |
| 7 | Hexagon socket screw, M5xP0.8x15L | 10 | 91110515 | 91110515 | 91110515 |
| 8 | Pin-taper,6x35 (8 feet) | 2 | | | |
| | (10 feet) | 5 | | | |
| | (15 feet) | 5 | | | |
| 9 | Cover-coolant motor seat (with socket hole) | 1 | 3004035 | 3004035 | 3004035 |
| | motor seat (without socket hole) | 1 | 3004035-001 | 3004035-001 | 3004035-001 |
| 10 | Supporter-shaft | 1 | 3004010 | 3004010 | 3004010 |
| 11 | Set screw, M6xP1.0x10L | 2 | 91120610 | 91120610 | 91120610 |
| 12 | Collar | 1 | 3004012 | 3004012 | 3004012 |
| 13 | Shoe-brass | 4 | 3004013 | 3004013 | 3004013 |
| 14 | Set screw, M6xP1.0x6L | 1 | 91120606 | 91120606 | 91120606 |
| 15 | Cam-auto feed stopping | 4 | 3004015 | 3004015 | 3004015 |
| 16 | Shaft-auto stopping (8 feet) | 1 | 5004016-008 | 5004016-008 | 5004016-008 |
| | (10 feet) | 1 | 5004016-010 | 5004016-010 | 5004016-010 |
| | (15 feet) | 1 | 5004016-015 | 5004016-015 | 5004016-015 |
| 17 | Set screw, M8xP1.25x8L | 1 | 91120808 | 91120808 | 91120808 |
| 18 | Spring , 1x6x10L | 1 | 4004018 | 4004018 | 4004018 |
| 19 | Ball steel , 1/4" | 1 | 91820104 | 91820104 | 91820104 |
| 20 | Lever-turning shaft | 4 | 3004020 | 3004020 | 3004020 |
| 21 | Collar | 1 | 3004021 | 3004021 | 3004021 |
| 22 | Hexagon socket screw, M8xP1.25x16L | 14 | 91110816 | 91110816 | 91110816 |
| 23 | Supporter-shaft | 1 | 3004023 | 3004023 | 3004023 |
| 24 | Hexagon socket screw, M10xP1.25x80L | 2 | 91111080 | 91111080 | 91111080 |
| 25 | Head, M6xP1.0x20L | 4 | | | |
| 26 | Hexagon socket screw, M8xP1.25x20L | 4 | 91110820 | 91110820 | 91110820 |
| 28 | Cover-motor seat | 2 | 3504028 | 3504028 | 3504028 |

