

SHARP



HORIZONTAL MILL

UH-3-PLC-3N



OPERATING INSTRUCTIONS AND PARTS MANUAL

www.sharp-industries.com

Introduction

The Ultimate Synergy of Rigidity and Intelligent Automation

Congratulations on choosing the **SHARP UH-3**, a high-performance **Knee-Type Horizontal Milling Machine** engineered to redefine productivity on your shop floor. The UH-3 bridges the gap between traditional heavy-duty milling and modern precision, offering an unmatched combination of structural integrity and **PLC-driven automation**.

1. Unmatched Structural Integrity & Power

At the heart of the UH-3 is a foundation built for the most demanding material removal tasks. Equipped with a robust **7.5 HP spindle motor** and high-precision **C5-grade ball screws** on all three axes, the UH-3 is designed to handle heavy workloads with ease. Our high-tensile castings ensure maximum **vibration dampening**, allowing you to maintain superior surface finishes and long-term **geometric accuracy** even during aggressive milling operations.

2. Intelligent Automation: CNC Consistency with Manual Flexibility

The UH-3 features an advanced **PLC servo control system** that transforms complex manual tasks into streamlined, automated cycles. Through an intuitive HMI, operators can easily program multi-axis loops for slotting, step-over milling, and repetitive surfacing. This "Intelligent Edge" allows your facility to achieve **CNC-like consistency** and increased throughput without the complexity of full G-code programming, significantly reducing setup times and operator fatigue.

3. A Commitment to Safety and Operational Excellence

At SHARP, we believe a great machine is a safe and reliable one. Safety and **preventative maintenance** are the pillars of this manual. We have provided comprehensive safety protocols, maintenance schedules, and detailed **exploded-view diagrams** to ensure your investment remains in peak condition for decades to come. To ensure the highest level of performance and operator protection, please review this manual thoroughly before powering on the equipment.

SHARP UH-3-PLC-3N | Top 10 Engineering Features

1. High-Torque 7.5 HP Spindle with NST #50 Taper

The heart of the UH-3 is its robust 7.5 HP spindle motor, featuring a standard **NST #50 (NMTB 50)** taper. With a speed range of 80-1200 RPM, this machine is engineered for heavy-duty material removal, from large-diameter face milling to high-torque gear cutting, ensuring maximum rigidity and vibration-free performance.

2. PLC-Driven 3-Axis Independent Servo System

Moving beyond traditional mechanical power feeds, the UH-3-PLC-3N utilizes an advanced **PLC-controlled servo system** on all three axes. This setup provides infinitely variable feed rates (0–59 IPM), eliminating the wear-prone gearboxes of the past while delivering superior motion response and positioning accuracy.

3. High-Precision C5-Grade Ball Screws

To ensure long-term accuracy and reliability, the X, Y, and Z axes are equipped with **C5-grade precision ball screws**. Unlike conventional lead screws, these high-efficiency ball screws significantly reduce **backlash** and thermal expansion, allowing for tighter geometric tolerances and smoother table travel.

4. Intuitive HMI Touchscreen Interface

The industrial-grade **Human-Machine Interface (HMI)** simplifies complex operations. Operators can perform X/Y/Z zero-resetting, monitor real-time axis loads, and configure machining parameters with a few taps. This user-friendly interface reduces the learning curve for new operators and minimizes setup errors.

5. Automated Loop Machining & Job Recipe Management

The integrated PLC allows for automated machining cycles, such as slotting and repetitive face milling. Operators can define the **X-axis Start/End points, Y-axis Step-over, and Z-axis Target Depth**. The system supports storage for up to **256 job recipes**, enabling rapid recall for recurring production runs.

6. Heavy-Duty Cast Iron Knee-Type Construction

Built for maximum stability, the UH-3 features a high-tensile cast iron frame with wide, hand-scraped ways. The **Knee-type design** provides a massive 54" x 12" work surface, offering superior **structural damping** to handle aggressive cuts while maintaining precision over the full 15.74" vertical travel.

7. Rigid Overarm with Dual Arbor Supports

Specifically designed for heavy horizontal milling, the machine includes a reinforced overarm and **two standard arbor supports**. Combined with the 1-1/4" diameter arbor, this configuration provides exceptional tool rigidity, minimizing **chatter** and ensuring superior surface finishes on wide-cut operations.

8. Programmable Pressurized Auto-Lubrication System

Lubrication is managed directly by the PLC. The **pressurized automatic system** allows for precise adjustment of lubrication duration and intervals. This ensures that all critical slideways and ball screws maintain an optimal oil film, preventing dry-run wear and extending the machine's service life.

9. Electromagnetic Spindle Braking System

For enhanced operator safety and reduced cycle times, the spindle is equipped with an **electromagnetic brake**. Upon hitting the stop button or E-stop, the spindle comes to an immediate halt, allowing for faster tool changes and providing a critical layer of protection in emergency situations.

10. Comprehensive Chip & Coolant Management

The UH-3 comes standard with a high-flow coolant system and a complete splash protection package, including **rear chip guards and Y-axis telescopic bellows**. This design ensures that chips and coolant are contained, protecting the machine's precision components and keeping the workspace clean and safe.

1. Safety

1.1 General Operating Safety Protocol

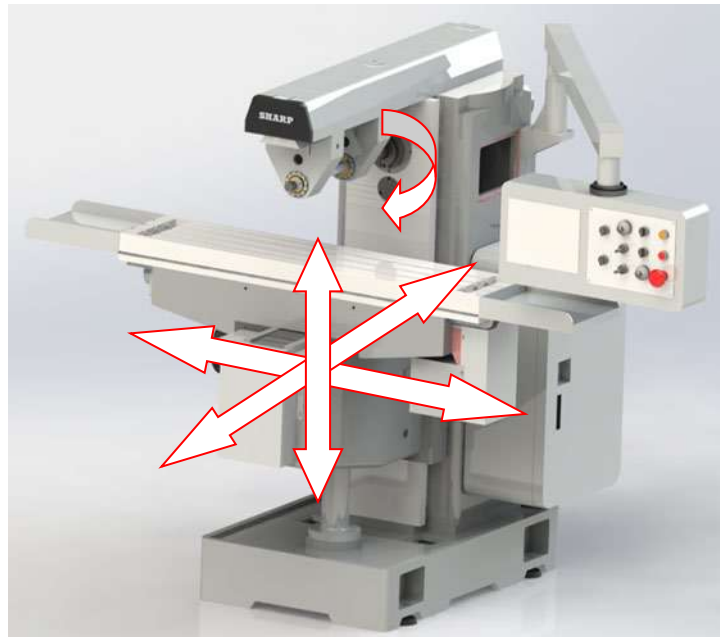
- **Authorized Personnel Only:** Operators must undergo comprehensive training and demonstrate proficiency before being authorized to operate this equipment. Do not attempt to operate without proper supervision or certification.
- **Safety Placards:** Observe all warning labels and safety signs affixed to the machine. These placards are critical for safety; do not deface, remove, or obstruct them. Replace any damaged or illegible labels immediately.
- **Pre-Operational Inspection:** Before powering on, verify that all control switches, emergency stops (E-Stops), and safety interlocks are in their proper positions and functioning correctly.
- **Personal Protective Equipment (PPE):** Operators must wear ANSI-approved safety glasses and industrial-grade safety shoes. Remove all jewelry (rings, watches, necklaces) and secure loose clothing or long hair that could become entangled in rotating spindles or moving axes.
- **Workspace Housekeeping:** Maintain a clear work zone around the machine. Ensure the floor is free of obstructions, oil spills, or trip hazards.
- **Tooling & Workholding Security:** Ensure that the workpiece is rigidly clamped and all cutting tools/arborers are securely locked before initiating a cycle. Unsecured components can become high-velocity projectiles.
- **No Tool Storage on Machine:** Never place hand tools, gauges, or loose hardware on the control console, machine table, or any moving surfaces (such as the knee or overarm).
- **Clearance Zone:** Keep hands and body parts clear of the machine's work envelope while the spindle is rotating or axes are in motion. Never reach around guards.
- **Electrical Safety:** Do not operate switches or touch electrical components with wet hands to prevent lethal electrical shock.
- **Thermal Hazards:** High-intensity work lamps and spindle housings can become extremely hot during prolonged operation. Avoid direct skin contact to prevent burns.
- **Lockout/Tagout (LOTO):** When performing belt adjustments, maintenance, or repairs, the main power must be disconnected and locked out following standard LOTO procedures to prevent accidental startup.
- **Fastener Integrity:** Regularly inspect the machine for loose bolts or components. Tighten immediately to prevent structural failure or machine disintegration during operation.
- **Power Failure Protocol:** In the event of a power outage, immediately turn off the main power switch/disconnect to prevent an uncontrolled restart when power is restored.
- **Qualified Service Technicians:** All electrical and mechanical repairs must be performed by certified technicians or authorized service personnel familiar with knee-type milling machines.

1.2 Machine Hazard Zones

The machining envelope is a high-danger zone during operation. Areas marked with the **[Safety Symbol]** involve high-speed rotation or linear motion.

- **Rotating Hazards:** The spindle, arbor, and cutters pose extreme entanglement and cutting risks.
- **Pinch Points:** The movement of the table (X/Y-axis) and the knee (Z-axis) creates potential pinch points against the machine column and overarm.
- **Flying Debris:** High-speed chip ejection and coolant spray are present within the work zone. Ensure all splash guards are in place.

Alert: All operators and maintenance personnel must remain vigilant when near these zones to prevent catastrophic injury.



CAUTION

This means that if precautions are not heeded, it may result in minor injury and/or possible machine damage.



