HAFCO METALMASTER

OPERATION MANUAL

CENTRE LATHE

Models

CL-510 x 1000, CL-510 x 1500

Order Code L608D, Order Code L609D

Edition No : CL-510-1

Date of Issue : 09/2022

MACHINE DETAILS

MACHINE	CENTRE LATHE
MODEL NO.	CL-510
SERIAL NO.	
DATE OF MANF.	

DISTRIBUTED BY

MACHINERYHOUSE

www.machineryhouse.com.au
www.machineryhouse.co.nz

NOTE:
This manual is only for your reference. At the time of the compiling of this manual every effort to be exact with the instructions, specifications, drawings, and photographs of the machine was taken. Owing to the continuous improvement of the HAFCO METALMASTER machine, changes may be made at any time without obligation or notice. Please ensure the local voltage is the same as listed on the specification plate before operating any electric machine.

SAFETY SYMBOLS

The purpose of safety symbols is to attract your attention to possible hazardous conditions

⚠ WARNING	*Indicates a potentially hazardous situation causing injury or death*
⚠ CAUTION	*Indicates an alert against unsafe practices.*
Note:	*Used to alert the user to useful information*

NOTE:
In order to see the type and model of the machine, please see the specification plate. Usually found on the back of the machine. See example (Fig.1)

FIG.1

HAFCO METALMASTER

PRODUCT SPECIFICATIONS

Model:
Capacity: Voltage: V/50Hz
Nett Weight: Motor:
MFG Date: FLC:

Serial No:

Imported by **www.machineryhouse.com.au**
Made in China **www.machineryhouse.co.nz**

CONTENTS:

WARNING!

Serious injury or death can result from using this machine BEFORE understanding its controls and related safety information. DO NOT operate, or allow others to operate, the machine until the information is understood.

1.1. SPECIFICATIONS

Order Code	L608D	L609D
Model	**CL-510**	**CL-510**
Swing Over Bed	510mm	510mm
Swing Over Cross Slide	320mm	320mm
Swing In Gap (dia)	740	740
Distance Between Centers	1000mm	1500mm
Centre Height	255mm	255mm
Bed Width	300mm	300mm
Spindle Bore	80mm	80mm
Spindle Nose Size or Type	D1-8 Camlock	D1-8 Camlock
Spindle Steps / Speed Range	12 (25 - 1700rpm)	12 (25 - 1700rpm)
Headstock Spindle Taper	7MT	7MT
Toolholder Size	25mm	25mm
Cross Slide Travel	285mm	285mm
Compound Slide Travel	128mm	128mm
Leadscrew	Metric 6mm Pitch	Metric 6mm Pitch
Cross Feed Range (X-Axis)	42 (0.014 - 0.784mm/rev)	42 (0.014 - 0.784mm/rev)
Longitudinal Feed Range (Z-Axis)	42 (0.31 - 1.7mm/rev)	42 (0.31 - 1.7mm/rev)
Metric Thread Steps & Pitch Range	41 (0.1 - 14mm)	41 (0.1 - 14mm)
Diametrical Pitches	50 (4-112D.P.)	50 (4-112D.P.)
Module Pitches	34 (0.1-7M.P.0)	34 (0.1-7M.P.0)
Imperial Thread Steps & TPI Range	60 (2 - 112tpi)	60 (2 - 112tpi)
Tailstock Taper	4MT	4MT
Tailstock Quill Travel	130mm	130mm
Tailstock Quill Diameter	60mm	60mm
Spindle Motor Power	7.5kW / 10hp	7.5kW / 10hp
Coolant Pump Motor Power	0.1kW(1/8HP)	0.1kW(1/8HP)
Voltage	415Volts	415Volts
Weight	1775kgs	2025kgs
Machine Foot Print L×W×H):cm	220×108×140	280×108×140
Digital Readout	2 Axis	2 Axis

1.2 INCLUDED ACCESSORIES

- 2 axis digital readout system
- Taper turning attachment
- Quick change toolpost
- Concertina leadscrew covers
- 315mm 3-jaw chuck with reverse jaws
- 350mm 4-jaw chuck
- 400mm face plate
- Fixed steady with roller bearings
- Traveling steady with brass guides
- Dead centres
- Thread chasing dial
- Foot brake
- Coolant system
- LED Work light
- Rear splash guard
- Spindle reducing bush

WARNING

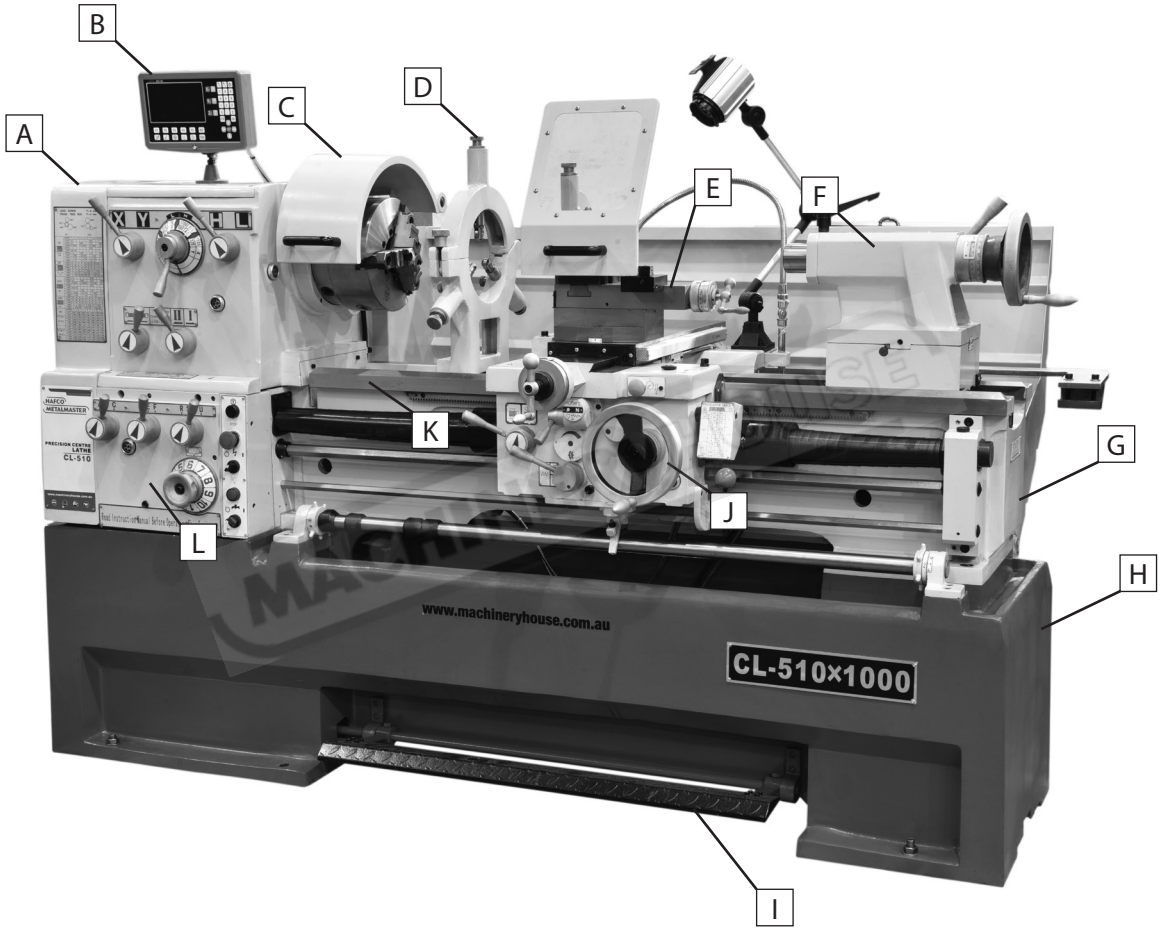
The machine is the sole responsibility of the owner for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training, proper inspection and maintenance, manual availability and comprehension. The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.

WARNING!

Serious injury or death can result from using this machine BEFORE understanding its controls and related safety information. DO NOT operate, or allow others to operate, the machine until the information is understood.

1.3 IDENTIFICATION

Become familiar with the names and locations of the controls and features shown below to better understand the instructions in this manual.



A	Headstock	**G**	Bed
B	Digital Readout	**H**	Base
C	Chuck Guard	**I**	Foot Brake
D	Fixed Steady	**J**	Saddle
E	Top Slide & Toolpost	**K**	Bed Gap
F	Tailstock	**L**	Feed & Threading Gearbox

2.1 GENERAL METALWORKING MACHINE SAFETY

DO NOT use this machine unless you have read this manual or have been instructed in the safe use and operation of this machine.

WARNING

This manual provides safety instructions on the proper setup, operation, maintenance, and service of this machine. Save this manual, refer to it often, and use it to instruct other operators. Failure to read, understand and follow the instructions in this manual may result in fire or serious personal injury—including amputation, electrocution, or death.

The owner of this machine is solely responsible for its safe use. This responsibility includes, but is not limited to proper installation in a safe environment, personnel training and authorization to use, proper inspection and maintenance, manual availability and comprehension, of the application of the safety devices, integrity, and the use of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.

- ✓ Always wear safety glasses or goggles.
- ✓ Wear appropriate safety footwear.
- ✓ Wear respiratory protection where required.
- ✓ Gloves should never be worn while operating the machine, and only worn when handling the workpiece.
- ✓ Wear hearing protection in areas > 85 dBA. If you have trouble hearing someone speak from one metre (three feet) away, the noise level from the machine may be hazardous.
- ✓ DISCONNECTION THE MACHINE FROM POWER when making adjustments or servicing.
- ✓ Check and adjust all safety devices before each job.
- ✓ Ensure that guards are in position and in good working condition before operating.
- ✓ Ensure that all stationary equipment is anchored securely to the floor.
- ✓ Ensure all machines have a start/stop button within easy reach of the operator.
- ✓ Each machine should have only one operator at a time. However, everyone should know how to stop the machine in an emergency.

2.1 GENERAL METALWORKING MACHINE SAFETY Cont.

- ✓ Ensure that keys and adjusting wrenches have been removed from the machine before turning on the power. Appropriate storage for tooling should be provided.
- ✓ Ensure that all cutting tools and blades are clean and sharp. They should be able to cut freely without being forced.
- ✓ Stop the machine before measuring, cleaning or making any adjustments.
- ✓ Wait until the machine has stopped running to clear cuttings with a vacuum, brush or rake.
- ✓ Keep hands away from the cutting head and all moving parts.
- ✓ Avoid awkward operations and hand positions. A sudden slip could cause the hand to move into the cutting tool or blade.
- ✓ Return all portable tooling to their proper storage place after use.
- ✓ Clean all tools after use.
- ✓ Keep work area clean. Floors should be level and have a non-slip surface.
- ✓ Use good lighting so that the work piece, cutting blades, and machine controls can be seen clearly. Position any shade lighting sources so that they do not cause any glare or reflections.
- ✓ Ensure there is enough room around the machine to do the job safely.
- ✓ Obtain first aid immediately for all injuries.
- ✓ Understand that the health and fire hazards can vary from material to material. Make sure all appropriate precautions are taken.
- ✓ Clean machines and the surrounding area when the operation is finished.
- ✓ Use proper lock out procedures when servicing or cleaning the machines or power tools.

DO NOT

- × Do not distract an operator. Horseplay can lead to injuries and should be strictly prohibited.
- × Do not wear loose clothing, gloves, necktie's, rings, bracelets or other jewellery that can be come entangled in moving parts. Confine long hair.
- × Do not handle cuttings by hand because they are very sharp. Do not free a stalled cutter without turning the power off first. Do not clean hands with cutting fluids.
- × Do not use rags or wear gloves near moving parts of machines.
- × Do not use compressed air to blow debris from machines or to clean dirt from clothes.
- × Do not force the machine. It will do the job safer and better at the rate for which it was designed.

WARNING.

Before operating any machine, take time to read and understand all safety signs and symbols. If not understood seek explanation from your supervisor.

2.1 GENERAL METALWORKING MACHINE SAFETY Cont.

HAZARDS ASSOCIATED WITH MACHINES include, but are not limited to:

- Being struck by ejected parts of the machinery
- Being struck by material ejected from the machinery
- Contact or entanglement with the machinery
- Contact or entanglement with any material in motion

Health Hazards (other than physical injury caused by moving parts)

- Chemicals hazards that can irritate, burn, or pass through the skin
- Airborne items that can be inhaled, such as oil mist, metal fumes, solvents, and dust
- Heat, noise, and vibration
- Ionizing or non-ionizing radiation (X-ray, lasers, etc.)
- Biological contamination and waste
- Soft tissue injuries (for example, to the hands, arms, shoulders, back, or neck) resulting from repetitive motion, awkward posture, extended lifting, and pressure grip)

Other Hazards

- Slips and falls from and around machinery during maintenance
- Unstable equipment that is not secured against falling over
- Safe access to/from machines (access, egress)
- Fire or explosion
- Pressure injection injuries from the release of fluids and gases under high pressure
- Electrical Hazards, such as electrocution from faulty or ungrounded electrical components
- Environment in which the machine is used (in a machine shop, or in a work site)

WARNING!

Machines are safeguarded to protect the operator from injury or death with the placement of guards. Machines must not be operated with the guards removed or damaged.

WARNING!

People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to heart pacemaker could cause pacemaker interference or pacemaker failure.

2.2 SPECIFIC LATHE SAFETY

DO NOT use this machine unless you have been instructed in its safe use and operation and have read and understood this manual


Safety glasses must be worn at all times in work areas


Long and loose hair must be contained


Gloves must not be worn when using this machine


Sturdy footwear must be worn at all times in work areas


Close fitting/protective clothing must be worn


Rings and jewelery must not be worn.

PRE-OPERATIONAL SAFETY CHECKS
- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all guards are fitted, secure and functional. Do not operate if guards are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Check the job is clamped tight in the chuck.
- ✓ Remove all tools from the bed and slides of the machine.
- ✓ Ensure the correct speed for machining process is selected.
- ✓ Remove the chuck key before starting the lathe.

OPERATIONAL SAFETY CHECKS
- ✓ Before making adjustments or measurements, switch off and bring the machine to a complete standstill.
- ✓ Always remove the chuck key from the chuck.

ENDING OPERATIONS AND CLEANING UP
- ✓ Switch off the machine when work completed.
- ✓ Reset all guards to a fully closed position.
- ✓ Avoid letting swarf build up on the tool or job. Stop the machine and remove it.
- ✓ Leave the machine in a safe, clean and tidy state.

DON'T
- × Do not use faulty equipment. Immediately report suspect machinery.
- × Do not try to lift chucks or face plates that are too heavy for you.
- × Never leave the machine running unattended.
- × Do not attempt to slow or stop the chuck or revolving work by hand.
- × Do not leave equipment on top of the machine.

POTENTIAL HAZARDS AND INJURIES
- ❒ Flying objects such as the chuck key left in chuck.
- ❒ Cutting tool injury when cleaning, filing or polishing.
- ❒ Hair/clothing getting caught in moving machine parts.
- ❒ Metal splinters and swarf.
- ❒ Eye Injuries.

3. POWER SUPPLY

3.1 ELECTRICAL REQUIREMENTS

Place the machine near an existing power source. Make sure all power cords are protected from traffic, material handling, moisture, chemicals, or other hazards. Make sure there is access to a means of disconnecting the power source. The electrical circuit must meet the requirements for 415V. To minimize the risk of electrocution, fire, or equipment damage, these machines should be hard wired with installation work and electrical wiring done by a qualified electrician.
NOTE : The use of an extension cord is not recommended as it may decrease the life of electrical components on your machine.

ELECTRICAL REQUIREMENTS

Nominal Voltage..... 415V
Cycle..... 50 Hz
Phase..... Three Phase
Power Supply Circuit..... 20 Amps
Full Load Current.....14.7 Amps

(Full load current rating is also on the specification plate on the motor.)

3.2 FULL-LOAD CURRENT RATING

The full-load current rating is the amperage a machine draws when running at 100% of the output power. Where machines have more than one motor, the full load current is the amperage drawn by the largest motor or a total of all the motors and electrical devices that might operate at one time during normal operations.
Full-Load Current Rating for these machine at 415V is 14.7 Amps
It should be noted that the full-load current is not the maximum amount of amps that the machine will draw. If the machine is overloaded, it will draw additional amps beyond the full-load rating and if the machine is overloaded for a long period of time, damage, overheating, or fire may be caused to the motor and circuitry.
This is especially true if connected to an undersized circuit or a long extension lead. To reduce the risk of these hazards, avoid overloading the machine during operation and make sure it is connected to a power supply circuit that meets the requirements.

4. SETUP

4.1 CLEAN - UP

The unpainted surfaces of the machine have been coated with a waxy oil to protect them from corrosion during shipment. Remove the protective coating with a solvent cleaner or a citrus based degreaser.
Optimum performance from your machine will be achieved when you clean all moving parts or sliding contact surfaces that are coated with rust prevented products.
Hafco advise to avoid chlorine based solvents, such as acetone or brake parts cleaner, as they will damage painted surfaces and strip metal should they come in contact. Always follow the manufacturer's instructions when using any type of cleaning product.

4.2 SITE PREPARATION

When selecting the site for the machine, consider the largest size of workpiece that will be processed through the machine and provide enough space around the machine for operating the machine safely. Consideration should be given to the installation of auxiliary equipment. Leave enough space around the machine to open or remove doors and covers as required for the maintenance and service as described in this manual.
It is recommended that the machine is anchored to the floor to prevent tipping or shifting. It also reduces vibration that may occur during operation. See dimensions for foundation bolts in Figures 4.3, 4.4

4.3 FOUNDATION PLAN

The machine is best mounted on a concrete slab.
Masonry anchors with bolts are the best way to anchor machinery, because the anchors sit flush with the floor surface, making it easy to unbolt and move the machine later, if needed. (Fig. 4.1)

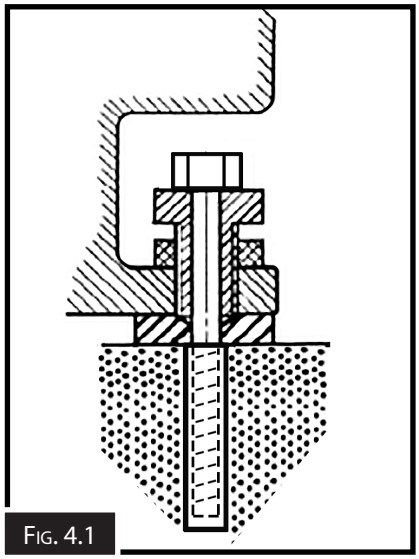


FIG. 4.1

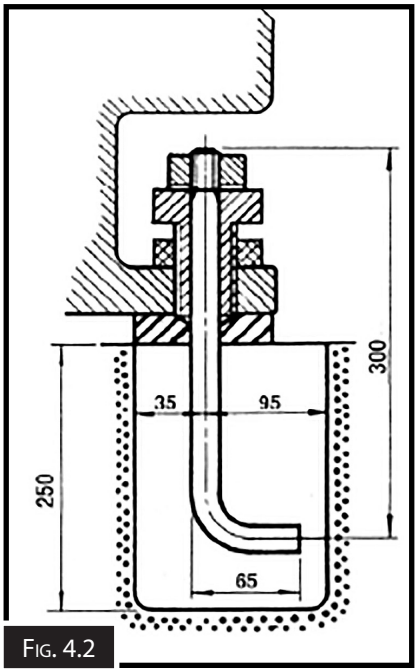


FIG. 4.2

In some case a suitable foundation may not be available and a new one may need to be prepared.
The foundation should be concrete approximately 200mm thick with pockets left clear for the hold down bolts.. The hold down bolts can be "L" shape as per the example in Fig. 4.2

4.3 FOUNDATION PLAN

	A	B	C	D
CL-510 1000mm Between Centres (mm)	1317	558	463	558
CL-510 1500mm Between Centres (mm)	1867	558	463	558

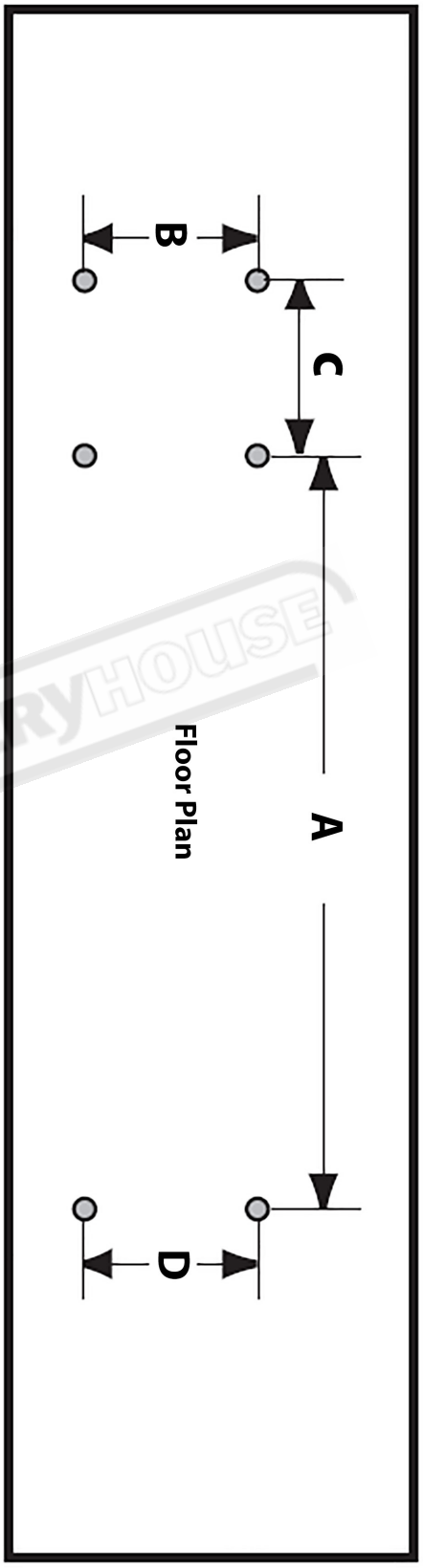


FIG. 4.3

4.3 FOUNDATION PLAN Cont.

	MODEL CL-510 1000mm Between Centers	MODEL CL-510 1500mm Between Centres
A	1317mm	1867mm
B	2165mm	2715mm

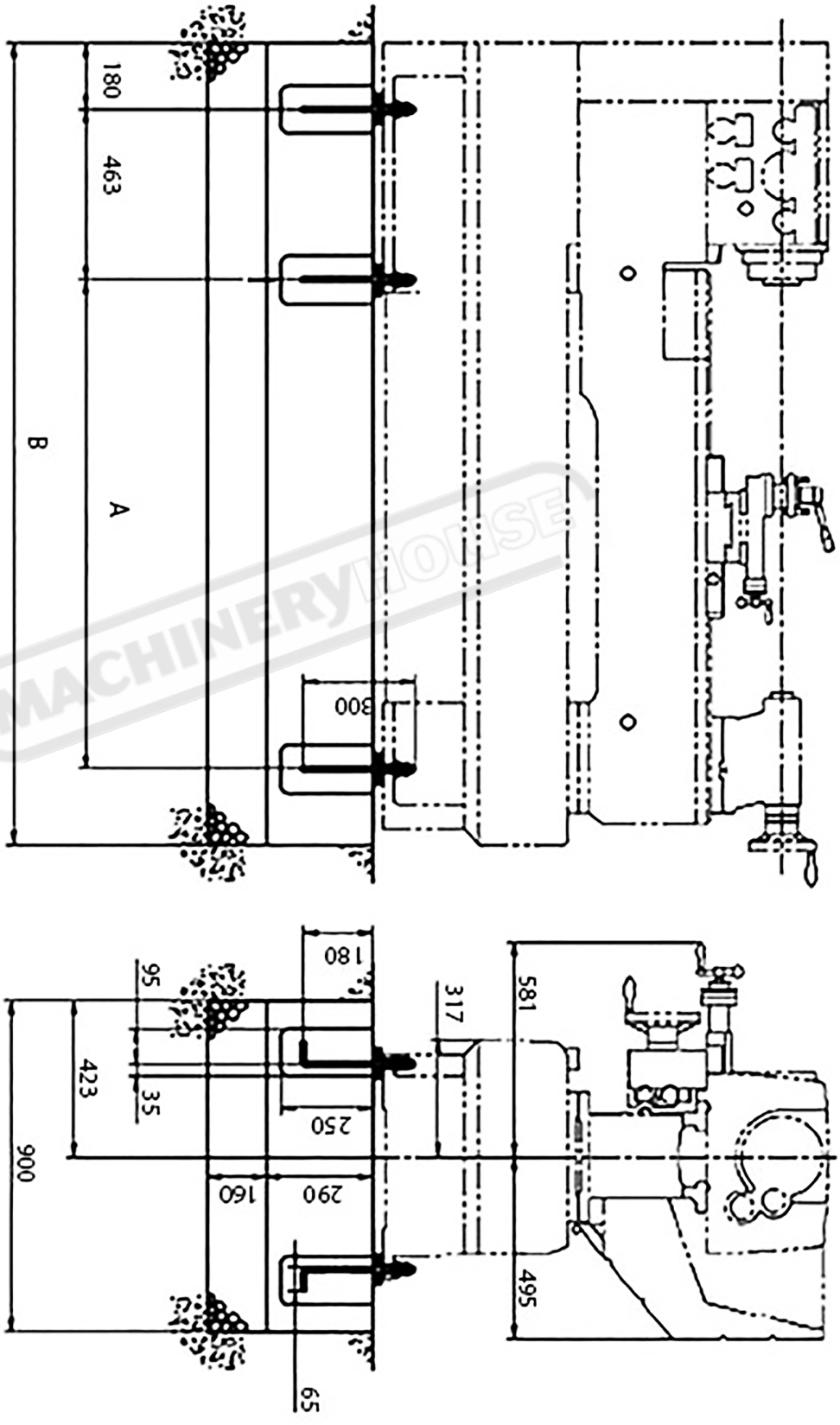


FIG. 4.4

4.4 LIFTING

Move the lathe to its prepared location while it is still attached to the shipping pallet. To balance the load for lifting, move the tailstock and carriage to the right end of the bedway, then lock them in place.
Note: Before attempting to move the carriage, make sure the carriage lock is loose, the half nut is disengaged, and the feed selection lever is disengaged. Refer to Page18 to identify these controls. Prepare two round metal bars (approx.830mm long x 40mm dia) and insert them into the preserved holes on the lathe bed. (See Fig. 4.5). Using web slings or chains place them around the bars and adjust the length until the lathe when it is raised is level. (see Fig. 4.6).

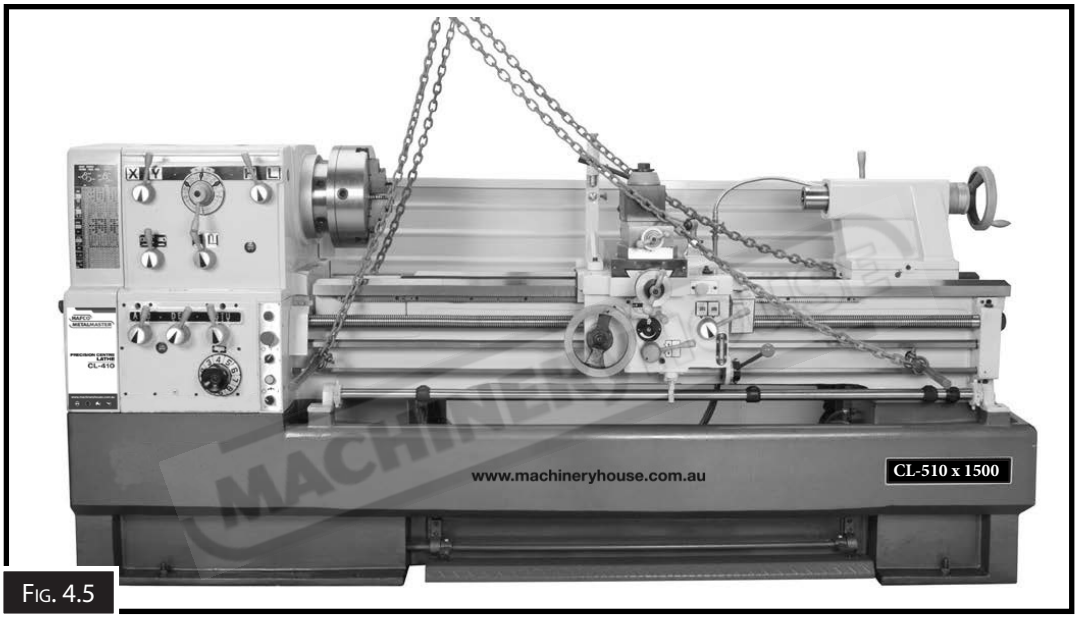


FIG. 4.5


FIG. 4.6

NOTE :
Before lifting check that the slings or chains will not bend either the control shaft, lead screw, feed shaft, coolant hoses or electrical cables.
The slings or chains must be certified and suitable to handle the weight of the machine.
The lifting must be managed by experienced persons with rigging and lifting qualifications.

4.5 LEVELING

This lathe can be placed on the included leveling screws and cast-iron pads (Figure 4.7). and the lathe should be secured to the floor. The lathe must be sitting flat at each mounting point, and the ways must be perfectly level. The bed cannot be twisted or bent. If the lathe is found to be misaligned, shim the lathe where it mounts to the floor, or adjust the leveling screws until the bed and ways are in alignment. A precision machinist's level (Q205) should be used.
Place the level on the bedways and on top of the cross slide for the best results (See Fig. 4.8)

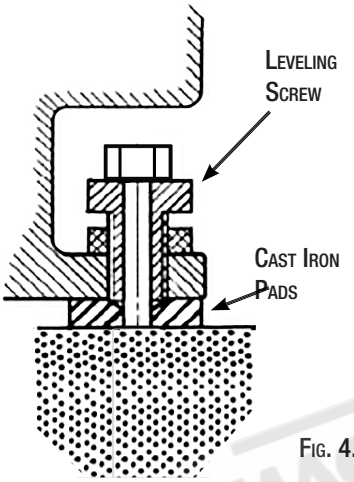


Fig. 4.7

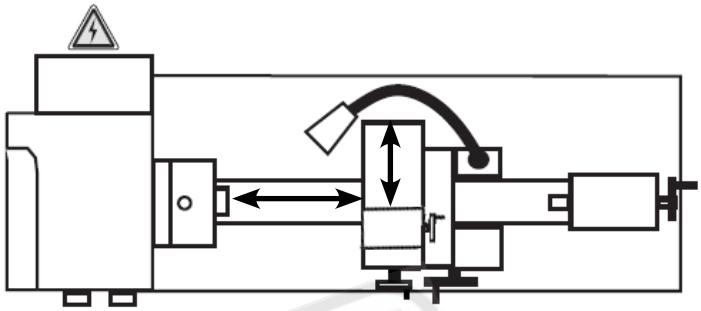


Fig. 4.8

Order Code Q205

4.6 CHECKING THE LUBRICATION

Before operating the machine, make sure that all lubricants are at their proper levels. Being that all machines may be supplied differently, it is impossible to cover the lubrication position for all the types of situations found when the machine arrives in the shop.
The headstock, gearbox, and apron oil reservoirs must have the proper amount of oil in them before the machine can be operated for the first time.
Running the machine without oil in a gearbox will void the warranty, and will result in damage to the bearings and gears.
In addition to the gearboxes, we also recommend that you lubricate all other points on the machine at this time. This can be accomplished by following the lubrication schedule in the maintenance section of this manual.

Note: If your machine was shipped with oil in the gearboxes, do not change that oil until after the two month break-in period.

5.12 TEST RUN

Once the assembly and setup of the machine is complete, test run your machine to make sure it runs properly and is ready for regular operation. The test run consists of verifying the following:

1. The motor powers up and runs correctly, and in the right direction.
2. The emergency STOP/RESET button safety feature works correctly.

If, during the test run, you cannot easily locate the source of an unusual noise or vibration, stop the machine immediately,
Read and understand the safety instructions at the beginning of this manual. Take all required safety precautions, and make sure all previous preparation steps have been followed and completed. Clear away all tools and objects used during assembly, lubrication, and preparation. Make sure that the chuck and jaws, if installed, will swing clear, and are secure (refer to Chuck Installation on Page 29)

a. To ensure the carriage components do not unexpectedly move during the following steps, disengage the half nut lever and feed selection lever (see Fig. 5.30).

b. Make sure the spindle lever is in the middle OFF position (Fig. 4.9)

c. Rotate the emergency STOP/RESET button clockwise so it pops out. The power lamp on the control panel should illuminate. Make sure the chuck guard is closed.

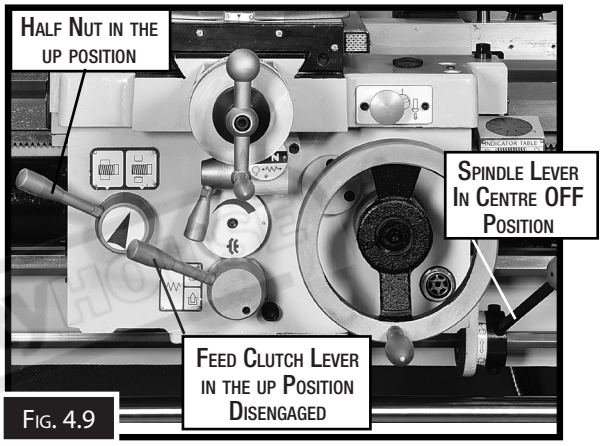


Fig. 4.9

d. Set the spindle speed levers so the speed is at 120 RPM

e. Move the spindle lever (Fig. 5.2) down to start the spindle. The top of the chuck should turn down and toward the front of the lathe.

f. Push the emergency STOP/RESET button to turn the lathe OFF, then, without resetting the RESET button, try to restart spindle rotation, as instructed in the previous step. The spindle should not start.

g. Move the spindle lever to the OFF (middle) position, and reset the RESET button by twisting it clockwise until it pops out and then restart the lathe by moving the spindle lever down.

h. Move the spindle lever to the OFF (middle) position, and then lift the chuck guard. With the chuck guard up, try to restart spindle rotation, as instructed in step “e”. The spindle should not start. Close the chuck guard and retry starting the lathe by moving the spindle lever down. The lathe should start.
If everthing has operated as it should then the test run is now completed. If not, then check for a solution in the “Troubleshooting”section on Page 38 or contact your dealer.

5. OPERATION

5.1 CONTROLS & COMPONENTS

CONTROL PANEL (Fig. 5.1)

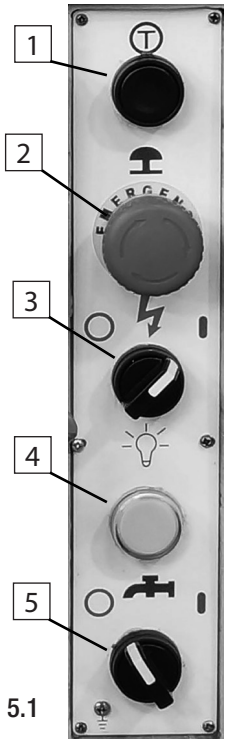


FIG. 5.1

1. **Jog Button:** Turns the spindle motor ON while being pressed and held.
2. **Emergency Stop Button:** Stops all machine functions. Twist clockwise to reset.
3. **Lathe Power Switch:** Turns power ON/OFF to the lathe so lathe operations can begin.
4. **Power Light:** Indicates the lathe is energized when illuminated.
5. **Coolant Pump Switch:** Turns coolant pump ON/OFF.

