

VERTICAL MACHINIG CENTERS INSTRUCTION MANUAL

MODEL NO: VMC 850

S/O NUMBER:

TYPE OF CONTROLER:

SERIAL NUMBER:

TEL:

FAX:

DATE : 2023

PREFACE:

We take this opportunity to thank you purchase of this product manufactured by Machine size Tabriz.

Every product we made is the result of ample experience and research over the years conducted by our dedicated team of engineers, and of the incorporation of the ideas and advice given to us by the users.

Notwithstanding, a machine requires proper handling, and its performance and service life are greatly affected by how it is handled and maintained.

We therefore request that you read through. These instructions before you actually use your machine, in order to familiarize yourself with its functions and capabilities and to keep the machine in its best operating conditions.

Please be sure to pay attention to the following before start the machine:

1. Please clear the rust preventing oil completely after unpacked the machine ', and spray the lubricating oil on all the slide ways and all the covers. (Details please see the operation manual).
2. All of fixing part has the red color for distinguishing and the fixing part must be removed before start the machine.

Otherwise, the machine accuracy may be affected and damaged' !!

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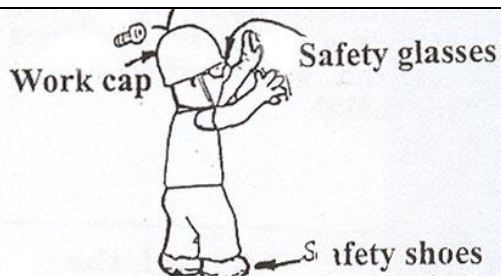
V. ELECTRICAL DIAGRAM

VI. PART'S LIST

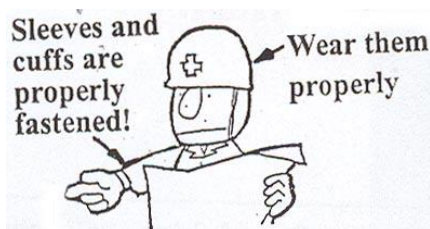
I. PRECAUTIONS REGARDING SAFETY

The safety precautions listed below are intended to prevent human injury or mechanical damage caused by accidents. These precautions apply to the setup and operation of the main unit and of devices, so operators should read them carefully and make sure they are put into practice, rather than relying solely on safety devices themselves.

OVERALL SAFETY PRECAUTIONS

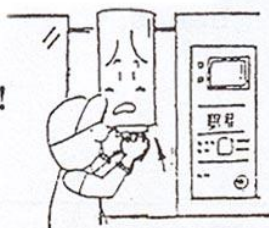


- ☐ When working, wear protective clothing appropriate for safety (safety shoes, work cap, safety, etc.)

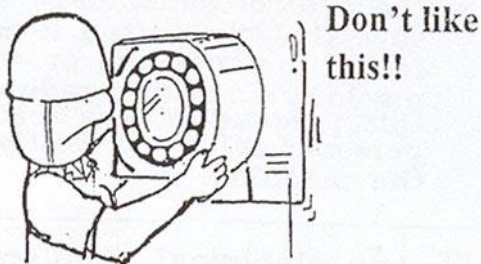


- ☐ Make sure your work cap is worn properly, and that your sleeves and cuffs are properly fastened. Wear the proper clothes for working.

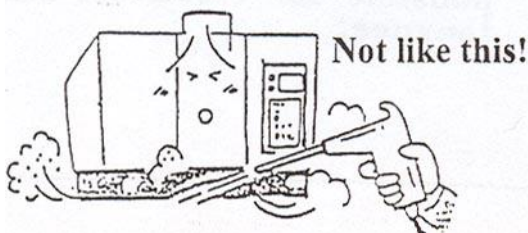
Take off
your gloves!