WARNING

This means that if precautions are not heeded, it may result in serious or even fatal injury.

2. Installation

2.1 Site Requirements

To ensure long-term accuracy and operational stability, the installation site must meet the following criteria:

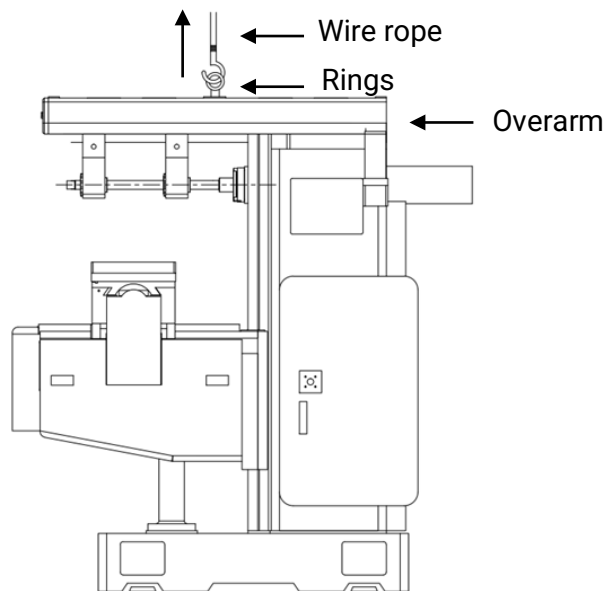
- **Service Clearance:** Maintain sufficient clearance around the machine for maintenance. Ensure the electrical cabinet door can swing open at least 90° (or per local NEC codes) without obstruction.
- **Foundation Integrity:** The floor must be a reinforced concrete slab capable of supporting the machine's gross weight without deflection.
- **Ambient Temperature:** Operating range of 0° – 40°C (32° – 104°F).
- **Humidity:** 30% – 95% Relative Humidity (non-condensing).
- **Access for Maintenance:** Leave adequate space (recommended 3 feet / 1 meter) between the machine and any walls or adjacent equipment.

2.2 Power Requirements

- **Supply Voltage:** 200V / 220V AC (±10%), 3-Phase.
- **Line Frequency:** 50/60Hz (±1Hz).

Note: Ensure the machine is properly grounded according to local electrical codes.

2.3 Rigging & Handling



Lifting Requirements

- **Weight Specification:** The gross weight of the UH-3-PLC-3N is approximately 2,100 kg (4,630 lbs).
- **Equipment:** Only use certified heavy-duty hoists, overhead cranes, or forklifts with a rated capacity exceeding the machine weight.
- **Personnel:** Rigging must be performed by a certified rigger or qualified technician.

Lifting Method

- The machine is typically lifted using the **Overarm** (Cross-arm). Adjust the overarm position to align with the machine's **Center of Gravity (CoG)** to ensure a level lift and prevent tipping.
- Use **protective padding** (rags) and **wood cribbing** (blocks) where slings contact the machine casting to prevent paint damage or marring of precision surfaces.

Rigging Precautions

- All crane and forklift operators must hold valid licenses/certifications.
- Inspect all rigging gear (slings, shackles, eye-bolts) for wear or damage before use.
- Danger Zone: Once the machine is airborne, no personnel are permitted within the fall radius of the load.
- Verify that all shipping brackets and loose components are secured or tightened before movement.

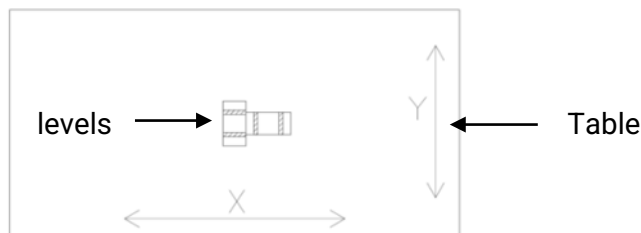
2.4 Machine Setup & Commissioning

Positioning

- Place **Leveling Pads (Mounts)** at the designated supporting points before lowering the machine onto the floor.
- Cleaning: Use a lint-free cloth and an approved solvent to remove the **anti-rust coating** (Cosmoline) from the table and ways. Immediately apply a light coat of way-oil to prevent flash-rusting.
- Verify the lubrication reservoir is filled to the "High" mark.

Leveling Adjustment

- Place two Precision Master Levels (0.0005"/ft sensitivity) on the center of the table, oriented at 90° to each other (Longitudinal and Cross).
- Center the table travel (X and Y).
- Adjust the leveling bolts on the machine base until the bubbles are centered. The machine must be level within the manufacturer's tolerance to ensure proper oil drainage and axis alignment.



Geometric Precision Verification

- With X and Y axes centered, mount a Dial Indicator to the spindle nose.
- Perform a Squareness Check: Sweep the table surface by rotating the spindle manually. This ensures the spindle axis is perfectly perpendicular/square to the table surface.

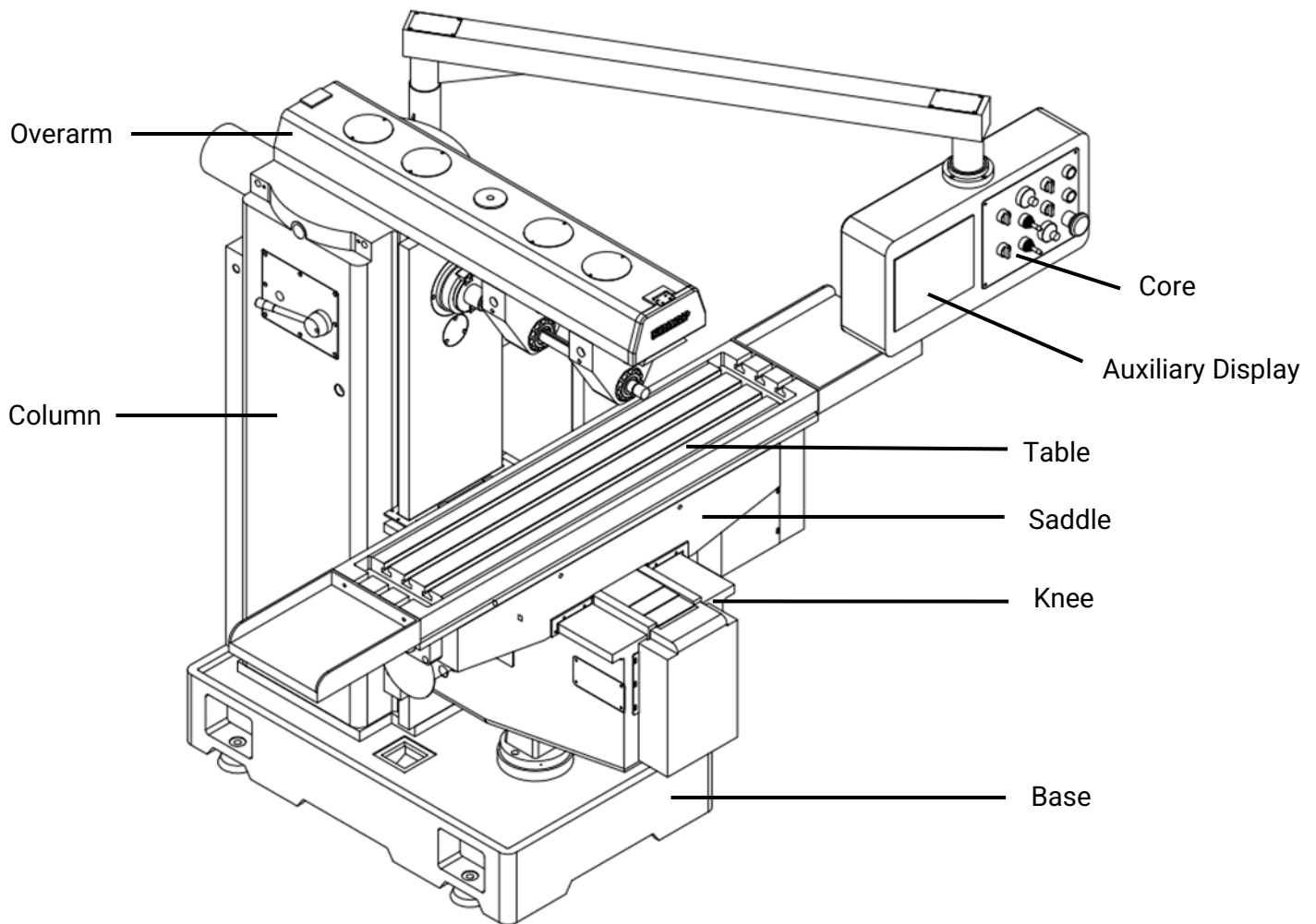
Pre-Start Inspection

Before the initial power-up, complete the following checklist:

- **Visual Inspection:** Check all electrical lines, pneumatic piping, and connectors for damage during transit.
- **Utility Verification:** Confirm incoming voltage, frequency, and phase rotation are correct.
- **Switch Test:** Manually toggle all switches and E-Stops to ensure smooth, unobstructed operation.
- **Clearance Check:** Ensure the work envelope is clear of tools, shipping materials, and personnel.