APRON (Fig. 5.2)

I. **Compound Slide Handwheel:** Moves the tool toward and away from the workpiece at the preset angle of the compound slide.

J. **Carriage Lock:** Secures the carriage in place for greater rigidity when it should not move.

K . **Thread Dial:** Indicates when to engage the half nut during threading operations.

L. **Spindle Lever:** Starts, stops and reverses direction of spindle rotation.

M. **Half Nut Lever:** Engages/disengages the half nut for threading operations.

N. **Feed Selection Lever:** Selects the carriage or cross slide for power feed.

O. **Feed Clutch Lever:** Engages the feed mechanism for the item selected.

P. **Cross Slide Handwheel:** Moves the cross slide toward and away from the workpiece.

Q. **Carriage Handwheel:** Moves the carriage along the bed.

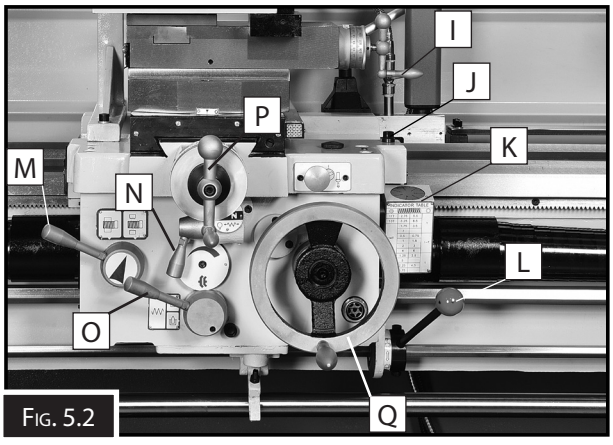


FIG. 5.2

5.1 CONTROLS & COMPONENTS Cont.

TAILSTOCK (Fig. 5.3)

R. Quill Handwheel: Moves the quill toward or away from the spindle.

S. Graduated Scale: Indicates quill movement in increments of 0.02mm or 0.001" graduations.

T. Tailstock Lock Lever: Secures the tailstock in position along the bedway.

U. Quill Lock Lever: Secures the quill in position.

V. Quill: Moves toward and away from the spindle and holds centers and tooling.

W. Tailstock Offset Screws: Adjusts the tailstock offset left or right from the spindle centerline (1 of 2).

X. Offset Scale: Indicates the relative distance of tailstock offset from the spindle centerline. (Fig. 5.4)

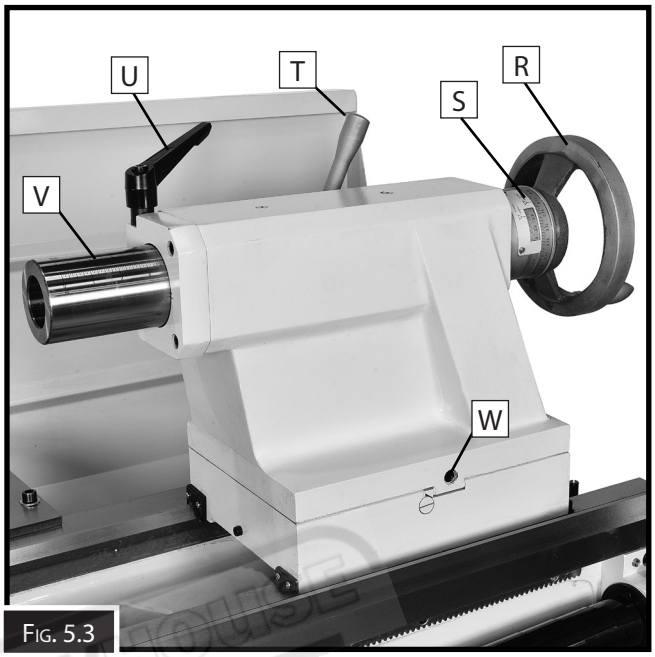


FIG. 5.3

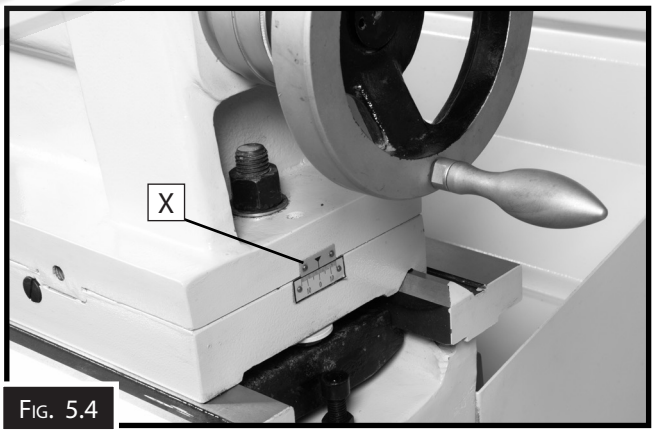


FIG. 5.4

5.2 OFFSETTING THE TAILSTOCK

The tailstock is typically used to support long workpieces by means of a live or dead center. It can also be used to hold a drill or chuck to drill holes in the center of the end of a part. Custom arbors and tapers can also be cut on your lathe by using the offset tailstock adjustment screws (W in Fig. 5.3)

The tailstock can be offset from the spindle centerline for turning tapers. Move the tailstock top casting toward the front of the lathe to machine a taper at the tailstock end. Conversely, move the tailstock top casting toward the back of the lathe to machine a taper at the spindle end.

Note: The marks on the indicator on the end of the tailstock (Fig. 5.4) are only a guide. For a precise offset, use a dial indicator to check while adjusting the screws that are located on both sides of the tailstock. (W in Fig. 5.3)

5.3 ALIGNING TAILSTOCK TO SPINDLE CENTERLINE

This is an essential adjustment that should be checked or performed each time the tailstock is used to turn concentric workpieces between centers or immediately after offsetting the tail-stock when turning a taper. If the tailstock is not aligned with the spindle centerline when it is supposed to be, turning results will not be parallel along the length of the workpiece.

Steps to align the tailstock to the spindle centerline:

1. Center drill both ends of one piece of round bar, then set it aside for use in a later step 4

2. Use the other piece of round stock to make a dead center, and turn it to a 60° point, as illustrated in the Fig. 5.5

NOTE : Do not remove machined centre from the chuck. The point of the center will remain true to the spindle centerline

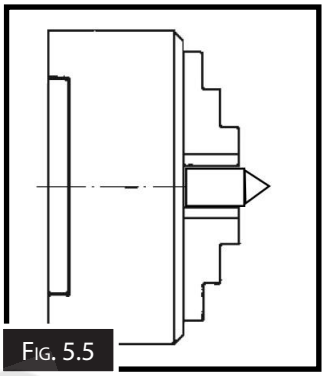


FIG. 5.5


FIG. 5.6

3. Install a center in the tailstock.

4. Attach a lathe dog to the test piece of round stock from Step 1, then mount it between the centers as shown in Fig. 5.6

5. Turn 1mm off the stock diameter.

6. Mount a test or dial indicator so that the plunger is on the tailstock quill and set the dial to “0” (Fig. 5.7)

7. Use a micrometer to measure both ends of the workpiece.
   If the test stock is larger at the tailstock end, then adjust the tailstock toward the front of the lathe 1⁄2 of the difference.
   (See Fig. 5.3 for adjustment screws)

8. Repeat the steps until the round bar is turned parallel.

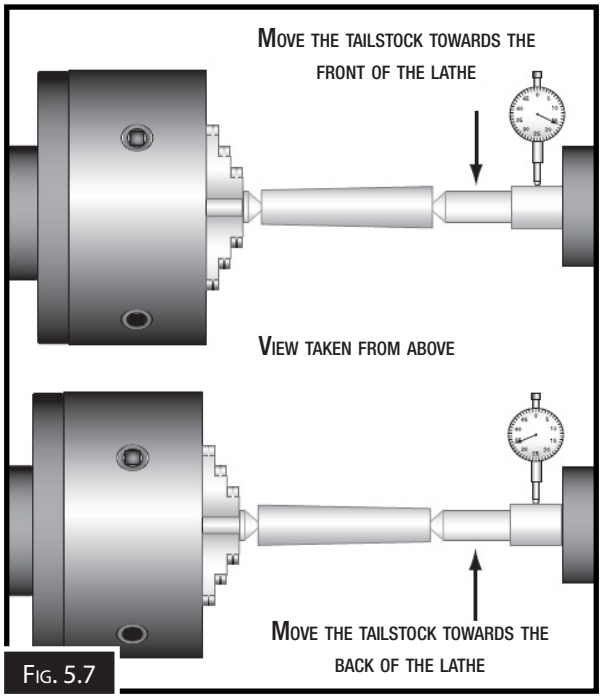


FIG. 5.7

5.4 CARRIAGE & SLIDE LOCKS

The compound rest, and carriage are fitted with locks that can be tightened to increase rigidity when taking heavy turning cuts.
See Fig. 5.8 for the locations of the locks for each device.

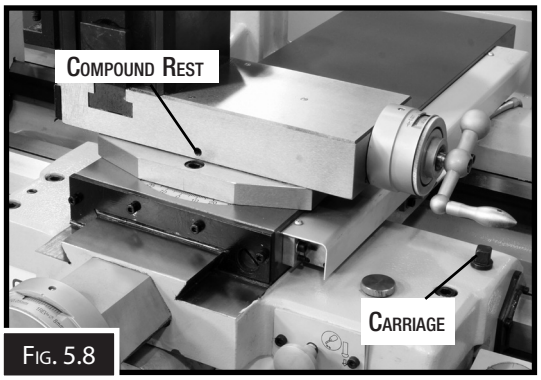


Fig. 5.8

5.5 FIXED AND TRAVELING STEADIES

FIXED STEADY REST

The fixed steady rest supports long, small diameter shafts and can be mounted anywhere along the length of the bedway. Components are shown in Figure 5.9
To install, thoroughly clean all mating surfaces, then place the fixed steady rest base on the bedways so the triangular notch fits over the bedway prism. Position the fixed steady rest with the base clamp where required to properly support the workpiece, then tighten the hex clamp nut. Undo the clamp knob and open the steady rest. Use the finger adjustment knobs to position the bottom two centre rollers against the workpiece. then close the steady rest making sure that the top centre roller does not touch the workpiece.
Close the steady rest, then use the finger adjustment knobs to adjust all three centre rollers to just touch the workpiece without causing any deflection.

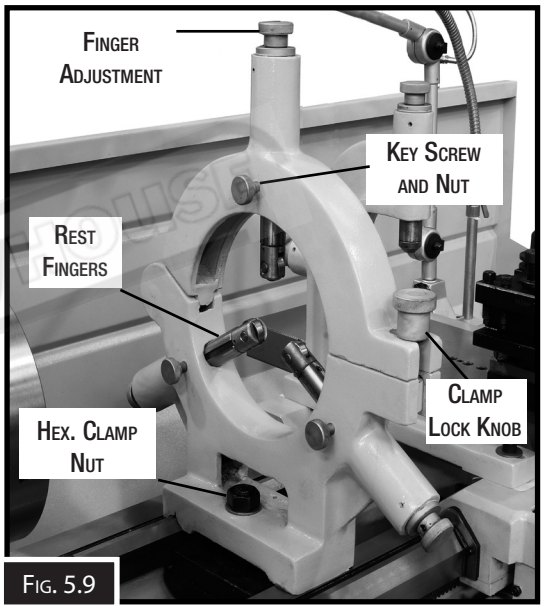


Fig. 5.9

TRAVELING STEADY REST

The traveling rest is used when turning long, slender parts to prevent the workpiece from being deflected by the pressure of the cutting tool. It mounts to the saddle with two cap screws (see Fig. 5.10).
Adjustment of the follow rest fingers is done in the same manner as those for the fixed steady rest.

NOTE: To reduce the effects of friction, lubricate the fingers with way oil during operation.

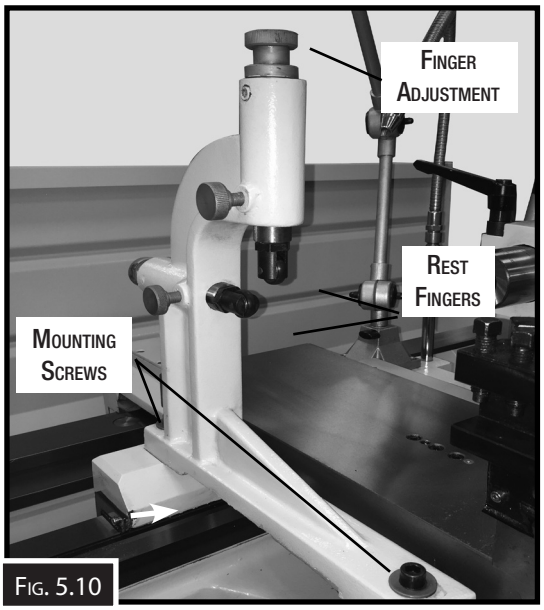


Fig. 5.10

5.6 COMPOUND SLIDE & TOOLPOST

COMPOUND SLIDE

The compound slide provides a smaller mount of movement along its axis via another feed-screw. The compound slide axis can be adjusted independently of the carriage or cross-slide. It is used for turning short tapers, to control depth of cut when screw-cutting or precision facing, or to obtain finer feeds (under manual control) than the feed shaft permits.

To set the compound slide at a certain angle:

1. Loosen the two hex screws at the base of the compound slide. (One at the front and one at the back of the compound slide.) (Fig 5.11).

2. Rotate the compound slide to the desired angle, as indicated by the scale at the base, then re-tighten the two hex screws.

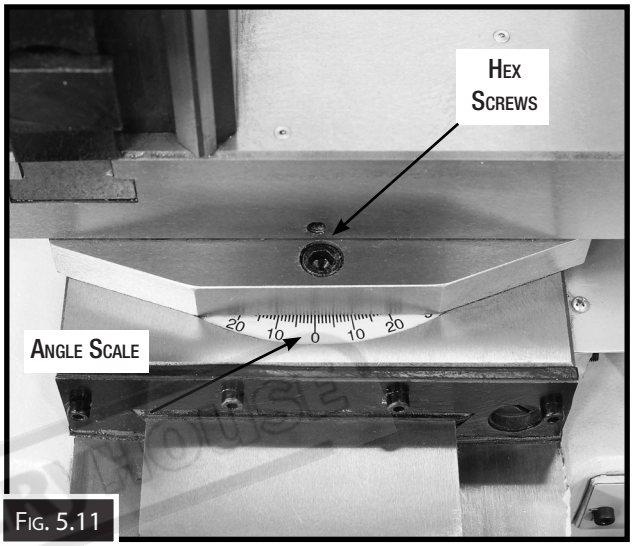


Fig. 5.11

TOOL POST

The tool bit is mounted in the toolpost which is a quick-change style. The advantage of a quick change set-up is to allow an unlimited number of tools to be used (up to the number of holders available) rather than being limited to four tools with the four-sided type. Interchangeable tool holders allow all tools to be preset to the center height which remains constant, even if the holder is removed and replaced on the machine.(Fig. 5.12)

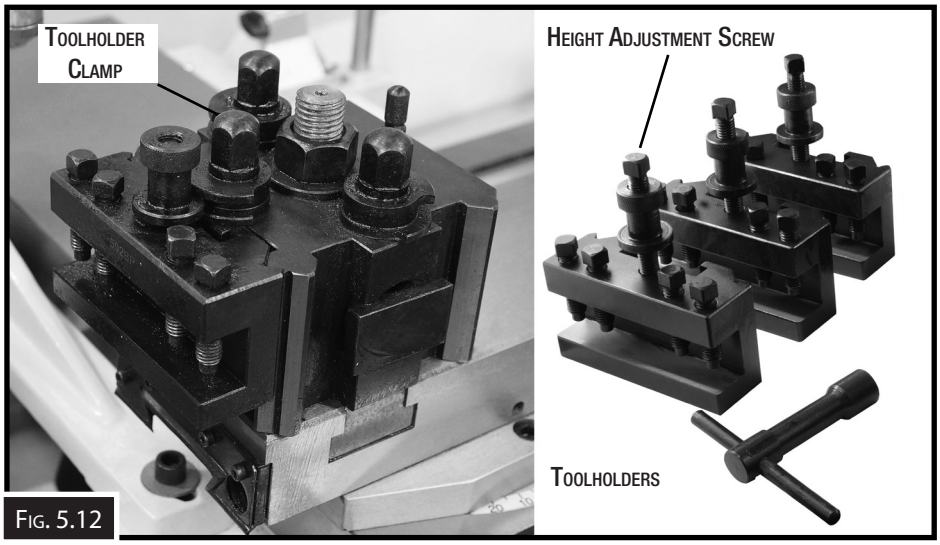


Fig. 5.12

Extra Holders available
Order Code L294A

5.7 SETTING THE CUTTING TOOL WITH SPINDLE CENTERLINE

The tip of the cutting tool should be set up so that it is in line with the centerline of the spindle, as illustrated in Fig 5.13 . The cutting tool can be raised by placing steel shims underneath it. The shims should be as long and as wide as the cutting tool to properly support it.

If fitted with a quick change toolpost height adjustment can be easily set with the height adjusting screw.
There are a number of ways to check that the cutting tool is on the centre line of the spindle.

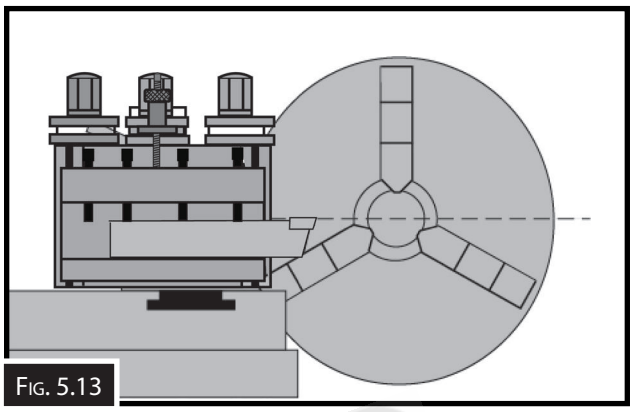


FIG. 5.13

Below are two common methods:

• Move the tailstock center over the cross slide and use a fine ruler to measure the distance from the surface of the cross slide to the tip of the center. Adjust the cutting tool height so it is the same distance above the cross slide as the tailstock center.

Align the tip of the cutting tool with a tailstock center, as described in the following procedure.

1. Mount the cutting tool and secure the post so the tool faces the tailstock.
2. Install a center in the tailstock, and position the tip near the cutting tool.
3. Lock the tailstock and quill in place.
4. Adjust the height of the cutting tool tip to meet the center tip, as shown. (Fig.5.14)

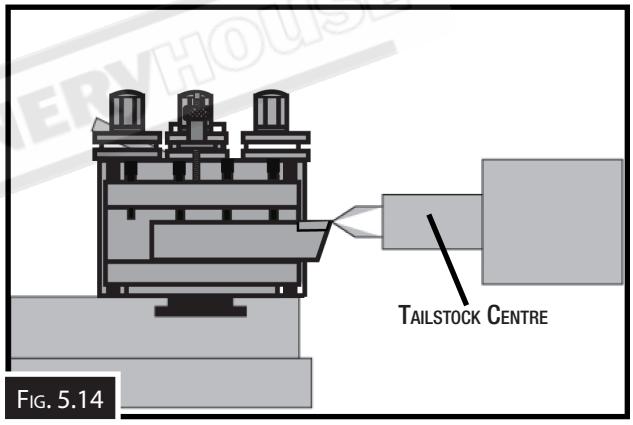


FIG. 5.14

To set the height

Place the toolholder with the cutting tool attached onto the block and rotate “A” until the toolholder can slightly move up and down. Loosen the locking screw “B” in Fig 5.15. Adjust the height stop “C” until the tool tip is in line with the centre line. Tighten “B” lock screw then tighten the toolholder to the block with screw “A”. Check the centre height of the tool tip and if not correct repeat the steps until on the centre line. Remove the toolholder by releasing “A” screw and replace. Check again the centre height.

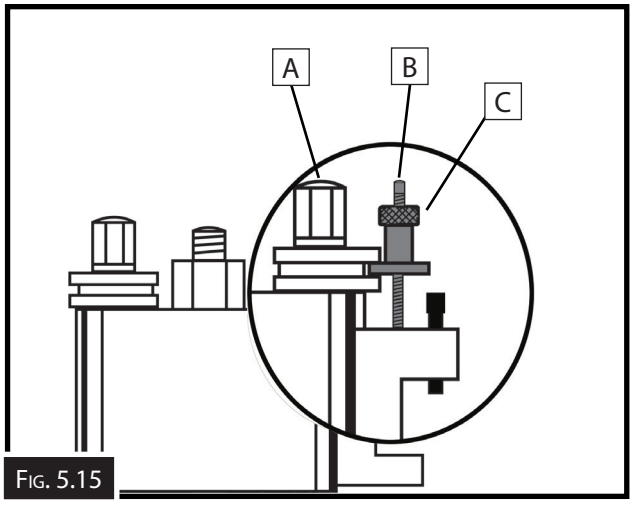


FIG. 5.15

N***OTE: The locking screw “B” can be supplied as a set screw or a grub screw.***

5.8 FOUR-POSITION APRON STOP

The four-position apron stop is used for disengaging the apron feed automatically at a total of four different apron positions. The eccentrics rings ("C" in Fig.5.16) can be tightened in place on the shaft at different positions, and the shaft rotated with each stop corresponding with a number on the dial.

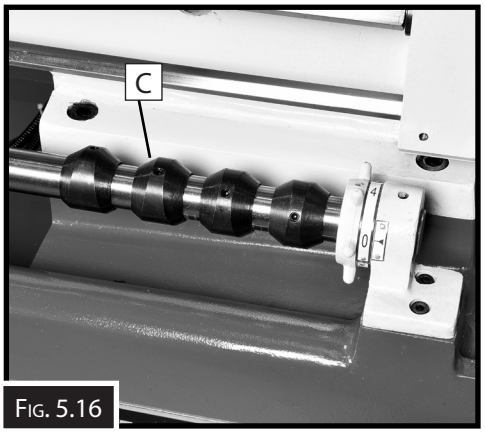


Fig. 5.16

When the shaft is turned to the stop selected the stop is selected. When the apron reaches that point, the top of the stop eccentric will depress the clutch release lever ("D" in Fig. 5.17) and disengage the feed on the apron, thus stopping the apron.

5.9 GAP REMOVAL

This lathe is fitted with a gap section below the spindle that can be removed for machining large diameter parts. The gap is installed, during lathe assembly at the factory and then finished ground for precise fit and alignment. Once the gap has been removed replacing the gap to the original position will be very difficult. Reinstalling the gap to the original factory alignment is nearly impossible. For this reason Hafco do not recommend removing the gap unless absolutely necessary and then recommend to then leave the gap out.

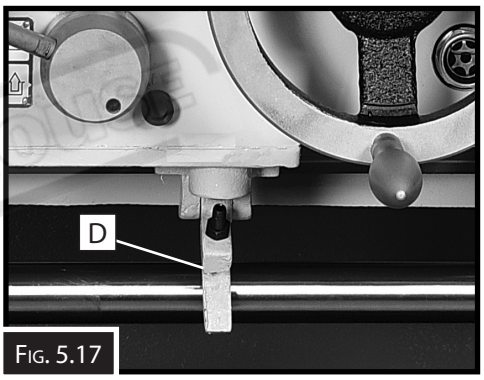


Fig. 5.17

To remove the gap

1. Remove the four cap screws from the bottom of the gap and two from the ends of the ways ("E" in Fig. 5.18).

2. Remove the set screw plug, and assemble an M6 x 30 cap screw, 6mm flat washer, and the gap pin puller hub ("F" in Fig. 5.18)

3. Thread the cap screw into the threaded hole and tighten until the pin is pulled free of the gap and bed.

4. Repeat on the remaining pin.

5. Tap the outside of the gap with a dead blow hammer to loosen, and remove the gap section

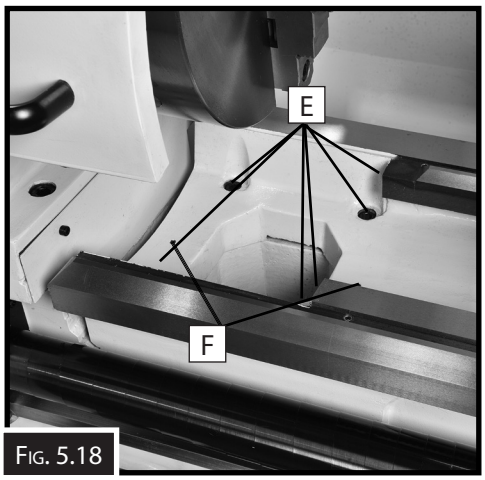
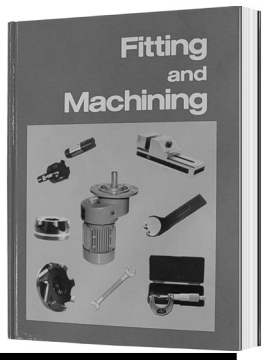


Fig. 5.18

5.10 FEEDS AND THREADING

The machine is designed to cut most metric and inch threads. The following sections will describe how to use the threading controls to set up the lathe for a threading operation. If you are unfamiliar with the process of cutting threads on a lathe, it is strongly recommend that you read a trade manual such as Hafco L341, or seek formal training before attempting any threading projects. Consult the thread charts for the correct lever settings. The numbers on the thread dial are used with the thread dial chart to show when to engage the half nut during threading. (Fig. 5.22)

ORDER CODE L341



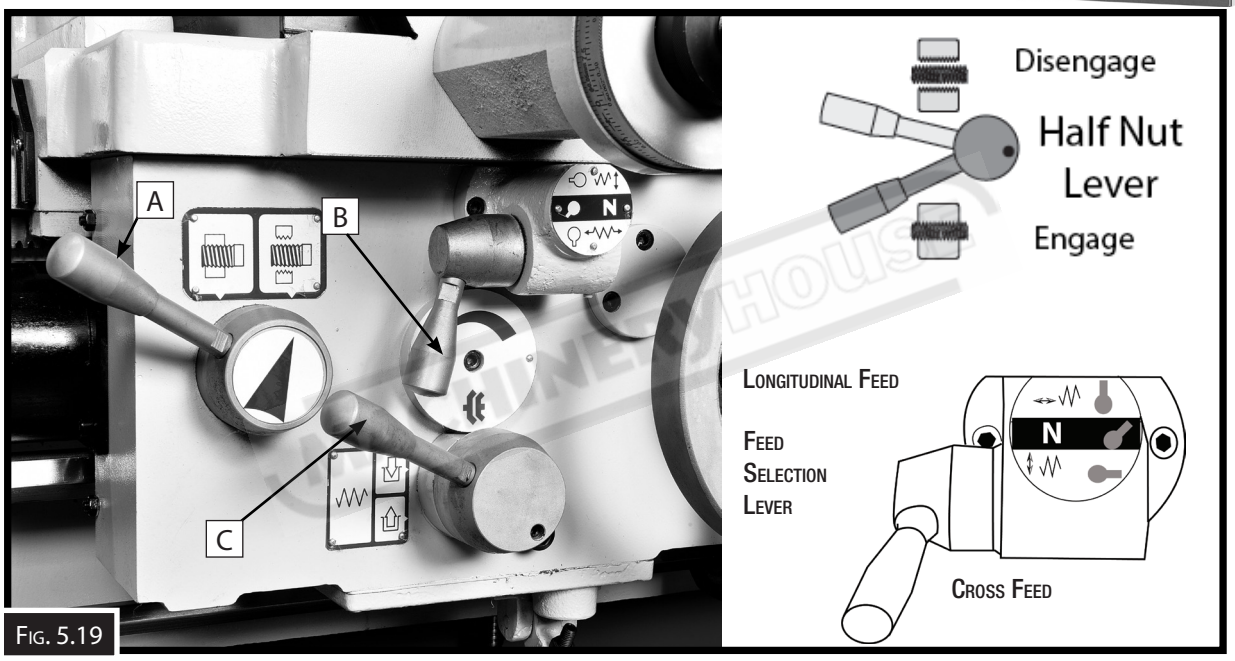


FIG. 5.19

Both the carriage and cross slide are equipped with power feed when the carriage is engaged with the feed rod. The rate that these components move per revolution of the feed rod is controlled by the quick-change gearbox lever positions and the end gear configuration. Consult the feed chart for the correct settings.
Once the feed selection lever position has been chosen then the feed is engaged by the feed clutch lever “C” in Fig. 5.19. The direction of the feed or threading is controlled by lever “E” on the headstock. (See Fig. 5.20)

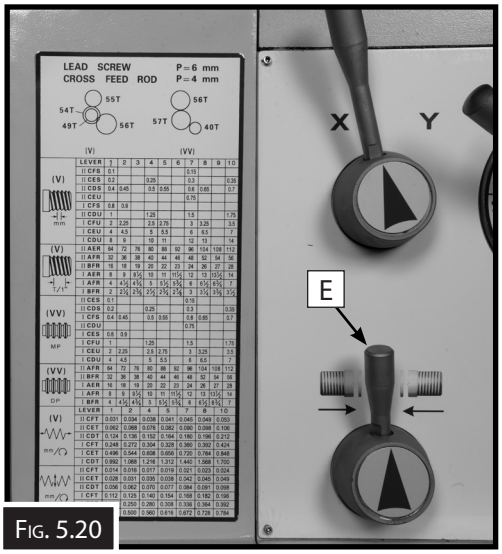


FIG. 5.20

APRON THREADING CONTROLS

The half nut lever engages the carriage with the leadscrew, which moves the carriage and cutting tool along the length of the workpiece for threading operations (see Fig. 5.21).

NOTE : Make sure the feed selection lever is in the disengaged (middle) position before attempting to engage the half nut.

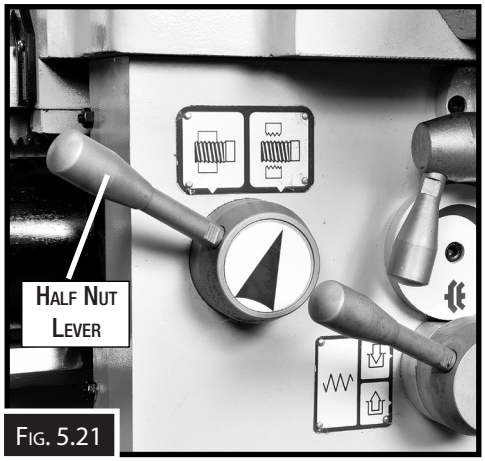


Fig. 5.21

THREAD DIAL INDICATOR

It is advised to use the slowest speed when thread cutting. The lathe is fitted with a Thread Dial Indicator with numbers on the thread dial indicator face which are used to show when to engage the half nut during threading. Before commencing check with the thread dial chart to what number should be used. (Fig.5.22)

NOTE! When cutting threads sometimes the pitch of the leadscrew does not allow for the half nuts to be disengaged so the tool will need to be cleared and the machine will need to be reversed.

1. Loosen the cap screw on the thread dial and pivot the gear teeth so they mesh with the leadscrew threads, then re-tighten the cap screw. (see Fig. 5.23),
2. When the first cutting pass is complete, disengage the carriage from the leadscrew using the half nut lever. Return the carriage for the next pass and re-engage the half nut using the same thread dial setting to resume the cut in the previous pass.

NOTE : If the thread required is not on the chart then the method below is used.

1. Before taking the first cut set the crosslide dial to “0”
2. Engage the half nuts and take the first cut. When the tool reaches the end of the cut wind the tool away from the job and stop the machine. DO NOT Disengage The Halfnuts.
3. Reverse the spindle and return the carriage for the next pass and wind in the crosslide to “0” and add a small amount for the cut.

NOTE : Aways use small cuts for the best results

INDICATOR TABLE

11T	2.75	5.5	1
13T	3.25	6.5	
14T	1.75	3.5	
	7		
	0.5	0.75	1-7
	1	1.5	
	2	3	
	4	6	
15T	1.25	2.5	1
	5		
	2.25	4.5	
18T	6.75		

Fig. 5.22

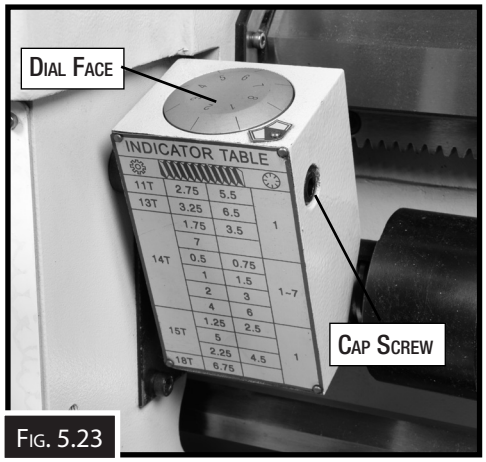


Fig. 5.23

5.11 END GEARS

The end gears are used to setup for power feed, and inch, or metric threading operations. See Fig. 5.24 to identify the upper gear, middle 54T/49T change gears, and the lower gear. Details on which gears to use is found in the feed and threading charts on the head-stock.
The lathe may need to have the centre gears changed to cut other pitch threads, and may require the centre 54 tooth gear to be replaced with the 57 tooth gear. The following covers this process.

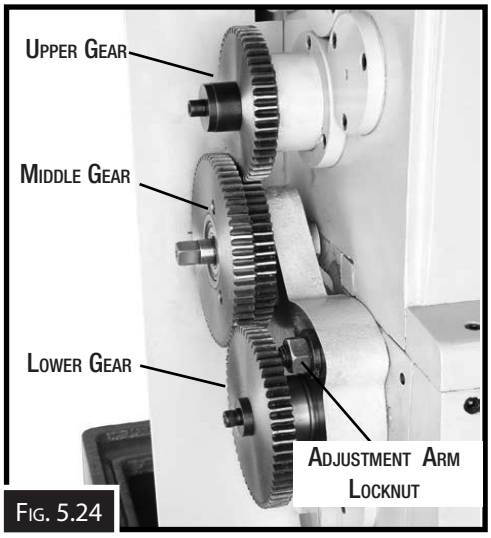


Fig. 5.24

END-GEAR CONFIGURATION

To configure the end gears, first

1. Locate the chart on the headstock that has the thread or feed option that is required.
2. DISCONNECT LATHE FROM POWER!
3. Remove the headstock end gear cover.
4. Using a 14mm wrench, remove the center spindle and gear assembly (Fig. 5.25).
5. Using retaining ring pliers, remove the circlip from the spindle (Fig. 5.25).
5. With the circlip removed, Use a press to remove the spindle.

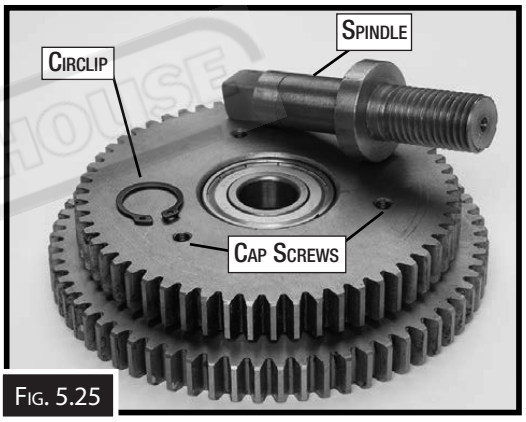


Fig. 5.25

Note: A workshop press and a collar that will support the inner bearing race should be used when removing the spindle from the gear so as not to damage the ball bearings.

6. Remove the three M6-1 x 25 cap screws that hold the two gears together.
7. Carefully, using two flat tip screwdrivers inserted between the gears at opposing sides, ease the 54-tooth gear off of the shoulder. Do not use a hammer to separate the gears.
9. Use the 6mm hex wrench and remove the lower and top spindle cap screw, shoulder washer, to change the bottom and top gears. (Fig. 5.26)


Fig. 5.26

END-GEAR CONFIGURATION Cont.