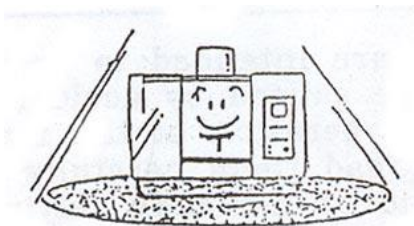
- ☐ Do not wear gloves when operating the equipment.



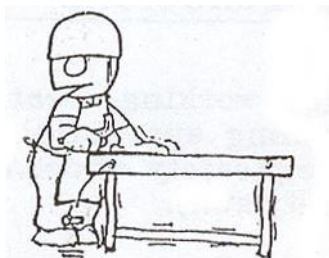
- ☐ Never remove safety devices or safety covers from the equipment.



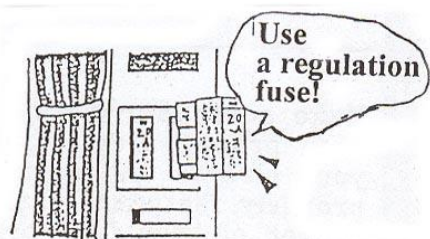
- ☐ The main unit, power control board, NC equipment and the floor around the equipment should be kept free of dust and chippings. Avoid using compressed air to clean the equipment and area.



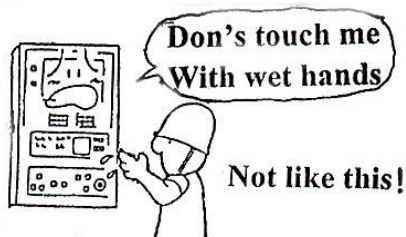
☐ Make sure the area around the equipment is adequately illuminated and is dry. Keep the area organized so there are no obstacles lying around on the floor. The surroundings should be neat and clean.



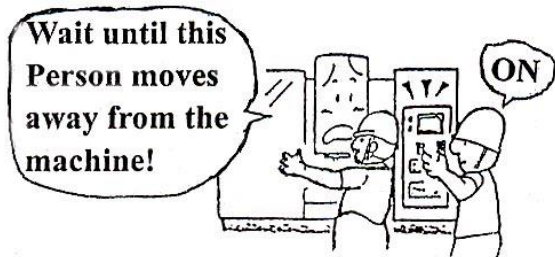
☐ Workbenches set up near the equipment must be strong and sturdy and their surfaces treated with non-skid material.



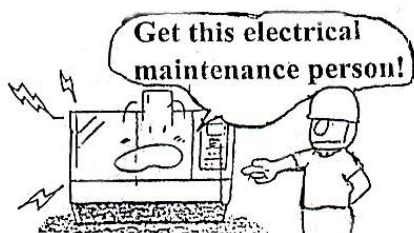
☐ Use only fuses of the specified rating



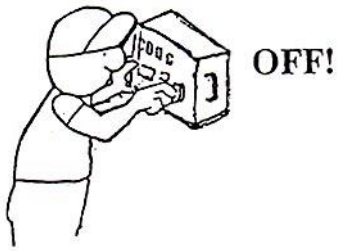
☐ Be careful of high voltages. Never touch switches with wet hands.



☐ When you are, about to turn ON the power or to operate any controls on the control panel, make absolutely sure that no person is working inside the machine or within the machine's working radius. Disregarding this precaution may result in serious to the machine.



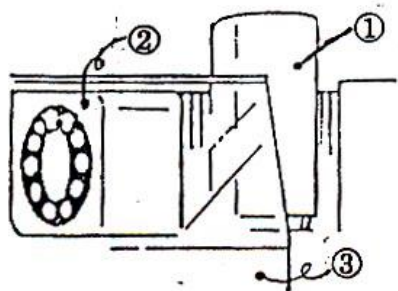
☐ Any electrical problems should be handled by the person responsible for electrical maintenance.



☐ When replacing fuses, turn off the main power supply first.

SAFETY DEVICES

The following devices are provided as standard equipment with this machine, for the safety of the operator and to protect the machine. Never remove or modify these devices. Furthermore, the operator should' never rely solely on these devices for protection when operating the equipment.