BED AND BASE ASSEMBLY

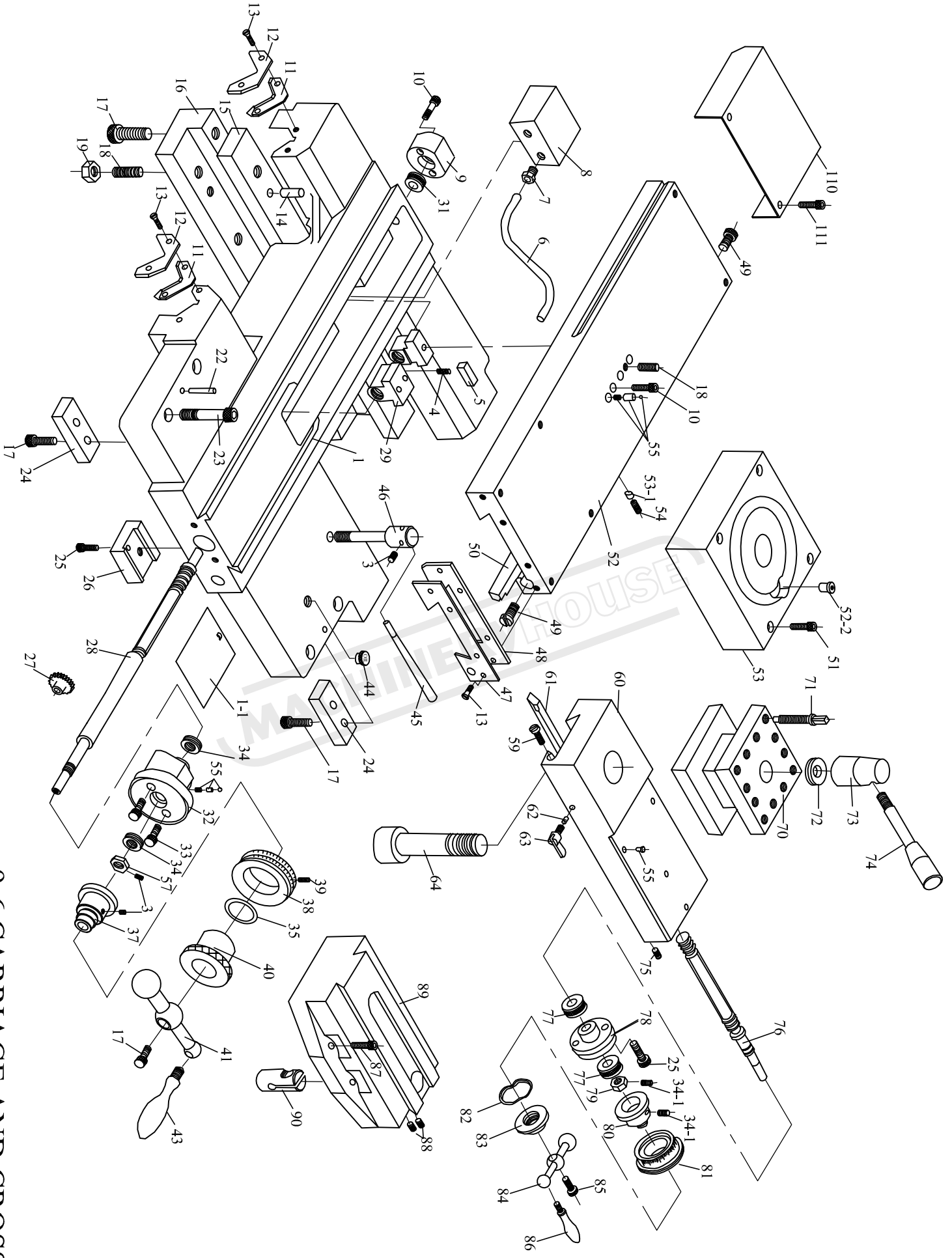
| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|-----------------|--|------------------|--------------------------------|--------------------------------|--------------------------------|
| 29 | Bolt-set machine | 5 | 3004029 | 3004029 | 3004029 |
| 30 | Nut-lock | 5 | 3004030 | 3004030 | 3004030 |
| 31 | Block-leveling | 5 | 3004031 | 3004031 | 3004031 |
| 34 | Seat-coolant pump | 1 | 5004034 | 5004034 | 5004034 |
| 37 | Bolt-hexa. head , M8x38L | 2 | | | |
| 40 | gap | 1 | 5004040 | 5004040 | 5004040 |
| 41 | Hexagon socket screw, M12xP1.0x25L | 4 | 91111225 | 91111225 | 91111225 |
| 42 | Nut-lock , M6 | 2 | | | |
| 43 | Pin ϕ 7x40L | 2 | | | |
| 44 | Hexagon socket screw, M10xP1.25x35L | 2 | 91111035 | 91111035 | 91111035 |
| 51 | Connect board | 1 | 5004051 | 5004051 | 5004051 |
| 52 | Tank cover | 1 | 5004052 | 5004052 | 5004052 |
| 53 | Cover | 4 | 5004053 | 5004053 | 5004053 |
| 101 | Bracket | 1 | 5004101 | 5004101 | 5004101 |
| 102 | Slide plate | 1 | 5004102 | 5004102 | 5004102 |
| 104 | bracket | 1 | 5004104 | 5004104 | 5004104 |
| 105 | supporter-upside | 1 | 5004105 | 5004105 | 5004105 |
| 106 | supporter-middle | 1 | 5004106 | 5004106 | 5004106 |
| 107 | supporter- | 1 | 5004107 | 5004107 | 5004107 |
| 108 | screw | 1 | 5004108 | 5004108 | 5004108 |
| 109 | bolt-set | 1 | 5004109 | 5004109 | 5004109 |
| 110 | block | 1 | 5004110 | 5004110 | 5004110 |
| 111 | steady block | 1 | 5004111 | 5004111 | 5004111 |
| 112 | spring | 1 | 5004112 | 5004112 | 5004112 |