NOTE: In some cases a spacer may need to be used on the bottom shaft to make the bottom gear mesh with the outside gear of the centre gears.

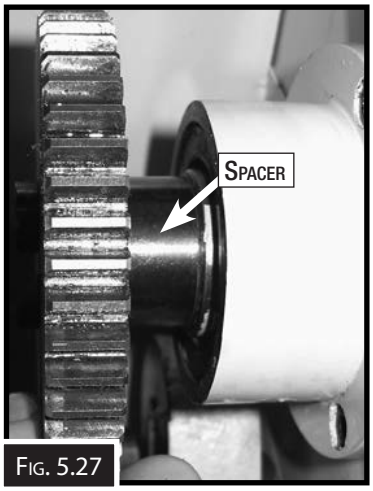
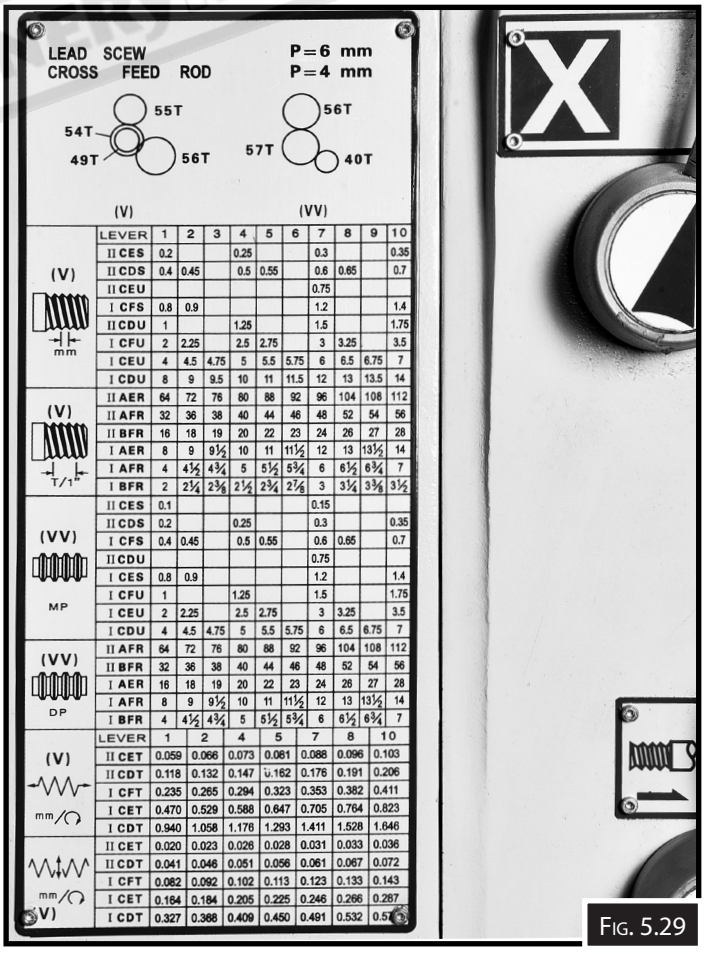


FIG. 5.27

10. If required slide the spacer onto the spindle, (Fig. 5.27) then slide the gear on the shaft. If the spacer is not required then place the gear on the shaft so that the shoulder is then placed against the bearing (Fig. 5.28).
11. Move the center gear and adjustment arm assembly, so they mesh with the top and bottom gear then tighten the spindle and adjustment arm lock nut so all gears mesh and have approximately 0.038 to 0.102mm of backlash.

FIG. 5.28

12. Rotate the gears by hand to make sure that no binding occurs, and then cover the gear teeth with general purpose automotive grease.
13. When the change is finished, make sure the gear arrangement matches the configuration shown on the chart.
14. Close the end cover and refer to the Threading Chart for how to shift the lathe to the appropriate feed or thread pitch. (Fig. 5.29)



	LEVER	1	2	3	4	5	6	7	8	9	10
(V) mm	II CES	0.2			0.25			0.3			0.35
	II CDS	0.4	0.45		0.5	0.55		0.6	0.65		0.7
	II CEU							0.75			
	I CFS	0.8	0.9					1.2			1.4
	II CDU	1			1.25			1.5			1.75
	I CFU	2	2.25		2.5	2.75		3	3.25		3.5
	I CEU	4	4.5	4.75	5	5.5	5.75	6	6.5	6.75	7
	I CDU	8	9	9.5	10	11	11.5	12	13	13.5	14
(V) T/1"	II AER	64	72	76	80	88	92	96	104	108	112
	II AFR	32	36	38	40	44	46	48	52	54	56
	II BFR	16	18	19	20	22	23	24	26	27	28
	I AER	8	9	9½	10	11	11½	12	13	13½	14
	I AFR	4	4½	4¾	5	5½	5¾	6	6½	6¾	7
	I BFR	2	2¼	2⅜	2½	2¾	2⅞	3	3¼	3⅜	3½
(VV) MP	II CES	0.1						0.15			
	II CDS	0.2			0.25			0.3			0.35
	I CFS	0.4	0.45		0.5	0.55		0.6	0.65		0.7
	II CDU							0.75			
	I CES	0.8	0.9					1.2			1.4
	I CFU	1			1.25			1.5			1.75
	I CEU	2	2.25		2.5	2.75		3	3.25		3.5
	I CDU	4	4.5	4.75	5	5.5	5.75	6	6.5	6.75	7
(VV) DP	II AFR	64	72	76	80	88	92	96	104	108	112
	II BFR	32	36	38	40	44	46	48	52	54	56
	I AER	16	18	19	20	22	23	24	26	27	28
	I AFR	8	9	9½	10	11	11½	12	13	13½	14
	I BFR	4	4½	4¾	5	5½	5¾	6	6½	6¾	7

	LEVER	1	2	4	5	7	8	10
(V) mm/rev	II CET	0.059	0.066	0.073	0.081	0.088	0.096	0.103
	II CDT	0.118	0.132	0.147	0.162	0.176	0.191	0.206
	I CFT	0.235	0.265	0.294	0.323	0.353	0.382	0.411
	I CET	0.470	0.529	0.588	0.647	0.705	0.764	0.823
	I CDT	0.940	1.058	1.176	1.293	1.411	1.528	1.646
(V) mm/rev	II CET	0.020	0.023	0.026	0.028	0.031	0.033	0.036
	II CDT	0.041	0.046	0.051	0.056	0.061	0.067	0.072
	I CFT	0.082	0.092	0.102	0.113	0.123	0.133	0.143
	I CET	0.164	0.184	0.205	0.225	0.246	0.266	0.287
	I CDT	0.327	0.368	0.409	0.450	0.491	0.532	0.573

FIG. 5.29

WARNING

Watch your fingers & hands

5.12 CHUCK & FACEPLATE MOUNTING

This lathe is equipped with a Camlock spindle nose. This type of spindle uses cams that are adjusted with a chuck key to securely mount a chuck or faceplate with repeatable precision and ease.
Because chucks are heavy and often awkward to hold, some kind of lifting, support, or protective device should be used during installation or removal. (Fig. 5.30)

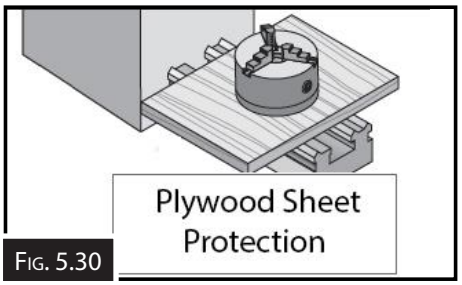


Fig. 5.30

To ensure that the work is accurate, it is extremely important to make sure the spindle nose and chuck mating surfaces and tapers are clean. Even a small amount of lint or dirt can affect the accuracy.
The chuck is properly installed when all camlocks are tight, the spindle and chuck tapers firmly lock together, and the back of the chuck is firmly seated against the face of the spindle all the way around without any gaps.

Mounting The Chuck
Clean and lightly oil the camlock studs, then thoroughly clean the mating surfaces of the spindle and chuck.
Install the chuck by inserting the camlock studs straight into the spindle cam holes.

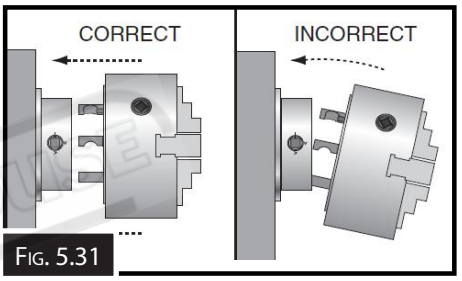


Fig. 5.31

Note ! Avoid inserting the studs in from an angle or rotating the spindle. This can damage the studs or the cam holes. (Fig 5.31)

When the chuck is fully seated and all the camlocks are tight, check that the cam line is between the two “V” marks on the spindle nose, as shown in Figure 5.32

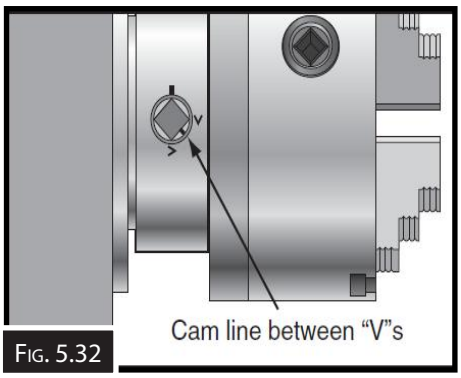


Fig. 5.32

> ***WARNING***
> ***Serious injury could occur if you connect machine to power before completing the setup process. DO NOT connect to power until all assembly and adjusting processes are complete***

If the cam line is not between the “V” marks when the camlock is tight, the stud may not be installed at the incorrect height.
First check that the line on the cam is flush with the surface of the chuck. If it is not then adjust the stud height as shown (Fig. 5.33). Make sure to re-install the stud locking cap screw after adjustment has been made.
If adjusting the stud height does not correct the problem, try swapping stud positions on the chuck.

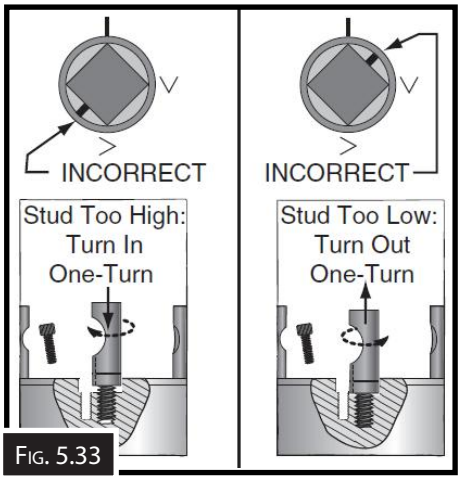


Fig. 5.33

5.13 SPINDLE SPEEDS

Using the correct spindle speed is important for getting safe and satisfactory results, as well as maximizing tool life.
To set the spindle speed for your operation, you will need to:

1) Determine the best spindle speed for the cutting task and material.
2) Configure the lathe controls to produce the required spindle speed.

Determining Spindle Speed
Many variables affect the optimum spindle speed to use for any given operation, but the two most important items are the recommended cutting speed for the workpiece material and the diameter of the workpiece, as noted in the formula shown below.

$$\frac{\text{Recommended Cutting Speed (Mtrs/Min) x 1000}}{\text{Diameter in Millimeters x 3.14}} = \text{RPM}$$

The Fitting & Machining handbook (L341) and some Internet sites, provide excellent recommendations for which cutting speeds to use when calculating the spindle speed.
These sources also provide a wealth of additional information about the variables that affect cutting speed and they are a good educational resource.

Example
Figure 5.34 shows the levers positioned for a spindle speed of 475 RPM.

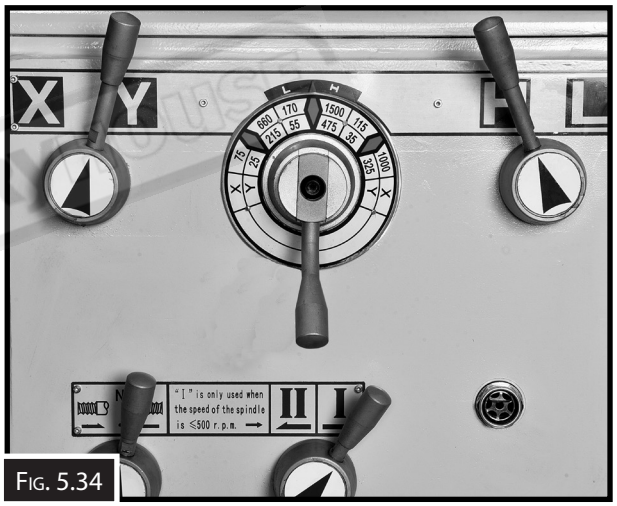


FIG. 5.34

NOTE: If the spindle speed levers do not easily adjust into position, rotate the spindle by hand while you apply pressure to the lever. When the gears align, the lever will easily move into place.

If you have trouble rotating the spindle by hand, you can use the spindle key or a chuck key to get additional leverage—just be sure to remove the key when you are done.

WARNING.
To avoid damaging gears, ALWAYS make sure the spindle is completely stopped BEFORE moving the spindle speed levers.

5.14 TAPER TURNING ATTACHMENT

Some models of these lathes may be supplied with a Taper Turning Attachment as a standard option.(Fig. 5.35)
The range of the taper is from 0 ° - 20 ° included angle. It works in the following way. The dead-man clamp cap screws when they are loose, disengage the taper attachment and the lathe is in normal operation.
When the cap screws (Figure 5.36) are used to clamp the dead-man clamp against the bedway, the taper turning attachment is engaged.

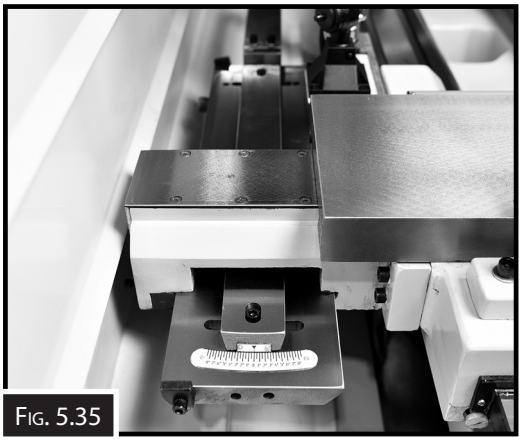


FIG. 5.35

Operation
1. DISCONNECT THE LATHE FROM POWER.

2. Move the carriage, cross slide, and compound slide so your turning tool is at beginning of the taper to be cut.

NOTE: Make sue that there is enough travel on the Taper Turning Attachment slide to cover the length of the taper.

3. Using an 8mm hex wrench, tighten both the dead-man clamp cap screws so the dead-man clamps against the lathe bedway (Fig. 5.36).

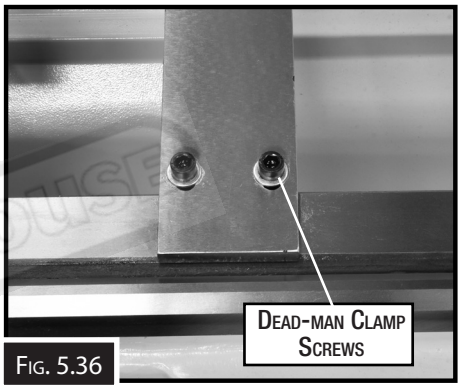


FIG. 5.36

4. Using a 6mm hex wrench, loosen both dovetail lock cap screws (Fig. 5.37, 5.38)

5. Turn the taper angle control knob (Fig. 5.39) until you reach the taper angle that you need as indicated by the taper scale (Fig. 5.37).

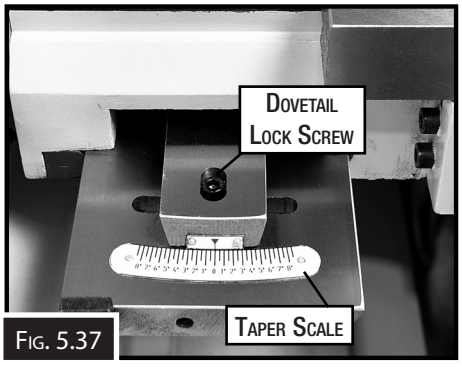


FIG. 5.37

6. Re-tighten both dovetail lock cap screws and begin the machining operations.

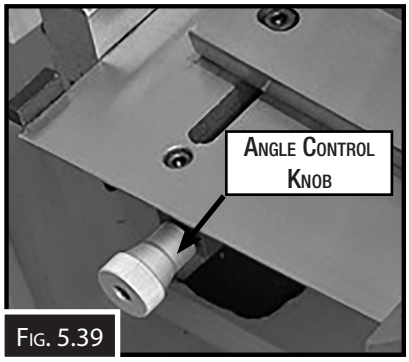


FIG. 5.39

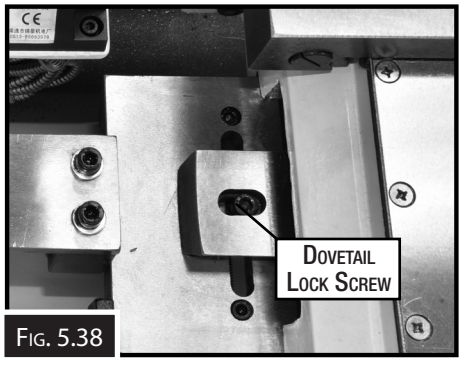


FIG. 5.38

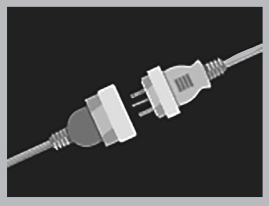
6. MAINTENANCE

6.1 LUBRICATION TYPE AND FREQUENCY

Use the information in the charts below as a daily guide for lubrication tasks

Assembly	Part	Method	Lubricant	Interval
Headstock	Spindle Gears and Bearings	Oil Bath	Machine Oil	6 Months
Feed Box	Gears and Bearings	Oil Bath	Machine Oil	Check site glass daily and fill as required
Carriage	Gears and Bearings	Oil Bath	Machine Oil	Check site glass daily and fill as required
End Gears	Change gears and quadrant	Oil Can	Machine Oil and Grease	Once per shift
Carriage Slide	Bedway slides	One Shot Lubrication	Machine Oil	Once per shift
Cross Slide	Slides and Screws	One Shot Lubrication	Machine Oil	Once per shift
Tailstock	Quill and Screw	Oil Can	Machine Oil	Once per shift
Feed and Lead Screw	Screws and Bearings	Oil Can	Machine Oil	Once per shift

FIG. 6.1



WARNING

Always disconnect the power to the machine before servicing or doing maintenance to the machine.

6.2 LUBRICATION POINTS

Headstock

The headstock utilizes an oil-splash feed lubrication system. The reservoir has the proper amount of oil when the oil level in the sight glass is approximately halfway. (Fig. 6.2) The oil sight glass is located below the spindle speed levers. The oil should be changed every six months by firstly draining the oil by removing the drain plug (Fig. 6.3) then filling by the oil filler plug (Fig. 6.4)

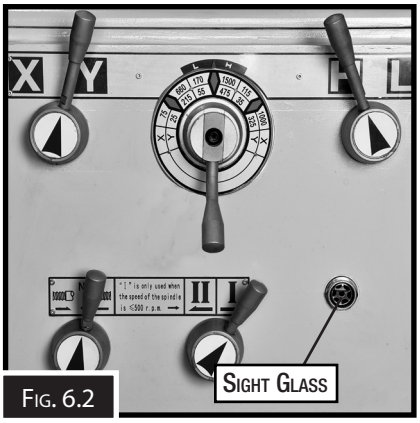


Fig. 6.2

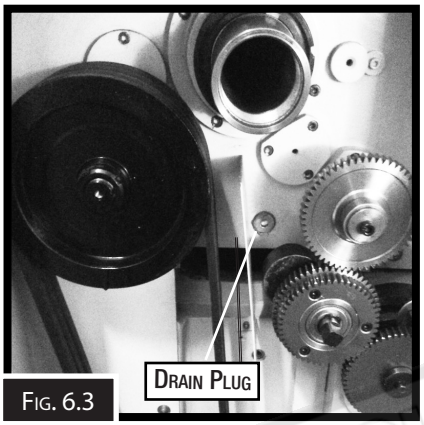


Fig. 6.3

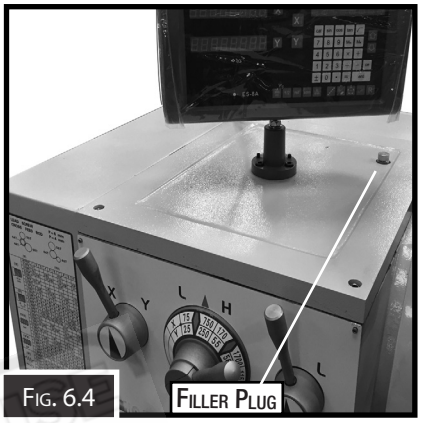


Fig. 6.4

Quick Change Gearbox

The quick change gearbox is oil-bath lubricated to insure the long life of the gears and bearing. It is recommended the lubricant to be changed every twelve months with a 20W non-detergent oil, or an equivalent gearbox machine oil. The oil level can be checked by viewing the sight glass (Figure 6.5) The oil level should be kept so that the oil is level to the middle of the sight glass.

Fig. 6.5

After the first month of daily operation the following procedure should be done.

1. Drain the gear box. See Fig. 6.5 for the drain plug.
2. Flush the gearbox with some fresh oil to remove any contaminants that may be left from the manufacturing process.
3. Replace the drain plug and fill the gearbox with new oil so that the oil level is halfway up the oil sight glass. The filler plug can be found by removing the cover plate above the gearbox. (See Fig. 6.6)

NOTE! The gearbox oil should be changed yearly, or more frequently if heavy machine use requires it.

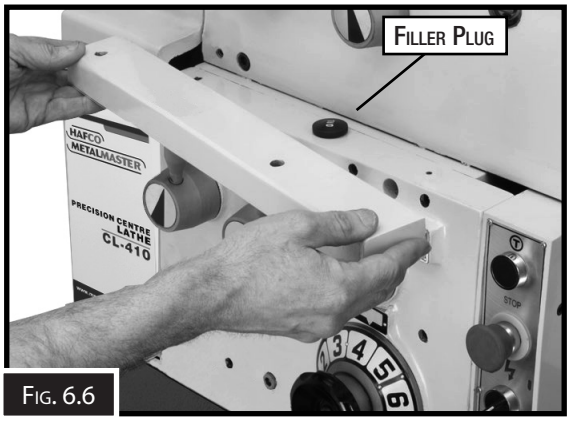


Fig. 6.6

6.2 LUBRICATION POINTS Cont.

APRON

The apron oil sight glass is on the front of the apron, as shown in Fig. 6.7. Maintain the oil volume so that the level is approximately halfway in the sight glass.

Changing Oil & Flushing Reservoir

Small metal particles may accumulate at the bottom of the reservoir with normal use. Therefore, to keep the reservoir clean, drain and flush it at least once a year. Place a catch pan under the apron drain plug (Fig. 6.7), remove the fill plug, (Fig. 6.8) then remove the drain plug and empty the reservoir. Flush the reservoir by pouring a small amount of clean oil into the fill hole and allow it to drain out the bottom. Replace the drain plug, add oil as required, then re-install the fill plug.

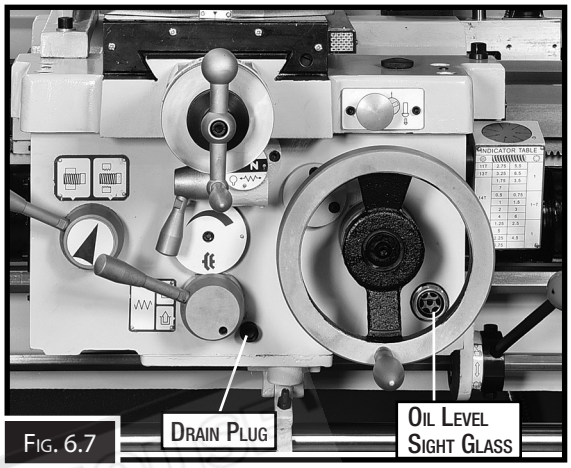


Fig. 6.7

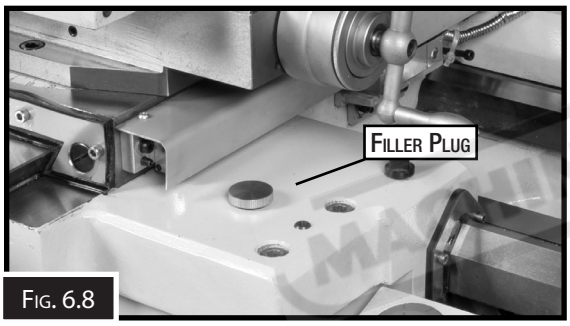


Fig. 6.8

BEDWAY LUBRICATION

The bed ways are lubricated by a one shot lubrication system (Fig. 6.9) which when pulled dispenses oil from the pump and reservoir mounted on the saddle of the machine. The oil needs to be way oil or 20W grade. The level should be checked daily

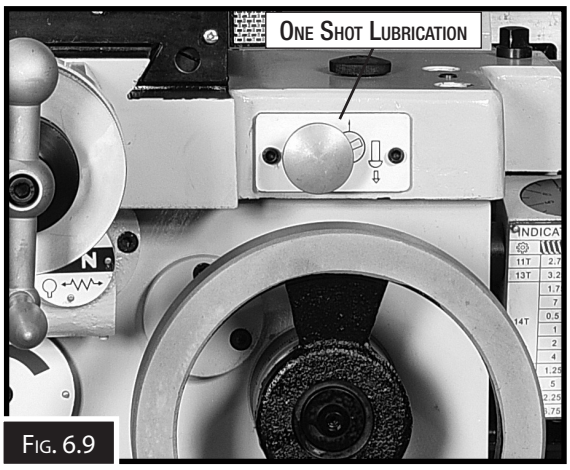


Fig. 6.9

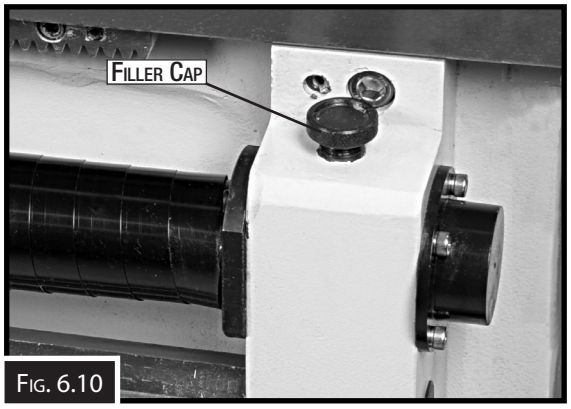


Fig. 6.10

LEADSCREW LUBRICATION

The leadscrew is lubricated from a reservoir system (Fig. 6.10) which is filled from the filler plug on the leadscrew support on the end of the machine. The oil needs to be 20W grade.

BALL OILERS

Proper lubrication of ball oilers is done with a pump-type oil can that has a plastic or rubberized cone tip, sometimes supplied with the accessories Lubricate the ball oilers before and after machine use, and more frequently under heavy use. When lubricating ball oilers, first clean the outside surface to remove any dust or grime. Push the tip of the oil can nozzle against the ball oiler to create a hydraulic seal, then pump the oil can once or twice. It is important not to press the ball oiler to hard with the nozzle of the oil can as it may cause the ball to jam in the open position, allowing dirt to enter. If you see sludge and dirt coming out of the lubrication area, keep pumping the oil can until the oil runs clear. When finished, wipe away any excess oil.

Ball Oilers can be found in the following areas.

- ❑ Cross-slide leadscrew & slides
- ❑ Compound-rest leadscrew & slides (Fig 6.11)
- ❑ Carriage handwheel (Fig.6.13)
- ❑ Feed selection lever gearing
- ❑ Tailstock ball oilers (Fig. 6.12)

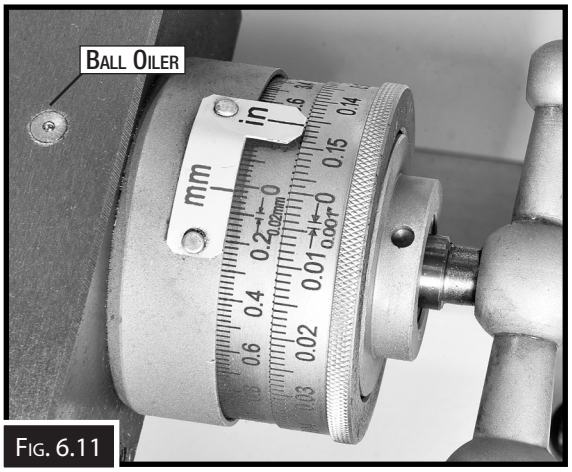


Fig. 6.11

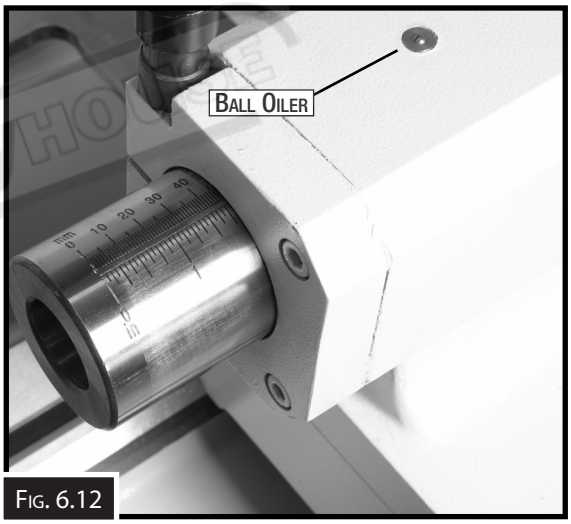


Fig. 6.12

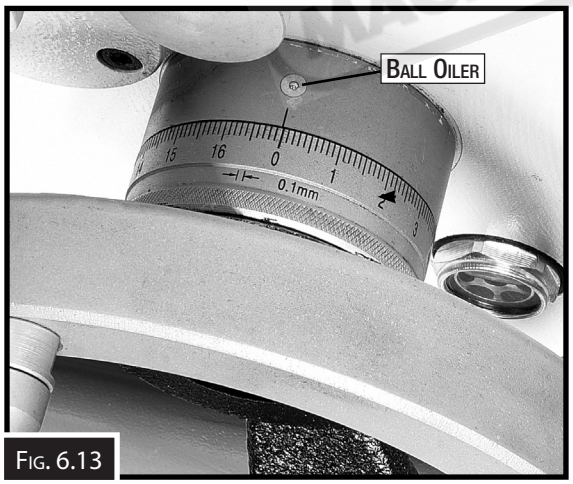


Fig. 6.13

WARNING

Disconnect all power from the machine before servicing. There may be multiple power sources present. Remove the plug from the power point or remove the fuse if hardwired. Failure to do may cause death or injury.

6.3 FEED CLUTCH ADJUSTMENT

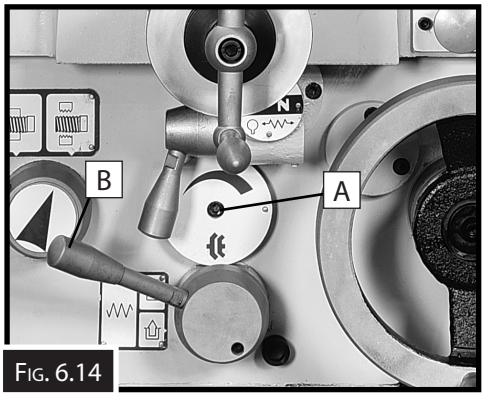


FIG. 6.14

This lathe is equipped with a cone type feed clutch. The clutch is designed to protect the apron feed system from overloading. The feed clutch is set by the factory, however, after the lathe has been used, it may require some re-adjustment.

To adjust the clutch release point:

1. With a 5mm hex wrench, turn the center cap screw ("A" in Fig. 6.14) clockwise to increase the clutch holding power, and turn counterclockwise to decrease the amount of clutch holding power.

2. Start the lathe,

3. Engage the power feed ("B" in Fig. 6.14) and hold the longitudinal feed handwheel with one hand. The clutch should release within a few seconds without much pressure of handwheel rotation. This holding force is approximately 12 kgs.

4. If the amount of pressure is not correct, adjust the clutch screw again as required to achieve 12kg correct setting.

6.4 GIB ADJUSTMENT

FIG. 6.15

The goal when adjusting the cross slide, tailstock, saddle, and compound rest gib screws is to remove sloppiness in the ways without causing the slides to bind. Loose gibs will cause a poor finish on the workpiece and may cause undue wear on the slide. Over-tightening may cause premature wear on the slide, lead screw, and nut.
The cross slide, (Fig. 6.15) saddle, and compound rest (Fig. 6.16) gibs use a tapered piece of cast iron which is held in position by two gib screws at opposing ends of the gib. When these opposing front and rear gib adjustment screws (Fig. 6.15) are turned in opposite directions from each other, "One screw clockwise and the other counter-clockwise, or visa versa" the single gib will be moved in or out to fill the gap between the slide and the dovetail By doing this the play in the slide is removed. If more play is needed, adjust the screws so the gib is moved and held in the opposite direction.

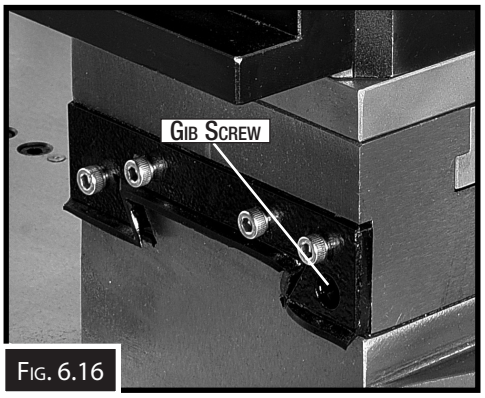


FIG. 6.16

NOTE! When the gib has been set, make sure that the screws at both ends of the gib are tight to ensure the gib will not move.

6.5 FOOT BRAKE & SWITCH ADJUSTMENT

As the brake lining wears, the foot pedal develops more travel. If the brake band is not adjusted to compensate for normal wear, the limit switch will still turn the lathe off, but the spindle will not stop as quickly. It is especially important that the brake is kept properly adjusted so it can quickly stop the spindle in an emergency.

To adjust the brake and brake switch:

1. DISCONNECT LATHE FROM POWER!
2. Put on a respirator and eye protection to protect from hazardous brake dust.
3. Remove the motor side rear access panel cover, by removing the 4 bolts.
4. Press the foot pedal so there is approximately a 25mm gap between the foot pedal and the end of the foot pedal travel,
4. Adjust the Nut “A” on brake belt band until it is fully clamped around the brake hub, then firmly tighten the pedal brake band lock nut.(Fig. 6.17)

Fig. 6.17

Micro Switch Adjustment

The foot brake is linked to a cam and Micro Switch. It needs to maintain a gap of 3-5mm between the Brake Cam and the head of the Micro Switch.