3. Machine Operation

3.1 Machine Part Description



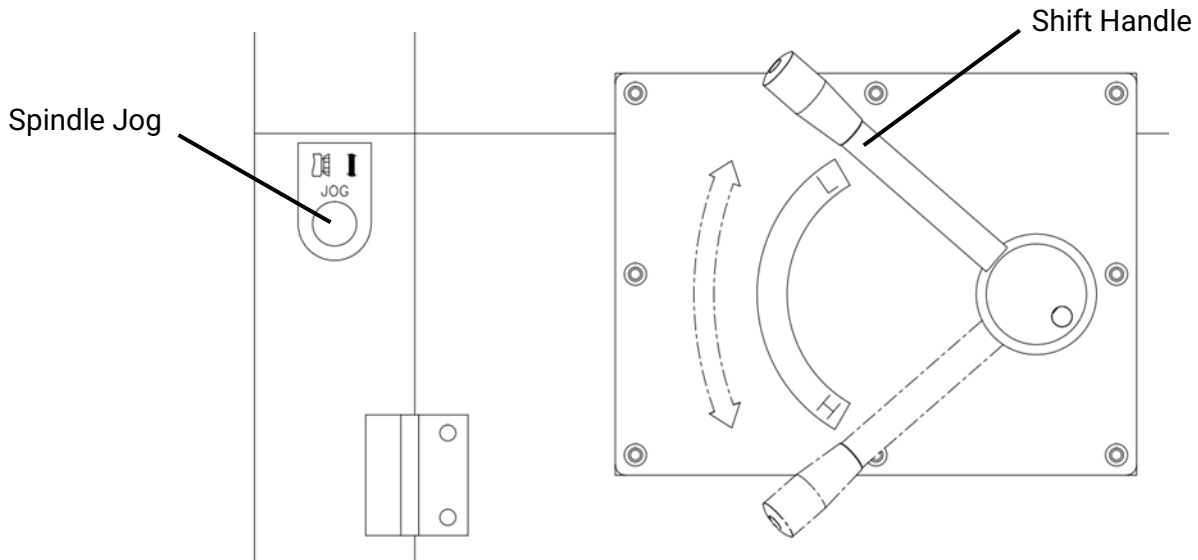
3.2 Spindle Speed Selection & Gear Shifting

The UH-3 is equipped with a dual-range manual gearbox designed to deliver maximum torque at low speeds and precision at higher RPMs.

- **Low Range:** 80 – 280 RPM (Optimized for heavy-duty material removal and large diameter cutters).
- **High Range:** 281 – 1,200 RPM (Optimized for general-purpose milling and finishing).

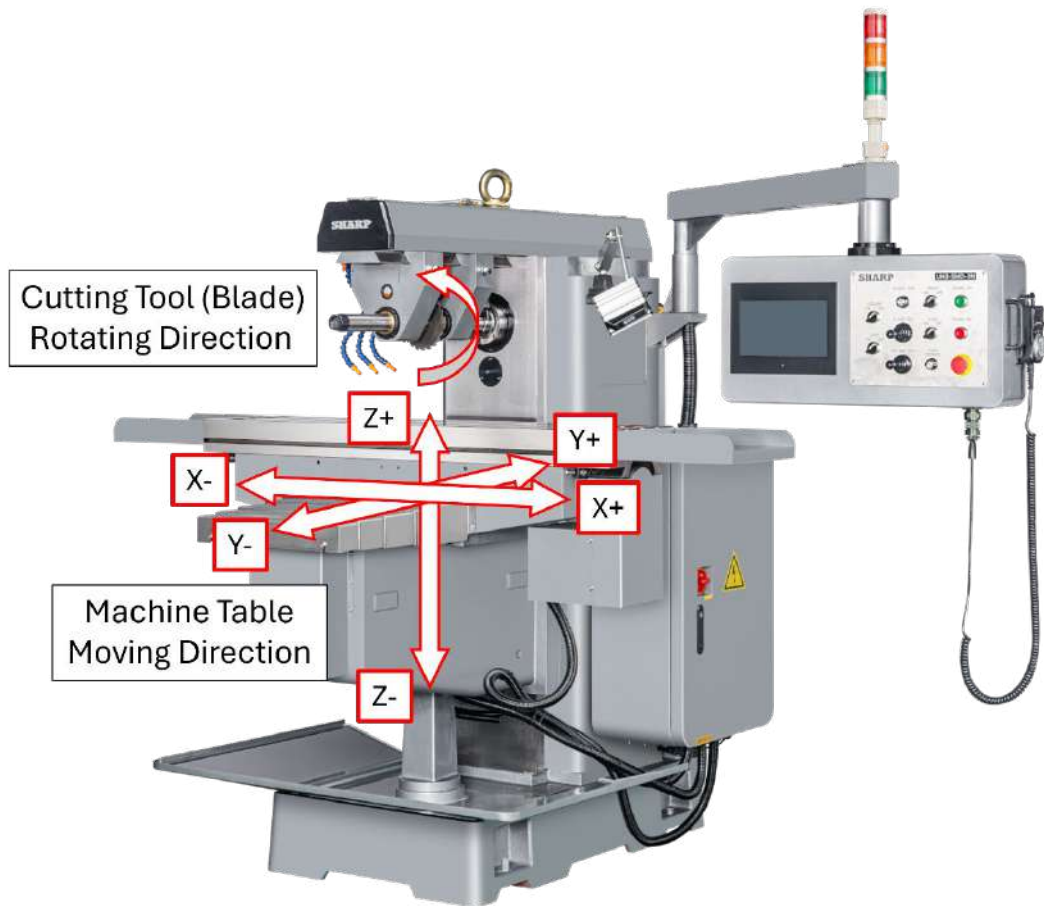
Shifting Instructions:

- **Stop Spindle:** Ensure the spindle is at a complete standstill before attempting to shift gears.
- **Manual Shift:** Move the gear selection lever to the desired range.
- **Spindle Jog / Gear Mesh:** If the gears do not fully engage or mesh immediately, press the **[SPINDLE JOG / SHIFT]** button. This will momentarily rotate the spindle at low torque, allowing the gears to align and slide into position.
- **Engagement Check:** Ensure the lever is fully locked into its detent before restarting machining operations.

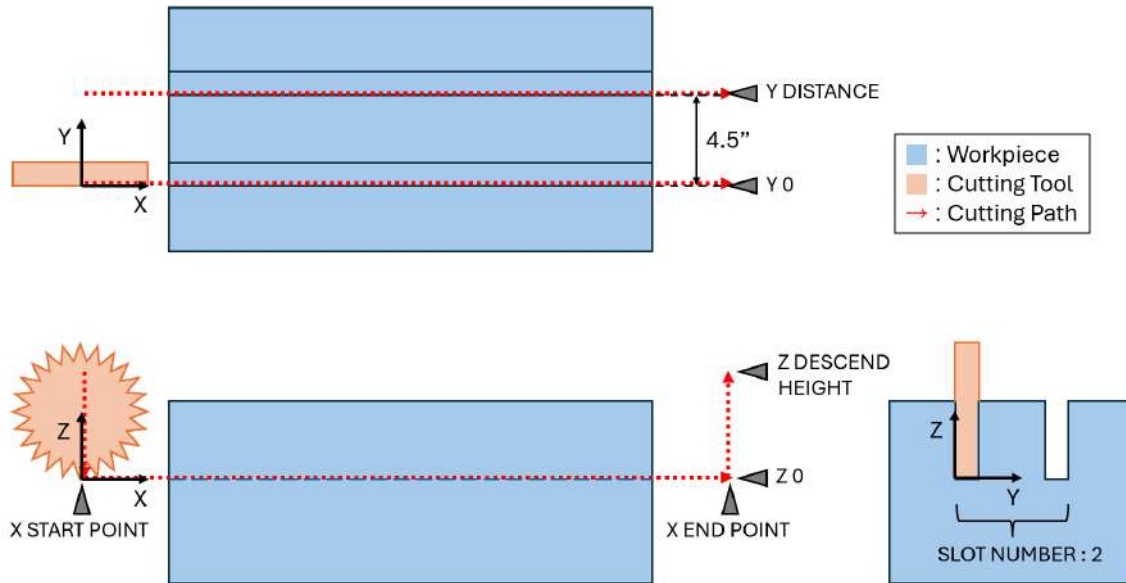


3.3 Quick Guide





This section uses a simple case study to demonstrate how to set machining parameters and start machining. The following is a schematic diagram of the motion directions of each axis of the machine.



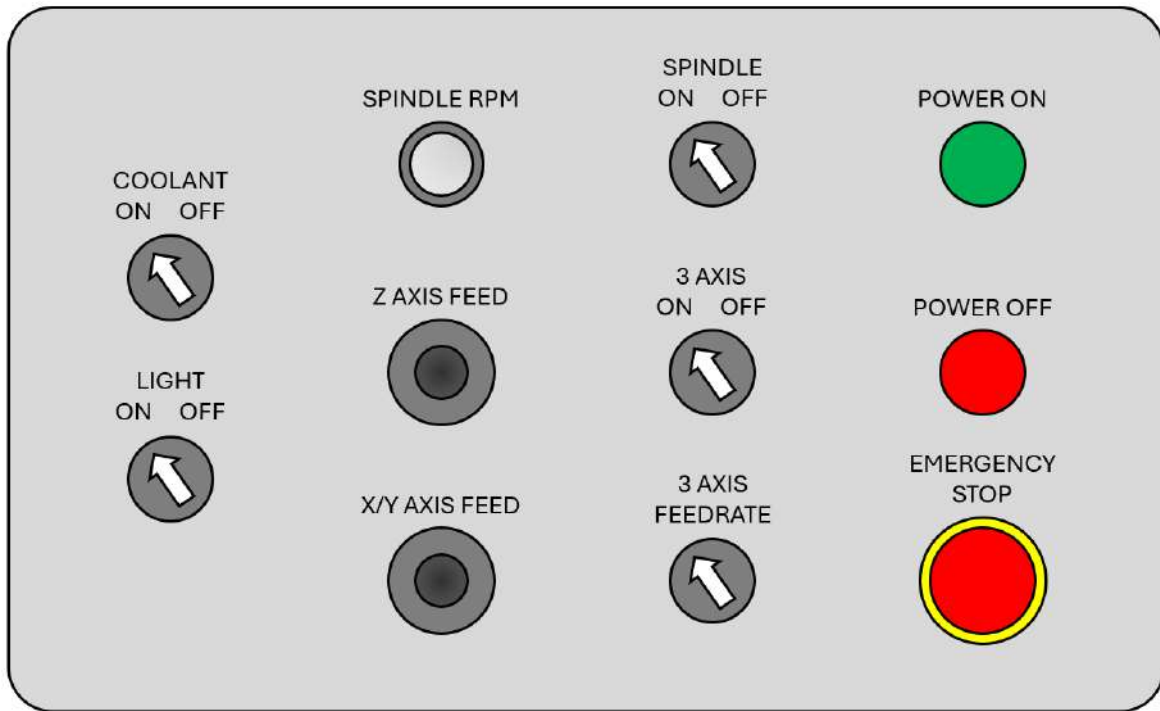
The target dimensions of the workpiece are shown in the figure below.