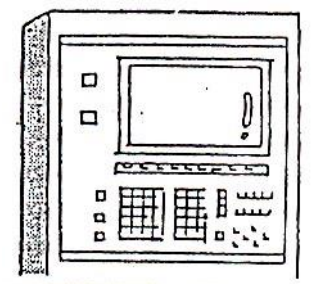


☐ Various safety covers

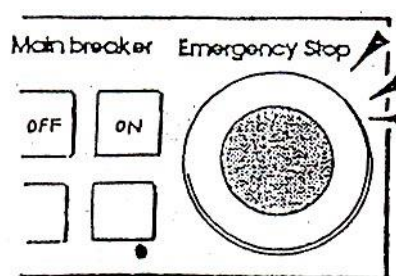
(1) Head cover

(2) Magazine cover

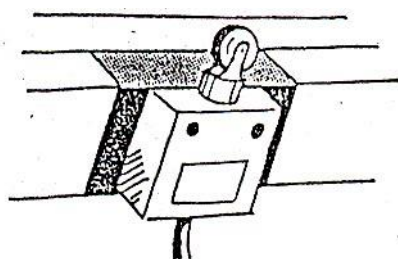
(3) Splash guard



☐ Do not change the parameters of the stored stroke limits.



☐ push button switch for emergency stop.



☐ Over travel limit switches and dogs and dogs for X,Y, and Z axes.

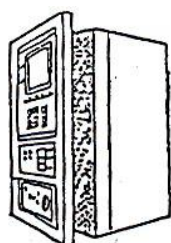
PRECAUTIONS REGARDING OPERATION

Read this manual thoroughly before operating the equipment for the first time.

It is recommended that a serviceman from the manufacturer be present the first time the equipment is operation, you should become familiar with the entire manual before handling the equipment.

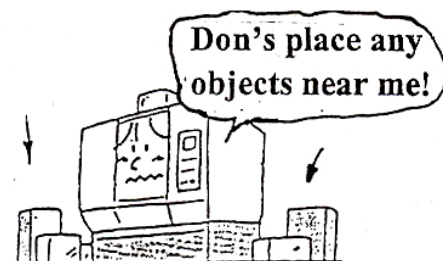
PRECAUTIONS FOR OPERATING THE EQUIPMENT SAFETY

Before on power



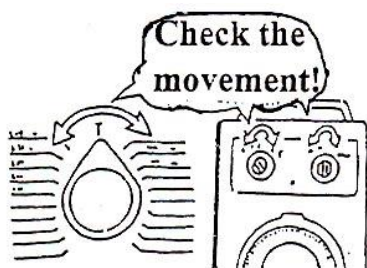
Not like this!

- ☐ Check that the doors to the operation and control panels are closed.



Don't place any objects near me!

- ☐ Make sure there are no objects lying on the floor around the equipment.



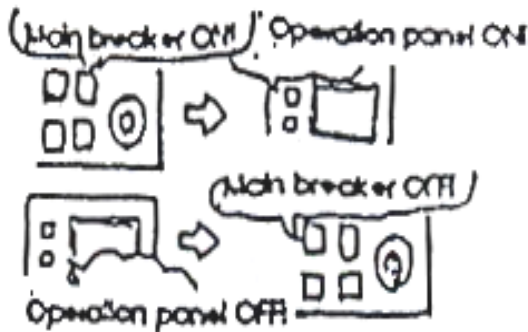
Check the movement!

- ☐ All operation levers and switches should be in good working condition.



REPLACE

- ☐ Cables should be in good condition. With no cracks or break. Replace tom or broken wipers, bellows and winding covers.