9-5 BRAKE SYSTEM

BRAKE SYSTEM

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|---------------------------------------|-----------|------------------------|------------------------|------------------------|
| 1 | Seat-motor | 1 | 5005001 | 5005001 | 5005001 |
| 2 | Shaft-motor seat | 1 | 4005002 | 4005002 | 4005002 |
| 3 | Block | 2 | 4005003 | 4005003 | 4005003 |
| 4 | Set screw, M6xP1.0x12L | 1 | 91120612 | 91120612 | 91120612 |
| 5 | Cam | 1 | 3005005-020 | 3005005-022 | 3005005-026 |
| 6 | Spring | 1 | 4005006 | 4005006 | 4005006 |
| 7 | Shaft-brake belt | 1 | 3005007 | 3005007 | 3005007 |
| 8 | Arm-brake | 1 | 5005008 | 5005008 | 5005008 |
| 9 | Pin-taper , 4x38L | 1 | | | |
| 10 | Set screw, M6xP1.0x10L | 1 | 91120610 | 91120610 | 91120610 |
| 11 | Hexagon socket screw, M10xP1.5x30L | 3 | 91111030 | 91111030 | 91111030 |
| 12 | Bracket-motor seat | 1 | 5005012 | 5005012 | 5005012 |
| 13 | Bracket-pedal | 2 | 3005013 | 3005013 | 3005013 |
| 14 | | 1 | | | |
| 15 | Pedal-brake (8 feet) | 1 | 3005015-008 | 3005015-008 | 3005015-008 |
| | (10 feet) | 1 | 3005015-010 | 3005015-010 | 3005015-010 |
| | (15 feet) | 1 | 3005015-015 | 3005015-015 | 3005015-015 |
| 16 | Shaft-pedal bracket | | | | |
| | (8 feet) | 1 | 5005016-008 | 5005016-008 | 5005016-008 |
| | (10 feet) | 1 | 5006016-010 | 5006016-010 | 5006016-010 |
| | (15 feet) | 1 | 5006016-015 | 5006016-015 | 5006016-015 |
| 17 | Hexagon socket screw, M8xP1.25x25L | 4 | 91110825 | 91110825 | 91110825 |
| 18 | Nut , M16 | 8 | | | |
| 19 | Washer , M16 | 6 | | | |
| 20 | Bolt-adjusting | 2 | 5005020 | 5005020 | 5005020 |
| 21 | Washer , M12 | 1 | | | |
| 22 | Nut , M12 | 1 | | | |
| 23 | Bolt-adjusting | 1 | 4005023 | 4005023 | 4005023 |
| 24 | Belt-brake | 1 | 5005024 | 5005024 | 5005024 |
| 25 | Belt pulley | 1 | | | |
| | (20HP/60HZ) | 1 | 5005025 | 5005025 | 5005025 |
| | (25HP/30HP/50HZ) | 1 | 5005025-001 | 5005025-001 | 5005025-001 |
| | (20HP/50HZ) | 1 | 5005025-002 | 5005025-002 | 5005025-002 |
| | (25HP/30hp/60HZ) | 1 | 5005025-003 | 5005025-003 | 5005025-003 |
| 26 | Bracket | 1 | 5005026 | 5005026 | 5005026 |
| 27 | Key ,12x12x55L | 1 | | | |
| | Key ,14x14x55L | | | | |
| 28 | Motor | 1 | | | |
| 29 | Bolt-hexa. Head, M10x30L | 4 | 91111030 | 91111030 | 91111030 |