1. DISCONNEC T THE MACHINE FROM THE POWER
2. Push the foot pedal down to verify that the cam lobe pushes the brake micro switch. When pushed in, the switch should click.
3. If the switch does not click, loosen the switch mounting screws, push the brake pedal all the way down, and move the switch closer to the lobe until it clicks. Secure the switch in place.
4. Released the foot pedal. There should be an approximate 3 - 5mm gap between the switch roller and the cam lobe. (Fig. 6.18)

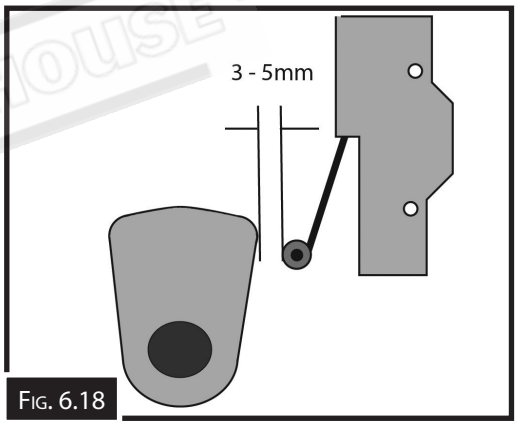


Fig. 6.18

6.6 CHANGING OR ADJUSTING THE BELTS

V-belts with use wear and stretch, so every month check the belts tension to ensure optimal power transmission. Replace all of the V-belts with a matched set if any of them show signs of fraying, glazing, or cracking.

1. DISCONNECT THE MACHINE FROM THE POWER
2. Open the cover on rear left side of the lathe.
3. Adjust the hex nuts on the motor mount bolts until there is approximately 20mm deflection of the V-belts when moderate pressure is applied midway between the pulleys. (Fig. 6.19)
4. Firmly tighten the hex nuts to secure the setting, then re-install the covers.

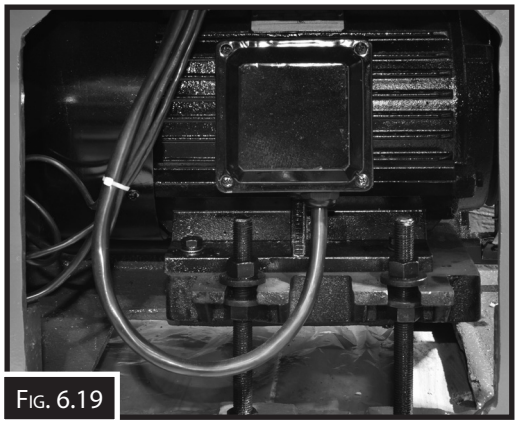


Fig. 6.19

6.7 TROUBLE SHOOTING

If the machine develops a problem, review the trouble shooting section below to find a fix for the problem. If the problem cannot be solved then contact your dealer for help or to book a service engineer.

Symptoms	Possible Cause	Possible Solution
Machine does not start or circuit breaker trips	Foot brake is engaged	Check to see if the foot brake is up.
	Emergency button needs to be reset.	Rotate the emergency stop button until it pops out and resets
	Chuck guard open	Close chuck guard
	Fuse has blown in the machines electrical box.	Replace fuse. Determine if overload is due to heavy operation; ensure power source has high enough voltage
	Power supply has switched OFF	Ensure power supply is ON and the voltage is correct
	Thermal overload relay has tripped.	The wiring connection is correct .
	Wall fuse or circuit breaker is blown/ tripped; caused by a short in electrical system;	Verify circuit is rated for machine amp load; troubleshoot and repair cause of overload; Have a qualified electrician replace weak breaker; find/repair electrical short.
	Start capacitor at fault	Test/replace if faulty.
	Contactor not getting energized. Has burnt contacts.	Test for power supply to contactors and that contactor operation is correct. Replace unit if faulty.
	Motor is at fault.	Test/replace if faulty.
Motor stalls or is under powered	Belts slipping	Check the tension of the belts and replace if worn.
	Faultiy run capacitor	Test and replace if faulty.
	Motor faulty	Test and replace if faulty
Loud noises coming from near the motor	Pulley keys worn or are missing or set crews loose	Inspect keys and set screws. Replace or tighten as required.
	Motor fan is loose.	Tighten the fan and reset the fan cover
Motor is noisy when the machine is cutting	Depth of cut is too deep	Reduce the depth of cut or feed rate.
	Speed or feed rate is wrong	Consult the speed and feed charts in the machinery handbook
	Cutting tool is dull	Replace or sharpen the cutting tool
Machined surface finish is rough.	Incorrect spindle speed or feed rate.	Adjust for appropriate spindle speed and feed rate.
	Blunt tool or poor tool selection	Sharpen tooling or select a better tool for the intended operation.
	Tapered gibs not correctly adjusted.	Tighten gibs

6.7 TROUBLE SHOOTING CONT.

Symptoms	Possible Cause	Possible Solution
Entire machine Vibrates excessively upon startup and while running	Workpiece is unbalanced. Loose or damaged belt(s). V-belt pulleys not properly aligned. Worn or broken gear present. Chuck or faceplate has become unbalanced. Spindle bearings badly worn.	Reinstall workpiece so it is as centered with the spindle bore as possible. Tighten/replace the belt as necessary. Align the V-belt pulleys. Inspect gears and replace if necessary. Re-balance chuck or faceplate; contact a local machine shop for help. Replace spindle bearings.
Bad surface finish.	Wrong RPM or feed rate. Dull tooling or poor tool selection. Too much play in gibs. Tool too high.	Adjust for appropriate RPM and feed rate. Sharpen tooling or select a better tool for the intended operation. Tighten gibs. Lower the tool position.
Can't remove tapered tool from tailstock quill.	Quill had not retracted all the way back into the tailstock. Debris on the taper before inserting	Turn the quill handwheel until it forces taper out of the quill. Always make sure that taper surfaces are clean.
Cross slide, compound slide, or carriage feed has sloppy operation	Gibs are out of adjustment. Handwheel is loose. Mechanism worn or needs adjustment.	Tighten gib screw(s). Tighten handwheel fasteners. Tighten any loose fasteners on lead screw mechanism.
Cutting tool or machine components vibrate excessively during cutting	Tool holder not tight enough. Cutting tool sticks too far out of tool holder; lack of support. Gibs are out of adjustment. Dull cutting tool. Incorrect spindle speed or feed rate.	Check for debris, clean, and re-tighten. Reinstall cutting tool so no more than 1/3 of the total length is sticking out of tool holder. Tighten gib screws at affected component. Replace or resharpen cutting tool. Use the recommended spindle speed.
Inaccurate turning results from one end of the workpiece to the other.	Headstock and tailstock are not properly aligned with each other.	Realign the tailstock to the headstock spindle bore centre line.
Chuck jaws won't move or don't move easily.	Chips lodged in the jaws.	Remove jaws, clean and lubricate chuck threads, and replace jaws.

6.7 TROUBLE SHOOTING CONT.

Symptoms	Possible Cause	Possible Solution
Carriage won't feed.	Gears are not all engaged. Gears are broken. Loose screw on the feed handle	Adjust gear positions. Replace. Tighten.
Carriage hard to move.	Carriage lock is tightened down. Chips have loaded up on bedways. Bedways are dry and in need of lubrication. Longitudinal stops are interfering. Gibs are too tight.	Check to make sure the carriage lock bolt is fully released. Frequently clean away chips that load up during turning operations. Lubricate bedways and handles. Check to make sure that stops are floating and not hitting the center stop. Loosen gib screw(s) slightly.
Gear change levers will not shift into position	Gears not aligned in headstock.	Rotate spindle by hand until gear falls into place
Loud, repetitious noise coming from the machine.	Gears not aligned in headstock or no backlash. Broken gear or bad bearing. Workpiece is hitting stationary object.	Adjust gears and establish backlash. Replace broken gear or bearing. Stop lathe immediately and correct interference problem..
Tailstock quill will not feed out of tailstock.	Quill lock knob is tightened down.	Turn knob counterclockwise.

WARNING

The machine is the sole responsibility of the owner for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training, proper inspection and maintenance, manual availability and comprehension. The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.

SPARE PARTS SECTION

CENTRE LATHE

Models

CL-510 x 1000, CL-510 x 1500

Order Code L608D, Order Code L609D

Edition No : CL-510-1
Date of Issue : 09/2022

The following section covers the spare parts diagrams and lists that were current at the time this manual was originally printed. Due to continuous improvements of the machine, changes may be made at any time without notification.

HOW TO ORDER SPARE PARTS

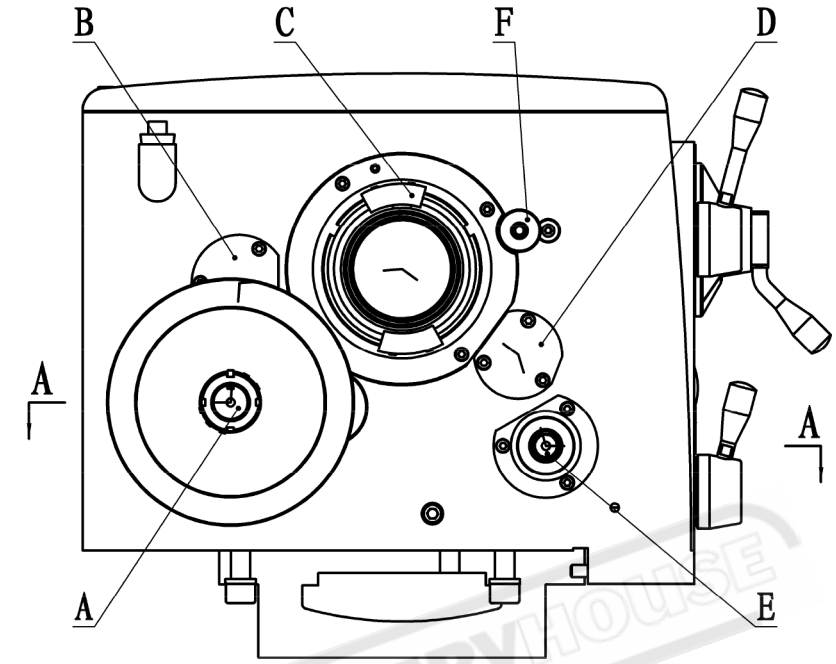
1. Have your machines model number, serial number & date of manufacture on hand, these can be found on the specification plate mounted on the machine
2. A scanned copy of your parts list/diagram with required spare part/s identified.

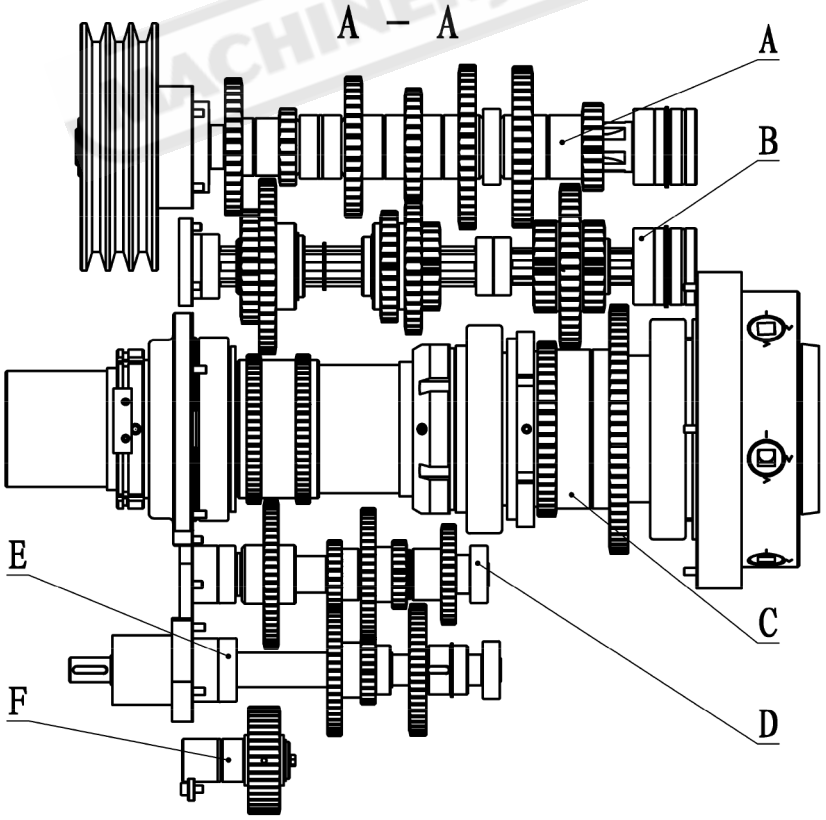
NOTE: SOME PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