Step	Icon	Description
1.		Press POWER ON to turn on the machine. After the screen is on, release the EMERGENCY STOP .
2.		Use the X/Y AXIS FEED handle to move the X and Y axes, and position the cutting tool roughly above the machining start position.
3.		Use the handwheel to move the Z-axis. Lower the cutting tool to the target cutting depth, then press Z0 . The spindle must remain OFF. Make sure the cutting tool does NOT contact the workpiece.
4.		Use the handwheel to move the Y-axis. Fine-adjust to the correct Y-axis position, then press Y0 .

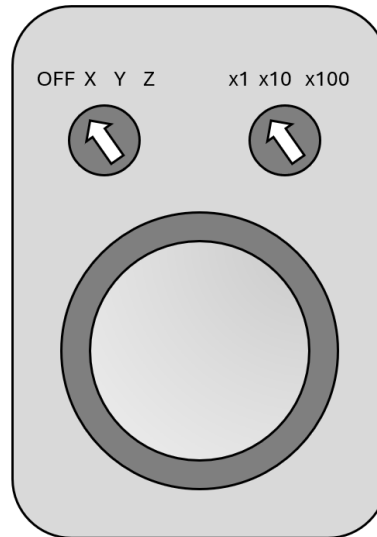
5.		<p>Use the handwheel to move the X-axis. Fine-adjust to the starting X-axis position, then press X0.</p> <p>Enter 0 in the X START POINT field.</p>
6.		<p>Check the cutting tool position. If needed, repeat Steps 3–5.</p>
7.		<p>Lower the table to a safe height where the cutting tool will not contact the workpiece.</p> <p>Enter the current Z-axis position into Z DESCEND HEIGHT.</p>
8.		<p>Use the X/Y AXIS FEED handle to move the X-axis near the machining end position.</p>
9.		<p>Fine-adjust the X-axis until the blade is completely clear of the workpiece.</p> <p>Enter the current position into X END POINT.</p>
10.		<p>As shown in the figure, 2 slots with a spacing of 4.5” need to be machined. Enter 4.5 in Y DISTANCE and 2 in SLOT NUMBER.</p>
11.		<p>Turn SPINDLE ON/OFF to ON. Adjust SPINDLE RPM and check the SP display.</p>
12.		<p>Press CYCLE START to begin machining.</p> <p>Adjust feedrate using the 3-AXIS FEEDRATE knob during operation.</p>

3.4 Control Panel Description



- **POWER ON:** Turn on machine power
- **POWER OFF:** Turn off machine power
- **EMERGENCY STOP:** Immediately stop all axis movement when pressed
- **SPINDLE ON/OFF:** Start or stop the spindle
- **SPINDLE RPM:** Adjust spindle speed
- **3 AXIS ON/OFF:** Not in use
- **3 AXIS FEEDRATE:** Adjust axis feedrate
- **X/Y AXIS FEED:** Left/right to control X-axis, in/out to control Y-axis
Switch the selected axis on handwheel to OFF to enable feed handle function
- **Z AXIS FEED:** Left/right to control Z-axis
Switch the selected axis on handwheel to OFF to enable feed handle function
- **COOLANT ON/OFF:** Turn coolant on or off
- **LIGHT ON/OFF:** Turn the work light on or off

3.5 Handwheel Description



- **OFF / X / Y / Z:** Select the axis controlled by the handwheel
- **x1 / x10 / x100:** Select moving increment per step (Unit: 0.0001 inch)
- **Handwheel:** Turn to move the selected axis

Please note that the handwheel function will be locked when overtravel occurred. The axis could only be moved inward the travel range by feed handle.

3.6 Screen Description

3.6.1 Main Page

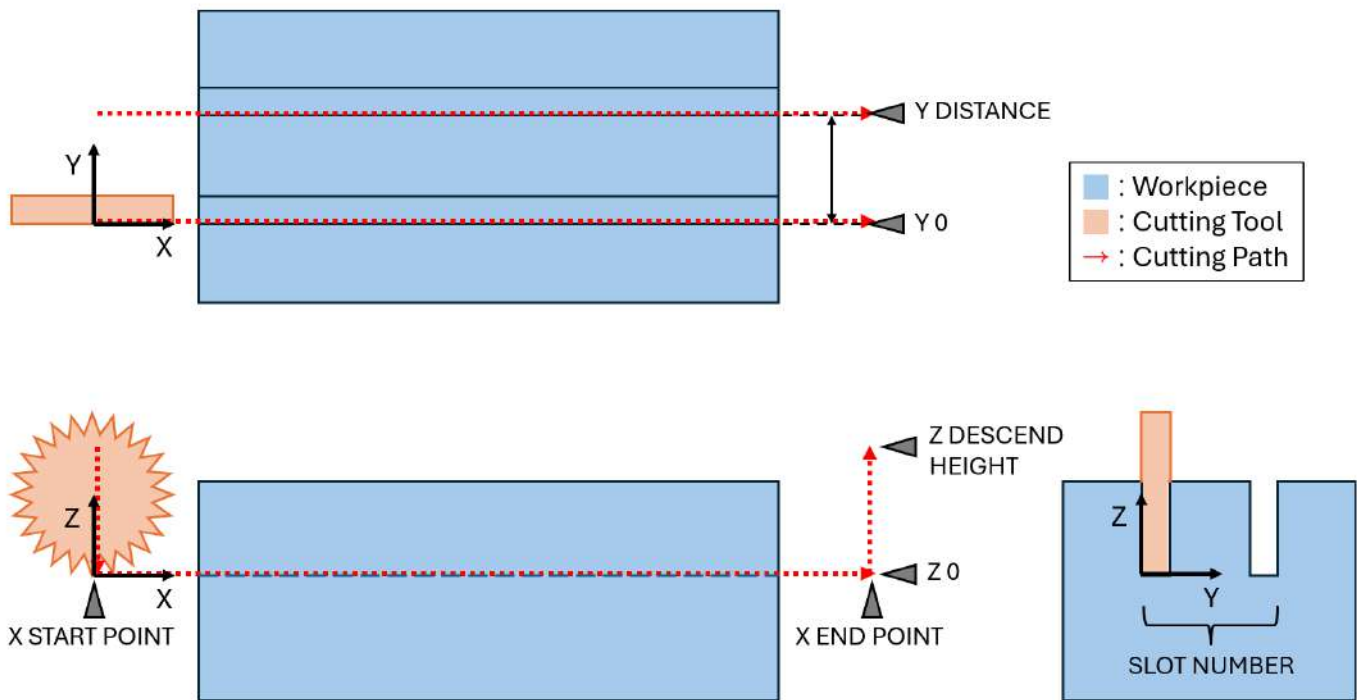
This page is used to set machining parameters and execute machining.



- **Axis Position Display:** Show current axis positions (inch)
- **Spindle Speed Display:** Show spindle speed (RPM)
- **Axis Feedrate Display:** Show axis feedrate (inch/min)
- **X0 / Y0 / Z0:** Set zero position
- **Y DISTANCE:** Distance to next slot (inch)
- **X START POINT:** X-axis start position (inch)
- **X END POINT:** X-axis end position (inch)
- **Z DESCEND HEIGHT:** Clearance position, to prevent tool collision (inch)
- **SLOT NUMBER:** Number of slots
- **CYCLE START:** Start program
- **STOP:** Pause program (press CYCLE START to resume)

- **RESET:** Stop and reset program
- **Handwheel Status Display:** Show selected axis and increment
- **Limit Status Display:** Show axis limit status if overtravel
- **SHARP LOGO:** Open axis load monitoring window
- **SETTING:** Go to SETTING page
- **PARAMETER:** Go to PARAMETER page
- **JOB:** Go to JOB page

The relationship between machining parameters and cutting path is shown in the figure below.