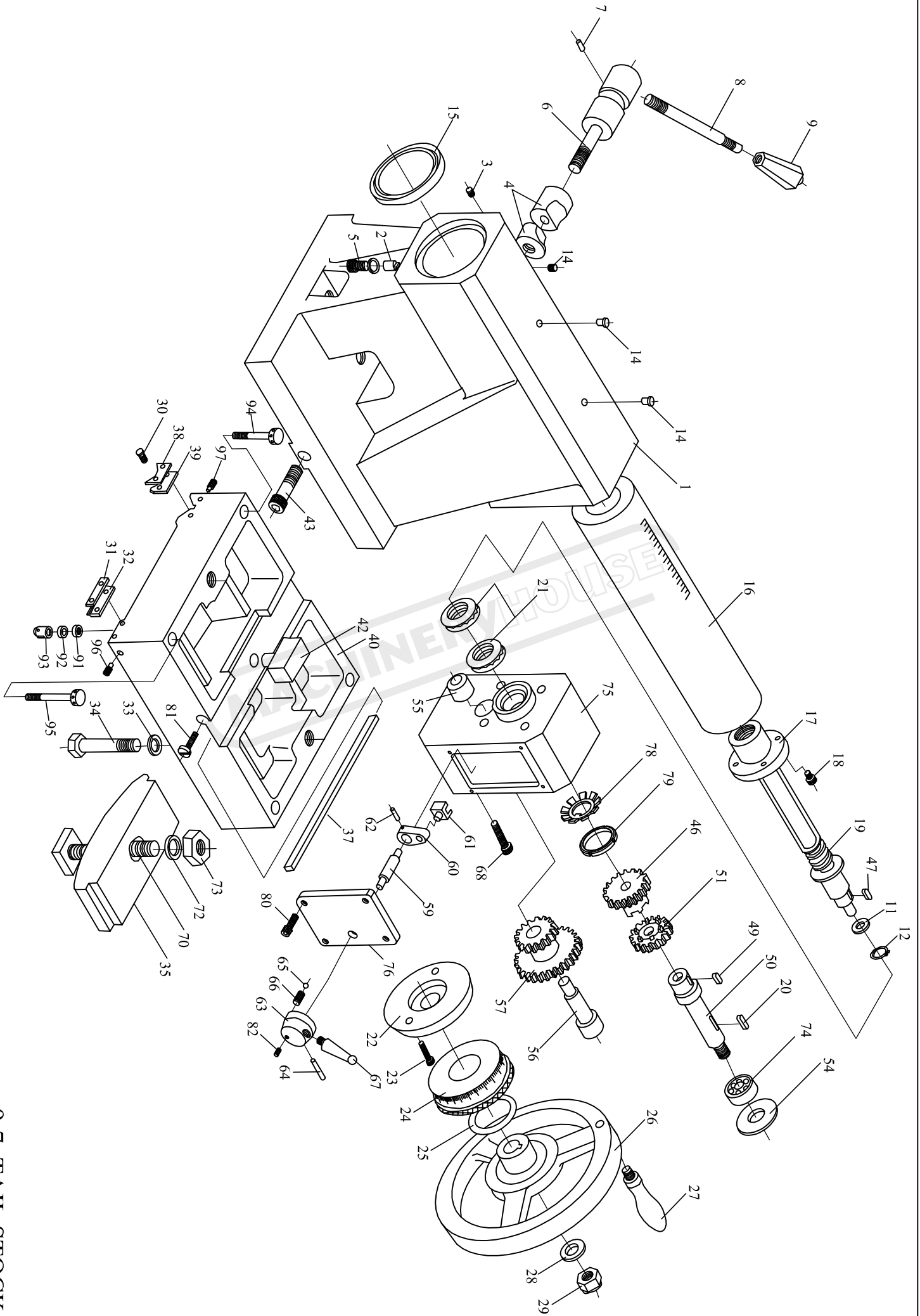
9-6 CARRIAGE AND CROSSFEED

CARRIAGE AND CROSSFEED ASSEMBLY

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|---------------------------------------|-----------|------------------------|------------------------|------------------------|
| 1 | Carriage | 1 | 5006001 | 5006001 | 5006001 |
| 1-1 | cover | 1 | 5006001-001 | 5006001-001 | 5006001-001 |
| 2 | Nut-crossfeed | 1 | 5006002 | 5006002 | 5006002 |
| 3 | Set screw , M6xP1.0x6.0L | 5 | 91120606 | 91120606 | 91120606 |
| 4 | Spring , 1x5x25L | 1 | 4006004 | 4006004 | 4006004 |
| 5 | Shim-crossfeed nut | 1 | 3006005 | 3006005 | 3006005 |
| 6 | Pipe-lubrication oil | 1 | | | |
| 7 | Nut-copper | 1 | | | |
| 8 | Conveyor-oil | 1 | 3006008 | 3006008 | 3006008 |
| 9 | Cap-crossfeed screw | 1 | 5006009 | 5006009 | 5006009 |
| 10 | Hexagon socket screw, M6xP1.0x25L | 5 | 91110625 | 91110625 | 91110625 |
| 11 | Wiper-rear | 4 | 5006011 | 5006011 | 5006011 |
| 12 | Case-wiper , rear | 4 | 5006012 | 5006012 | 5006012 |
| 13 | Screw-cross-recessed, M4xP0.7x10L | 12 | | | |
| 14 | Pin | 2 | | | |
| 15 | Gib | 1 | 5006015 | 5006015 | 5006015 |
| 16 | Holder-gib | 1 | 5006016 | 5006016 | 5006016 |
| 17 | Hexagon socket screw, M8xP1.25x20L | 8 | 91110820 | 91110820 | 91110820 |
| 18 | Set screw, M8xP1.25x25L | 5 | 91120825 | 91120825 | 91120825 |
| 19 | Nut , M8xP1.25 | 5 | | | |