3. Go to www.machineryhouse.com.au/contactus and fill out the inquiry form attaching a copy of scanned parts list.

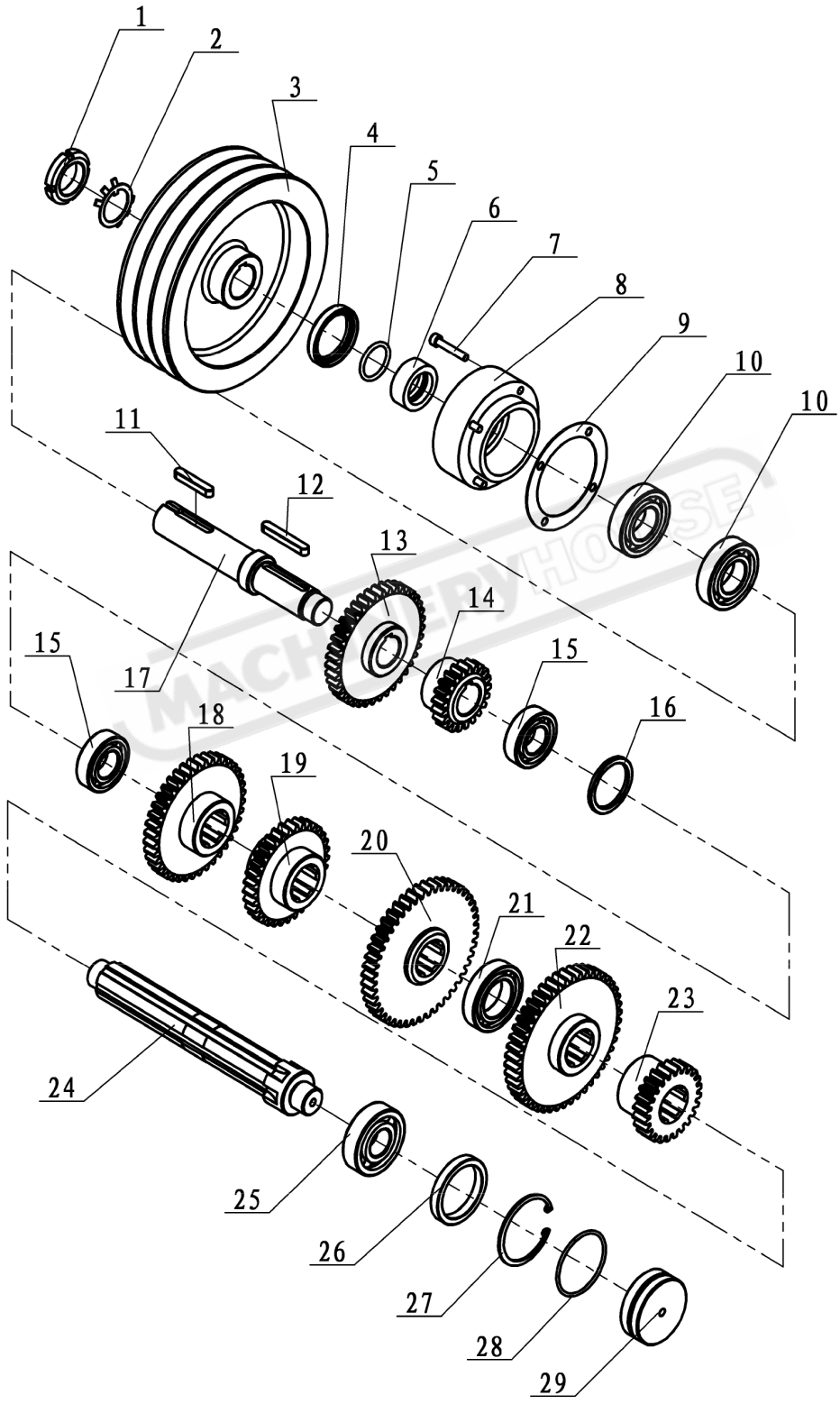
CONTENTS

HEADSTOCK SPARE PARTS DIAGRAM

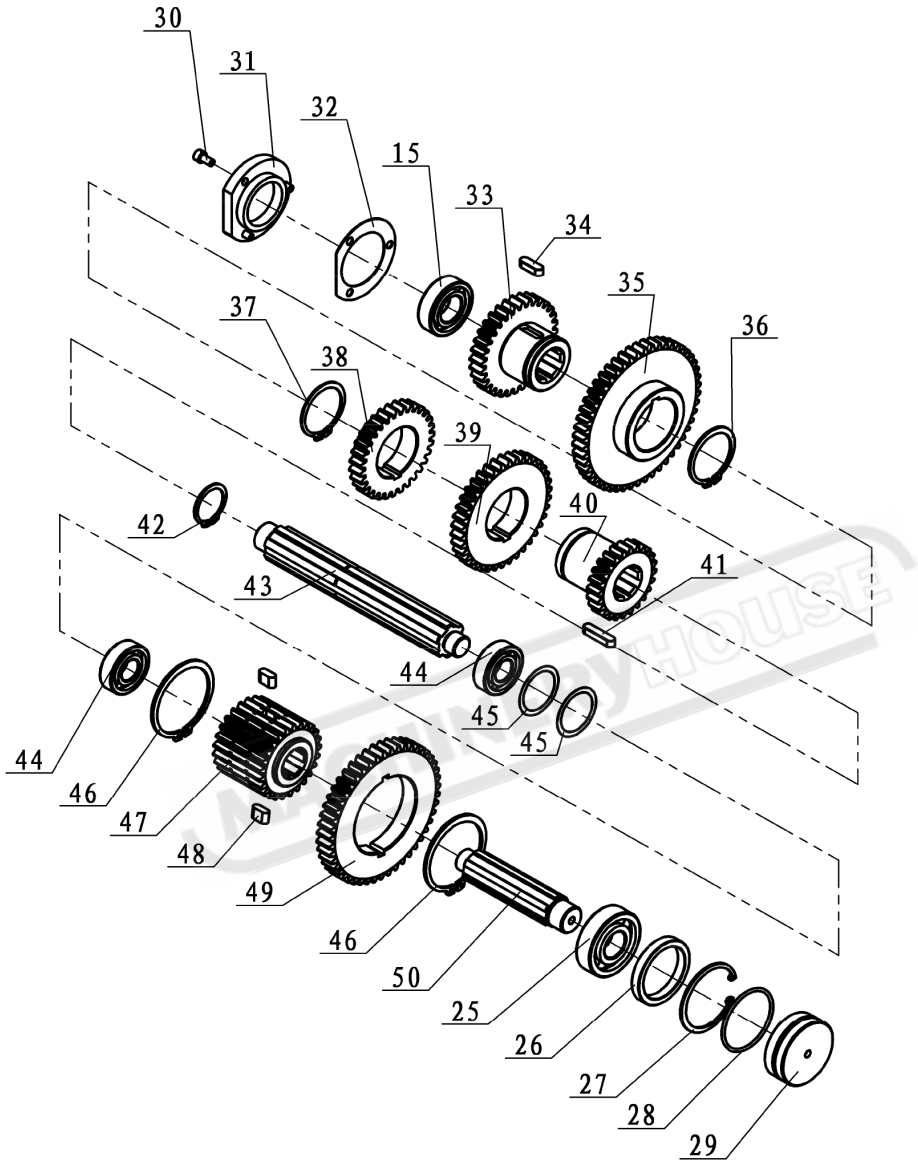




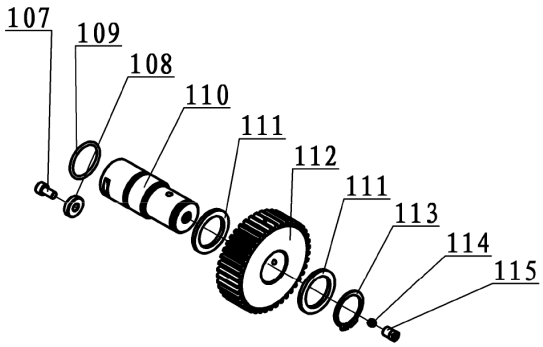
A - SHAFT DIAGRAM



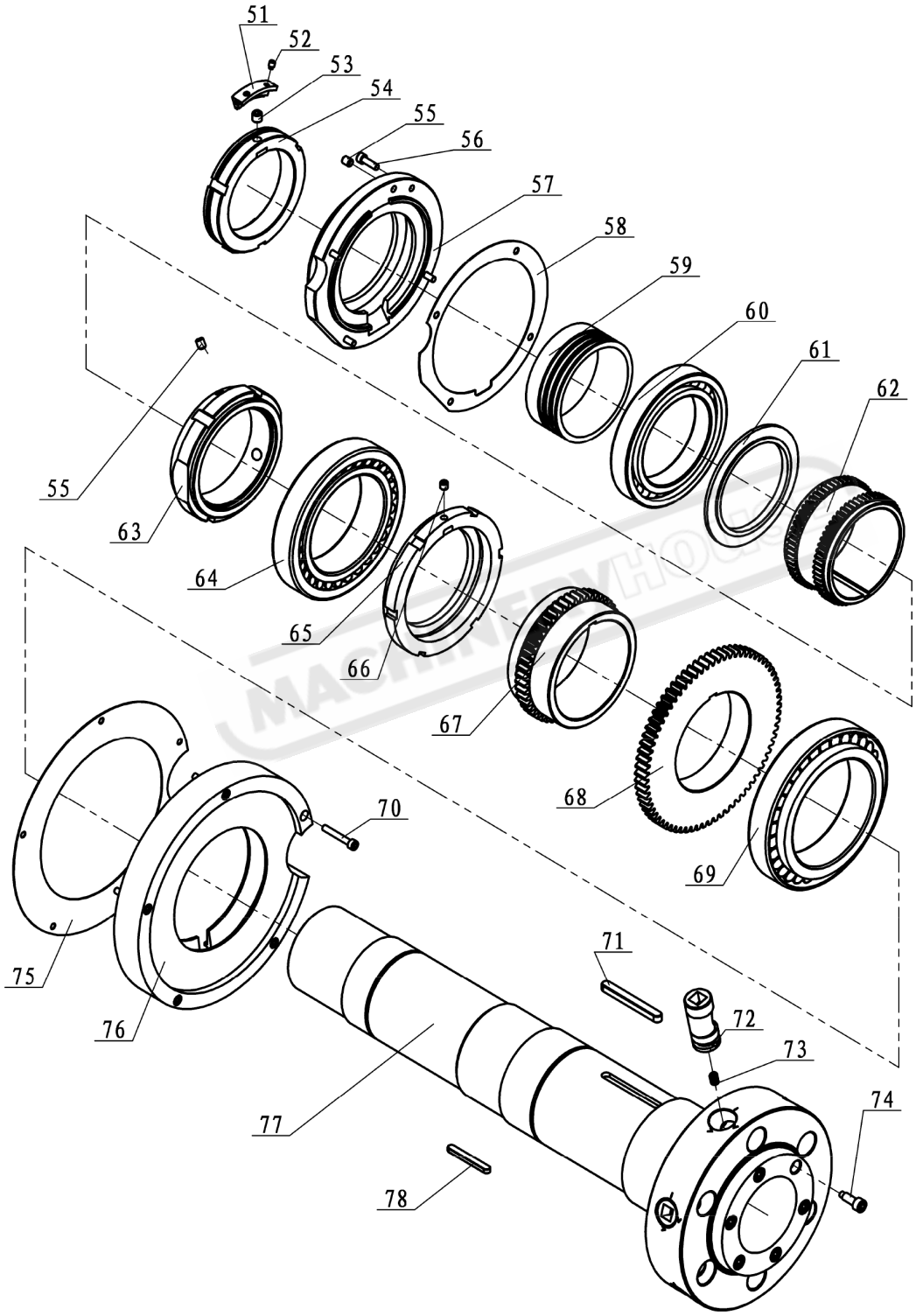
B - SHAFT DIAGRAM



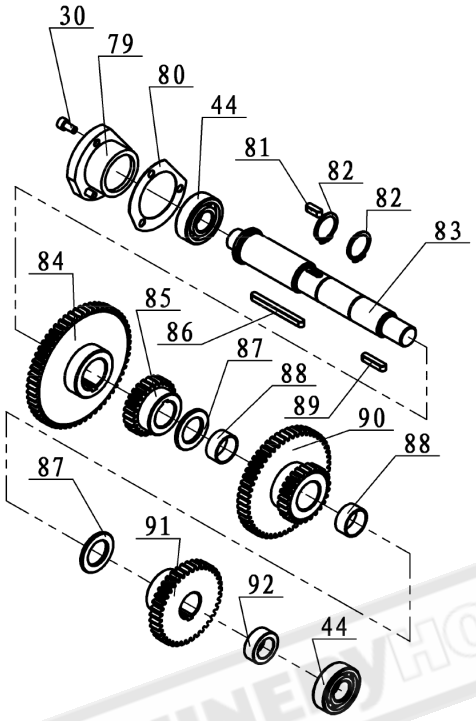
F - SHAFT DIAGRAM



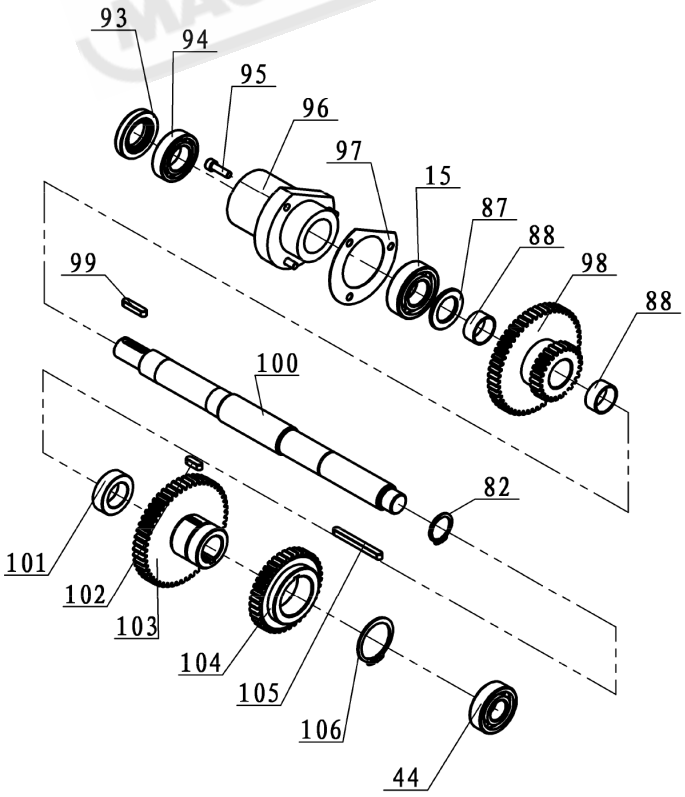
C - SHAFT DIAGRAM



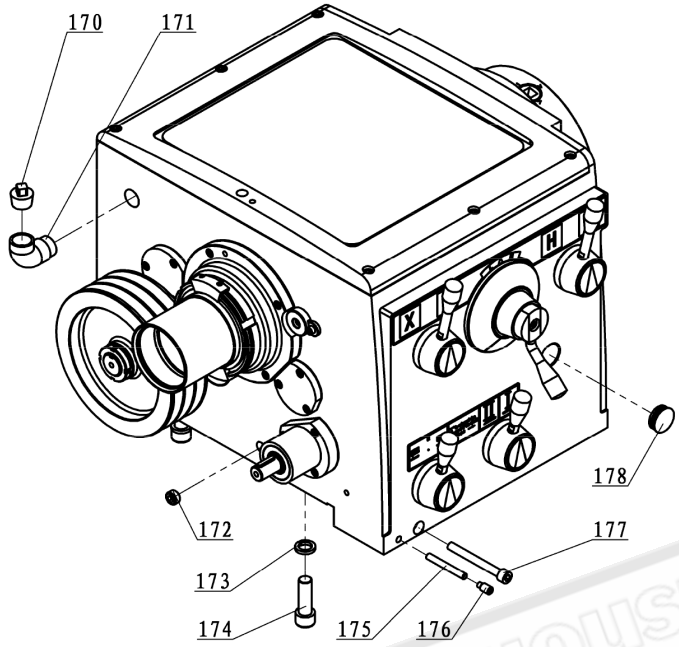
D - SHAFT DIAGRAM

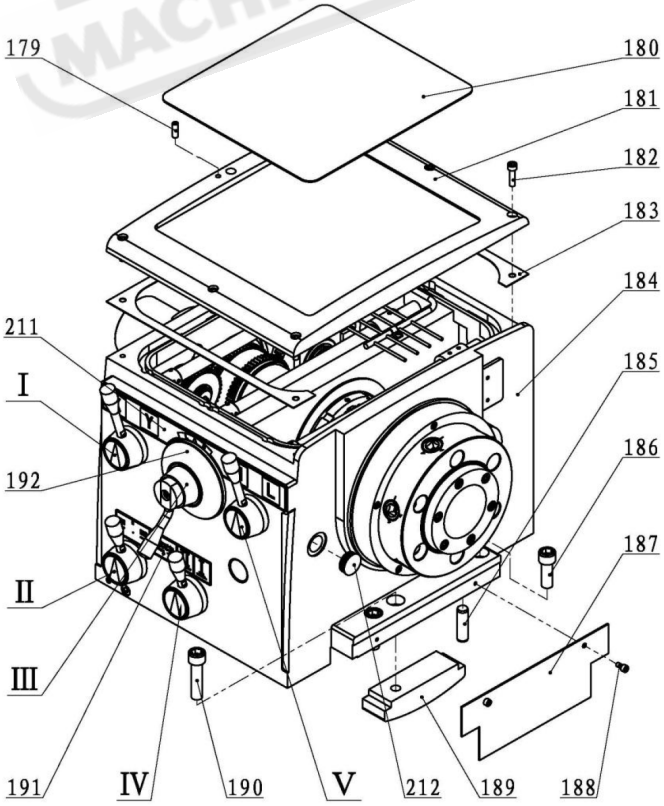


E - SHAFT DIAGRAM

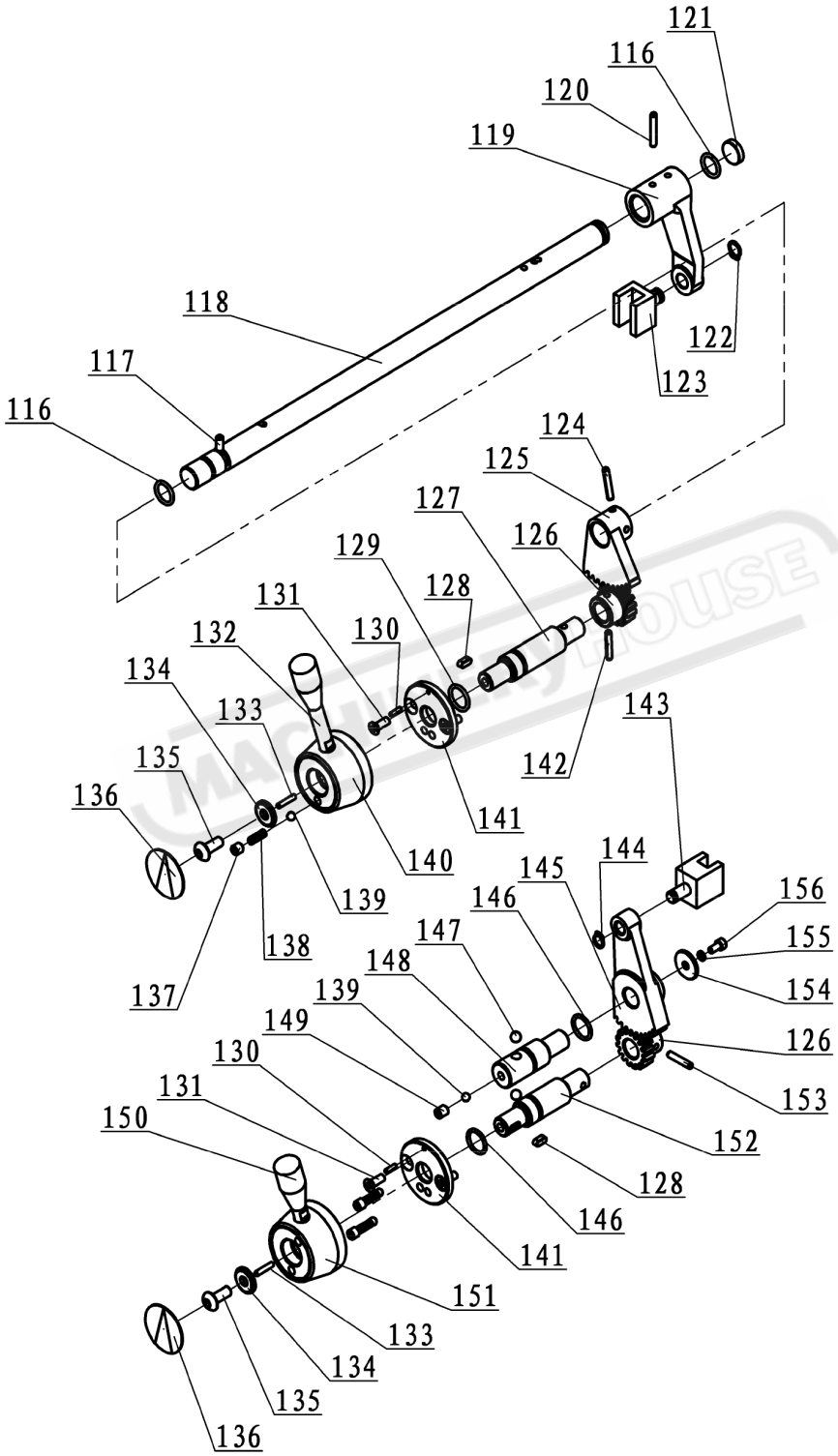


HEADSTOCK HARDWARE DIAGRAM

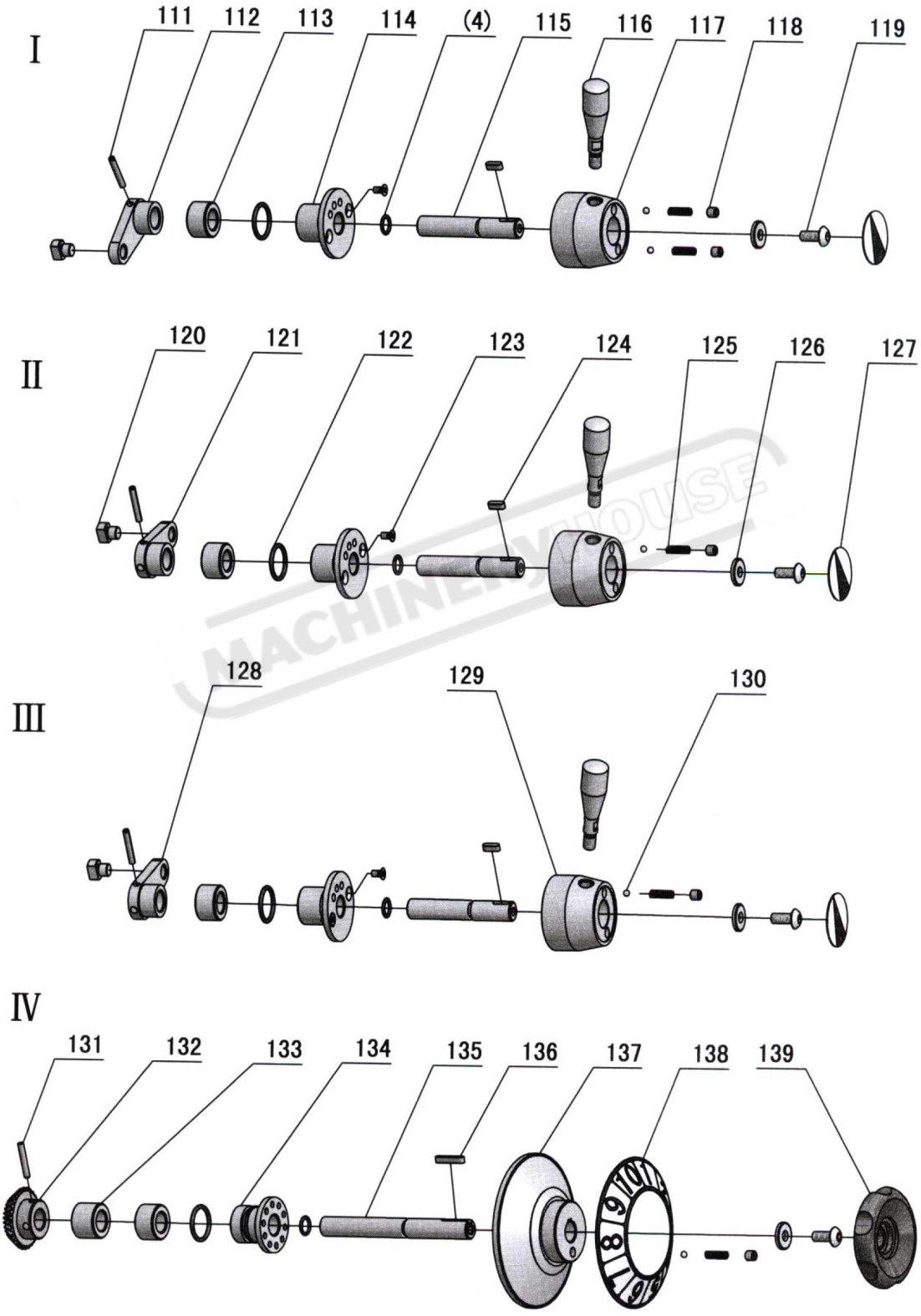




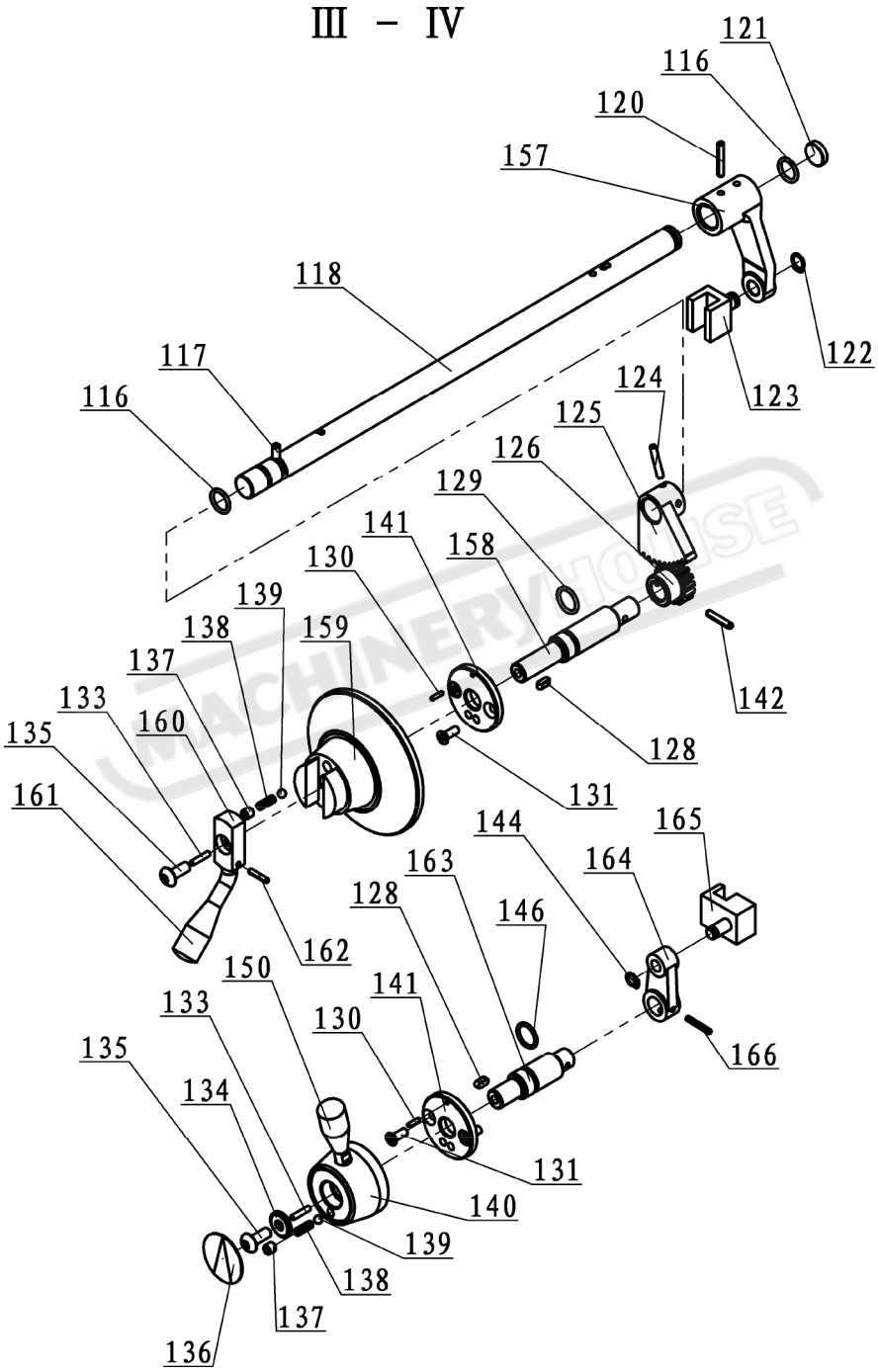
II CONTROL SHAFT DIAGRAM



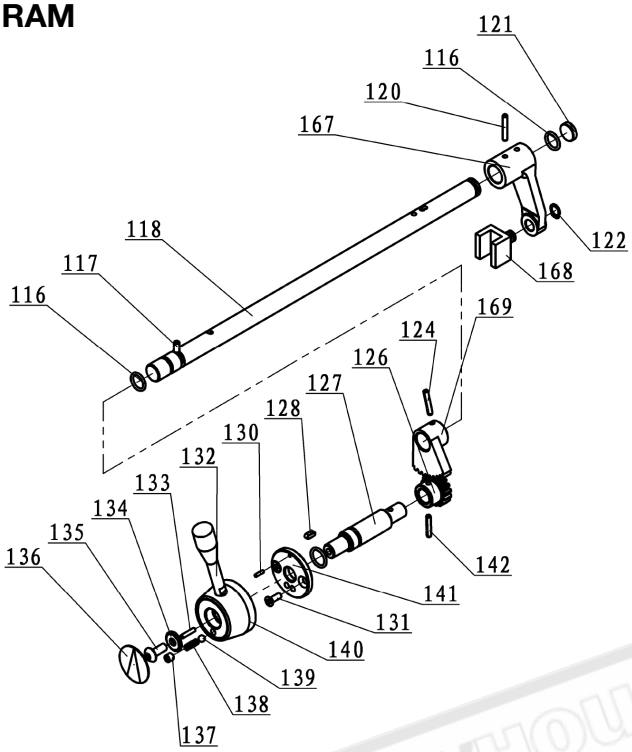
HEADSTOCK CONTROL SHAFTS



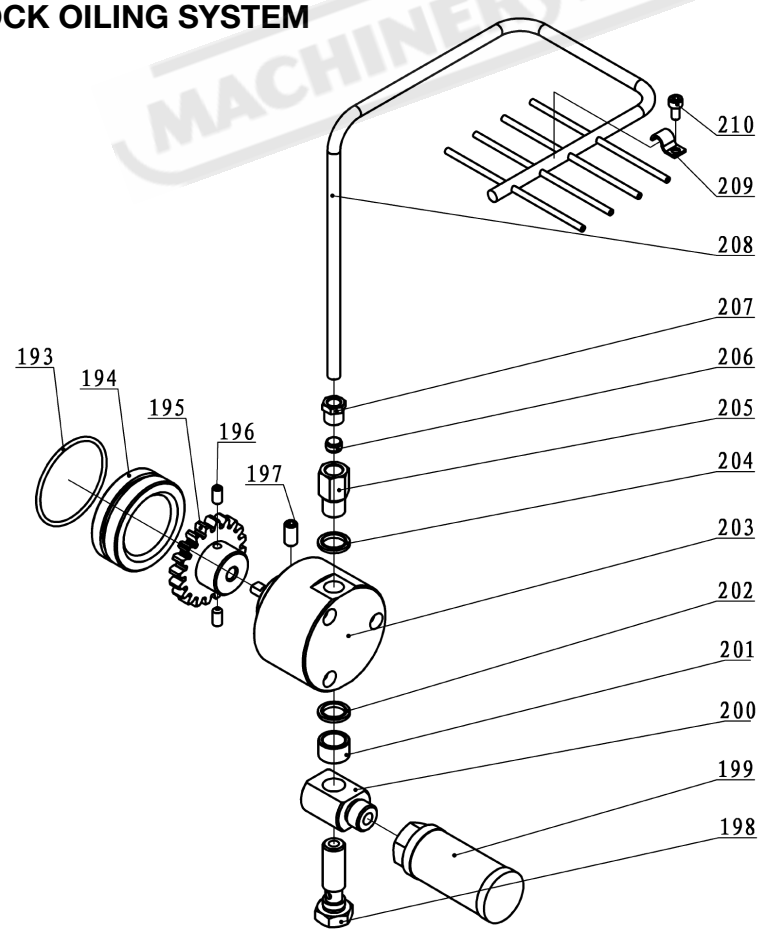
III - IV SHAFT DIAGRAMS



V - SHAFT DIAGRAM



HEADSTOCK OILING SYSTEM



HEADSTOCK SPARE PARTS LIST

No.	Part No.	Description	Specification	Qty
1	GB/T 812-1988	Nut	M30×1.5	1
2	GB 858-1988	Washer	30	1
3	CR6241-01-26	Pulley		1
4		Oil Seal	TC42×55×9	1
5	GB1235-76	O-Ring	36×3.5	1
6	CR6241-01-23	Spacer		1
7	GB/T70.1-2000	Screw	M6×35	4
8	CR6241-01-24	Bearing Cover		1
9	CR6241-01-25	Bealed Mat		1
10	GB/T276-1994	Ball Bearing	6206-2Z	2
11	GB1096-79	Key	8×45	1
12	GB1096-79	Key	B8×55	1
13	CR6246B-01-07	Gear		1
14	CR6246B-01-06	Gear		1
15	GB/T276-1994	Ball Bearing	6205-2Z	4
16	CR6241-01-20	Spacer		1
17	CR6241-01-19	Shaft		1
18	CR6246B-01-08	Gear		1
19	CR6246B-01-09	Gear		1
20	CR6246B-01-10	Gear		1
21	GB/T276-1994	Ball Bearing	6007-2Z	1
22	CR6246B-01-11	Gear		1
23	CR6246B-01-12	Gear		1
24	CR6241-01-27	Shaft		1
25	GB/T276-1994	Ball Bearing	6305-2Z	2
26	CR6251-01-43	Washer		2
27	GB893.1-86	Snap Ring	62	2
28	GB/T3452.1	O-Ring	56×2.65	3
29	CR6241-01-33	Plug		3
30	GB/T70-2000	Screw	M6×12	6
31	CR6241-01-46	Cover		1
32	CR6241-01-47	Sealed Mat		1
33	CR6246B-01-18	Gear		1
34	GB1096-79	Key	8×25	1
35	CR6246B-01-19	Gear		1
36	GB/T894.1-1986	Snap Ring	50	1
37	GB/T894.1-1986	Snap Ring	48	1
38	CR6246B-01-17	Gear		1
39	CR6246B-01-16	Gear		1
40	CR6246B-01-15	Gear		1
41	GB1096-79	Key	8×35	2
42	GB/T894.1-1986	Snap Ring	34	1
43	CR6241-01-40	Shaft		1
44	GB/T276-1994	Ball Bearing	6204-2Z	5
45	CR6241-01-39	Spacer		2
46	GB/T894.1-1986	Snap Ring	75	2
47	CR6246B-01-13	Gear		1
48	CR6241-01-37	Key		2
49	CR6246B-01-14	Gear		1
50	CR6241-01-35	Shaft		1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

HEADSTOCK SPARE PARTS LIST

No.	Part No.	Description	Specification	Qty
51	CR6251-01-82	Balance Piece		2
52	GB/T79-2000	Screw	M6×8	4
53	GB/T77-2000	Screw	M10×10	1
54	CR6251-01-05	Set Nut		1
55	GB 77-85	Screw	M8×8	3
56	GB70-86	Screw	M6×20	4
57	CR6246B-01-25	Rear Bearing Cover		1
58	CR6246B-01-26	Sealed Mat		1
59	CR6251-01-81	Cycle Oil Ring		1
60	GB/T276-1994	Ball Bearing	6020	1
61	CR6251-01-80	Oil Ring		1
62	CR6246B-01-24	Gear		1
63	CR6246B-01-27	Set Nut		1
64	GB/T297-1994	Taper Roller	32022/P5	1
65	CR6246B-01-23	Set Nut		1
66	GB 77-85	Screw	M8×8	1
67	CR6246B-01-22	Gear		1
68	CR6246B-01-21	Gear		1
69	GB/T297-1994	Taper Roller	32024/P5	1
70	GB/T70-2000	Screw	M6×40	5
71	GB1096-79	Key	10×85	1
72	CR6251-01-52	Cam Lock		6
73	CR6241-01-94	Spring		6
74	CR6251-01-53	Screw		6
75	CR6251-01-58	Sealed Mat		1
76	CR6251-01-57	Front Bearing Cover		1
77	CR6246B-01-20	Spindle		1
78	GB1567-79	Key	8×60	1
79	CR6241-01-68	Cover		1
80	CR6241-01-69	Sealed Mat		1
81	GB1096-79	Key	6×18	1
82	GB/T894.1-1986	Snap Ring	25	3
83	CR6246B-01-28	C Shaft		1
84	CR6246B-01-32	Gear		1
85	CR6246B-01-30	Gear		1
86	GB1096-79	Key	6×65	1
87	CR6241-01-16	Spacer		3
88	SF-1	Bearing	2512	4
89	GB1096-79	Key	6×28	1
90	CR6246B-01-49	Gear		1
91	CR6246B-01-31	Gear		1
92	CR6246B-01-29	Spacer		1
93		Oil Seal	TC25×47×8	1
94	GB/T276-1994	Ball Bearing	6005-2Z	1
95	GB/T70.1-2000	Screw	M6×20	3
96	CR6241-01-70	Bearing Flanged		1
97	CR6241-01-71	Sealed Mat		1
98	CR6246B-01-40	Gear		1
99	GB1096-79	Key	6×28	1
100	CR6246B-01-33	D Shaft		1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

HEADSTOCK SPARE PARTS LIST

No.	Part No.	Description	Specification	Qty
101	CR6246B-01-41	Spacer		1
102	GB1096-79	Key	6×18	1
103	CR6246B-01-35	Gear		1
104	CR6246B-01-34	Gear		1
105	GB1096-79	Key	6×60	1
106	GB/T894.1-1986	Snap Ring	40	1
107	GB/T70.1-2000	Screw	M6×12	1
108	CR6241-01-65	Washer		1
109	GB1235-76	O-Ring	35×3.1	1
110	CR6241-01-62	Shaft		1
111	CR6241-01-63	Spacer		2
112	CR6241-01-64	Gear		1
113	GB/T894.1-1986	Snap Ring	30	1
114		Bipyramid	B1061C	1
115		Connection	15326C	1
116	GB1235-76	O-Ring	20×2.4	6
117	GB/T79-2000	Screw	M6×16	3
118	CR6246B-01-36	Shaft		3
119	CR6246B-01-44	Lever		1
120	GB879-86	Spring Pin	5×30	3
121	CR6241-01-95	Plug		3
122	GB/T894.1-1986	Snap Ring	12	3
123	CR6246B-01-37	Fork		2
124	GB879-86	Spring Pin	5×26	3
125	CR6246B-01-45	Gear		2
126	CR6241-01-76	Gear		4
127	CR6241-01-80	Shaft		2
128	GB1096-79	Key	5×12	5
129	GB1235-76	O-Ring	22×2.4	3
130	GB879-86	Spring Pin	3×12	5
131	GB819-85	Screw	M6X16	10
132	CR6241-01-86	Lever		2
133	GB/T80-2000	Screw	M4×20	5
134	CR6241-01-84	Washer		4
135	CR6241-01-97	Screw		5
136	CR6241-01-100	Plate		4
137	GB/T77-2000	Screw	M8×8	6
138	CR6241-01-82	Spring	??	6
139	GB308-84	Steel Ball	1/4”	7
140	CR6241-01-85	Lever Head		3
141	CR6241-01-83	Fix Black		5
142	GB879-86	Spring Pin	5×26	3
143	CR6241-01-12	Fork		1
144	GB/T894.1-1986	Snap Ring	10	2
145	CR6246B-01-46	Lever		1
146	GB1235-76	O-Ring	22×2.4	3
147	GB308-84	Steel Ball	8	2
148	CR6246B-01-48	Shaft		1
149	GB/T80-2000	Screw	M8×10	1
150	CR6241-02-62	Lever		2

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

HEADSTOCK SPARE PARTS LIST

No.	Part No.	Description	Specification	Qty
151	CR6241-01-91	Handle		1
152	CR6246B-01-43	Shaft		1
153	GB879-86	Spring Pin	5×26	1
154	CR6246B-01-50	Washer		1
155	GB/T93-1987	Washer	5	1
156	GB70-85	Screw	M5×10	1
157	CR6246B-01-47	Lever		1
158	CR6241-01-81	Shaft		1
159	CR6241-01-88	Handel		1
160	CR6241-01-89	Fix Bracket		1
161	CR6241-01-90	Lever		1
162	GB879-86	Spring Pin	4×20	1
163	CR6246B-01-42	Shaft		1
164	CR6241-01-11	Lever		1
165	CR6246B-01-39	Fork		1
166	GB879-86	Spring Pin	4×26	1
167	CR6251-01-27	Lever		1
168	CR6246B-01-38	Fork		1
169	CR6251-01-15	Gear		1
170	SB4032-65	Plug	20	1
171	SB4010-65	Tube Fitting	20	1
172	G38-3A	Oil Plug	Z3/8	1
173	GB/T93-1987	Washer	16	2
174	GB/T70-2000	Screw	M16×50	2
175	GB119-86	Pin	8×65	1
176	GB/T79-2000	Screw	M10×20	1
177	GB/T70-2000	Screw	M10×90	1
178	GB1160.2	Oil Sight Glass	A20	1
179	GB/T77-2000	Screw	M8×25	1
180	CR6246B-01-05	Cover Dress		1
181	CR6246B-01-02	Headstock Cover		1
182	GB/T70-2000	Screw	M8×30	5
182	GB/T70-2000	Screw	M8×35	2
183	CR6246B-01-03	Sealed Mat		1
184	CR6251L-01-01	Headstock Casting		1
185	GB/T120.1-2000	Pin	16×55	1
186	GB/T70-2000	Screw	M16×45	2
187	CR6241A-01-02	Apron		1
188	GB/T70-2000	Screw	M6×12	2
189	CR6241A-01-03	Clamp		1
190	GB/T70-2000	Screw	M16×65	1
191	CR6246B-01-51	Plate		1
192	CR6246B-01-04	Plate		1
193	GB3452.1-82	O-Ring	56×2.65	1
194	CR6241-01-33	Plug		1
195	CR6251-01-91	Gear		1
196	GB/T80-2000	Screw	M6×12	2
197	GB/T80-2000	Screw	M8×16	1
198	CR6251-01-96	Connection	M14	1
199	WU-16-180-J	Fuel Filter	WU-16-180-J	1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

HEADSTOCK SPARE PARTS LIST

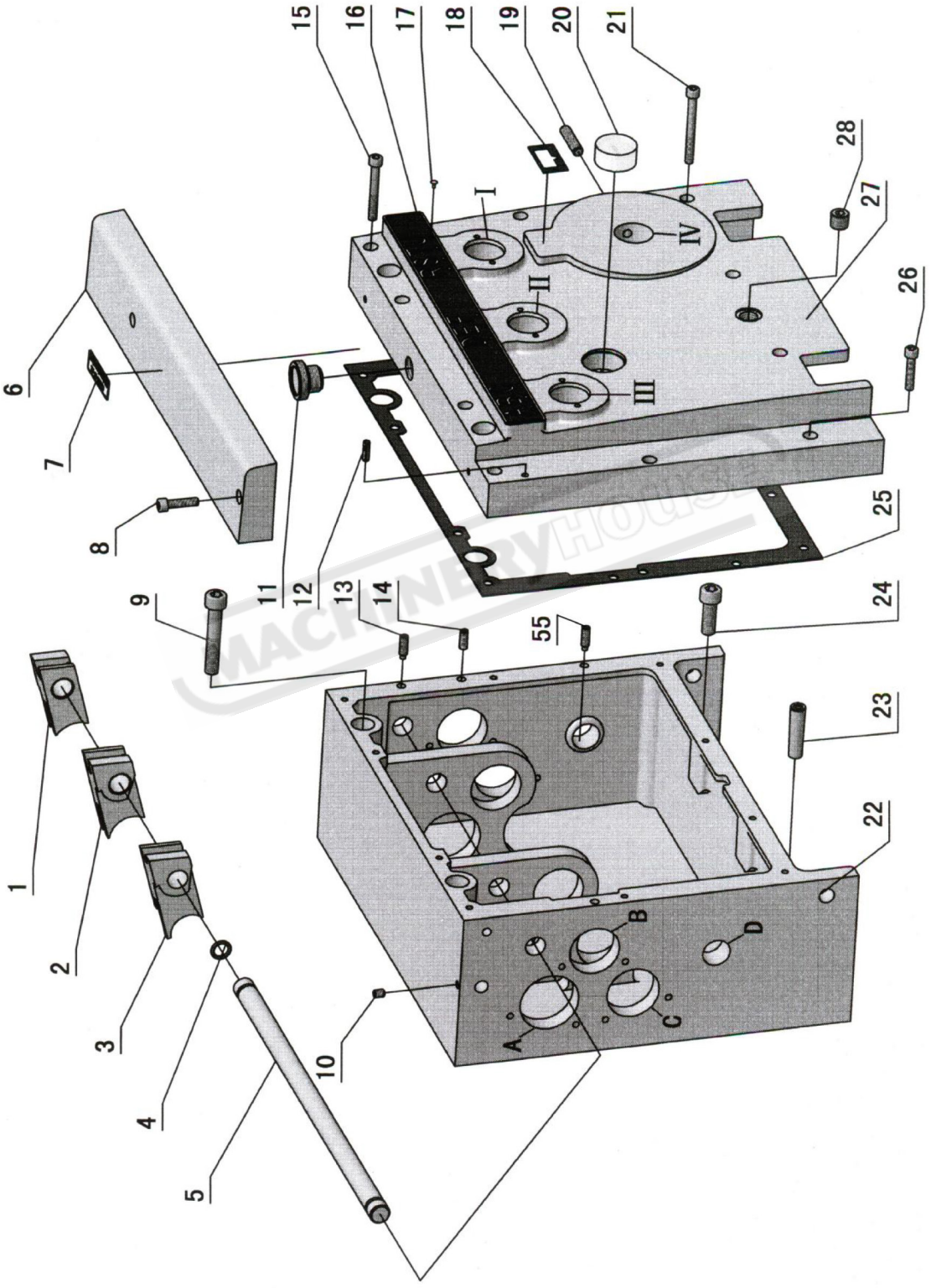
No.	Part No.	Description	Specification	Qty
200	CR6251-01-95	Connection	M18	1
201	CR6251-01-94	Spacer		1
202	G52-2	Sealing Washer	14	1
203	SNBY2.5-0.5	Pump	SNBY2.5-0.5	1
204	G52-2	Sealing Washer	14	1
205	CR6251-01-93	Connection		1
206	B145C	Bipyramid	B145C	1
207	25567	Connection	25567	1
208	CR6251-01-08	Oil Pipe		1
209		Pipe Clip	25594-1	1
210	GB/T70.1-2000	Screw	M5×10	1
211	CR6241-01-98	Plate		1
212		Oil Sight Glass	M27x1.5	1

WARNING

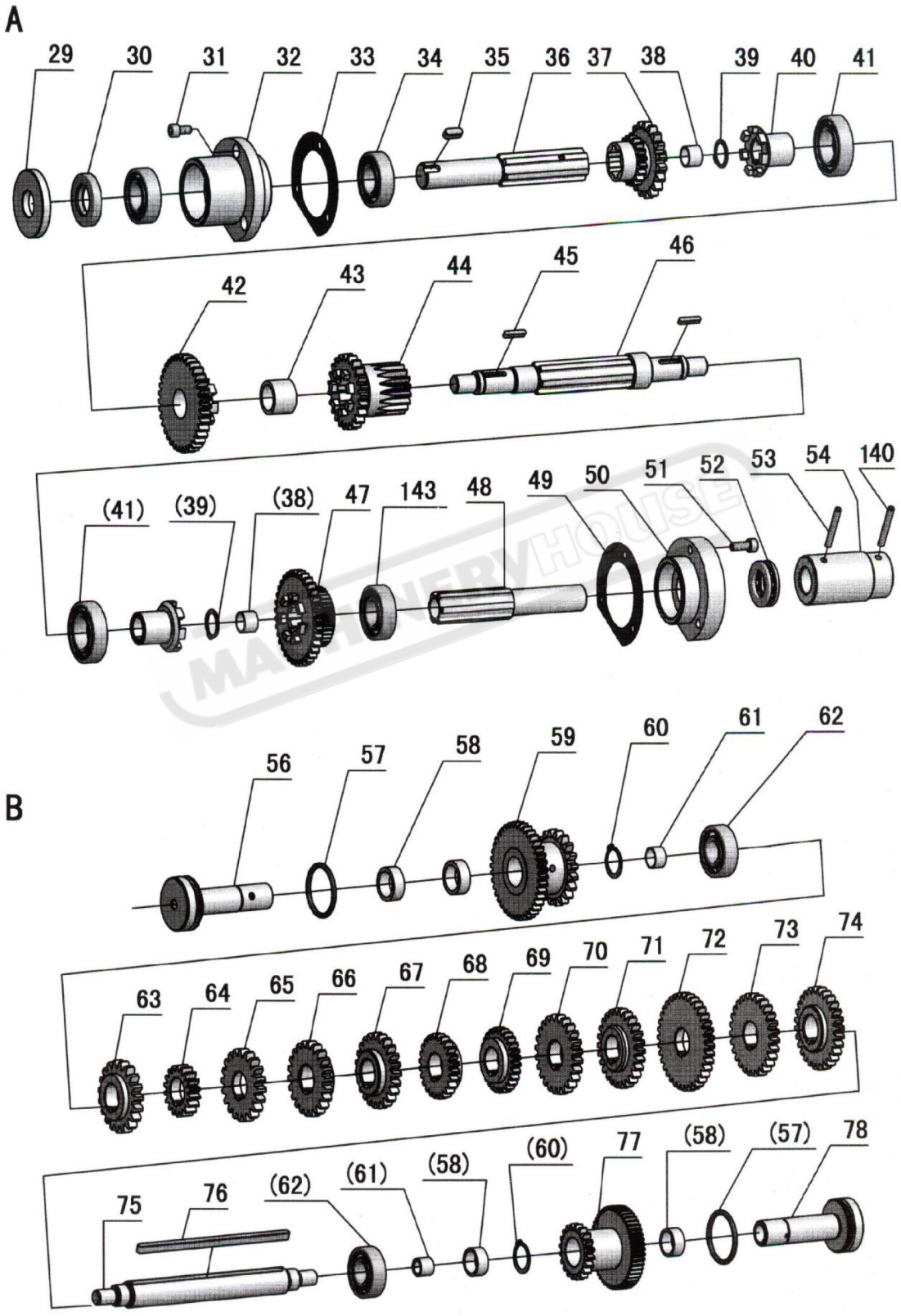
Disconnect all power from the machine before servicing. There may be multiple power sources present. Remove the plug from the power point or remove the fuse if hardwired. Failure to do may cause death or injury.

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

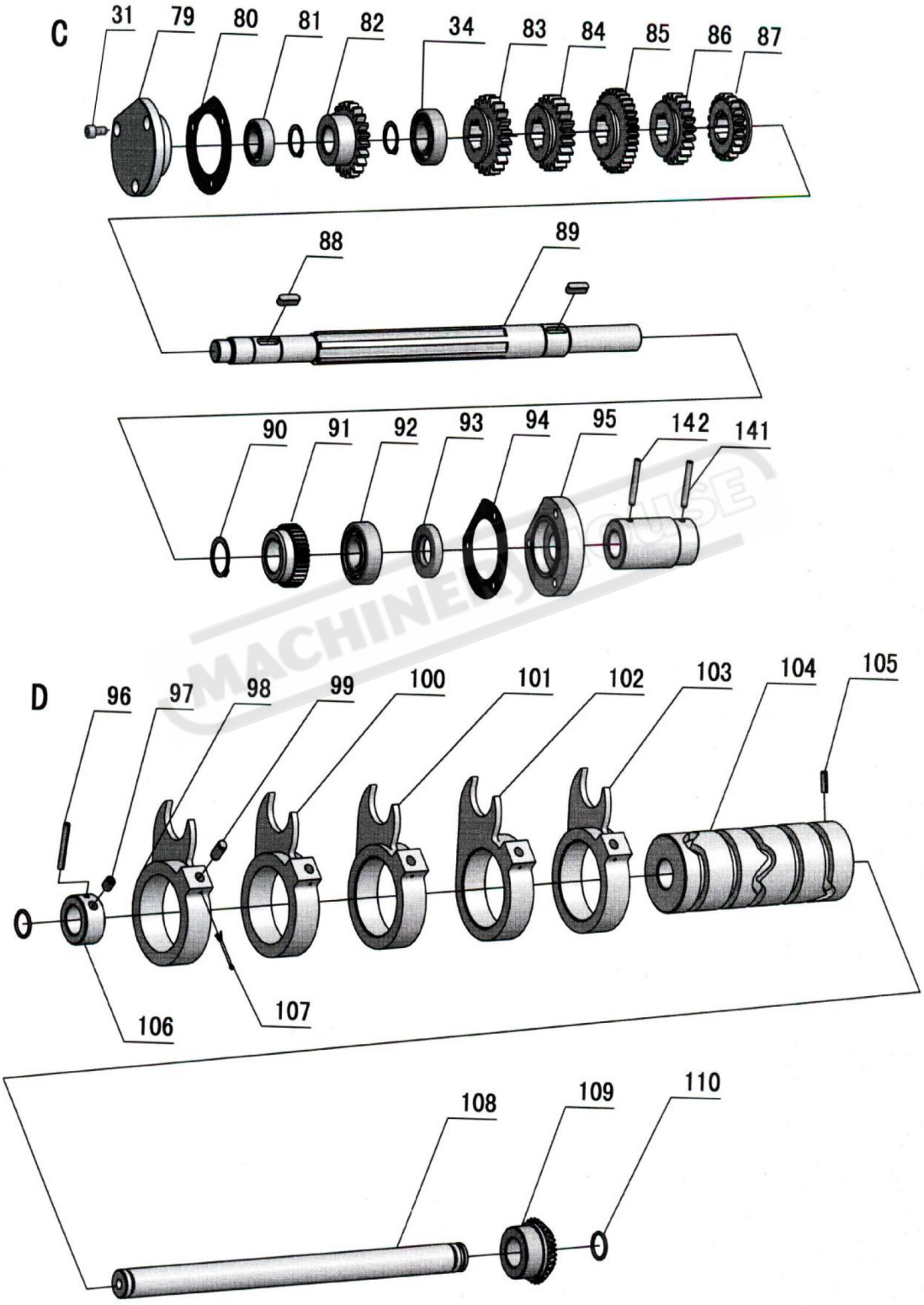
GEARBOX DIAGRAMS



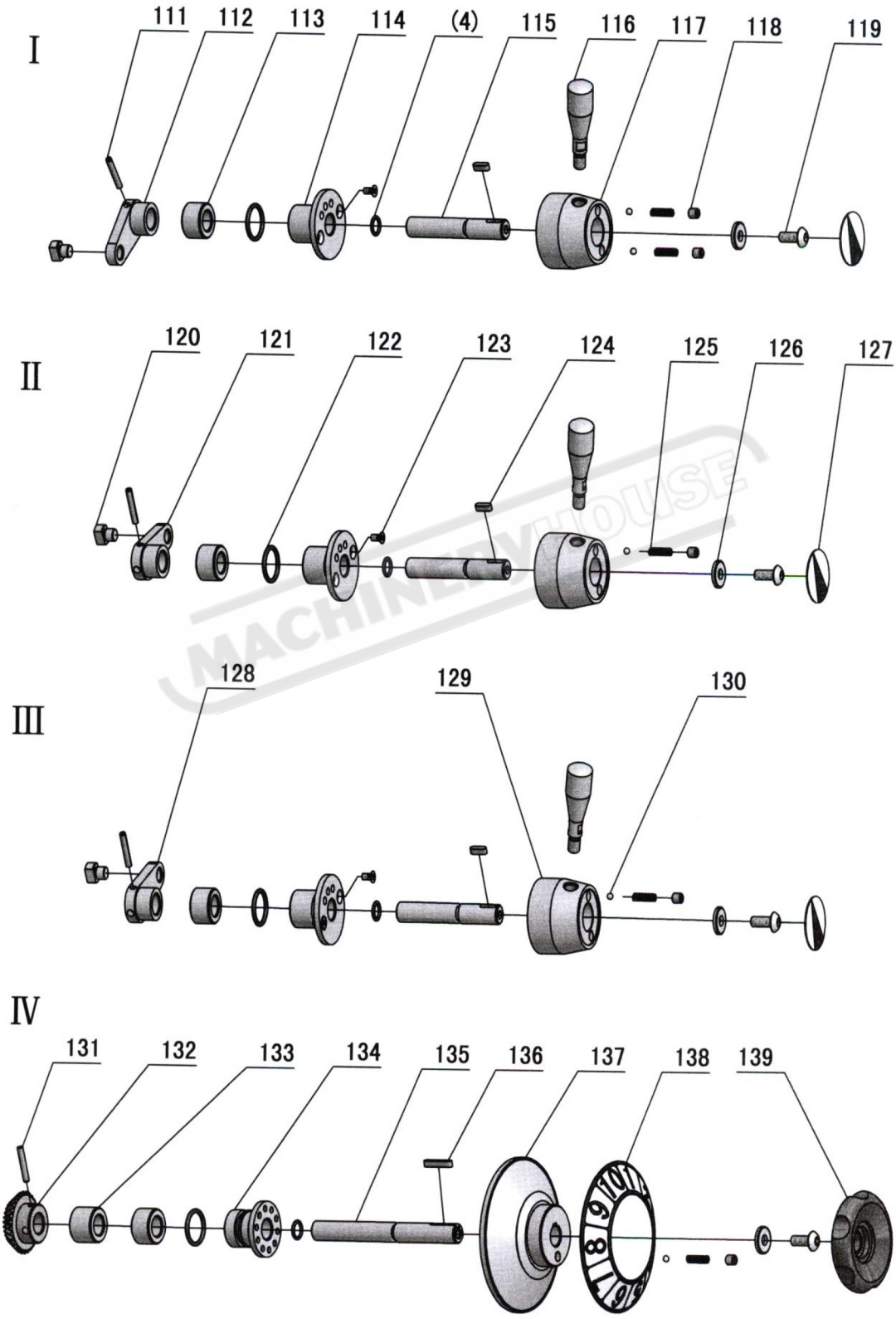
GEARBOX A & B SHAFT DIAGRAMS



GEARBOX C & D SHAFT DIAGRAMS



GEARBOX I - IV SHAFT DIAGRAMS



GEARBOX SPARE PARTS LIST

No.	Part No.	Description	Specification	Qty
1	CR6241-02-10	Fork		1
2	CR6241-02-71	Fork		1
3	CR6241-02-72	Fork		1
4	GB1235-76	O-Ring	16×2.4	6
5	CR6241-02-78	Shaft		1
6	CR6246B-02-01	Top Cover		1
7	CR6241-01-102	Plate		1
8	GB70-85	Screw	M6×28	2
9	GB70-85	Screw	M10×45	2
10	GB78-85	Screw	M6×8	1
11	CR6241-03-42	Oil Cover		1
	CR6241-03-43	Plate		1
12	GB879-86	Spring Pin	5×16	2
13	GB78-85	Socket Set Screw	M6×16	1
14	GB78-85	Screw	M6×16	2
15	GB70-85	Screw	M6×50	4
16	CR6251T-02-06	Plate		1
17	GB827-86	Rivet	2×5	14
18	CR6241-02-80	Plate		1
19	GB78-85	Screw	M8×35	1
20	GB1160.2-89	Oil Sight Glass	A20	1
21	GB70-85	Screw	M6×60	3
22	CR6251T-02-04	Gear Box		1
23	GB118-86	Taper Pin	8×50	2
24	GB70-85	Screw	M10×45	2
25	CR6251T-02-05	Sealed Mat		1
26	GB70-85	Screw	M6×30	3
27	CR6241A-02-01	Front Cover		1
28	G38-3A	Oil Plug	Z 3/8”	1
29	CR6241-02-60	Spacer		1
30		Oil-Seal	TC20×42×8	1
31	GB70-85	Socket Head Cap Screw	M6×12	6
32	CR6241-02-58	Cap		1
33	CR6241-02-59	Sealed Mat		1
34	GB278-89	Ball Bearing	80104	3
35	GB1096-79	Key	6×10	1
36	CR6241-02-57	B-Shaft		1
37	CR6241-02-56	Gear		1
38	SF-1	Ball Bearing	1410	2
39	GB894.1-86	Snap Ring	18	2
40	CR6241-02-55	Clutch		2
41	GB278-89	Ball Bearing	80105	2
42	CR6241-02-54	Gear		1
43	SF-1	Ball Bearing	2020	1
44	CR6241-02-53	Gear		1
45	GB1096-79	Key	4×20	2
46	CR6241-02-52	A-Shaft		1
47	CR6241-02-06	Gear		1
48	CR6241-02-51	C-Shaft		1
49	CR6241-02-50	Sealed Mat		1
50	CR6241-02-49	Cap		1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

GEARBOX SPARE PARTS LIST Cont.