3.6.2 SETTING Page

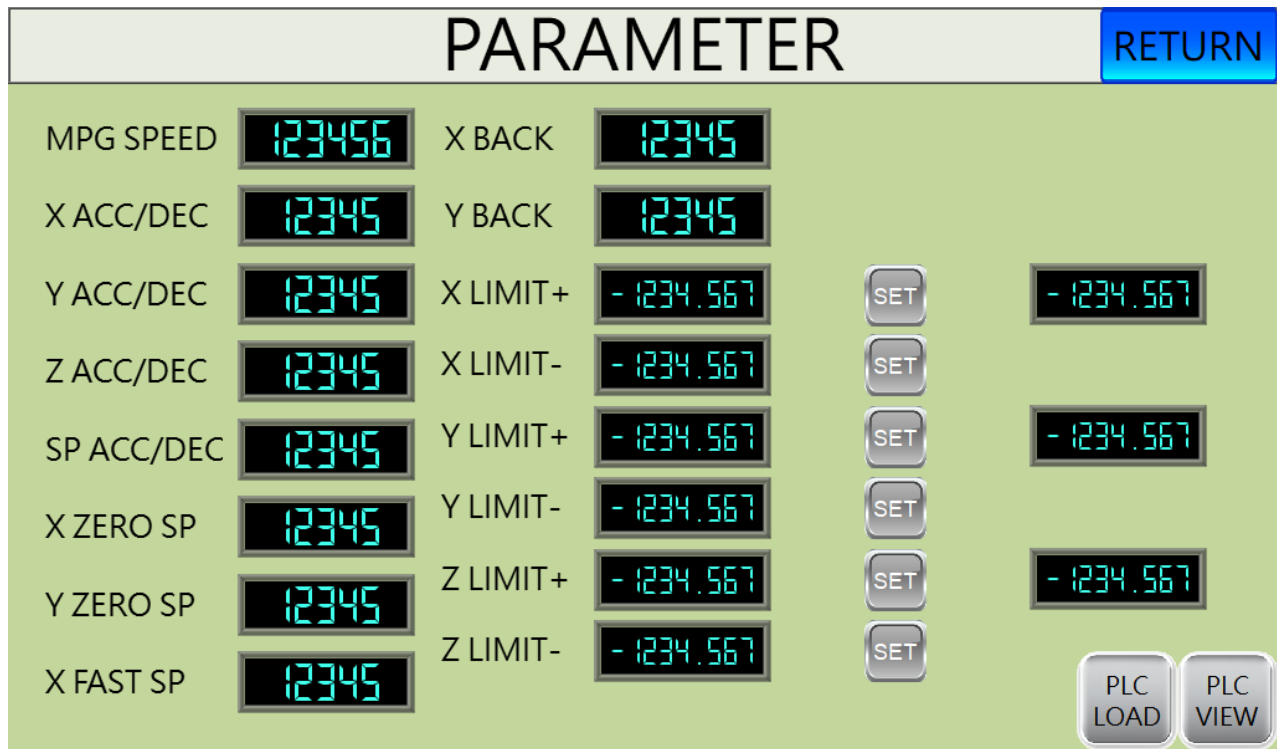
This page is used to configure machine operation settings. These settings are adjusted by machine manufacturer based on preference or requirements. Users should NOT modify settings unless necessary.

SETTING		RETURN	
AXIS SPEED	123456	X FEED END T	12345.6
FAST SPEED	123456	Z DOWN T	12345.6
LUBE TIME	12345.6	Z UP T	12345.6
LUBE INTERVAL	12345.6	Y MOVE T	12345.6

- **AXIS SPEED:** Cutting feedrate (inch/min)
- **FAST SPEED:** Rapid speed (inch/min)
- **LUBE TIME:** Lubrication duration (sec)
- **LUBE INTERVAL:** Lubrication interval (sec)
- **X FEED END T:** Dwell time after X-axis feed (sec)
- **Z DOWN T:** Dwell time after Z-axis downward movement (sec)
- **Z UP T:** Dwell time after Z-axis upward movement (sec)
- **Y MOVE T:** Dwell time after Y-axis movement (sec)
- **RETURN:** Back to Main Page

3.6.3 PARAMETER Page

This page is configured by the machine manufacturer. Users should NOT modify settings unless necessary. Only commonly used items are listed below:



- **X LIMIT+ SET:** Set X-axis positive software limit
- **X LIMIT- SET:** Set X-axis negative software limit
- **Y LIMIT+ SET:** Set Y-axis positive software limit
- **Y LIMIT- SET:** Set Y-axis negative software limit
- **Z LIMIT+ SET:** Set Z-axis positive software limit
- **Z LIMIT- SET:** Set Z-axis negative software limit
- **PLC LOAD:** Insert a USB device containing the PLC update file into the control panel USB port, then press to update PLC software
- **RETURN:** Back to Main Page

3.6.4 JOB Page

This page is used to store and load machining recipes for quick setup.

Recipe Storage and Loading Instructions

- The upper section shows the values stored in the **HMI**
- The lower section shows the **active working values**

To Save Values to HMI

1. Select a group using **GROUP SELECT**.
The name can be edited in the box on the right.
2. Set the desired values either on the **Main Page** or in the lower section.
Then press **PUSH TO SAVE JOB** to store the values into the HMI.

To Load Values for Operation

1. Select a saved group using **GROUP SELECT**.
2. Press **UPLOAD TO WORK** to load the values into the active working settings.

The screenshot displays the HMI interface for the JOB page. At the top, the word "JOB" is centered, and a blue "RETURN" button is on the right. Below this, there is a "GROUP SELECT" dropdown menu showing "AAAAAA_0" and a text box containing "ABCDEFGH IJKLMNP". A "GROUP VALUE" section features a red "UPLOAD TO WORK" button. The upper status bar shows "Y DISTANCE" with a "Stored Recipe" label, "Z DESCEND" at -12.3456, "X START POINT" at -12.3456, "X END POINT" at -12.3456, and "SLOT NUMBER" at 1234. A central table lists recipes from Recipe0 to Recipe4, with Recipe4 highlighted as the "Recipe Table". The lower status bar shows "WORK VALUE" and a red "PUSH TO SAVE JOB" button, along with "SAVE TO USB" and "USB UPLOAD" buttons. The bottom status bar shows "Y DISTANCE" with an "Active Recipe" label, "Z DESCEND" at -12.3456, "X START POINT" at -12.3456, "X END POINT" at -12.3456, and "SLOT NUMBER" at 1234.

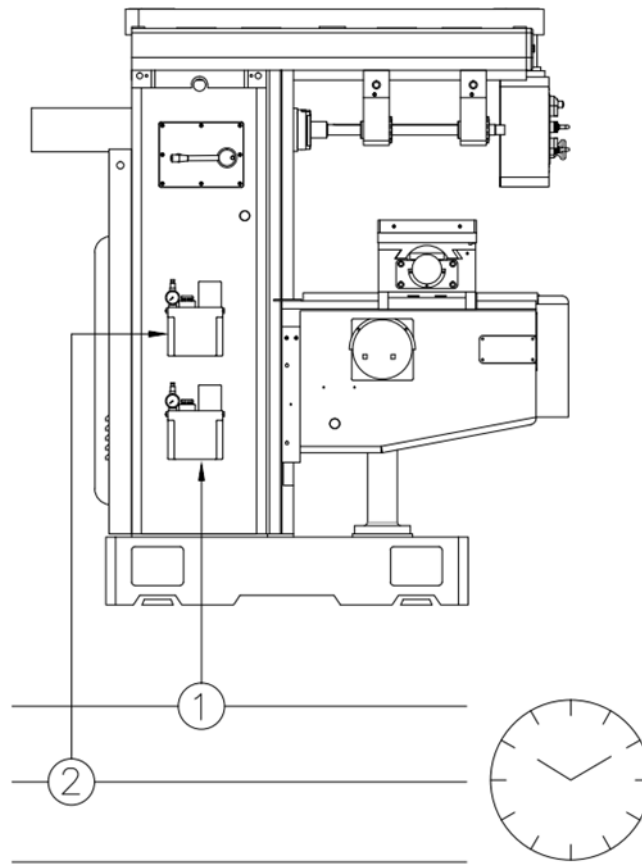
	Y DISTANCE	X START POINT	X ENDPOINT	Z DESCENDHEIGHT	SLOTNUMBER
•Recipe0	-0.0001	-0.0001	-0.0001	-0.0001	0
Recipe1	-0.0001	-0.0001	-0.0001	-0.0001	0
Recipe2	-0.0001	-0.0001	-0.0001	-0.0001	0
Recipe3	-0.0001	-0.0001	-0.0001	-0.0001	0
Recipe4	-0.0001	-0.0001	-0.0001	-0.0001	0

- **Recipe Table:** Displays up to 5 saved recipes
- **Stored Recipe:** Selected saved recipe
- **Active Recipe:** Current working recipe
- **Group Select:** Dropdown menu to select a stored recipe
- **Recipe Name:** Set the name of the selected recipe

- **UPLOAD TO WORK:** Load selected recipe into active recipe
- **PUSH TO SAVE JOB:** Save current active recipe into selected stored recipe
- **SAVE TO USB:** Save all recipes (5 sets) to USB
- **USB UPLOAD:** Load recipes from USB into recipe table
- **RETURN:** Back to Main Page