- ☐ power supply

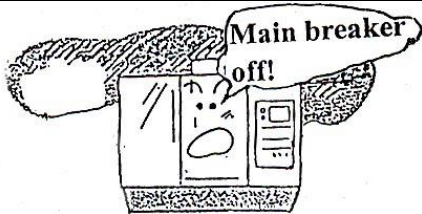
To turn on the power, first set the main break to "NO" and then the power supply switch on the operation panel to "NO" When turning off the power, first turn the power supply switch on the operation panel to "OFF" and then turn off the main breaker.

When turning on: main breaker ON/->

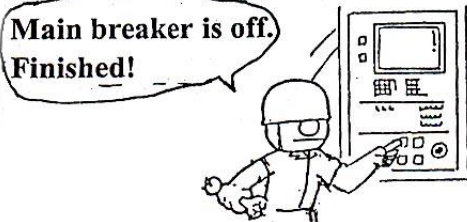
operation panel on/

When turning off: operation panel OFF/->

Main breaker OFF/



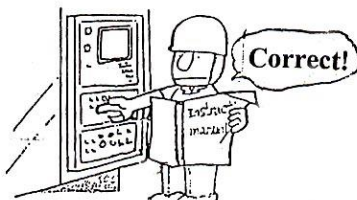
- ☐ When the power is restored after a power failure, immediately turn the main breaker to "OFF" and then turn it back to "ON".



- ☐ When operation is finished, turn off the main breaker if you are going to be away from the machine.

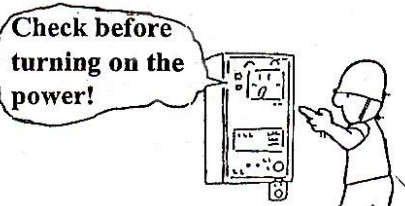


- ☐ Machine oil check Make sure all parts have sufficient oil. (For the lubrication location, oil brands, and the amount of oil to be used, please follow the directions on the label or in the instructions)

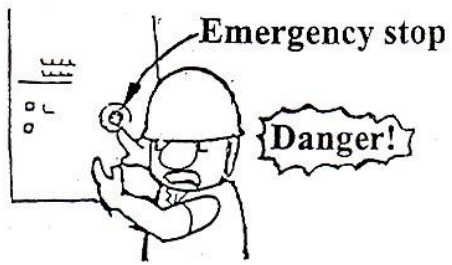


- ☐ operation

Before operating the equipment, check the functions and operation methods in the instruction manual.



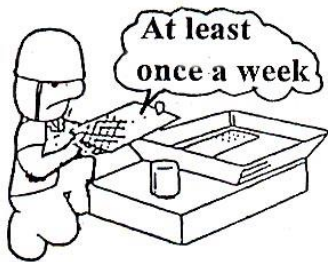
- ☐ Before turning on the power, check the inspection items and operation items.

☐ Stopping

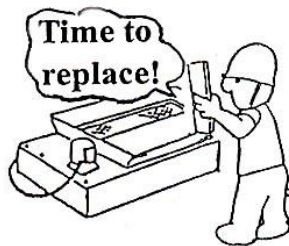
Emergency stop button

If you sense danger, press the Emergency stop button immediately.

PRECAUTIONS REGARDING CUTTING FLUID



- ☐ The filter for the coolant tank should be cleaned at least once a week.



- ☐ Replace cutting fluid whenever necessary.

WARMING UP

In order to keep the equipment in top condition, always follow the warming up procedure before beginning operation every day. Warming up is also effective for achieving stable precision with the material being processed.

For an example of programming for warming up, please refer to "630FU Operator's Manual Additional Data."

Warming up time	About 30 minutes
Spindle rpm	Half of maximum rpm
Travel- stroke	Stroke of each axis
ATC magazine operation	Include in program

CAUTION

- ☐ During the warming-up operation, check the lubrication condition and the movement of each section of the machine.
- ☐ If the unit has not been used for a long period of time, carry out a dry run of the ATC operation.
- ☐ Make sure there is a tool in the spindle when rotating the spindle.