No.	Part No.	Description	Specification	Qty
51	GB70-85	Socket Cap Screw	M6×20	6
52	GB301-84	Thrust Bearing	8104	1
53	GB879-86	Spring Pin	5×35	1
54	CR6241-02-21	Collar-Linkage		2
55	GB79-85	Socket Set Screw	M6×20	1
56	CR6241-02-33	E-Shaft		1
57	GB3452.1-82	O-Ring	35.5×3.55	2
58	SF-1	Ball Bearing	2012	4
59	CR6241-02-34	Gear		1
60	GB894.1-86	Snap Ring	20	4
61	SF-1	Ball Bearing	1218	2
62	GB278-89	Ball Bearing	80203	2
63	CR6241-02-36	Gear		1
64	CR6241-02-37	Gear		1
65	CR6241-02-38	Gear		1
66	CR6241-02-39	Gear		1
67	CR6241-02-40	Gear		1
68	CR6241-02-41	Gear		1
69	CR6241-02-42	Gear		1
70	CR6241-02-43	Gear		1
71	CR6241-02-44	Gear		1
72	CR6241-02-45	Gear		1
73	CR6241-02-46	Gear		1
74	CR6241-02-47	Gear		1
75	CR6241-02-35	D-Shaft		1
76	GB1096-79	Key	6×146	1
77	CR6241-02-05	Gear		1
78	CR6241-02-48	F-Shaft		1
79	CR6241-02-31	Cap		1
80	CR6241-02-32	Sealed Mat		1
81	GB278-89	Ball Bearing	80103	1
82	CR6241-02-29	Gear		1
83	CR6241-02-28	Gear		1
84	CR6241-02-27	Gear		1
85	CR6241-02-26	Gear		1
86	CR6241-02-25	Gear		1
87	CR6241-02-24	Gear		1
88	GB1096-79	Key	6×20	2
89	CR6241-02-30	G-Shaft		1
90	GB894.1-86	Snap Ring	25	1
91	CR6241-02-04	Gear		1
92	GB279-88	Ball Bearing	180204	1
93		Oil Seal	TC20×40×7	1
94	CR6241-02-23	Sealed Mat		1
95	CR6241-02-22	Cap-Right		1
96	GB879-86	Spring Pin	5×35	1
97	GB78-85	Socket Set Screw	M8×10	1
98	CR6241-02-17	Claw-Shifter		1
99	GB119-86	Pin	B8×16	5
100	CR6241-02-16	Claw-Shifter		1

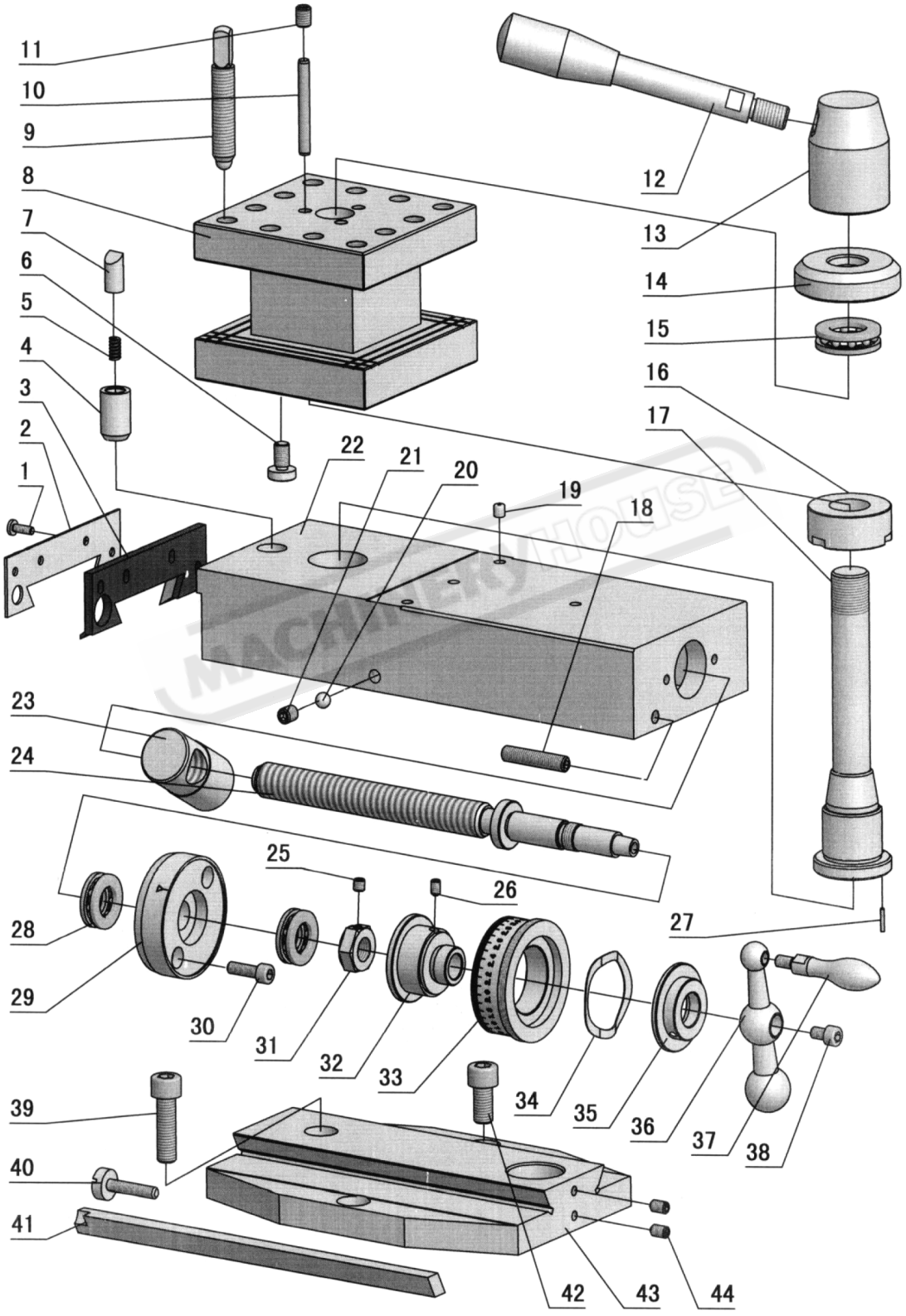
NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

GEARBOX SPARE PARTS LIST Cont.

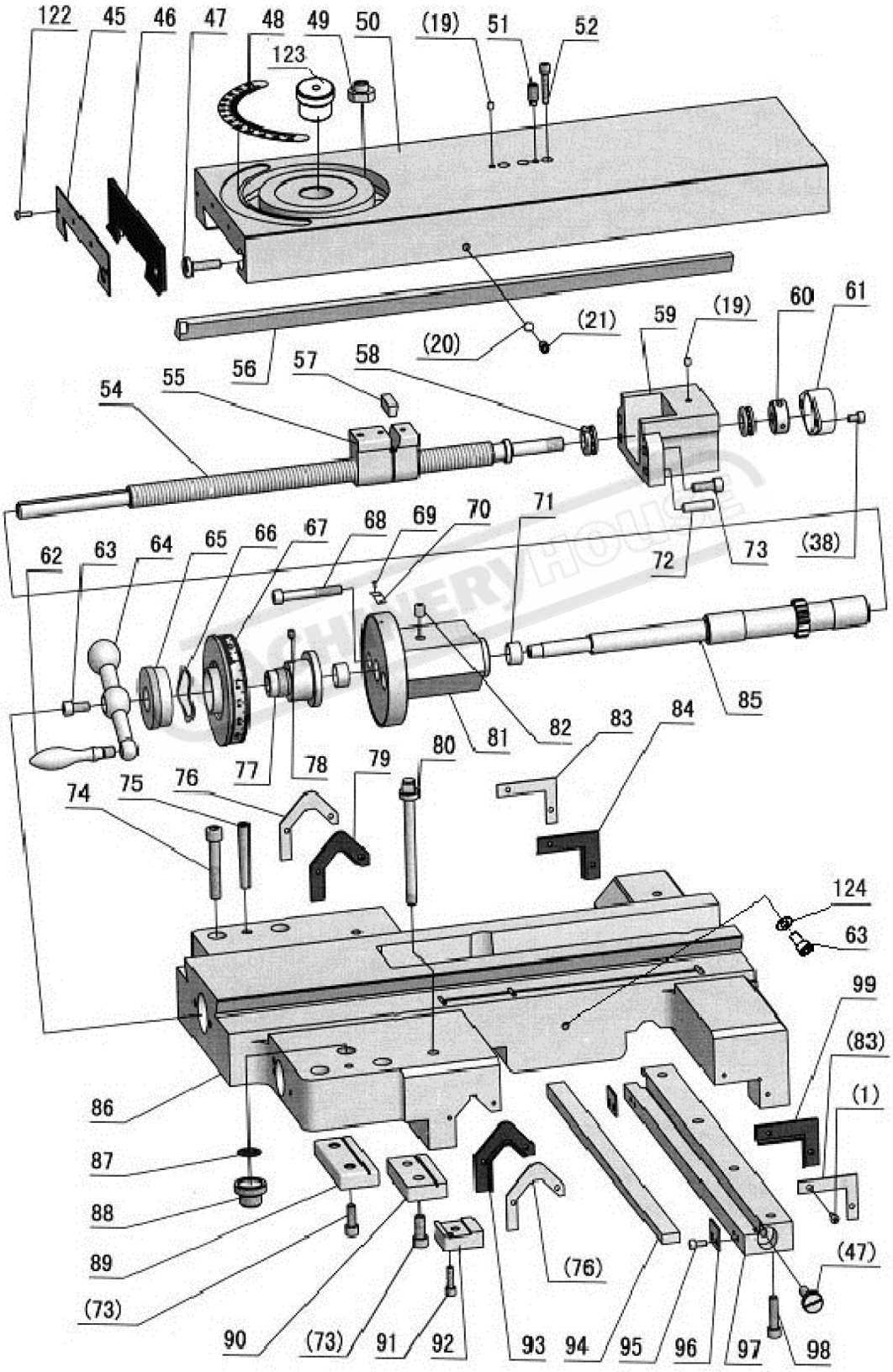
No.	Part No.	Description	Specification	Qty
101	CR6241-02-15	Claw-Shifter		1
102	CR6241-02-14	Claw-Shifter		1
103	CR6241-02-13	Claw-Shifter		1
104	CR6241-02-18	Cam		1
105	GB879-86	Spring Pin	5×16	2
106	CR6241-02-19	Fixed Ring		1
107	GB91-86	Split Pin	2×30	5
108	CR6241-02-20	Cam Shaft		1
109	CR6241-02-12	Bevel Gear		1
110	GB1235-76	O-Ring	22×2.4	2
111	GB879-86	Spring Pin	5×30	3
112	CR6241-02-68	Arm		1
113	CR6241-02-09	Spacer		4
114	CR6241-02-76	Detent Plate		3
115	CR6241-02-11	Shaft		3
116	CR6241-02-62	Lever		3
117	CR6241-02-77	Speed Change Handle		1
118	GB77-85	Screw	M8×8	5
119	CR6241-01-97	Screw		4
120	CR6241-02-74	Fork		3
121	CR6241-02-69	Arm		1
122	GB1235-76	O-Ring	30×3.1	4
123	GB819-85	Screw	M5×10	6
124	GB1096-79	Key	5×14	3
125	CR6241-01-82	Spring		5
126	CR6241-01-84	Washer		4
127	CR6241-01-100	Plate		3
128	CR6241-02-70	Arm		1
129	CR6241-02-67	Speed Change Handle		2
130	GB308-77	Steel Ball	1/4”	5
131	GB879-76	Spring Pin	5×30	1
132	CR6241-02-63	Bevel Gear		1
133	CR6241-02-65	Spacer		1
134	CR6241-02-64	Shaft Sleeve		1
135	CR6241-02-07	Shaft		1
136	GB1096-79	Key	5×28	1
137	CR6241-02-66	Selecting Dial		1
138	CR6241-02-81	Plate		1
139	CR6241-02-61	Wheel		1
140	CR6241-06-63	Pin		1
141	CR6241-06-63	Pin		1
142	GB879-86	Spring Pin	5×35	1
143	GB279-88	Ball Bearing	180104	1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

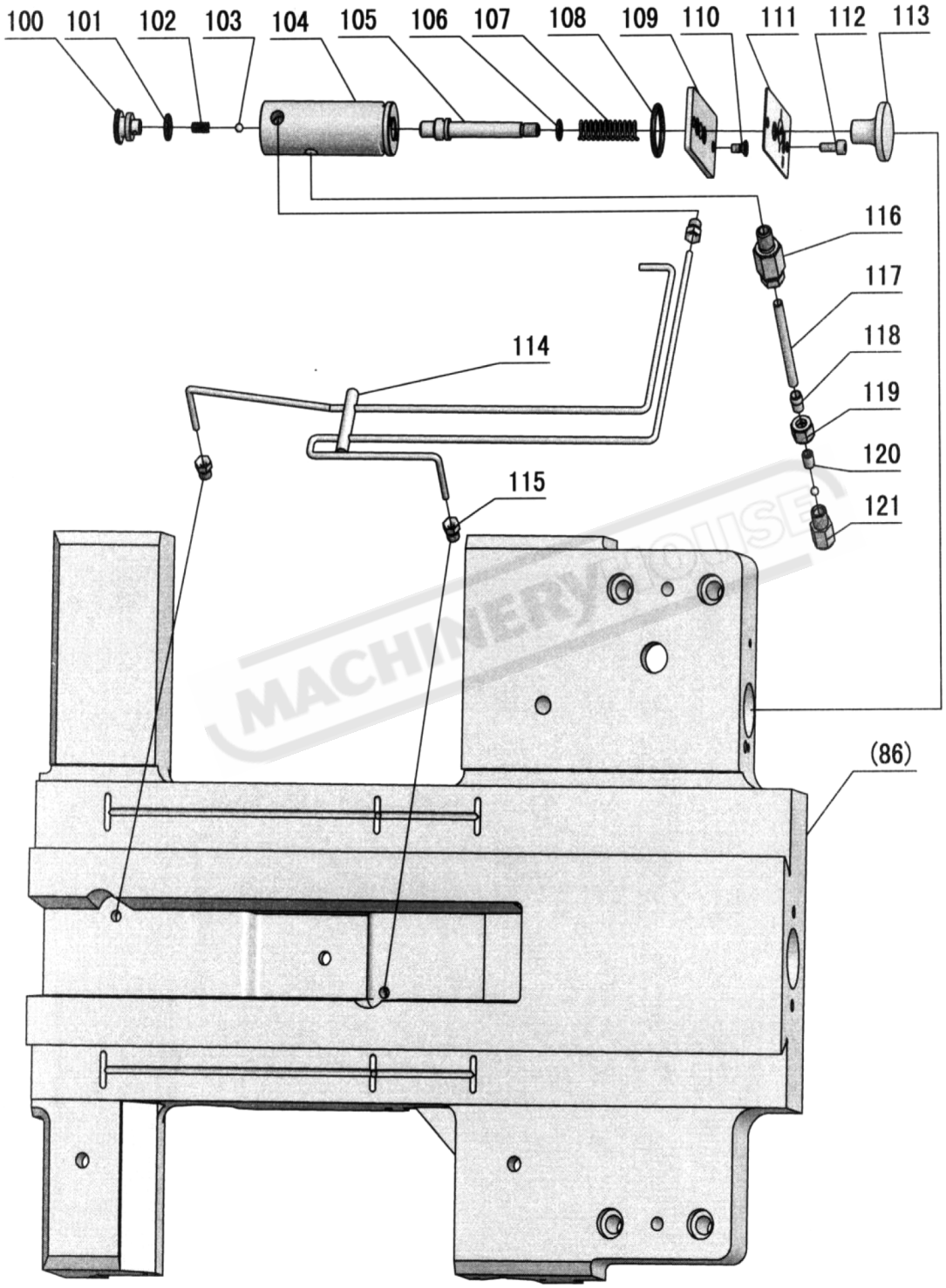
SADDLE PARTS DIAGRAMS



SADDLE PARTS DIAGRAMS Cont.



SADDLE PARTS DIAGRAMS Cont.



SADDLE SPARE PARTS LIST

No.	Part No.	Description	Specification	Qty
1	GB818-85	Screw	M4×12	12
2	CR6241-03-28	Case-Wiper		1
3	CR6241-03-27	Wiper		1
4	CR6241-03-57	Sleeve		1
5	GB2089-80	Spring	1×5×18	1
6	CR6241-03-60	Adjust Screw (Flat Type)		3
7	CR6241-03-58	Round Pin		1
8	CR6241-03-26	Four Way Tool Post (Flat Type)		1
8	CR6241-03-77	Four Way Tool Post (T Type)		1
8	CR6241-03-78	Block-Tee (T Type)		1
9	GB83-88	Screw	M12×55	12
10	GB119-86	Pin (Flat Type)	D6×50	3
11	GB77-85	Screw (Flat Type)	M8×10	3
12	CR6241-03-63	Clamping Handle		1
13	CR6241-03-62	Clamping Handle		1
14	CR6241-03-61	Washer		1
15	GB301-84	Thrust Bearing	8104	1
16	CR6241-03-59	Sleeve (Flat Type)		1
17	CR6241-03-25	Tool Post Shaft (Flat Type)		1
17	CR6241-03-76	Tool Post Shaft (T Type)		1
18	GB77-85	Screw	M8×40	1
19	GB1155-79	Ball Cup	6	6
20	GB308-84	Steel Ball	1/4”	2
21	GB80-85	Screw	M8×10	2
22	CR6241-03-23	Compound Rest (Flat Type)		1
22	CR6241-03-75	Compound Rest (T Type)		1
23	CR6241-03-48	Nut (Metric)		1
23	CR6241-03-48Y	Nut (Inch)		1
24	CR6241-03-47	Screw-Compound Rest (Metric)		1
24	CR6241-03-47Y	Screw-Compound Rest (Inch)		1
25	GB80-85	Screw	M6×6	1
26	GB80-85	Screw	M5×8	1
27	GB879-86	Spring Pin	2×12	1
28	GB301-84	Thrust Bearing	8102	2
29	CR6241-03-49	Seat Compound Rest Screw		1
30	GB70-85	Screw	M6×20	2
31	CR6241-03-50	Nut		1
32	CR6241-03-51	Collar		1
33	CR6241-03-52	Dial-Compound Rest (Metric)		1
33	CR6241-03-52Y	Dial-Compound Rest (Inch)		1
34	CR6241-03-54	Wave Type Washer		1
35	CR6241-03-53	Nut		1
36	CR6241-03-55	Handle		1
37	CR6241-03-56	Handle		1
38	GB70-85	Screw	M6×10	3
39	GB70-85	Screw	M10×85	1
40	CR6241-03-45	Screw		1
41	CR6241-03-24	Gib		1
42	GB70-85	Screw	M10×35	2
43	CR6250-03-22	Swivel Table		1
44	GB80-85	Screw	M6×10	2
45	CR6241-03-21	Case-Wiper		1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

SADDLE SPARE PARTS LIST Cont.

No.	Part No.	Description	Specification	Qty
46	CR6241-03-20	Wiper		1
47	CR6241-03-44	Screw		4
48	CR6241-03-03	Indicator Dial		1
49	CR6241-03-46	Nut		3
50	CR6241-03-02	Cover-Cross Sliding		1
51	GB79-85	Screw	M8×20	1
52	GB70-85	Screw	M6×30	3
54	CR6241-03-17Y	Cross Feed Screw (Inch)		1
54	CR6241-03-17	Cross Feed Screw (Metric)		1
55	CR6241-03-04	Nut (Metric)		1
55	CR6241-03-04Y	Nut (Inch)		1
56	CR6241-03-19	Gib		1
57	CR6241-03-32	Gib		1
58	GB301-84	Thrust Bearing	8101	2
59	CR6241-03-05	Bracket		1
60	CR6241-03-33	Nut		1
61	CR6241-03-30	Cover		1
62	CR6241-03-41	Handle		1
63	GB70-85	Screw	M8×16	2
64	CR6241-03-40	Handle		1
65	CR6241-03-39	Nut		1
66	CR6241-03-37	Wave Type Washer		1
67	CR6241-03-18	Cross Feed Dial (Metric)		1
67	CR6241-03-18Y	Cross Feed Dial (Inch)		1
68	GB70-85	Screw	M8×60	2
69	GB827-86	Rivet	2×5	4
70	CR6241-05-28	Plate		2
71	SF-1	Bearing	1810	2
72	GB118-86	Taper Pin	6×26	2
73	GB70-85	Screw	M8×20	6
74	GB70-85	Screw	M10×55	4
75	GB118-86	Taper Pin	8×60	2
76	CR6241-03-11	Case-Wiper		2
77	CR6241-03-38	Clutch-Dial		1
78	GB80-85	Screw	M6×8	1
79	CR6241-03-09	Wiper		1
80	CR6241-03-74	Bolt		1
81	CR6241-03-36	Bracket		1
82	GB1155-79	Ball Cup	8	1
83	CR6241-03-08	Case-Wiper		2
84	CR6241-03-06	Wiper		1
85	CR6241-03-35	Cross Feed Pinion		1
86	CR6241-03-01	Saddle		1
87	CR6241-03-43	Plate		1
88	CR6241-03-42	Plug-Oil Inlet		1
89	CR6241-03-16	Gib-Front		1
90	CR6241-03-15	Gib-Left-Front		1
91	GB70-85	Screw	M6×20	1
92	CR6241-03-34	Clamp-Carriage		1
93	CR6241-03-10	Wiper		1
94	CR6241-03-12	Gib		1
95	GB70-85	Screw	M5×8	4

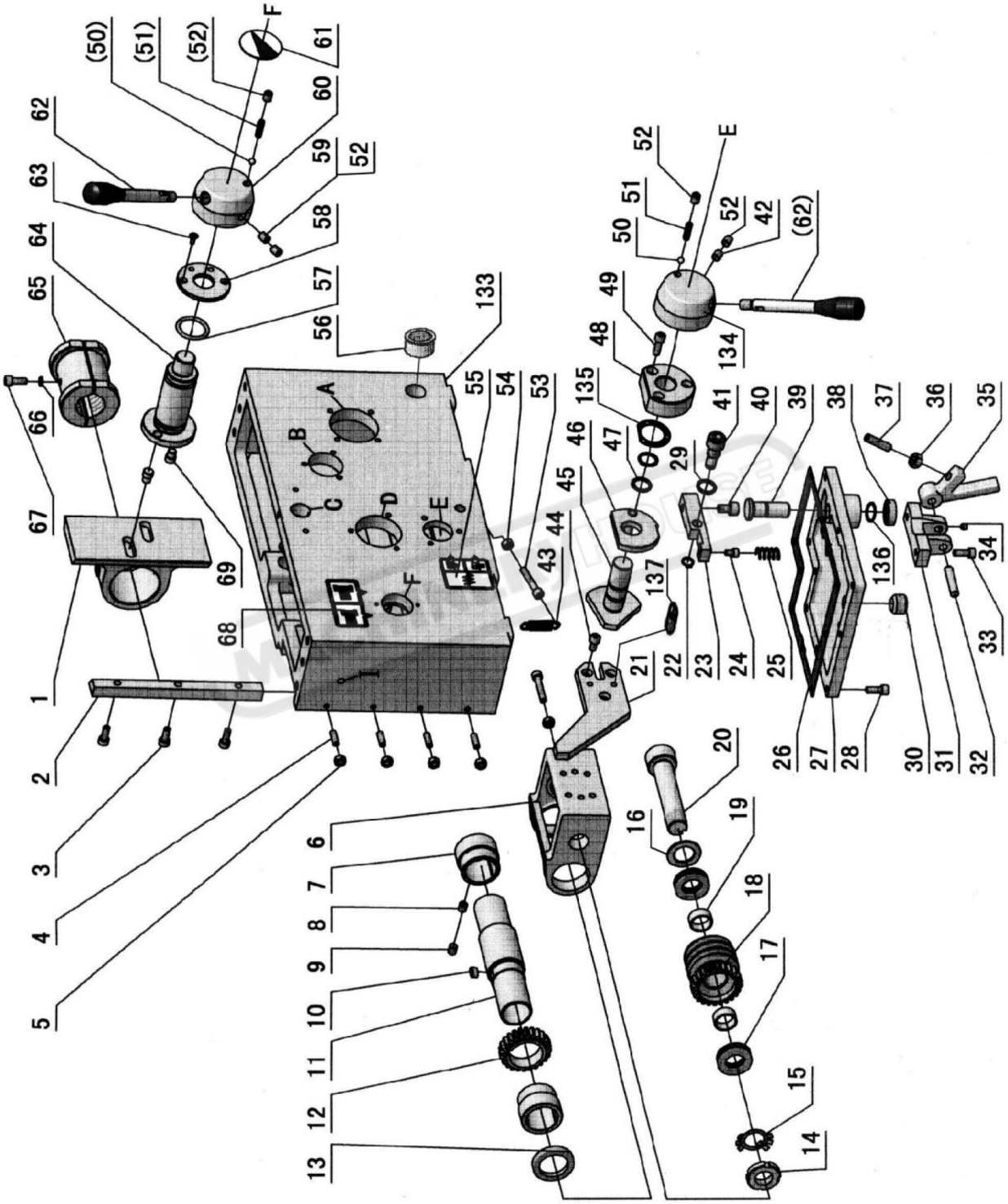
NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

SADDLE SPARE PARTS LIST Cont.

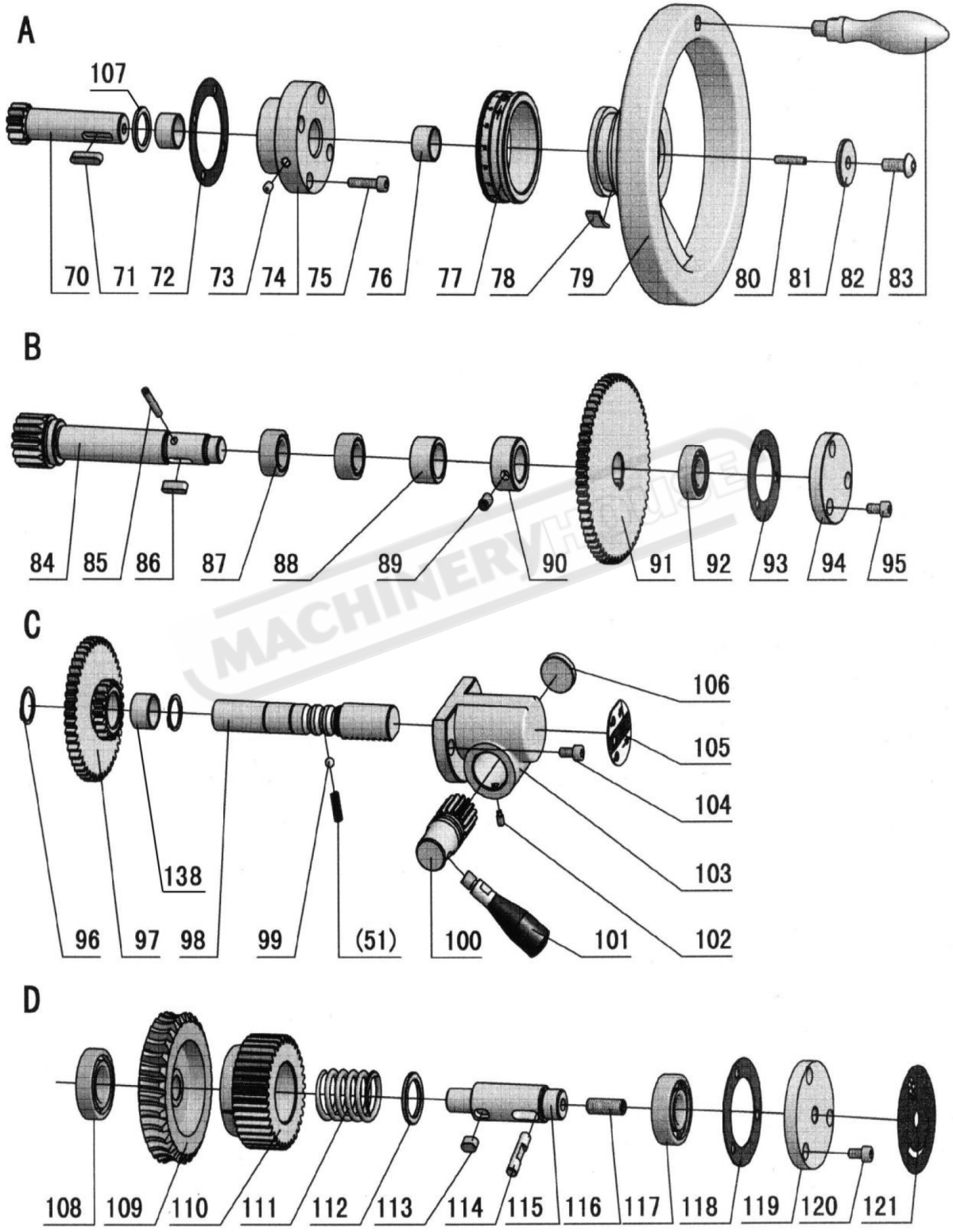
No.	Part No.	Description	Specification	Qty
96	CR6241-03-14	Baffle		2
97	CR6241-03-13	Holder Gib		1
98	GB70-85	Screw	M8×30	4
99	CR6241-03-07	Wiper		1
100	CR6241-03-70	Oil Plug		1
101	GB1235-76	O-Ring	16×2.4	1
102	GB2089-80	Spring	0.5×4.5×16	1
103	GB308-84	Steel Ball	⍰5	2
104	CR6241-03-64	Body Pump		1
105	CR6241-03-65	Piston Rod		1
106	GB3452.1-82	O-Ring	9×1.8	1
107	CR6241-03-66	Spring		1
108	GB1235-76	O-Ring	32×3.1	1
109	CR6241-03-67	Bottom Board		1
110	GB68-85	Screw	M5×10	2
111	CR6241-03-69	Plate		1
112	GB70-85	Screw	M5×12	2
113	CR6241-03-68	Plug		1
114	CR6241-03-31	Vitta welding		1
115		Tube Fitting	Z 1/8”×⍰4	3
116		Tube Fitting	Z 1/8”×⍰6	1
117		Brass Tube	⍰6×170	1
118	CR6241-03-71	Tube Fitting		1
119	CR6241-03-72	Nut		1
120	CR6241-03-73-2	Sleeve		1
121	CR6241-03-73-1	One Way Valve Ass		1
122	GB818-85	Screw	M5×14	4
123	CR6241-03-29	Shaft		1
124	GB70.1-85	Washer	M8	1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

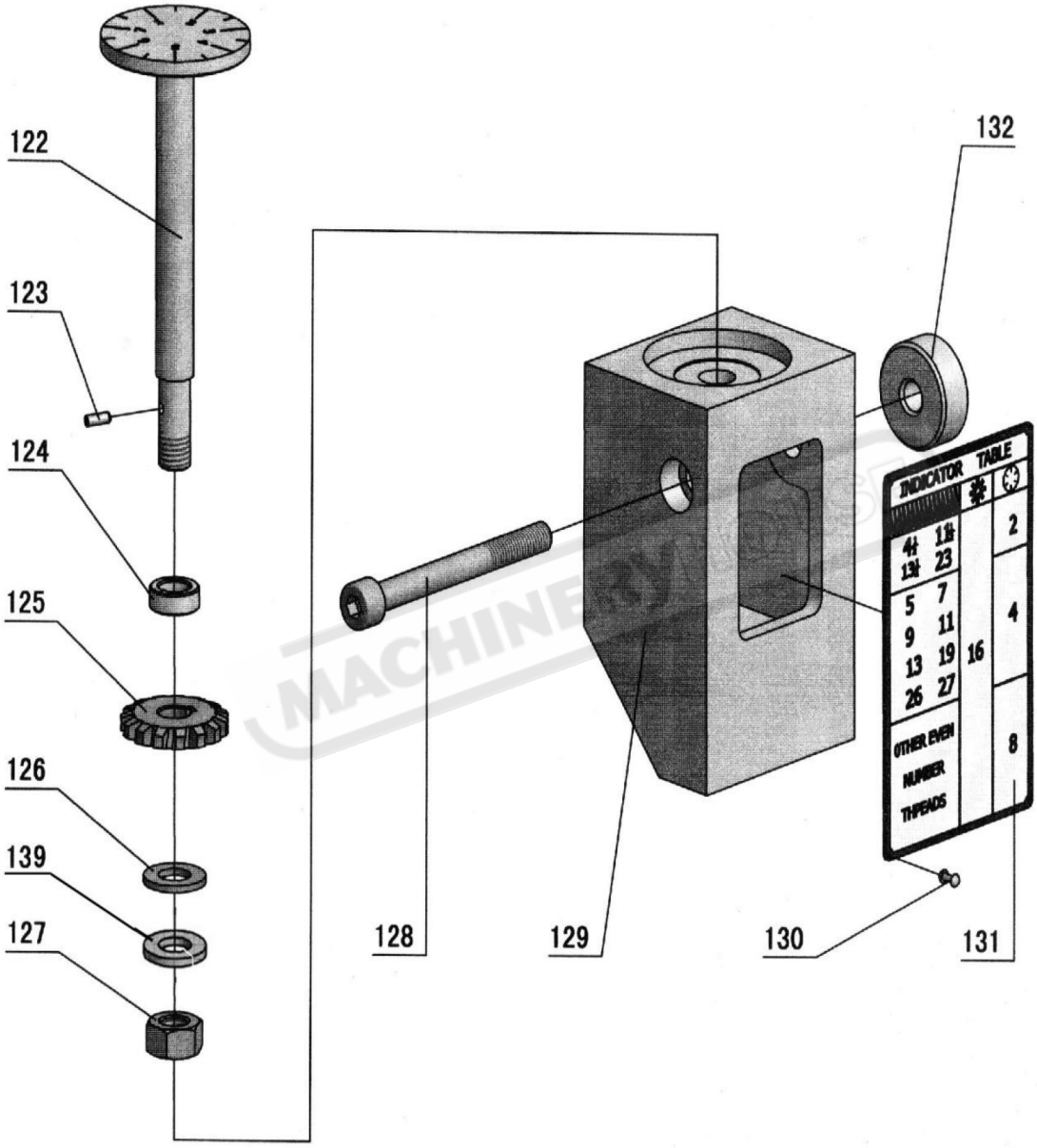
APRON PARTS DIAGRAMS



APRON A - D SHAFTS PARTS DIAGRAMS



APRON THREAD DIAL DIAGRAM



APRON SPARE PARTS LIST

No.	Part No.	Description	Specification	Qty
1	CR6241-04-03R	Lead Nut Assy (Right Hand)		1
1	CR6241-04-03	Lead Nut Assy (Left Hand)		1
2	CR6241-04-02	Gib		1
3	GB70-85	Screw	M6×16	3
4	GB80-85	Screw	M6×20	4
5	GB6170-86	Nut	M6	4
6	CR6241-04-18	Seat-Worm		1
7	CR6241-04-15	Bushing		2
8	GB80-85	Screw	M8×10	2
9	GB77-85	Screw	M8×10	2
10	GB1096-79	Key	6×12	1
11	CR6241-04-16	Sleeve-Feed Rod		1
12	CR6241-04-17	Gear		1
13		Oil Seal	TC32×42×8	2
14	GB812-88	Nut	M20×1.5	1
15	GB858-88	Nut	20	1
16	CR6241-04-21	Washer		1
17	GB301-84	Thrust Bearing	8104	2
18	CR6241-04-20	Worm Gear		1
19	SF-1	Set	2010	2
20	CR6241-04-19	Shaft		1
21	CR6241-04-23R	Safe Device Block (Right Hand)		1
21	CR6241-04-23	Safe Device Block (Left Hand)		1
22	GB894.1-86	Snap Ring	10	1
23	CR6241-04-30	Lever		1
24	GB70-85	Screw	M5×8	1
25	CR6241-04-32	Spring		1
26	CR6241-04-11	Bottom Cover		1
27	CR6241-04-12	Sealed Mat		1
28	GB70-85	Screw	M6×16	9
29	JB982-77	Washer	12	1
30	G38-3A	Oil Plug	Z 3/8”	1
31	CR6241-04-13	Bracket		1
32	GB119-86	Pin	B8×40	1
33	GB70-85	Screw	M6×16	2
34	GB80-85	Screw	M6×6	1
35	CR6241-04-14	Lever		1
36	GB77-85	Screw	M8×30	1
37	GB6170-86	Nut	M8	1
38		Oil Seal	TC15×25×7	1
39	CR6241-04-10	Pin		1
40	GB70-85	Screw	M8×12	1
41	CR6241-04-31	Screw		1
42	GB80-85	Screw	M8×10	1
43	CR6241-04-22	Spring		1
44	GB70-85	Screw	M6×12	3
45	CR6241-04-25R	Shaft (Right Hand)		1
45	CR6241-04-25	Shaft (Left Hand)		1
46	CR6241-04-26R	Buffer (Right Hand)		1
46	CR6241-04-26	Buffer (Left Hand)		1
47	GB1235-76	O-Ring	20×2.4	2
48	CR6241-04-27	Sleeve		1
49	GB70-85	Screw	M6×20	3
50	GB308-84	Steel Ball	1/4”	2

APRON SPARE PARTS LIST Cont.