4. Maintenance and Inspection

4.1 Machine Lubrication Schedule



Daily Lubrication & Inspection Table

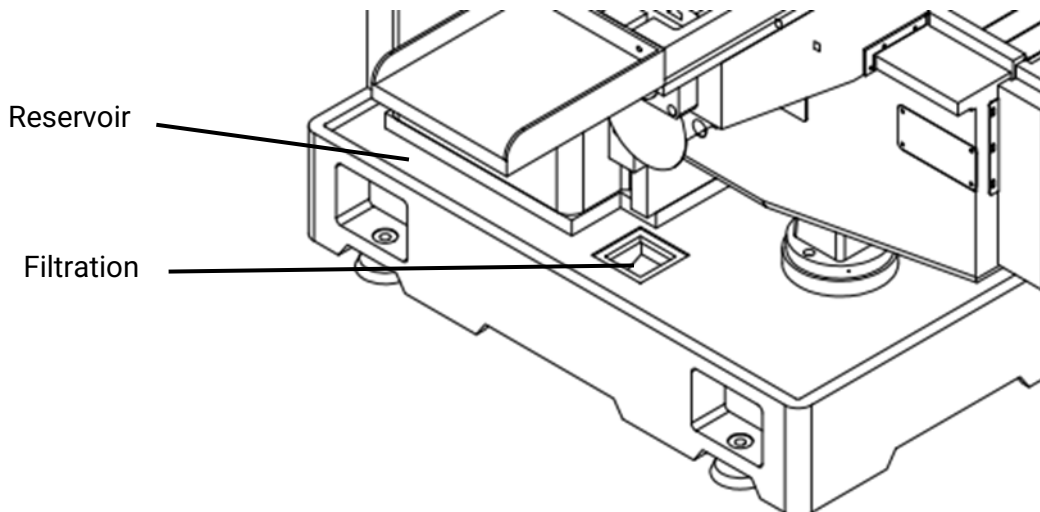
Lubrication position	1	2
Check (hours)	8	-
Add oil (days)	-	1
Specification for oil	VG68	VG68

CAUTIONS:

- Contamination Control:** Before adding lubricant, thoroughly clean the filler neck, reservoir cap, and surrounding area. It is critical to prevent dust, metal chips, or foreign contaminants from entering the system, as they can cause blockages in the distribution lines and catastrophic wear to the precision ways and ball screws.
- Routine Adherence:** Strict adherence to the prescribed lubrication schedule is mandatory. Consistent, high-quality lubrication is the foundation of machine accuracy and is essential to maximizing the service life of the equipment.

4.2 Cutting Fluid & Coolant System Maintenance

- **Coolant Selection:** The selection of cutting fluid (coolant) should be based on the workpiece material and specific machining parameters. Using the correct fluid is essential for maximizing tool life and achieving the desired surface finish.
- **CAUTION - Fluid Compatibility:** The use of inappropriate or low-quality cutting fluids can lead to severe machine damage, including the degradation of seals, paint peeling, and corrosion of the precision ways. Furthermore, contaminated or rancid coolant poses health risks to personnel, such as dermatitis or respiratory irritation.
- **Reservoir & Filtration Maintenance:**
 - Periodically clean the coolant sump (reservoir) to remove fine chips and "sludge" buildup.
 - Clean or replace filtration screens regularly to prevent pump cavitation and ensure consistent flow.
 - Pro-Tip: Monitor coolant concentration levels weekly using a refractometer and maintain the pH balance to prevent biological growth (rancidity) and foul odors.



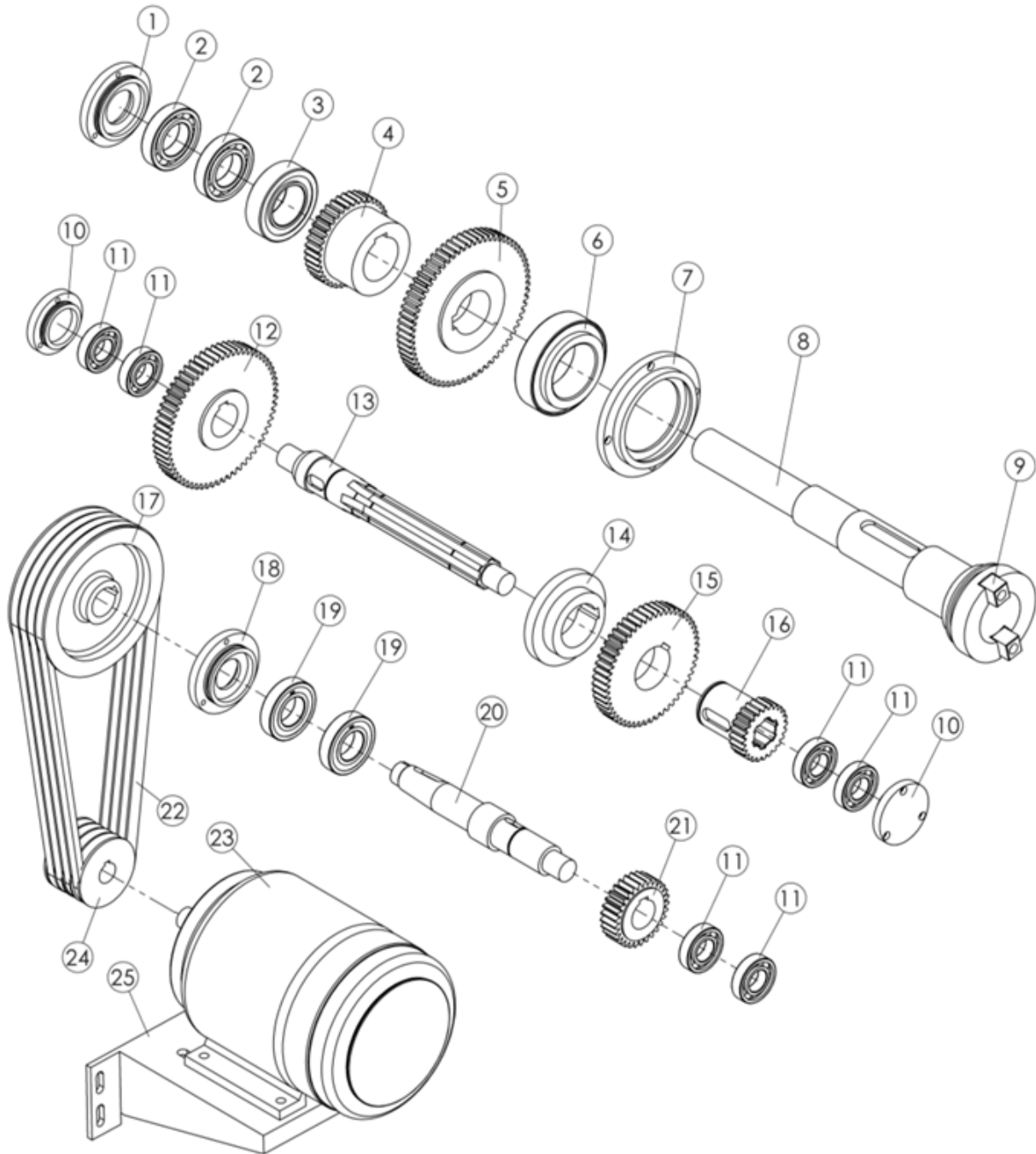
4.3 Routine Inspection

- **Daily Maintenance (Every Shift)**
 - **Lube Level Verification:** Check the automatic lubrication reservoir; ensure the level is above the minimum fill line.
 - **Table Housekeeping:** At the end of each shift, clear all chips from the table and remove workpieces.
 - **Corrosion Protection:** Apply a light coat of way oil or rust inhibitor to the cleaned table surface to prevent flash rusting.
- **Monthly Maintenance**
 - **Slideway Inspection:** Verify the lubrication condition of the X, Y, and Z-axis box ways. Ensure a consistent oil film is present during axis travel with no signs of dry friction.
 - **Lube Distribution Check:** Ensure all lubrication ports and meters are clear and unobstructed.
- **Quarterly Maintenance (Every 3 Months)**
 - **Filtration Service:** Clean or replace the lubrication system suction strainer and coolant filters.
 - **Interface Integrity:** Inspect all electrical buttons and the control console. Ensure all switches provide proper tactile feedback and are securely mounted; verify E-Stop functionality.

- **Semi-Annual Maintenance (Every 6 Months)**
 - **Motor & Spindle Audit:** Inspect motors for abnormal noise, vibration, or excessive heat buildup, which may indicate bearing wear.
 - **Proactive Parts Replacement:** Immediately replace any worn, frayed, or non-functional components identified during inspection (e.g., drive belts, way wipers).
 - **Leveling Re-calibration:** Perform a precision level check and adjust the machine base as necessary to compensate for floor settling.
- **Annual Maintenance**
 - **Geometric Precision Alignment:** Perform a comprehensive mechanical accuracy test (Tramming, Squareness, and Parallelism) and calibrate as required.
 - **Plumbing Inspection:** Inspect all lubrication lines and fittings for leaks, brittleness, or physical damage. Replace any compromised tubing immediately.