| 22 | Pin-taper , 6 # 75L | 2 | 4006022 | 4006022 | 4006022 |
| 23 | Hexagon socket screw, M10xP1.5x70L | 4 | 91111070 | 91111070 | 91111070 |
| 24 | Gib-left-front | 2 | 5006024 | 5006024 | 5006024 |
| 25 | Hexagon socket screw , M6xP1.0x16L | 3 | 91110616 | 91110616 | 91110616 |
| 26 | Clamp-carriage | 1 | 5006026 | 5006026 | 5006026 |
| 27 | Gear | 1 | 5006027 | 5006027 | 5006027 |
| 28 | Screw-crossfeed (5M/M , mm) | | 5006028 | 5006028 | 5006028 |
| 29 | Nut M25xp5.0 | 1 | 5006029 | 5006029 | 5006029 |
| 31 | Bearing thrust, 51101 | 2 | 91303001 | 91303001 | 91303001 |
| 32 | Bracket | 1 | 5006032 | 5006032 | 5006032 |
| 33 | Bolt-hexa. Socket , M8xP1.25x40L | 2 | 91110840 | 91110840 | 91110840 |
| 34 | Bearing thrust, 51104 | 2 | 91303003 | 91303003 | 91303003 |
| 34-1 | Set screw, | 2 | | | |
| 35 | Washer-wave type , 6210 | 1 | | | |
| 37 | Clutch-dial | 1 | 5006037 | 5006037 | 5006037 |
| 38 | Dial-crossfeed (10M/M , left) | 1 | 5006038 | 5006038 | 5006038 |
| 39 | Set screw ,M6xP1.0x15L | 2 | 91120615 | 91120615 | 91120615 |
| 40 | Nut M35 | 1 | 5006040 | 5006040 | 5006040 |
| 41 | Handle | 1 | 5006041 | 5006041 | 5006041 |
| 43 | Knob-handle | 1 | 5006043 | 5006043 | 5006043 |
| 43-1 | Screw-handle | 1 | 3006043-001 | 3006043-001 | 3006043-001 |
| 43-2 | Knob-handle | 1 | 3006043-002 | 3006043-002 | 3006043-002 |
| 44 | Plug-oil inlet | 1 | 3006044 | 3006044 | 3006044 |