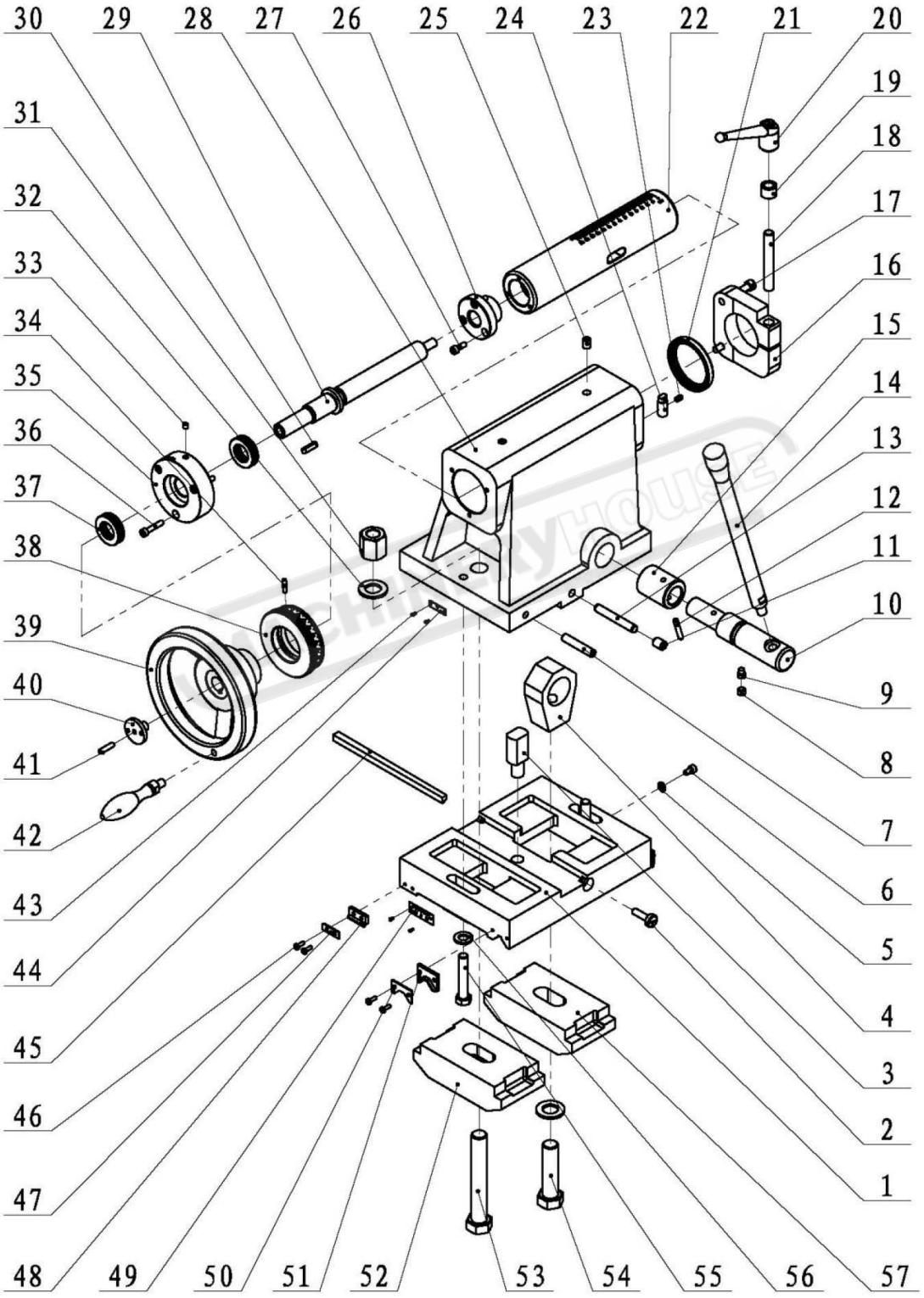
No.	Part No.	Description	Specification	Qty
51	CR6241-01-82	Spring		3
52	GB77-85	Screw	M8×10	4
53	GB70-85	Screw	M6×35	2
54	GB6170-86	Nut	M6	2
55	CR6241-04-71R	Knob (Right Hand)		1
55	CR6241-04-71	Knob (Left Hand)		1
56	GB1160.2-89	Oil Sight	A20	1
57	GB1235-76	O-Ring	32×3.5	2
58	CR6241-04-08	Washer		1
59	GB80-85	Screw	M8×10	1
60	CR6241-04-07R	Shaft Sleeve (Right Hand)		1
60	CR6241-04-07	Shaft Sleeve (Left Hand)		1
61	CR6241-01-100	Plate		1
62	CR6241-04-09	Lever		2
63	GB819-85	Screw	M4×10	2
64	CR6241-04-06R	Shaft (Right Hand)		1
64	CR6241-04-06	Shaft (Left Hand)		1
65	CR6241-04-04	Haft Nut (Metric)		1
65	CR6241-04-04Y	Haft Nut (Inch)		1
66	GB93-87	Spring Pin	M6	2
67	GB70-85	Screw	M6×20	2
68	CR6241-04-70R	Plate (Right Hand)		1
68	CR6241-04-70	Plate (Left Hand)		1
69	CR6241-04-05	Key		2
70	CR6241-04-53	Shaft		1
71	GB1096-79	Key	6×25	1
72	CR6241-04-55	Sealed Mat		1
73	GB1155-89	Ball Cup	6	1
74	CR6241-04-54	Seat		1
75	GB70-85	Screw	M6×25	4
76	SF-1	Bearing	2010	2
77	CR6241-04-57	Dial-Rack (Metric)		1
77	CR6241-04-57Y	Dial-Rack (Inch)		1
78	Q67-4-33	Spring	80	1
79	CR6241-04-58	Hand Wheel		1
80	GB80-85	Screw	M4×20	1
81	CR6241-04-60	Washer		1
82	CR6241-01-97	Screw		1
83	CR6241-04-59	Handle		1
84	CR6241-04-48	Pinon		1
85	GB879-86	Pin	5×35	1
86	GB1096-79	Key	6×20	1
87	GB5801-86	Needle Bearing	4644903	2
88	CR6241-04-56	Sleeve		1
89	GB80-85	Screw	M8×12	1
90	CR6241-04-49	Spacer		1
91	CR6241-04-50	Gear		1
92	GB278-89	Ball Bearing	80103	1
93	CR6241-04-52	Sealed Mat		1
94	CR6241-04-51	Cover		1
95	GB70-85	Screw	M6×12	3
96	GB894.1-86	Snap Ring	20	2
97	CR6241-04-41	Gear		1
98	CR6241-04-42	Shaft		1
99	GB308-84	Steel Ball	7/32”	1

APRON SPARE PARTS LIST Cont.

No.	Part No.	Description	Specification	Qty
100	CR6241-04-45	Change Gear		1
101	CR6241-04-46	Handle Lever		1
102	GB79-85	Screw	M5×10	1
103	CR6241-04-43	Change Sleeve		1
104	GB70-85	Screw	M6×12	2
105	CR6241-04-72	Plate		1
106	CR6241-04-44	Plug		1
107	CR6241-04-74	Washer		1
108	GB279-88	Ball Bearing	180105	1
109	CR6241-04-33	Worm Gear		1
110	CR6241-04-34	Gear		1
111	CR6241-04-37	Spring		1
112	CR6241-04-38	Spacer		1
113	GB1096-79	Key	8×12	1
114	CR6241-04-36	Pin		1
115	CR6241-04-35	Cover		1
116	GB77-85	Screw	M10×30	1
117	GB278-89	Ball Bearing	80204	1
118	CR6241-04-40	Sealed Mat		1
119	CR6241-04-39	Cover		1
120	GB70-85	Screw	M6×12	3
121	CR6241-04-69	Plate		1
122	CR6241-04-62	Dial Indicator Shaft (Metric)		1
122	CR6241-04-62Y	Dial Indicator Shaft (Inch)		1
123	GB879-86	Pin	3×8	1
124	CR6241-04-47	Spacer		1
125	CR6241-04-63	Gear (Metric)		1
125	CR6241-04-64	Gear (Metric)		1
125	CR6241-04-65	Gear (Metric)		1
125	CR6241-04-64Y	Gear (Inch)		1
125	CR6241-04-66	Gear (Metric)		1
125	CR6241-04-67	Gear (Metric)		1
126	GB97.2-85	Washer	10	1
127	GB6170-86	Nut	M10	1
128	GB70-85	Screw	M8×85	1
129	CR6241-04-61	Thread Dial Body		1
130	GB827-86	Rivet	2×5	15
131	CR6241-04-68	Indicator Dial (Metric)		1
131	CR6241-04-68Y	Indicator Dial (Inch)		1
132	CR6241-04-24	Spacer		1
133	CR6241-04-01R	Apron (Right Hand)		1
133	CR6241-04-01	Apron (Left Hand)		1
134	CR6241-04-29R	Hub (Right Hand)		1
134	CR6241-04-29	Hub (Left Hand)		1
135	CR6241-04-28	Sealed Mat		1
136	GB3452.1-82	O-Ring	11.8×1.8	1
137	GB879-86	Pin	5×16	2
138	SF-1	Bearing	2020	1
139	GB93-87	Spring Pin	10	1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

TAILSTOCK PARTS DIAGRAM



TAILSTOCK SPARE PARTS LIST

No.	Part No.	Description	Specification	Qty
1	CR6250-05-19	Bottom Tailstock		1
2	CR6241-05-25	Screw		2
3	CR6241-05-23	Block-Adjusting		1
4	CR6241-05-24	Bracket		1
5	GB/T97.1-1985	Washer	6	1
6	GB/T70.1-2000	Screw	M6×10	1
7	CR6241-05-22	Screw-Brake		1
8	GB/T77-2000	Screw	M10×8	1
9	GB/T79-2000	Screw	M10×12	1
10	CR6241-05-04	Shaft		1
11	GB/T80-2000	Screw	M12×16	2
12	GB879-86	Spring Pin	6×36	1
13	GB119-86	Pin Shaft	10×70	2
14	CR6241-05-21	Lead Screw		1
15	CR6241-05-26	Eccentric Block		1
16	CR6241-05-02A	Locking Block		1
17	GB/T70.1-2000	Screw	M8×25	2
18	CR6241-05-04A	Screw Bolt		1
19	CR6241-05-03A	Washer		1
20	HY8310.12-1	Adjustable Fixed Handle	A-M12×95	1
21	GB/T13871-1992	Oil-Seal	TC60×75×9	1
22	CR6241-05-05A	Tailstock Sleeve		1
23	GB/T80-2000	Screw	M6×10	1
24	CR6241-05-27	Pin Shaft		1
25	GB1155-89	Ball Cup	10	2
26	CR6241-05-06	Feed Nut (Metric)		1
26	CR6241-05-06Y	Feed Nut (Inch)		1
27	GB/T70.1-2000	Screw	M6×16	3
28	CR6241-05-01A	Tailstock Body		1
29	CR6241-05-07	Feed Screw (Metric)		1
29	CR6241-05-07Y	Feed Screw (Inch)		1
30	GB1096-79	Key	6×25	1
31	GB/T56-1988	Nut	M20	1
32	GB/T97.1-1985	Washer	20	2
33	GB1155-89	Ball Cup	6	1
34	GB/T80-2000	Screw	M5×20	1
35	CR6241-05-08	Cap-Body End (Metric)		1
35	CR6241-05-08Y	Cap-Body End (Inch)		1
36	GB/T70.1-2000	Screw	M6×30	3
37	GB/T301-1995	Thrust Bearing	51105	2
38	CR6241-05-09	Dial-Feed (Metric)		1
38	CR6241-05-09Y	Dial-Feed (Inch)		1
39	CR6241-05-10	Handle Wheel		1
40	CR6241-05-11	Lock Nut		1
41	GB/T80-2000	Screw	M6×25	1
42	CR6241-04-59	Handle		1
43	GB/T827-1986	Rivet	2×5	4
44	CR6241-05-28	Plate		1
45	CR6241-05-12	Taper Gib Strip		1
46	GB/T818-2000	Cross Recessed Head Screw	M4×12	8

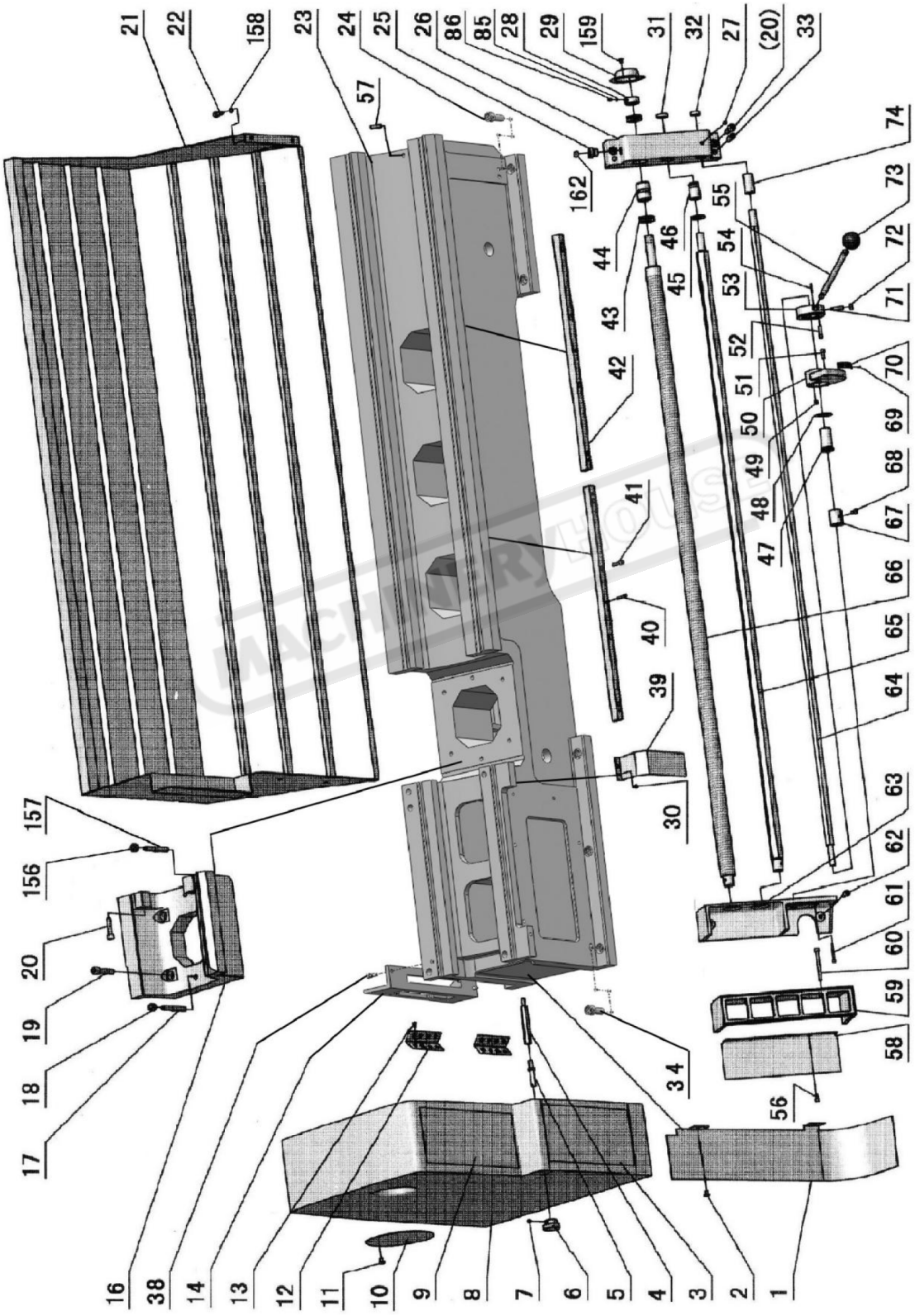
NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

TAILSTOCK SPARE PARTS LIST Cont.

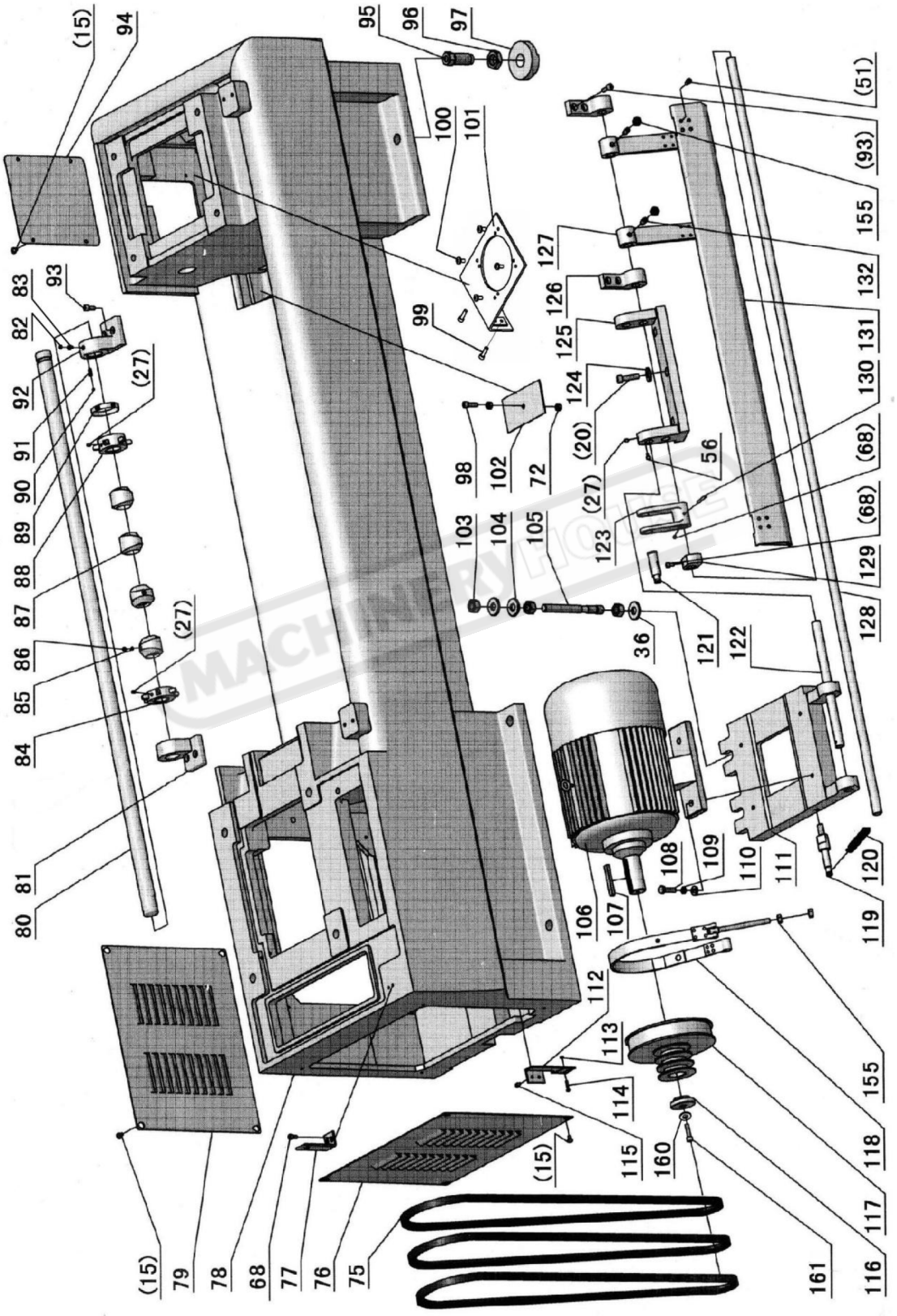
No.	Part No.	Description	Specification	Qty
47	CR6241-05-13	Case-Wiper		2
48	CR6241-05-14	Wiper		2
49	CR6241-05-29	Plate		1
50	CR6241-05-15	Case-Wiper		2
51	CR6241-05-16	Wiper		2
52	CR6241-05-18	Brake Block		1
53	GB/T5782-2000	Bolt	M20×160	1
54	GB/T5782-2000	Screw	M20×110	1
55	GB/T5782-2000	Screw	M12×90	2
56	GB/T95-1985	Washer	M12	2
57	CR6241-05-17	Brake Block		1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

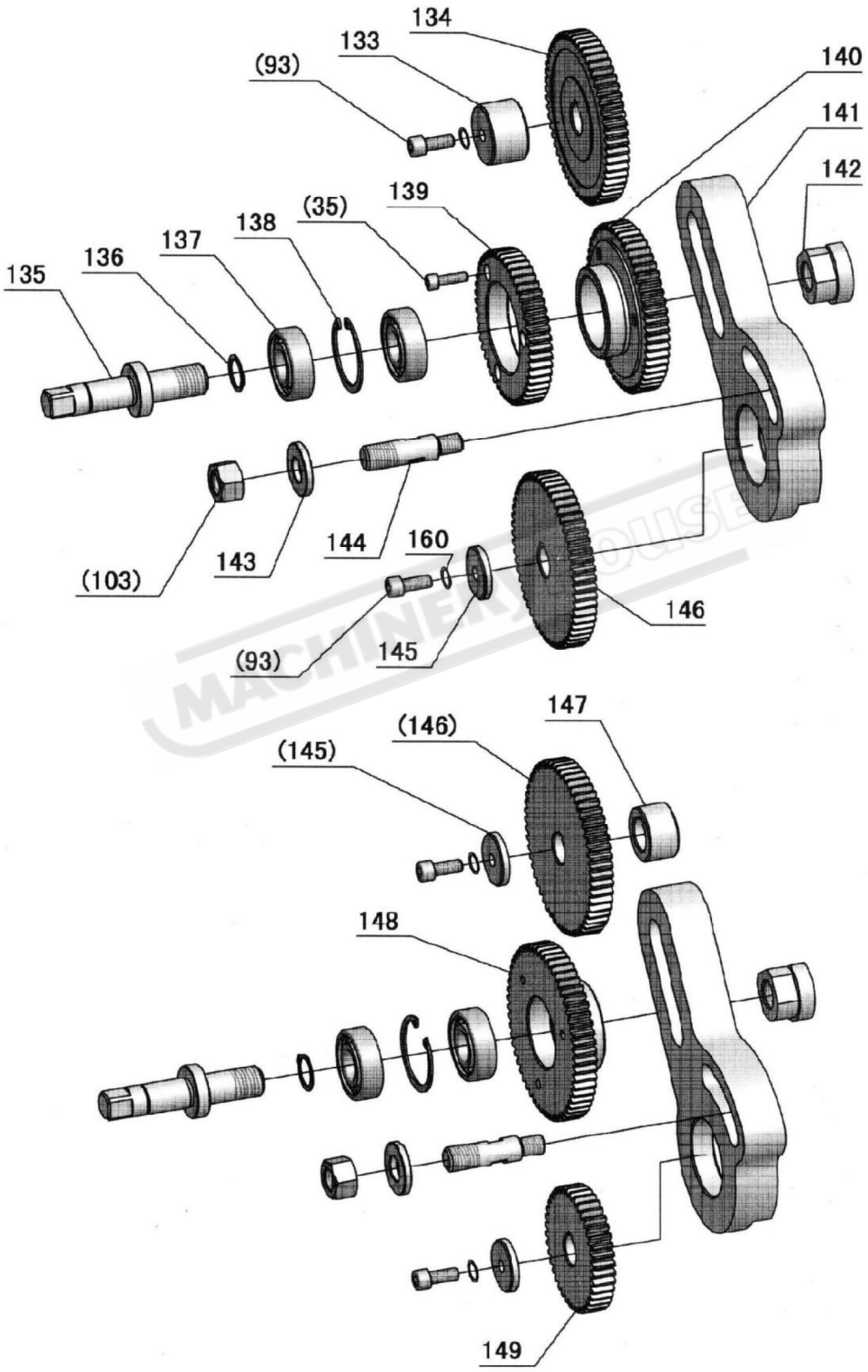
BED ASSEMBLY PARTS DIAGRAM



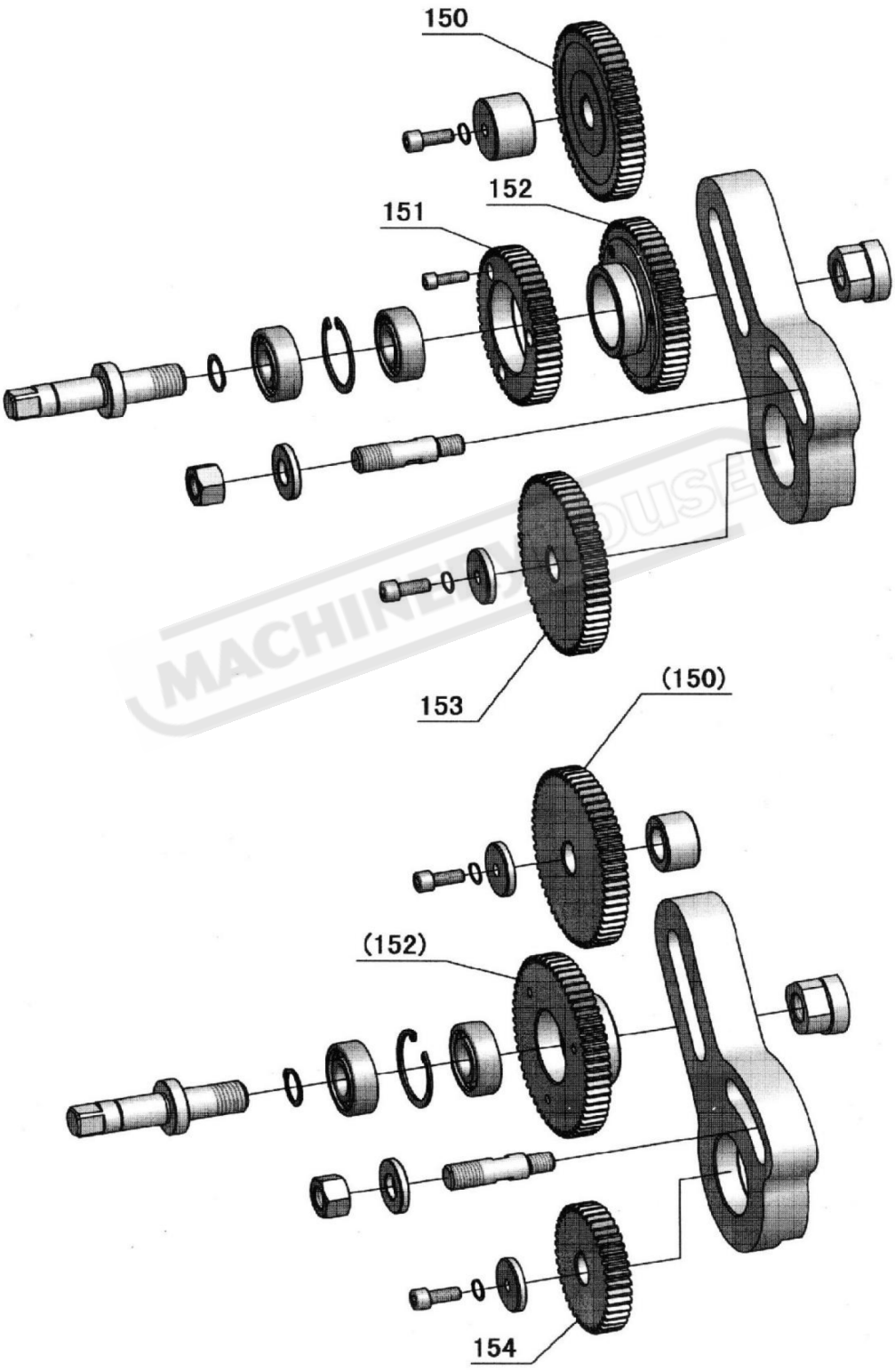
BED ASSEMBLY PARTS DIAGRAM Cont.



BED ASSEMBLY PARTS DIAGRAM Cont.



BED ASSEMBLY PARTS DIAGRAM Cont.



BED ASSEMBLY SPARE PARTS LIST Cont.

No.	Part No.	Description	Specification	Qty
1	CR6241-08-22	Oil Guard		1
2	GB70-85	Screw	M6×10	2
3	CR6241-08-21	Plate		1
4	CR6241-08-20	Bolt		1
5	CR6241-08-18	Screw		1
6	CR6241-08-17	Nut		1
7	GB80-85	Screw	M6×8	1
8	CR6251L-08-01	Cover-End		1
9	CR6250-08-02	Plate (Metric)		1
9	CR6250-08-02Y	Plate (Inch)		1
10	CR6241-08-23	Cover		1
11	GB/T70.2-2000	Screw	M6×10	1
12	GB7277-87	Hinge	100	2
13	GB68-85	Screw	M5×10	12
14	CR6241A-06-07	Heel Block		1
14	GB70-85	Screw	M6×25	2
14	CR6241A-06-06	Stand		1
15	GB818-85	Screw	M6×10	12
16	CR6241A-06-02	Saddle		1
17	GB118-86	Pin	10×70	2
18	GB73-85	Screw	M6×10	2
19	GB70-85	Screw	M12×50	4
20	GB70-85	Screw	M10×40	7
21	CR6241A-06-05	Guard Assembly 1000		1
21	CR6241A-06-05-1	Guard Assembly 1500		1
21	CR6241A-06-05-2	Guard Assembly 2000		1
22	GB70-85	Screw	M8×16	4
23	CR6241A-06-01	Bed 1000		1
23	CR6241A-06-01-1	Bed 1500		1
23	CR6241A-06-01-2	Bed 2000		1
24	GB70-85	Screw	M16×40	4
25	CR6241-06-21	Plug-Oil Inlet		1
26	CR6241-06-18	Bracket		1
27	GB80-85	Screw	M6×8	4
28	CR6241-06-15	Nut		1
29	CR6241-06-70	Cover		1
30	GB818-85	Screw	M5×8	2
31	CR6241-06-19	Plug		1
32	CR6241-06-20	Plug		1
33	GB118-86	Taper Pin	8×50	2
34	GB70-85	Screw		6
35	GB70-85	Screw	M6×20	3
36	GB93-86	Spring Washer	16	2
38	GB70-85	Screw	M8×20	2
39	CR6241-06-17	Protection Cover		1
40	GB879-86	Spring Pin	5×30	6
41	GB70-85	Screw	M6×25	10
42	CR6241-06-12A	Rack		1
42	CR6241-06-12B	Rack		1
42	CR6241-06-13	Rack (Left Hand)		1
43	GB301-84	Thrust Bearing	8104	2
44	CR6241-06-22	Sleeve		1
45	CR6241-06-23	Spacer		1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

BED ASSEMBLY SPARE PARTS LIST Cont.