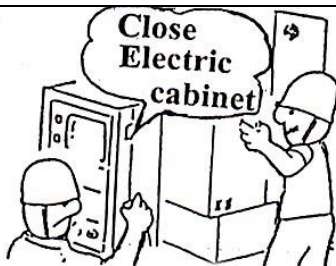
PRECAUTIONS REGARDING MAINTENANCE



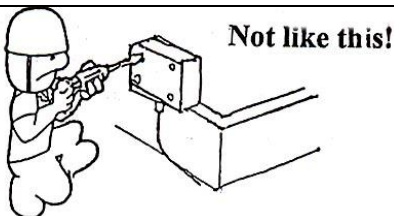
□ Operators or maintenance personnel should read the caution plates attached to the machine carefully and observe these cautions at all times. Be careful that caution plates do not get dirty, scratched, or detached from the machine. If caution plates become hard to read for any reason, please contact us for replacement.



□ Before performing maintenance work on the machine, especially inside the splash guard or at the top or rear of the machine, shut off the power by first turning off the power switch on the control panel, then moving the main breaker on the power box to the "OFF" side. Check carefully to make sure everything is off before beginning the work. Also, post warning signs to keep other people from turning on the power by mistake at this time.



□ All doors and covers should remain closed except when adjustments are being carried out. Be especially careful with regard to the doors of the control box and the operation box.

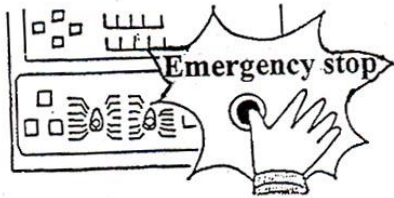


□ Never remove or modify the limit switches for stroke over travel of traveling axes, or the mechanism and electrical circuits installed for safety.



□ Use the specified spanners and wrenches for adjustments and repairs.

PERCAUTIONS REGARDING OPERATION

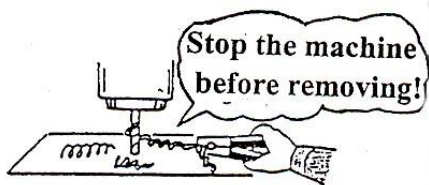


- ☐ Be completely familiar with the position of the Emergency Stop button so that you can press it instantly if necessary.

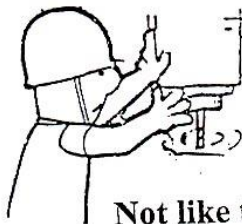


**Read carefully
and follow
procedures!**

- ☐ Follow the procedures outlined in the manual to start up the equipment.

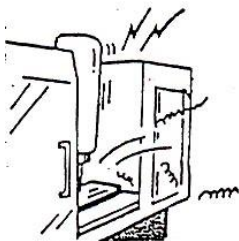


- ☐ When removing clippings that have adhered to tools have fallen onto the work table, it is dangerous to pick them up and pull them towards, you with your hand. Before removing these clippings, turn off the machine and make sure all rotating and moving parts have stopped.



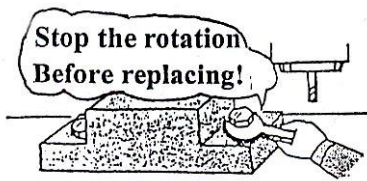
Not like this!

- ☐ During operation, keep your hands and away from the spindle, ATC, magazine and other moving parts.

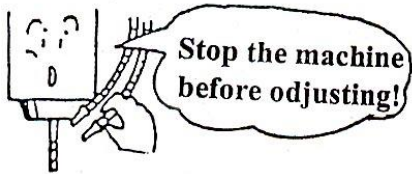


Not like this!

- ☐ Never operate the machine without safety covers in place.