CARRIAGE AND CROSSFEED ASSEMBLY

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|--|-----------|------------------------|------------------------|------------------------|
| 45 | Lever | 1 | 3006045 | 3006045 | 3006045 |
| 46 | Screw-carriage clamp | 1 | 3006046 | 4006046 | 4006046 |
| 47 | Case-wiper | 1 | 5006047 | 5006047 | 5006047 |
| 48 | Wiper | 1 | 5006048 | 5006048 | 5006048 |
| 49 | Screw-adjusting | 2 | 4006049 | 4006049 | 4006049 |
| 50 | Gib | 1 | 5006050 | 5006050 | 5006050 |
| 51 | Bolt-hexa. Socket , M10xP1.5x40L | 4 | 91111040 | 91111040 | 91111040 |
| 52 | Cover-cross sliding | 1 | 5006052 | 5006052 | 5006052 |
| 52-2 | Plug | 4 | 5006052-002 | 5006052-002 | 5006052-002 |
| 53 | Bracket -cross slideing | 1 | 5006053-001 | 5006053-002 | 5006053-003 |
| 53-1 | Shoe-clamp | 1 | 3006053 | 3006053 | 3006053 |
| 54 | Set screw, M8xP1.25x20L | 1 | 91120820 | 91120820 | 91120820 |
| 55 | Ball-steel , 1/4" | 4 | | | |
| 56 | Square key , 5x5x15L | 1 | 91610501 | 91610501 | 91610501 |
| 57 | Shoe-Nut | 1 | 3006057 | 3006057 | 3006057 |
| 59 | Screw-gib | 2 | 5006059 | 5006059 | 5006059 |
| 60 | Compound rest | 1 | 5006060 | 5006060 | 5006060 |
| 61 | Gib-compound rest | 1 | 5006061 | 5006061 | 5006061 |
| 62 | Shoe-clamp | 1 | 5006062 | 5006062 | 5006062 |
| 63 | Screw-clamp | 1 | | | |
| 64 | Shaft-tool post | 1 | 5006064 | 5006064 | 5006064 |
| 70 | Tool post-square | 1 | 5006070 | 5006070 | 5006070 |
| 71 | Screw-square head | 1 | 5006071 | 5006071 | 5006071 |
| 72 | Bearing-thrust | 1 | | | |
| 73 | Knob-lever | 1 | 5006073 | 5006073 | 5006073 |
| 74 | Lever | 1 | 5006074 | 5006074 | 5006074 |
| 75 | Screw-gib, M8xP1.25x30L | 1 | 5006075 | 5006075 | 5006075 |
| 76 | Screw compound rest | 1 | 5006076 | 5006076 | 5006076 |
| 77 | Bearing thrust, 51102 | 2 | | | |
| 78 | Seat-compound rest screw | 1 | | | |
| 79 | Nut | 1 | | | |
| 80 | Collar | 1 | 5006080 | 5006080 | 5006080 |
| 81 | Dial-compound rest | 1 | 5006081 | 5006081 | 5006081 |
| 82 | Washer-wave type | 1 | | | |
| 83 | Nut | 1 | | | |
| 84 | Handle | 1 | 5006084 | 5006084 | 5006084 |
| 85 | Hexagon socket screw, M6xP1.0x16L | 1 | 91110616 | 91110616 | 91110616 |
| 86 | Knob-handle | 1 | 5006086 | 5006086 | 5006086 |
| 87 | Hexagon socket screw, M12xP1.75x15L | 4 | 91111215 | 91111215 | 91111215 |
| 88 | Set screw, M8xP1.25x8L | 2 | 91120808 | 91120808 | 91120808 |
| 89 | Swivel | 1 | | | |
| 90 | Nut-compound rest screw | 1 | 5006090 | 5006090 | 5006090 |
| 110 | Dust proof cover | 1 | 5006110 | 5006110 | 5006110 |
| 111 | Hexagon socket screw, M5xP0.8x12L | 2 | 91110512 | 91110512 | 91110512 |