5. Assembly Drawing and Parts Lists

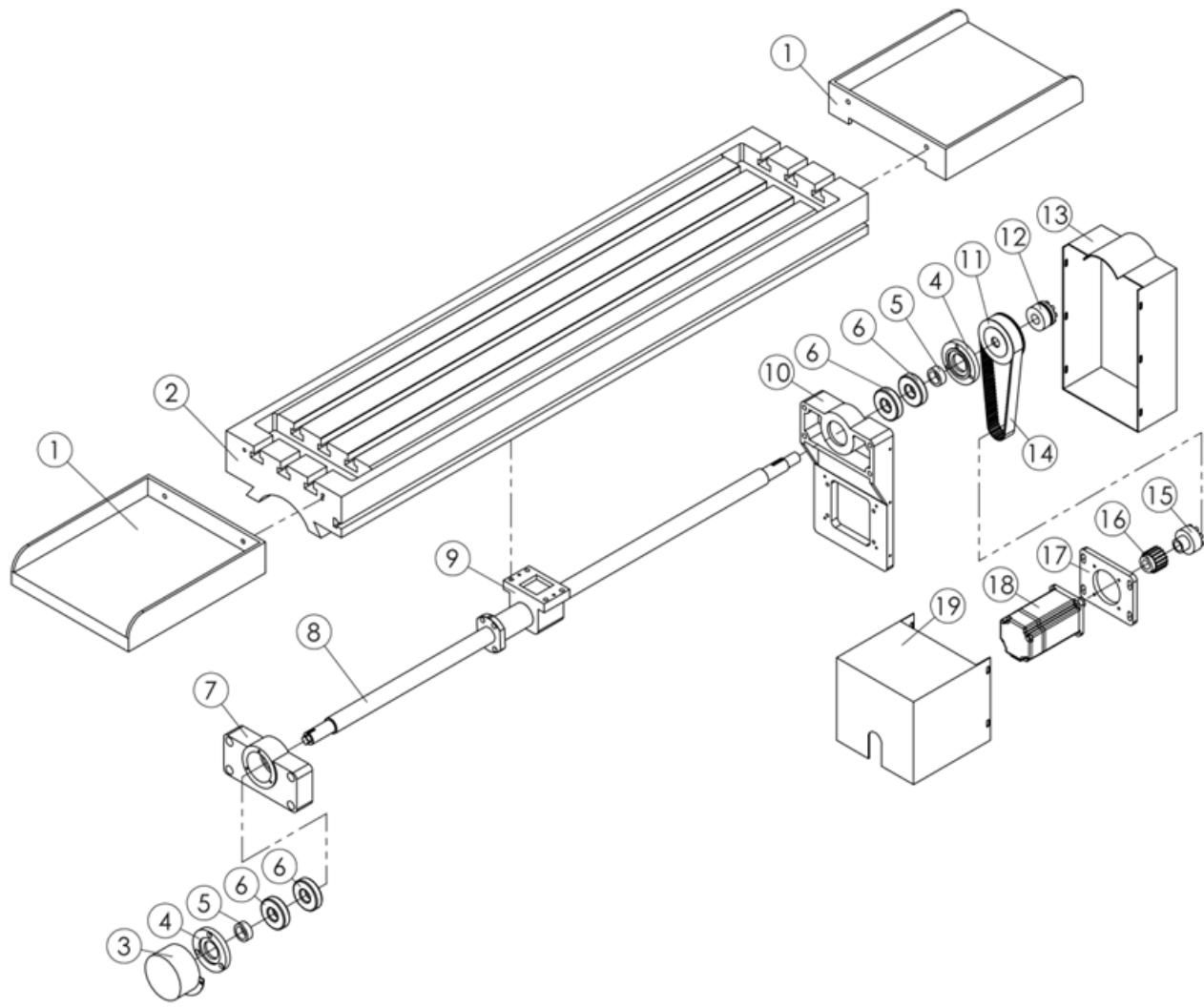
5.1 Horizontal Milling Gearbox Assembly — Exploded Drawing



Horizontal Milling Gearbox Assembly – Parts List

Index No.	Part No	Description	Index No.	Part No	Description
1	50C019A	Cover	14	60C017	Spacer
2	BR008	Ball Bearing (6209)	15	60C014	Gear (52T)
3	BR046	Roller Bearings(33211)	16	60C013	Gear (24T)
4	60C012	Gear (39T)	17	60C021	Pulley
5	60C011	Gear (67T)	18	60C049	Cover
6	BR047	Roller Bearings(33215)	19	BR007	Ball Bearing (6208)
7	50C018A	Cover	20	600C20	Pulley shaft
8	60C018	Horizontal Spindle	21	60C016	Gear (29T)
9	50C123	Stop Block	22		V-belts (SPA)
10	60C024	Cover	23		Motor 7.5HP
11	BR005	Ball Bearing (6206)	24	60C026	Pulley
12	60C015	Gear (62T)	25	60C022	Motor base
13	60C019				

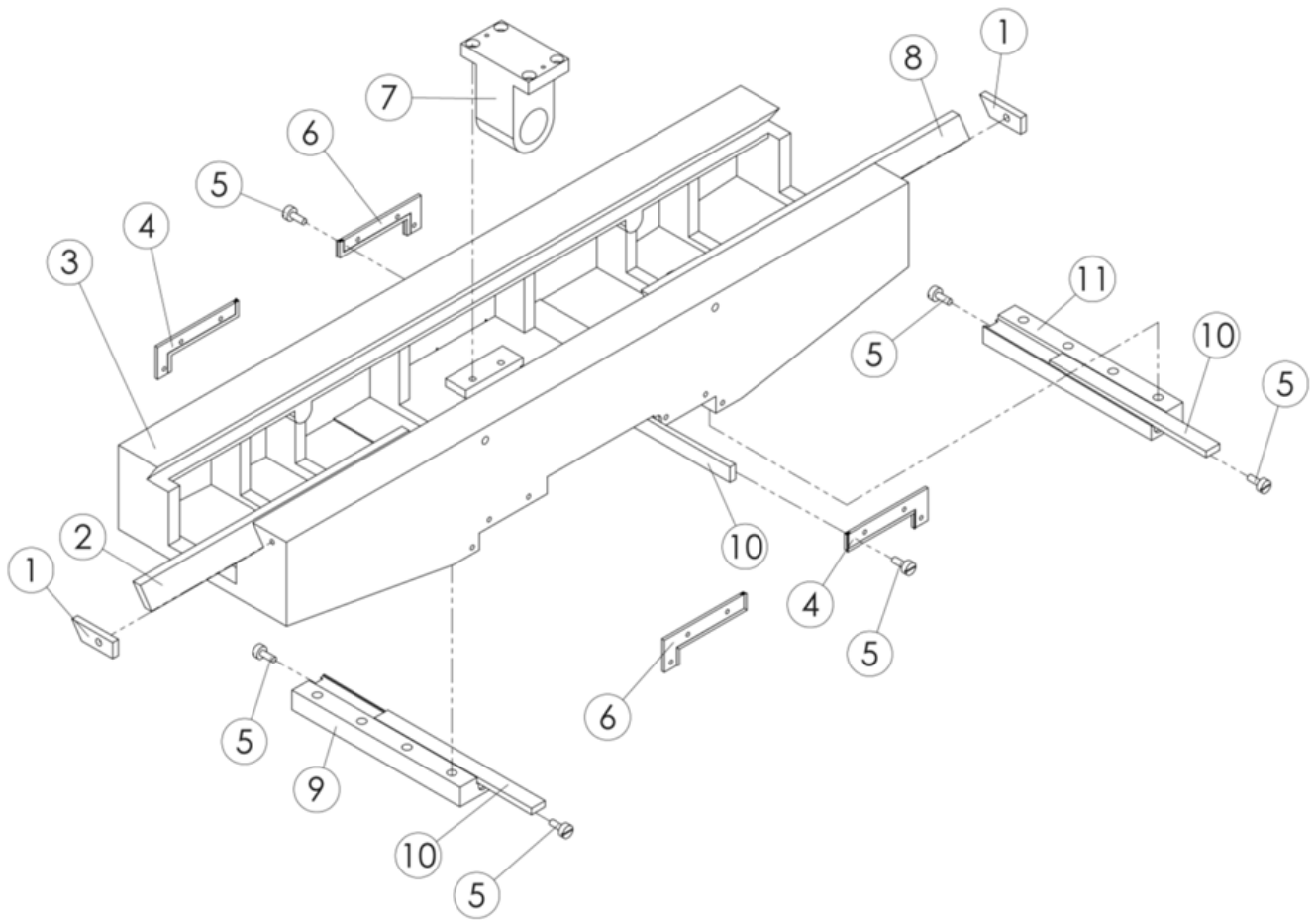
X axis Assembly — Exploded Drawing



X axis Assembly — Parts List

Index No.	Part No	Description	Index No.	Part No	Description
1	60C033	Table Sheet Metal	11	26C306	Pulley
2	86C023A	Table(54"x12")	12	SDS20	Power Lock
3	40C106	Cover	13	26C317B	Cover
4	50C038	Bearing Cover	14	8YU-600L	Tooth Belt
5	50C037	Spacer	15	SB19	Power Lock
6	BR043	Ball Bearing(25x62)	16	26C305	Pulley
7	40C036A	Bearing Housing	17	26C309A	Motor plate
8	26C312C	Ball screw	18		Servo Motor
9	F016	X-axis Nut Seat	19	40C091B	Cover
10	40C044B	Bearing Housing			