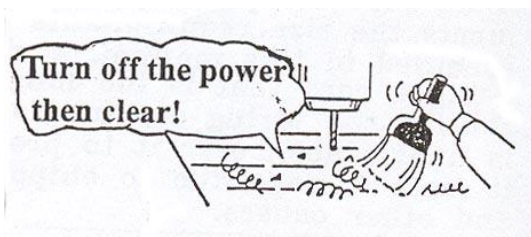


- ☐ When attaching or removing work pieces from a machine which is not equipped with a pallet changer, stop. The rotation of the tool and stay as far away from the tool as possible.

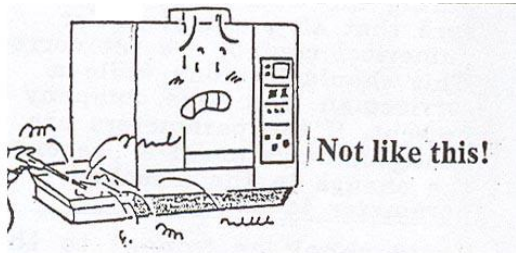


- ☐ Do not adjust the position of the coolant nozzle until you have stopped all rotating and moving parts.

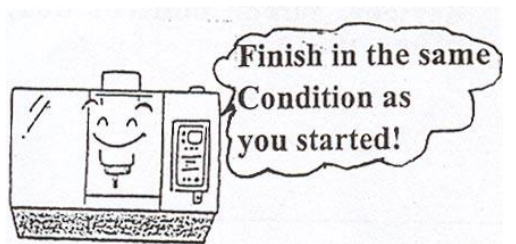
PRECAUTIONS WHEN WORK IS FINISHED



☐ When work is finished, always turn off the power in the specified sequence and clean all sections of the machine, especially the sliding surfaces. When using a water-soluble cutting fluid, this is Particularly important.



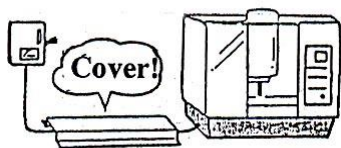
☐ Do not use an air gun for cleaning the machine.



☐ Check to make sure that each part is in the same condition it was in when operation was begun.

PRECAUTIONS REGARDING ELECTRICAL EQUIPMENT AND NC DEVICES

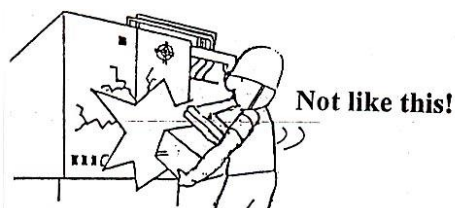
**When handling electrical equipment or NC devices, please pay particular
Attention to the following items.**



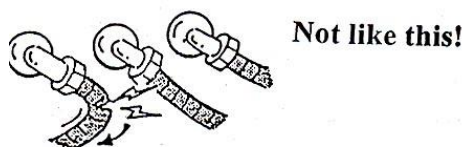
☐ Make sure the primary wiring meets the size requirements specified in this manual. Avoid using a cord that is too long. If routing the wiring on the floor is unavoidable, cover it to protect it from damage due to chippings and other causes.



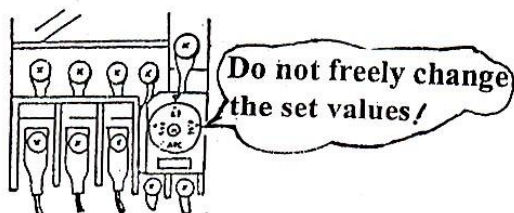
☐ During the trial run, check to be sure that all parameters for numerical control are set correctly. This should be done while a serviceman from this company is present. If the parameters are changed, always make a record of the change in the attached Parameter table.



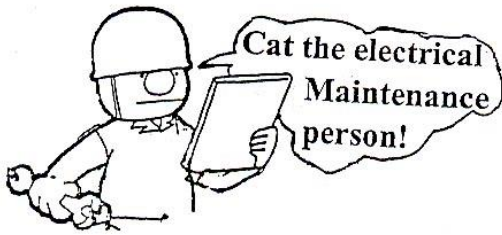
☐ Avoid shock or impact to the NC devices, power control box, and other units.