9-7 TAIL STOCK

TAILSTOCK ASSEMBLY

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|---------------------------------------|-----------|------------------------|------------------------|------------------------|
| 1 | Body-tailstock | 1 | 5007001 | 5007001 | 5007001 |
| 2 | Set key | 1 | 5007002 | 5007002 | 5007002 |
| 3 | Set screw, M6xP1.0x12L | 1 | 91120612 | 91120612 | 91120612 |
| 4 | Block-clamp | 1 | 5007004 | 5007004 | 5007004 |
| 5 | Hexagon socket screw, M8xP1.25x10L | 1 | 91110810 | 91110810 | 91110810 |
| 6 | Shaft-clamp spindle | 1 | 5007006 | 5007006 | 5007006 |
| 7 | Pin , 5x12 | 1 | | | |
| 8 | Lever | 1 | 3007008 | 3007008 | 3007008 |
| 9 | Sleeve-lever | 1 | 3007009 | 3007009 | 3007009 |
| 11 | Washer | 1 | 3507300 | 3507300 | 3507300 |
| 12 | Snap ring S18 | 1 | 9171S018 | 9171S018 | 9171S018 |
| 14 | Plug-oil , 1/4" | 3 | | | |
| 15 | Seal-oil , TC120X150X14 | 1 | | | |
| 16 | Spindle-tang slot | 1 | 5007016 | 5007016 | 5007016 |
| 17 | Cap-spindle | 1 | 5007017 | 5007017 | 5007017 |
| 18 | Hexagon socket screw, M8xP1.25x16L | 4 | 91110816 | 91110816 | 91110816 |
| 19 | Screw-spindle feed (mm) | 1 | 5007019 | 5007019 | 5007019 |
| 20 | Key-square , 6x6x25 | 1 | 91610606 | 91610606 | 91610606 |
| 21 | Bearing-thrust, 51205 | 2 | 91303006 | 91303006 | 91303006 |
| 22 | Indicator | 1 | 4007022 | 4007022 | 4007022 |
| 23 | Hexagon socket screw, M5xP0.8x15L | 2 | 91110515 | 91110515 | 91110515 |
| 24 | Dial-feed | 1 | 3507024-M01 | 3507024-M01 | 3507024-M01 |
| 25 | Washer-wave type, WW-46 | 1 | | | |
| 26 | Handwheel | 1 | 3507026 | 3507026 | 3507026 |
| 27 | Knob | 1 | 3007027 | 3007027 | 3007027 |
| 28 | Washer , W1/2" | 1 | | | |
| 29 | Nut , 1/2"-20UNF | 1 | | | |
| 30 | Screw-cross-recessed, M4xP0.7x10L | 8 | | | |
| 31 | Case-wiper | 2 | 5007031 | 5007031 | 5007031 |
| 32 | Wiper | 2 | 5007032 | 5007032 | 5007032 |
| 33 | Washer-flat , M12 | 2 | | | |
| 34 | Bolt-clamp, M12xP1.75X75L | 2 | 91111275 | 91111275 | 91111275 |
| 35 | Clamp | 2 | 5007035 | 5007035 | 5007035 |
| 36 | Nut | 1 | | | |
| 37 | Strip | 1 | 3507037 | 4007037 | 4007037 |
| 38 | Case | 2 | 5007038 | 5007038 | 5007038 |
| 39 | Wiper | 2 | 5007039 | 5007039 | 5007039 |
| 40 | Bottom-tailstock | 1 | 5007040-033 | 5007040-037 | 5007040-041 |
| 42 | Blcok-adjusting | 1 | 5007042 | 5007042 | 5007042 |
| 43 | Hexagon socket screw, M10xP1.5x80L | 2 | 91111080 | 91111080 | 91111080 |
| 46 | Clutch shaft | 1 | 4007046 | 4007046 | 4007046 |