No.	Part No.	Description	Specification	Qty
46	CR6241-06-16	Bush		1
47	CR6241-06-55	Shaft Sleeve		1
48	CR6241-06-57	Washer		1
49	Q81-1	Spring	1×6×20	3
50	CR6241-06-58	Switch Bracket		1
51	GB70-85	Screw	M6×16	10
52	CR6241-06-54	Pin		1
53	CR6241-06-53	Bracket		1
54	GB879-86	Spring Pin	3×20	1
55	CR6241-06-56	Lever		1
56	GB70-85	Screw	M5×8	3
57	GB878-86	Pin	M12×50	1
58	CR6241-06-05	Cover		1
59	CR6251T-06-10	Seat-Pilot Light		1
60	GB70-85	Screw	M6×70	2
61	GB70-85	Screw	M4×40	2
62	GB70-85	Screw	M8×25	2
63	CR6241A-06-04	Seat-Switch		1
64	CR6241A-06-11	Started Rod 1000		1
64	CR6241A-06-11-1	Started Rod 1500		1
64	CR6241A-06-11-2	Started Rod 2000		1
65	CR6241A-06-10	Feed Rod 1000		1
65	CR6241A-06-10-1	Feed Rod 1500		1
65	CR6241A-06-10-2	Feed Rod 2000		1
66	CR6241A-06-09Y	Lead Screw 1000(Inch)		1
66	CR6241A-06-09	Lead Screw 1000(Metric)		1
66	CR6241A-06-09-1Y	Lead Screw 1500(Inch)		1
66	CR6241A-06-09-1	Lead Screw 1500(Metric)		1
66	CR6241A-06-09-2Y	Lead Screw 2000(Inch)		1
66	CR624A1-06-09-2	Lead Screw 2000(Metric)		1
67	CR6241-06-68	Cam		1
68	GB70-85	Screw	M6×12	5
69	GB827-86	Rivet	2×5	12
70	CR6241-06-64	Plate		1
71	GB79-85	Screw	M8×30	2
72	GB6170-86	Nut	M8	4
73	Z16-1	Lever Bush	M12×40	1
74	CR6241-06-26	Bush		1
75	7.5HP/60HZ	Belt	B74”	3
75	7.5HP/50HZ	Belt	B75”	3
76	CR6241A-06-08A	Cover Motor Seat		1
77	CR6241-08-19	Limited Switch Seat		1
78	CR6241A-06-03A	Stand 1000		1
78	CR6241A-06-03-1A	Stand 1500		1
78	CR6241A-06-03-2A	Stand 2000		1
79	CR6241-06-36	Cover Motor Seat		1
80	CR6241A-06-12	Auto Stopping Shaft 1000		1
80	CR6251-06-20-1	Auto Stopping Shaft 1500		1
80	CR6251-06-20-2	Auto Stopping Shaft 2000		1
81	CR6241-06-06	Bracket		1
82	GB77-85	Screw	M8×6	1
83	GB79-85	Screw	M8×12	1
84	CR6241-06-30	Star Type Ring		1
85	CR6241-06-34	Shoe Clamp		5

BED ASSEMBLY SPARE PARTS LIST Cont.

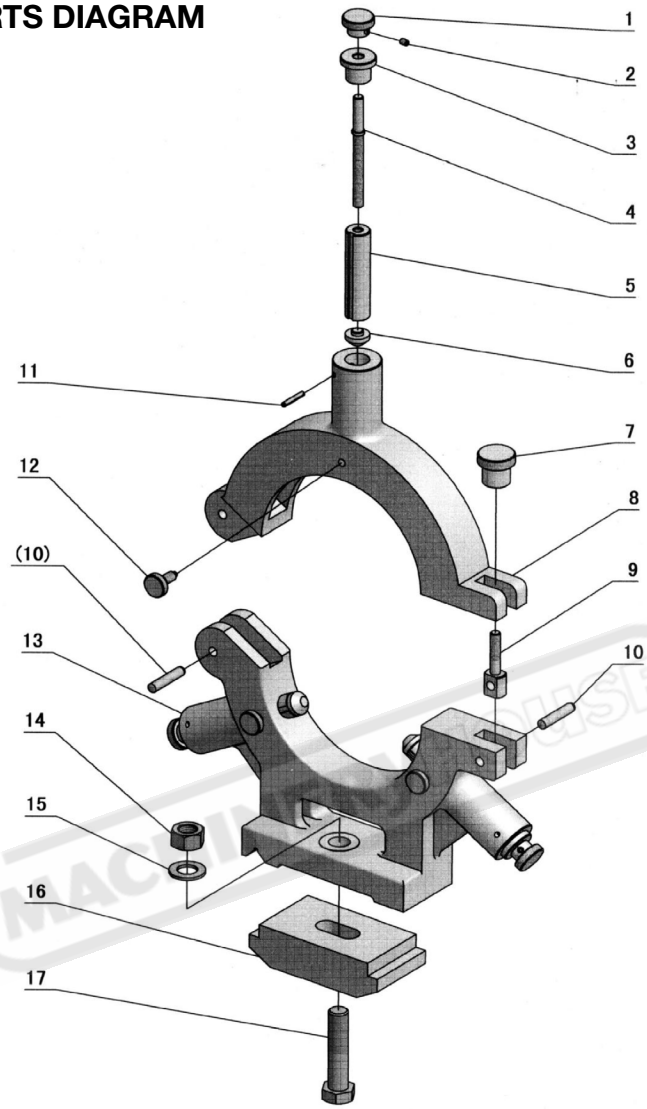
No.	Part No.	Description	Specification	Qty
86	GB77-85	Screw	M8×6	5
87	CR6241-06-33	Cam		4
88	CR6241-06-31	Star Type Ring		1
89	CR6241-06-32	Plate		1
90	GB308-84	Steel Ball	6	1
91	Q81-1	Spring	0.9×5×25	1
92	CR6241-06-07	Bracket		1
93	GB70-85	Screw	M8×20	10
94	CR6241-06-38	Pump Hole Cover		1
95	CR6241-06-37	Bolt		6
96	GB6173-86	Nut	M24×2	6
97	CR6241-06-59	Block-Leveling		6
98	GB70-85	Screw	M8×30	1
99	GB70-85	Screw	M6×25	2
100	GB818-85	Screw	M6×10	4
101	CR6241-06-65	Coolant Pump Seat		1
102	CR6241-06-52	Screen		1
103	GB6170-86	Nut	M16	7
104	CR6241-06-62	Washer		4
105	CR6241-06-49	Screw		2
106		Motor	7.5kw	1
107	GB1096C-79	Key	10×70	1
108	GB5782-86	Bolt	M10×35	4
109	GB93-87	Spring Washer	10	4
110	GB97.1-85	Washer	10	4
111	CR6241-06-39	Motor Seat		1
112	CR6241-06-66	Limited Switch Seat		1
113	GB6170-86	Nut	M4	2
114	GB818-85	Screw	M4×35	2
115	GB70-85	Screw	M5×10	2
116	CR6241-06-09	Washer		1
117	CR6241-06-08-1	Belt Pulley	60Hz	1
117	CR6241-06-08	Belt Pulley	50Hz	1
118	CR6241-06-50	Belt-Brake		1
119	CR6241-06-51	Shaft		1
120	Q81-3	Spring	3×16×115	1
121	CR6241-06-42	Shaft		1
122	CR6241-06-47	Shaft		1
123	CR6241-06-43	Arm Brake		1
124	CR6241-06-67	Washer		3
125	CR6241-06-45	Bracket-Motor Seat		1
126	CR6241-06-40	Bracket		2
127	CR6241-06-46	Arm		2
128	CR6241A-06-13	Shaft 1000		1
128	CR6241A-06-13-1	Shaft 1500		1
128	CR6241A-06-13-2	Shaft 2000		1
129	CR6241-06-41	Cam		1
130	GB879-86	Spring Pin	5×40	1
131	CR6241-06-44	Pedal-Bracket 1000		1
131	CR6241-06-44-1	Pedal-Bracket 1500		1
131	CR6241-06-44-2	Pedal-Bracket 2000		1
132	GB79-85	Screw	M10×25	2
133	CR6241-08-02	Spacer		1

BED ASSEMBLY SPARE PARTS LIST Cont.

No.	Part No.	Description	Specification	Qty
134	CR6251-08-02	Gear (Metric)	55T×M2.25	1
135	CR6241-08-04	Bolt		1
136	GB894.1-86	Snap Ring	20	1
137	GB279-88	Ball Bearing	180204	2
138	GB893.1-86	Snap Ring	47	1
139	CR6251-08-08	Gear (Metric)	49T×M2.25	1
140	CR6251-08-09	Gear (Metric)	54T×M2.25	1
141	CR6251-08-06	Bracket		1
142	CR6241-08-05	Nut		1
143	CR6241-08-13	Washer		1
144	CR6251-08-04	Bolt		1
145	CR6241-08-07	Spacer		1
146	CR6251-08-05	Gear (Metric)	56T×M2.25	1
147	CR6241-08-12	Spacer		1
148	CR6251-08-09Y	Gear (Inch)	57T×M2.25	1
149	CR6251-08-11	Gear (Metric)	40T×M2.25	1
150	CR6251-08-02Y	Gear (Inch)	48T×M2.25	1
151	CR6251-08-12Y	Gear (Inch)	66T×M2.25	1
152	CR6251-08-09Y	Gear (Inch)	57T×M2.25	1
153	CR6251-08-11Y	Gear (Inch)	42T×M2.25	1
154	CR6251-08-05Y	Gear (Inch)	57T×M2.25	1
155	GB6170-86	Nut	M10	4
156	GB73-85	Screw	M5×8	2
157	GB118-86	Pin	8×40	2
158	GB97.1-85	Washer	8	4
159	GB70-85	Screw	M4×8	2
160	GB93-87	Spring Washer	8	3
161	GB70-85	Screw	M8×40	1
162	CR6241-06-24	Plate		1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

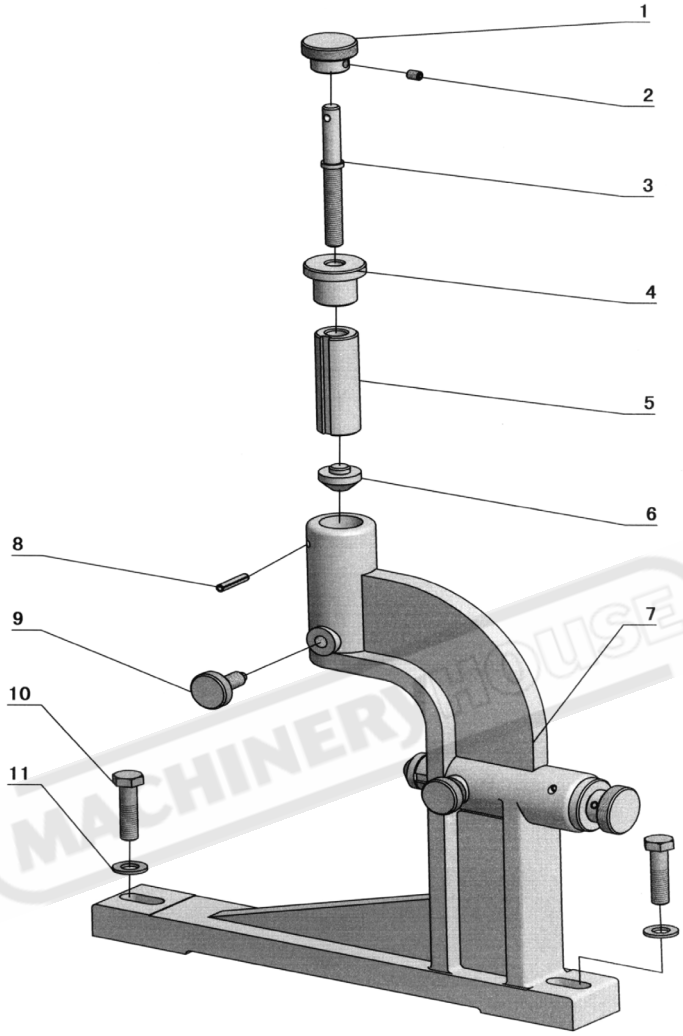
FIXED STEADY PARTS DIAGRAM



FIXED STEADY SPARE PARTS LIST

No.	Part No.	Description	Specification	Qty
1	CR6241-10-12	Rotate Handle		3
2	GB78-85	Screw	M6×8	3
3	CR6241-10-06	Bush		3
4	CR6241-10-04	Screw Shaft		3
5	CR6241-10-05	Sleeve		3
6	CR6241-10-13	Bracket		1
7	CR6241-10-08	Handle		1
8	CR6241-10-02	Upside of Steady Rest		1
9	CR6241-10-07	Clamping Screw		1
10	GB119-86	Pin	10×50	1
11	GB879-86	Spring Pin	5×32	3
12	CR6241-10-11	Limited Screw		3
13	CR6250-10-01	Downside of Steady Rest		1
14	GB6170-86	Nut	M20	1
15	GB97.1-85	Washer	20	1
16	CR6241-10-14	Clamping Bracket		1
17	GB5780-86	Bolt	M20×90	1

TRAVELING STEADY PARTS DIAGRAM

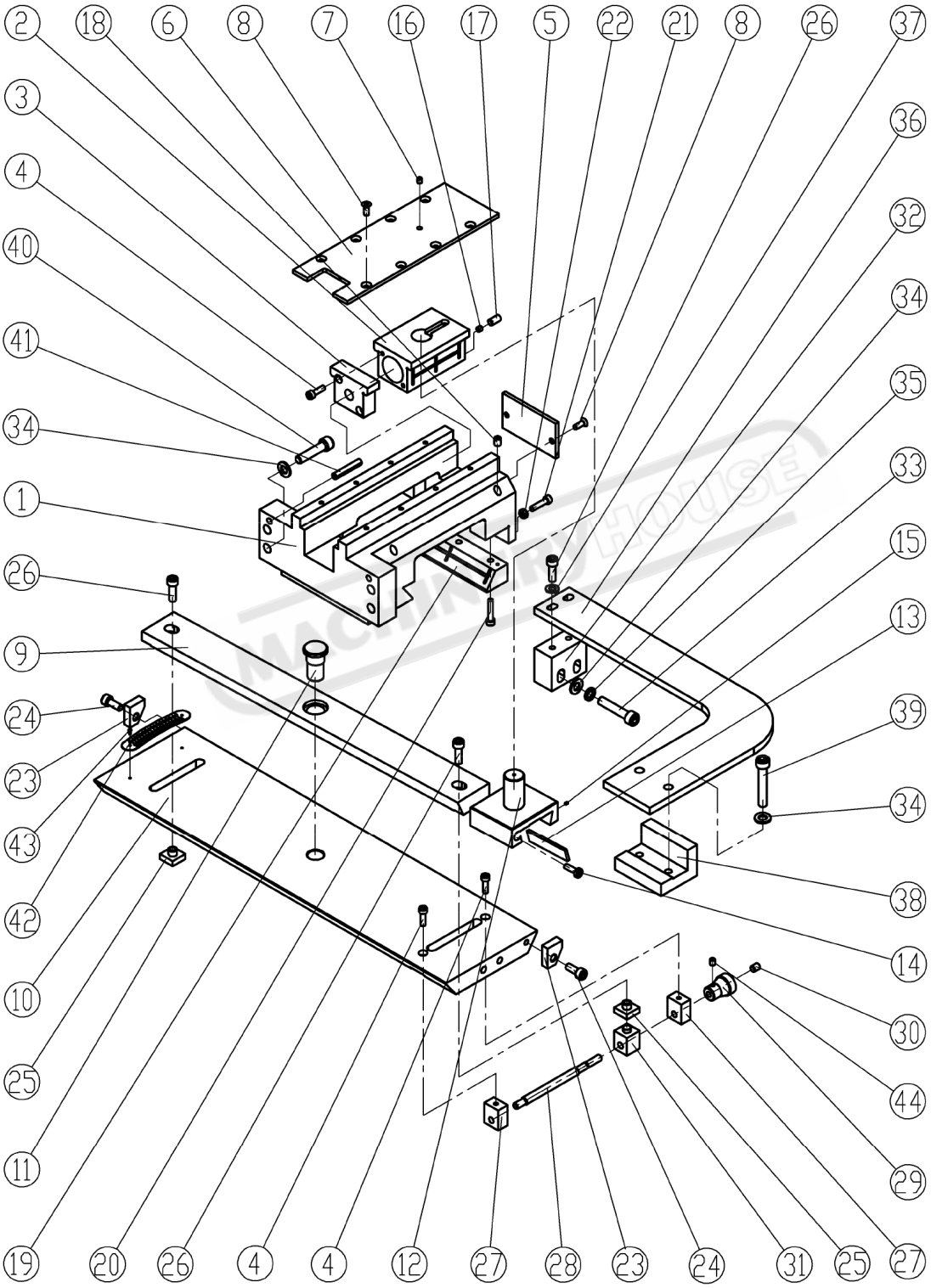


NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

TRAVELING STEADY SPARE PARTS LIST

No.	Part No.	Description	Specification	Qty
1	CR6241-10-12	Rotate Handle		2
2	GB78-85	Screw	M6×8	2
3	CR6241-10-09	Screw Shaft		2
4	CR6241-10-06	Bush		2
5	CR6241-10-10	Sleeve		2
6	CR6241-10-13	Bracket		2
7	CR6250-10-03	Follow Rest		1
8	GB879-86	Spring Pin	5×26	2
9	CR6241-10-11	Limited Screw		2
10	GB5782-86	Bolt	M10×40	2
11	GB97.1-85	Washer		2

TAPER TURNING ATTACHMENT DIAGRAM

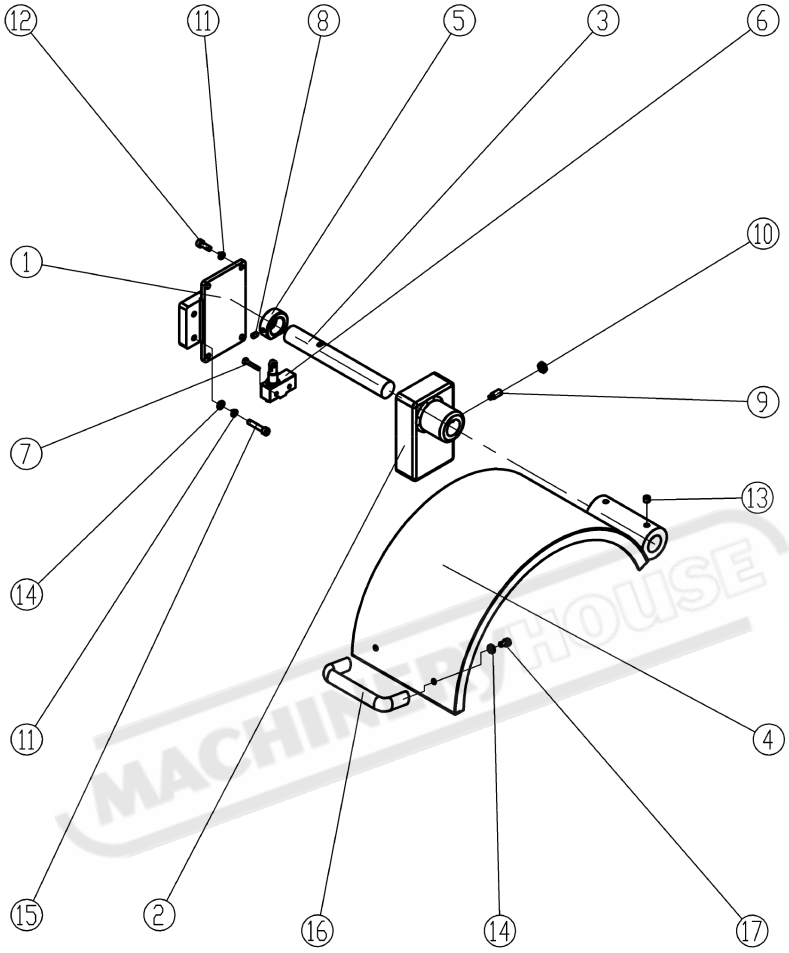


TAPER TURNING ATTACHMENT PARTS LIST

No.	Part No.	Description	Specification	Qty
1	CR6241-17-10	Main Support		1
2	CR6241-17-07	Slide Block		1
3	CR6241-17-01	End Block		1
4	GB70-85	Socket Head Cap Screw	M6×20	4
5	CR6241-17-02	Stopper		1
6	CR6241-17-06	Press Plate Cover		1
7	GB1155-89	Press-Fit Oil Cup	6	1
8	GB819-85	Cross Recess Sunk Screw	M6×16	10
9	CR6241-17-0510	Profiling Plate		1
10	CR6241-17-2411	Profiling Seat		1
11	CR6241-17-0912	Position Axle		1
12	CR6241-17-08	Pivot		1
13	CR6241-17-18	Inlaid Strip		1
14	CR6241-17-19	Press Screw		2
15	CR6241-17-16	Block Pin		3
16	CR6241-17-17	Copper Washer		1
17	GB77-85	Socket Flat Set Screw	M8×16	1
18	GB1155-89	Press-Fit Oil Cup	8	2
19	CR6241-17-14	Wedge		1
20	GB70-85	Socket Head Cap Screw	M6×30	3
21	GB70-85	Socket Head Cap Screw	M6×25	3
22	GB6170-86	Nut	M6	3
23	CR6241-17-03	Stopper		2
24	GB70-85	Socket Head Cap Screw	M8×20	2
25	CR6241-17-11	Mobile Block		2
26	GB70-85	Socket Head Cap Screw	M8×25	4
27	CR6241-17-15	Adjustment Supporter		2
28	CR6241-17-12	Adjustment Screw		1
29	CR6241-17-20	Handle		1
30	GB77-85	Socket Flat Set Screw	M8×10	1
31	CR6241-17-13	Adjustment Nut		1
32	CR6241-17-21	Connection Block		1
33	GB70-85	Socket Head Cap Screw	M10×50	2
34	GB97.1-85	Flat Washer	10	8
35	GB93-87	Spring Washer	10	2
36	CR6241-17-22	Pull Rod		1
37	GB97.1-85	Flat Washer	8	2
38	CR6241-17-23	Pressed Block		1
39	GB70-85	Socket Head Cap Screw	M10×60	2
40	GB70-85	Socket Head Cap Screw	M10×45	4
41	GB879-86	Spring Cylindrical Pin	8×45	2
42	CR6241-17-04	Sign Board		1
43	GB827-86	Rivet	2×5	2
44	GB78-85	Screw	M5×6	1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

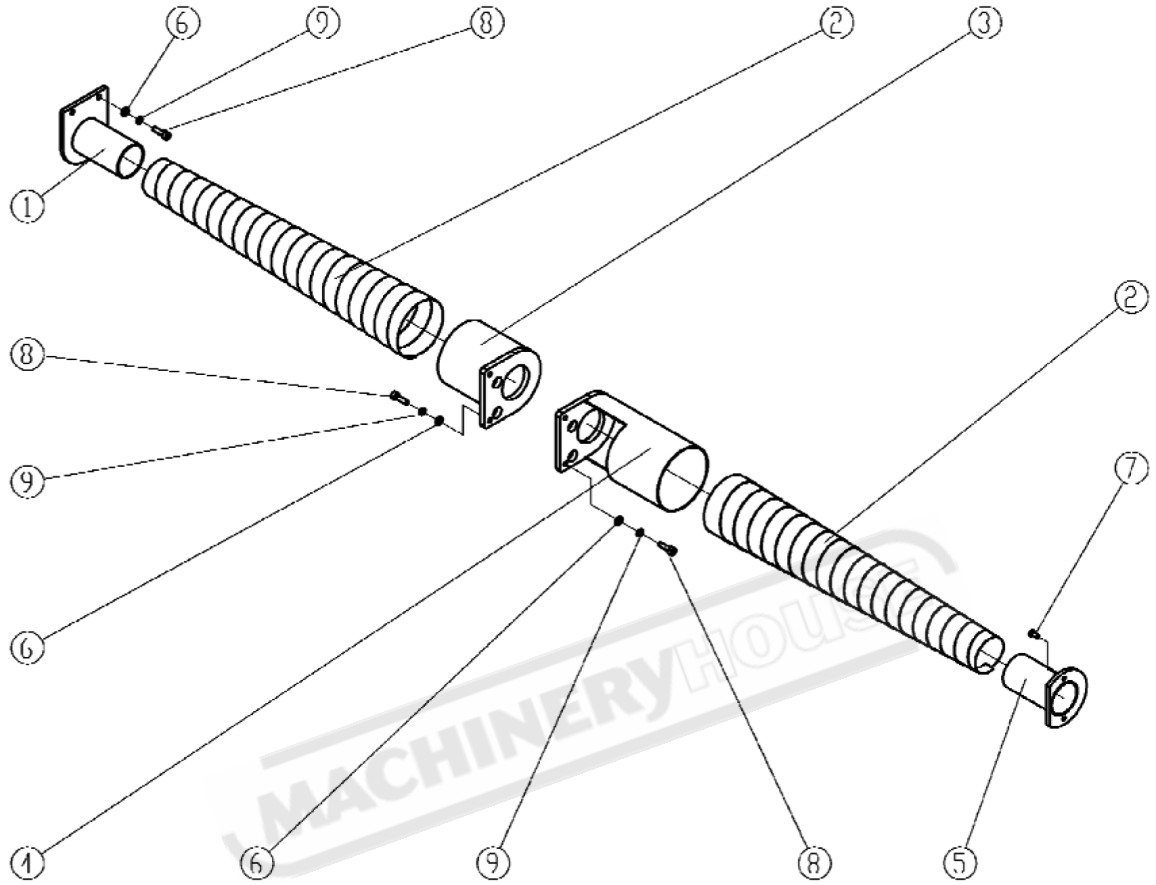
CHUCK GUARD PARTS DIAGRAM



CHUCK GUARD PARTS LIST

No.	Part No.	Description	Specification	Qty
1	CR6246B-15-02	Support		1
2	CR6246B-15-03	Guard Stand		1
3	CR6241-15-02	Shaft		1
4	CR6246B-15-01	Cover		1
5		Sleeve		1
6	CR6241-15-05	Microswitch		1
7	GB818-85	Screw	M4×25	2
8	GB78-85	Screw	M6×10	1
9	GB79-85	Screw	M8×20	1
10	GB6172-86	Nut	M8	1
11	GB93-87	Spring Washer	M6	6
12	GB70-85	Socket Head Cap Screw	M6×16	4
13	GB80-85	Screw	M8×8	2
14	GB97.1-85	Flat Washer	M6	4
15	GB70-85	Socket Head Cap Screw	M6×30	2
16	HY8315.4	Handle	A114	1
17	GB70-85	Socket Head Cap Screw	M6×10	2

LEADSCREW GUARD DIAGRAM

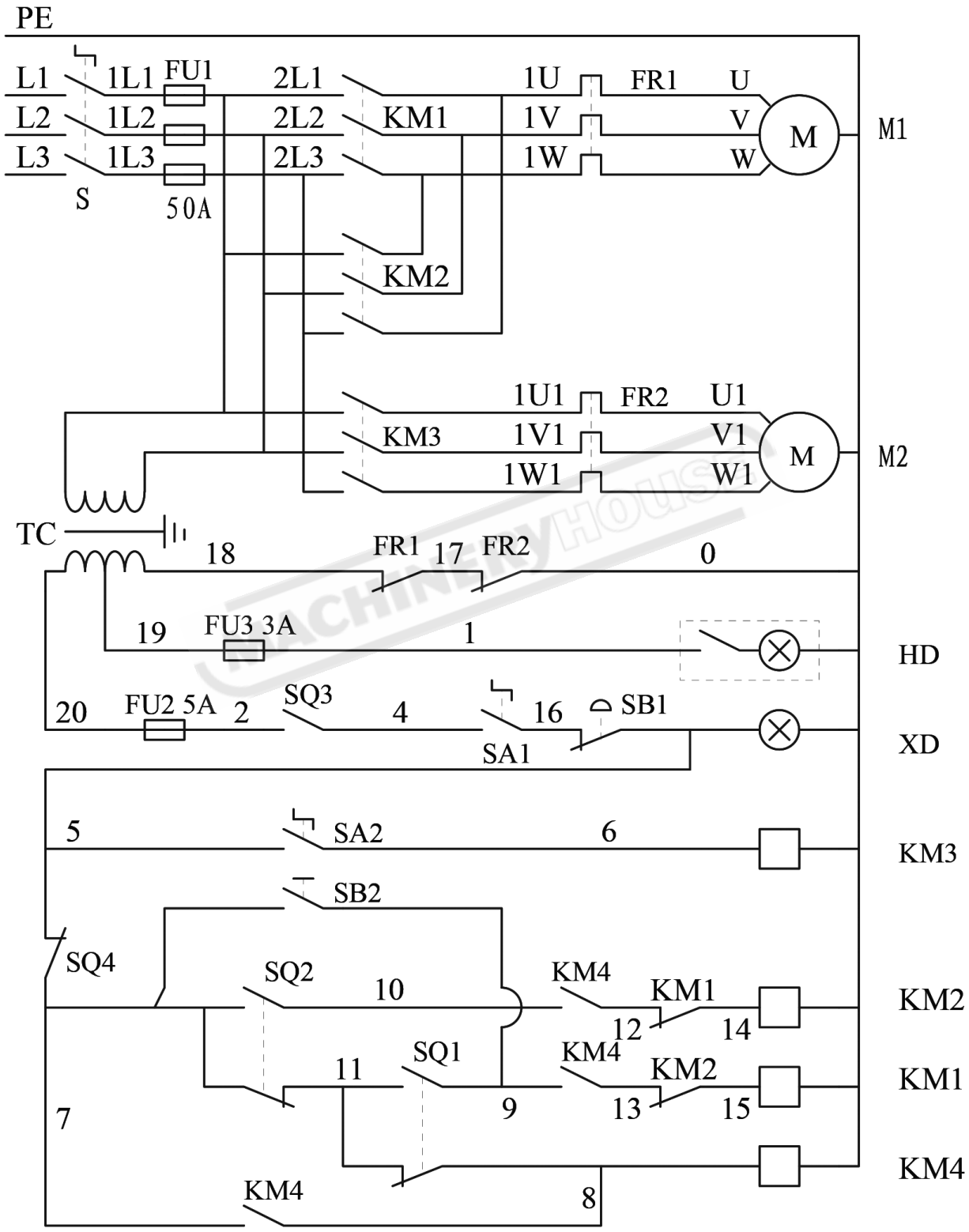


LEADSCREW GUARD PARTS LIST

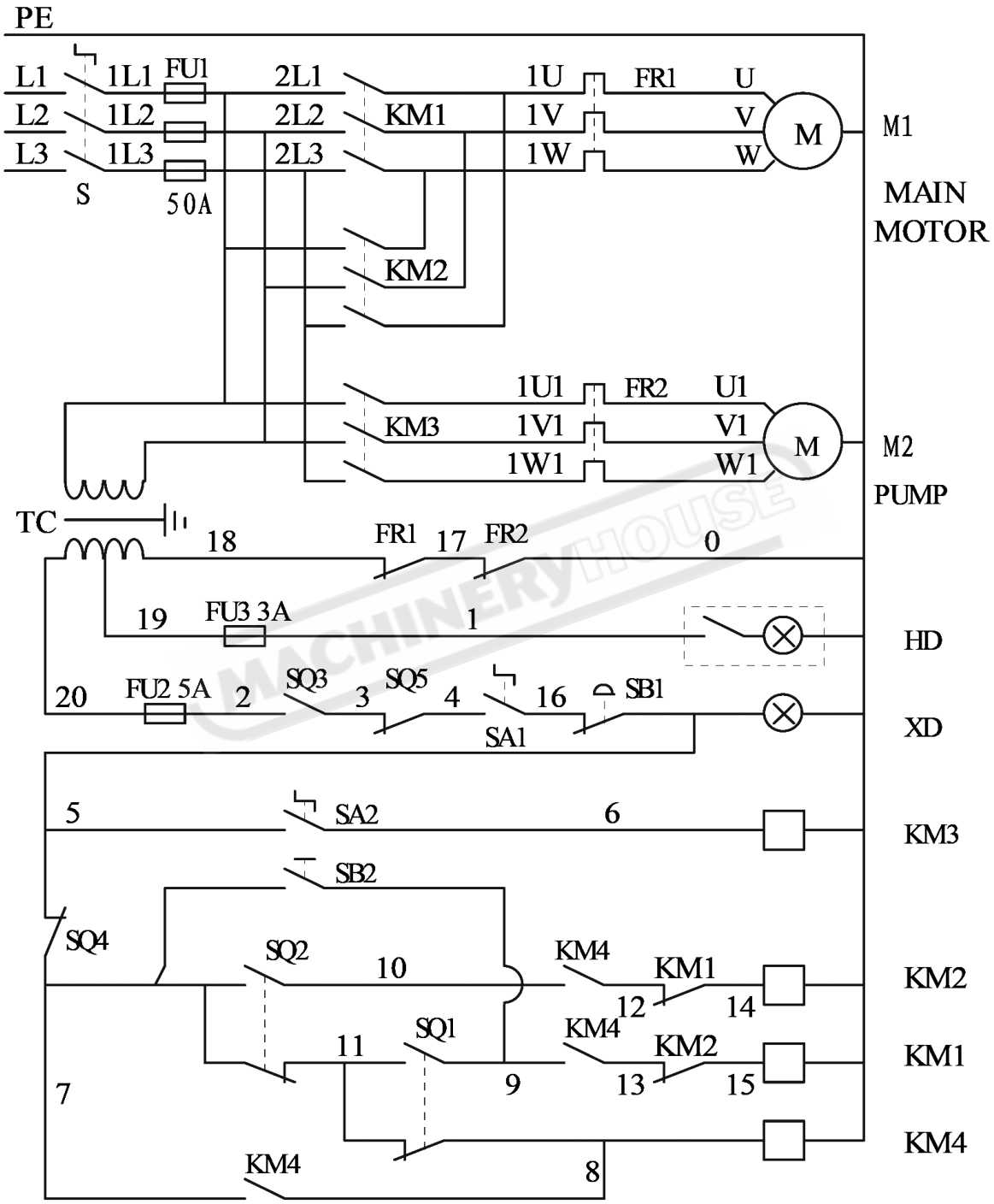
No.	Part No.	Description	Specification	Qty
1	CR6251-16-01	Connect Sleeve		1
2	CR6251-16-04	Protect Sleeve	1000	2
2	CR6251-16-04-1	Protect Sleeve	1500	2
2	CR6251-16-04-2	Protect Sleeve	2000	2
2	CR6251-16-04-3	Protect Sleeve	3000	2
3	CR6251-16-02	Connect Sleeve	1000. 1500	1
3	CR6251-16-02-2	Connect Sleeve	2000. 3000	1
4	CR6251-16-03	Connect Sleeve	1000. 1500	1
4	CR6251-16-03-2	Connect Sleeve	2000. 3000	1
5	CR6251-16-05	Connect Sleeve		1
6	GB97.1-85	Flat Washer	M6	6
7	GB819-85	Screw	M5×12	2
8	GB70-85	Socket Cap Screw	M6×20	6
9	GB93-87	Spring Washer	M6	6

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

WIRING DIAGRAM



WIRING DIAGRAM Cont.



⚠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 ellergic 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.

⚠WARNING

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 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 you 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 you 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 (Recommended for Purchase / Buyer / User)
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. Machine should be installed & checked by a Licensed Electrician.
N	HIGH - TEMPERATURE	LOW	Wear appropriate protective clothing to prevent hot swarf.
O	OTHER HAZARDS, NOISE.	LOW	Wear hearing protection as required.
Plant Safety Program to be read in conjunction with manufactures instructions			

HARE&FORBES MACHINERYHOUSE

www.machineryhouse.com.au

MACHINERYHOUSE

www.machineryhouse.co.nz

Authorised and signed by:
Safety officer:.....
Manager:.....

Revised Date: 12th March 2012