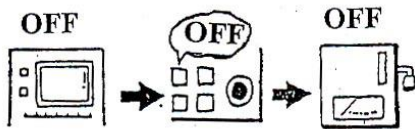
☐ Connectors of canon plugs, flexible tube, and tough rubber sheathed cables should be relaxed, but should not be forced to bend.



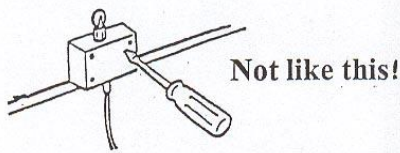
☐ When you wish to change the values which have been set for the current of the thermal relay or other set values in the power control panel, please consult with this company.



□ Maintenance of electrical equipment, including the primary wiring, should be carried out by the person responsible for such work, or by another person who is qualified to carry out the work safely..



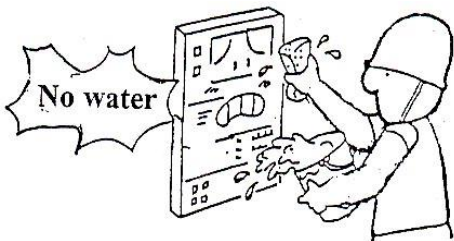
□ Before doing a maintenance inspection of the electrical equipment, turn off the power supply in the following order. 1) Power supply on the operation panel, 2) main breaker in the control box, 3) power switch in the plant electrical system. Double check that everything is turned off before beginning servicing.



□ Never remove or modify limit switches for over travel or for safety interlock, proximity switches, or any other parts related to these.



□ When working in a high place, use a ladder or a stand that meets safety requirements, and always wear a helmet.



□ Handle all electrical equipment of the main unit with care, to prevent shorts and broken or disconnected wires. Always keep the equipment dry.



□ Always use the electrical components that are specified by this company. This applies especially to fuses. Never use fuses that exceed the rated capacity, and avoid using copper wire.

Direct sunlight
strobe flashes

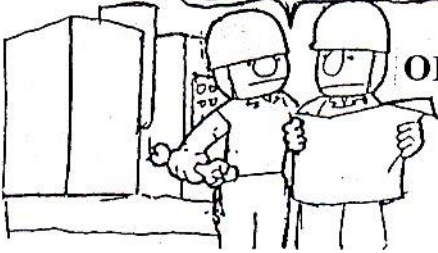
Not like this!



- ☐ Always keep the doors of NC devices, closed to avoid exposing the interior of the unit to direct sunlight or strobe flashes from cameras, which could damage the equipment.

Operation is finished.

OK!



- ☐ Results of operations should always be double-checked by a person responsible for maintenance.

II. FOUNDATION AND INSTALLATION

1. CUSTOMER'S NOTES

Machine centers is a high precision automatic machine tool controlled by computer. So it can't be treated as a conventional one.

Before it is operated, please be sure to read the maintenance and operating instructions carefully. If any question, please our local distribution service.

We will reply you promptly.

1-1 SPECIFICATION of MACHINE

SPECIFICATION		VMC 850
Table working surface		1000mmX500mm
Longitudinal travel (X)		800mm
Cross travel (Y)		500mm
Vertical travel (Z)		610mm
Spindle nose to table		100mm-710mm
Spindle center to column		550mm
Spindle taper		BT40
Spindle speed		60-8000rpm
Spindle motor		9 / 12 KW
X-Y-Z Rapid traverse		30/30/24 M/min
Cutting feed		1-12000mm/min
Coolant pump motor		GRUNDFOS 0.46KW (3.1m ³ /h)
Tool selection		Bi Direction random type, shortest path
No. of tools		24
Adjacent pockets max. tool dia.		75mm
Max. tool diameter		150mm
Max. tool length		350mm
Max. tool weight		8Kgs
Table load capacity		600Kgs
Machine weight		5500Kgs
Floor space		2350X3200mm
X-Y-Z Ball screw dia.		40X40X40 mm
Cutting capacity Ck45N	milling	120 cc/min
	drilling	φ30mm
	tapping	M30XP3.5