TAILSTOCK ASSEMBLY

| ITEM NO. | Part Name | Amt. Used | Model: 33" Part No. | Model: 37" Part No. | Model: 41" Part No. |
|----------|--|-----------|------------------------|------------------------|------------------------|
| 47 | Square key , 5x5x10L | 1 | | | |
| 49 | Square key , 5x5x25L | 1 | | | |
| 50 | Clutch shaft | 1 | 5007050 | 5007050 | 5007050 |
| 51 | Gear | 1 | 4007051 | 4007051 | 4007051 |
| 54 | Washer | 1 | 5007054 | 5007054 | 5007054 |
| 55 | Spacer | 1 | 5007055 | 5007055 | 5007055 |
| 56 | Idle shaft | 1 | 5007056 | 5007056 | 5007056 |
| 57 | Gear | 1 | 4007057 | 4007057 | 4007057 |
| 59 | Shaft | 1 | 5007059 | 5007059 | 5007059 |
| 60 | Shifting lever | 1 | 4007060 | 4007060 | 4007060 |
| 61 | Shifting fork | 1 | 4007061 | 4007061 | 4007061 |
| 62 | Spring pin , ϕ 4x25L | 1 | | | |
| 63 | Knob | 1 | 3507063 | 3507063 | 3507063 |
| 64 | Spring pin , ϕ 5x38L | 1 | | | |
| 65 | Ball steel , ϕ 1/4" | 1 | 91820104 | 91820104 | 91820104 |
| 66 | Spring , D6xd1x20L | 1 | | | |
| 67 | Lever | 1 | 3007067 | 3007067 | 3007067 |
| 68 | Hexagon socket screw, M8xP1.25x125L | 4 | 911108125 | 911108125 | 911108125 |
| 70 | Bolt clamp | 2 | 4007070 | 4007070 | 4007070 |
| 72 | Washer , W3/4 | 2 | | | |
| 73 | Nut , W3/4-10NC | 2 | | | |
| 74 | Ball bearing , 6204 | 1 | | | |
| 75 | Shifting box | 1 | 5007075 | 5007075 | 5007075 |
| 76 | Shifting cover | 1 | 5007076 | 5007076 | 5007076 |
| 78 | Wash W25 | 1 | | | |
| 79 | Nut M25 | 1 | | | |
| 80 | Hexagon socket screw, M5xP0.8x10L | 4 | 91110510 | 91110510 | 91110510 |
| 81 | Screw | 1 | 3007081 | 3007081 | 3007081 |
| 82 | Screw M8xP1.25X10L | 1 | | | |
| 91 | Set screw | 4 | 4007091 | 4007091 | 4007091 |
| 92 | stoper | 4 | 4007092 | 4007092 | 4007092 |
| 93 | turning nut | 4 | 4007093 | 4007093 | 4007093 |
| 94 | set bolt | 2 | 5007094-033 | 5007094-037 | 5007094-041 |
| 95 | set bolt | 2 | 5007095-033 | 5007095-037 | 5007095-041 |
| 96 | set bolt | 2 | 5007096 | 5007096 | 5007096 |
| 97 | set bolt | 2 | 5007097 | 5007097 | 5007097 |