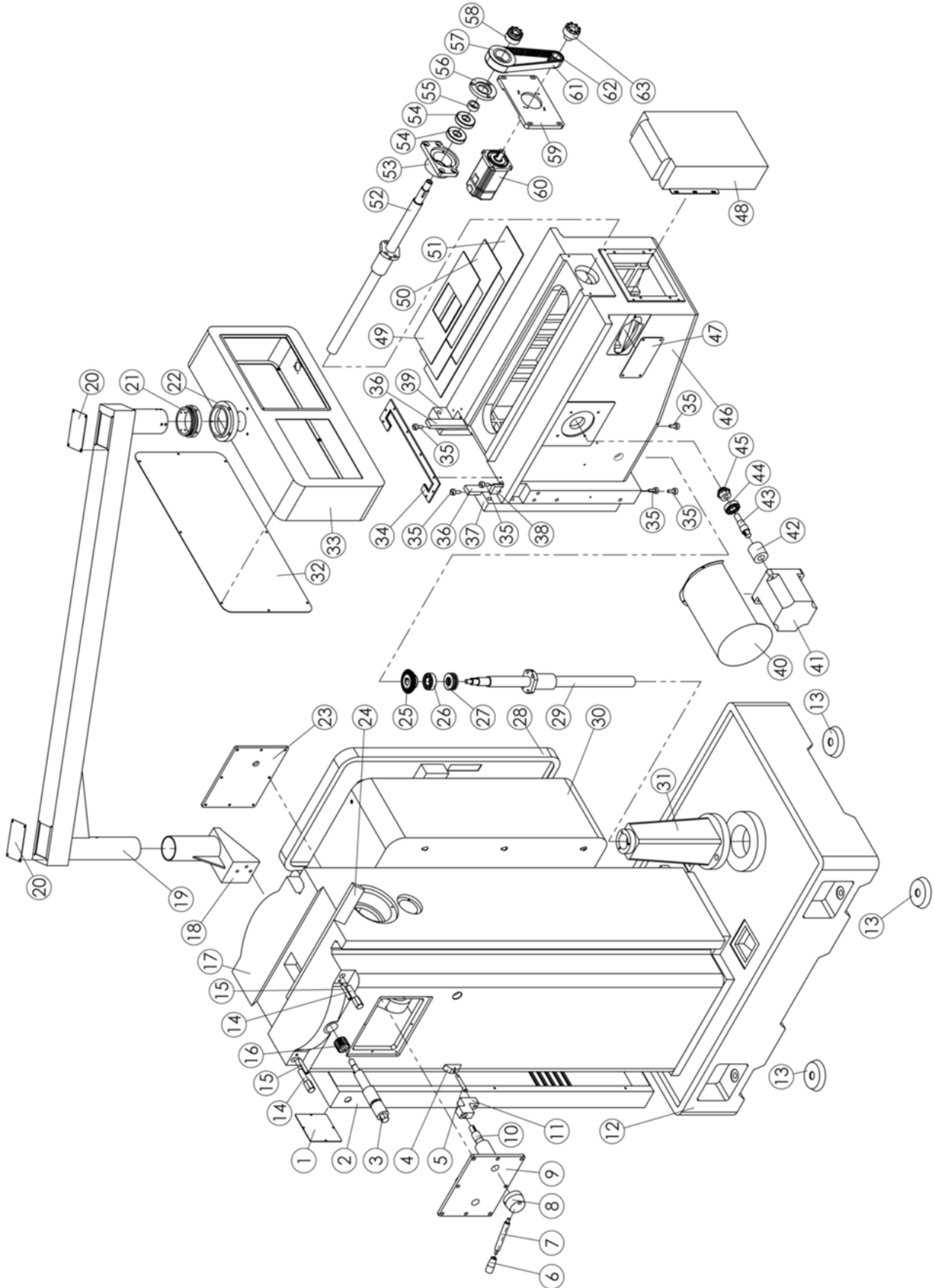
Y axis Assembly — Exploded Drawing



Y axis Assembly — Parts List

Index No.	Part No	Description	Index No.	Part No	Description
1	F032	X axis Stop Block	7	F017	Y-axis Nut Seat
2	F013	X axis Wedge	8	F013A	X axis Wedge
3	86C052A	Saddle	9	F030	Y axis Left Side Rail
4	20C042	Track Scraper	10	16C049	Y axis Wedge
5	15C041	Locking Screw	11	F031	Y axis Right Side Rail
6	20C041	Track Scraper			

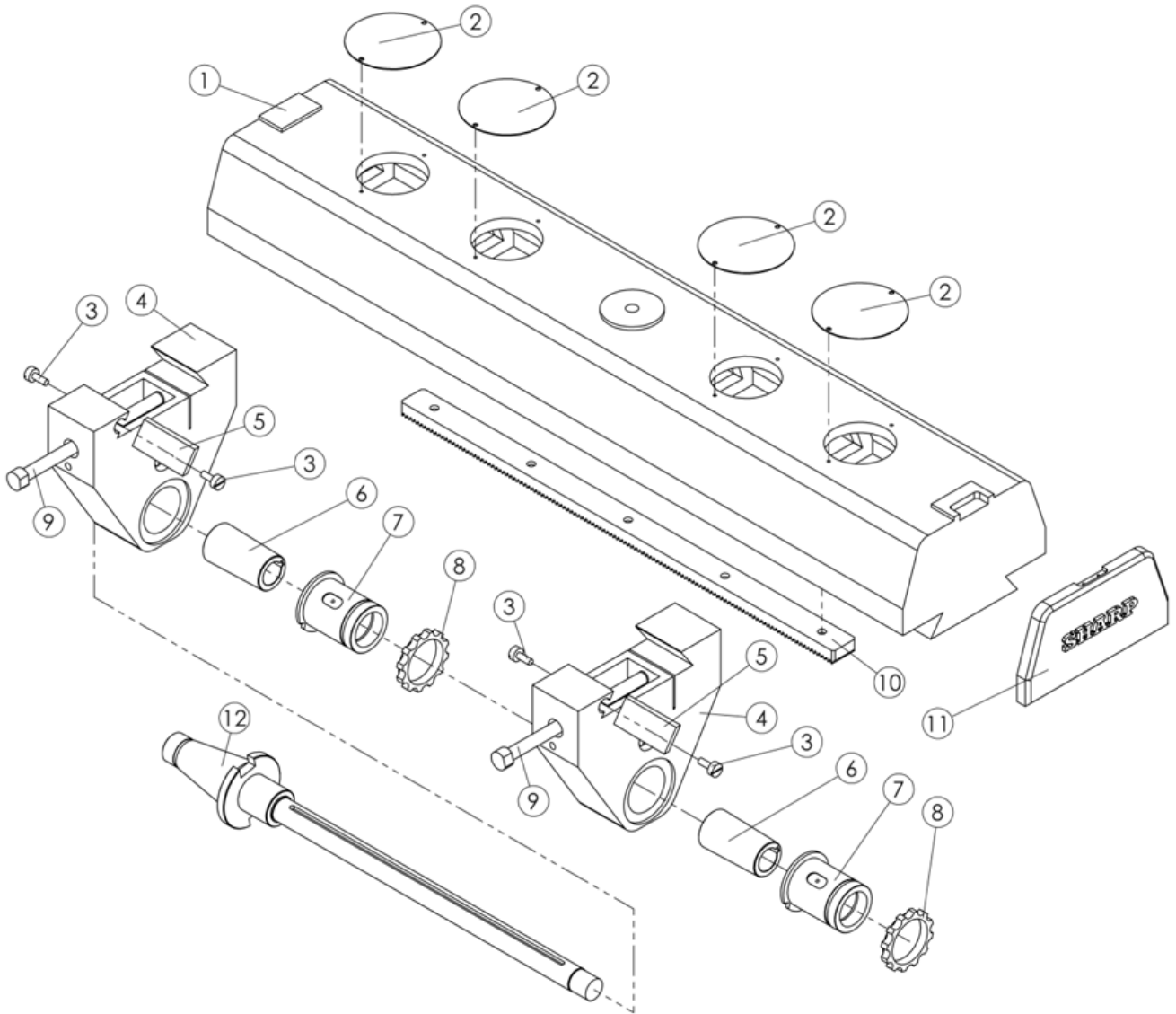
Z Axis Assembly — Exploded Drawing



Z Axis Assembly — Parts List

Index No.	Part No	Description	Index No.	Part No	Description
1	60C044	Cover	33	60C042	Operation box
2	60C034	Cover	34	20C043A	Track Scraper
3	26H172	Toothed Rod	35	15C041	Locking Screw
4	26H038	Toggle Claw	36	18C047	Z-axis wedge
5	26H037	Toggle Jaw Mandrel	37	18C141	Z axis Right Side Rail
6	15B191	Black Ball(3/8")	38	18C055	wedge
7	26H026	Shift Handle	39	18C140	Z axis Left Side Rail
8	26H039	Shift Seat	40	20C038	Cover
9	26H044	Shift Cover	41		Servo Motor
10	26H029	Speed Shaft	42	SGS50C	Flexible coupling
11	26H032	Shift Fork	43	18C115	shaft
12	26C099	Base	44	BR003	Ball Bearing(6204)
13	18C153	Feet Round Seat	45	15C096	Bevel gear
14	18C125	Locking Bolts	46	60C062	Lifting Seat
15	18C110	Stop Screw	47	60C045	Cover
16	26H170	Gear	48	60C043	Cover
17	60C098	Body	49	15C059	Chip Board (H)
18	60C041	Support Base	50	15C060	Chip Board (M)
19	60C040	Boom	51	16C061	Chip Board(L)
20	40C092	Cover	52	26C308C	Ball screw
21	40C074	Boom Support	53	40C037	Bearing housing
22	40C076	Boom Support	54	BR043	Ball Bearing(25x62)
23	26H030	Right Cover	55	50C037	Spacer
24	50C072A	Wedge	56	50C038	Cover
25	15C077	Bevel gear	57	26C306	Pulley
26	BR004	Ball Bearing(6205)	58	SDS20	Power Lock
27	BR017	Thrust Bearing(51305)	59	20C307	Motor plate
28	60C036	Electrical cabinet door	60	SM021	Spindle Motor
29	26C301	Ball screw	61	Y8U-624	Tooth Belt
30	60C035	Electrical cabinet	62	26C305	Pulley
31	16C103	Lift Bracket	63	SB19	Power Lock
32	60C046	Cover			

Coverarm Assembly — Exploded Drawing



Coverarm Assemble — Parts List

Index No.	Part No	Description	Index No.	Part No	Description
1	50C003A	Disc Holder (26)	7	50C060C	Bushing
2	50C165	Cover	8	50C061C	Locking Nut
3	15C041	Locking Screw	9	26H185	Locking support rod
4	50C004C	Horizontal Shaft Seat	10	26H170	Tooth row
5	50C074A	Wedge	11	SHARP	Aluminum plate
6	50C059F	Spacer Ring	12	50C048A	Horizontal Spindle Rod

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