1- 2 ACCESSORIES of MACHINE

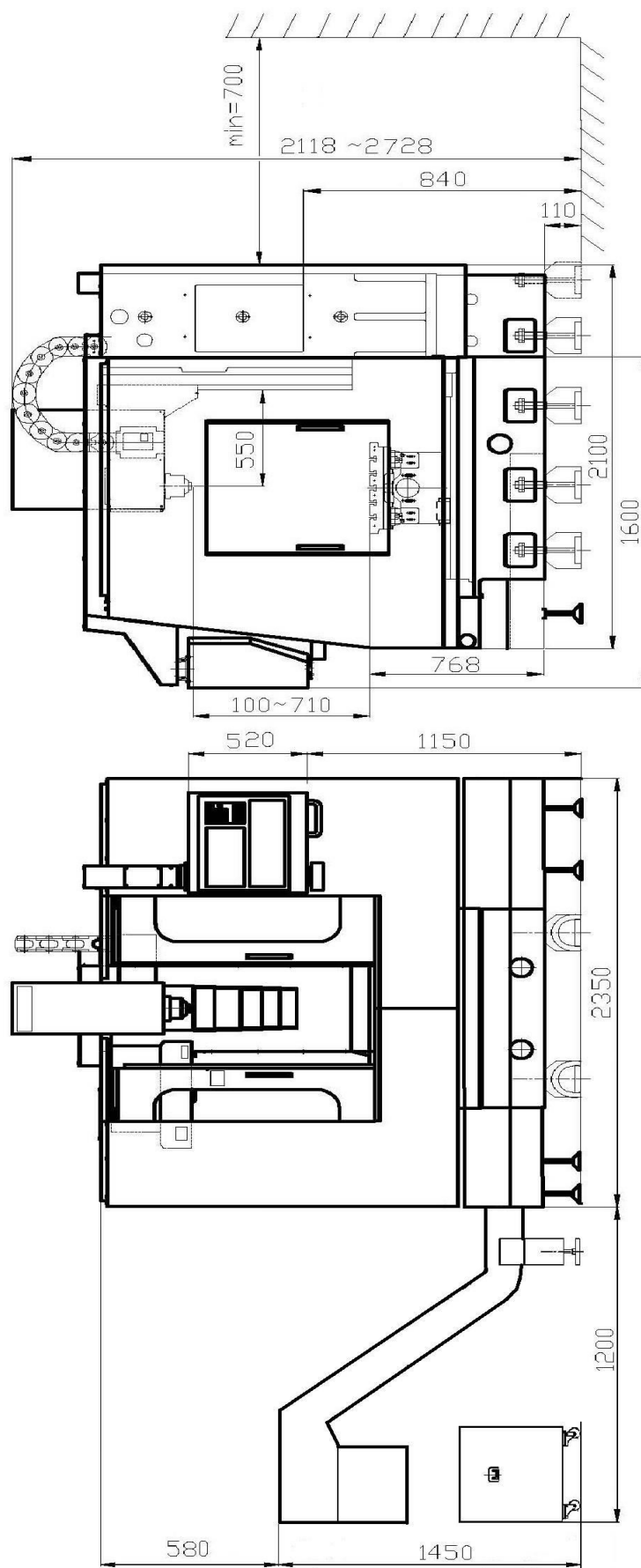
STANDARD ACCESSORIES:

1. Coolant system
2. Spindle air blast
3. Auto lube with alarm
4. Halogen work lamp
5. Tools, tool box and various manuals
6. Chain type chip conveyor
7. Full enclosure splash guard
8. Chip flushing coolant
9. Leveling screws and pads

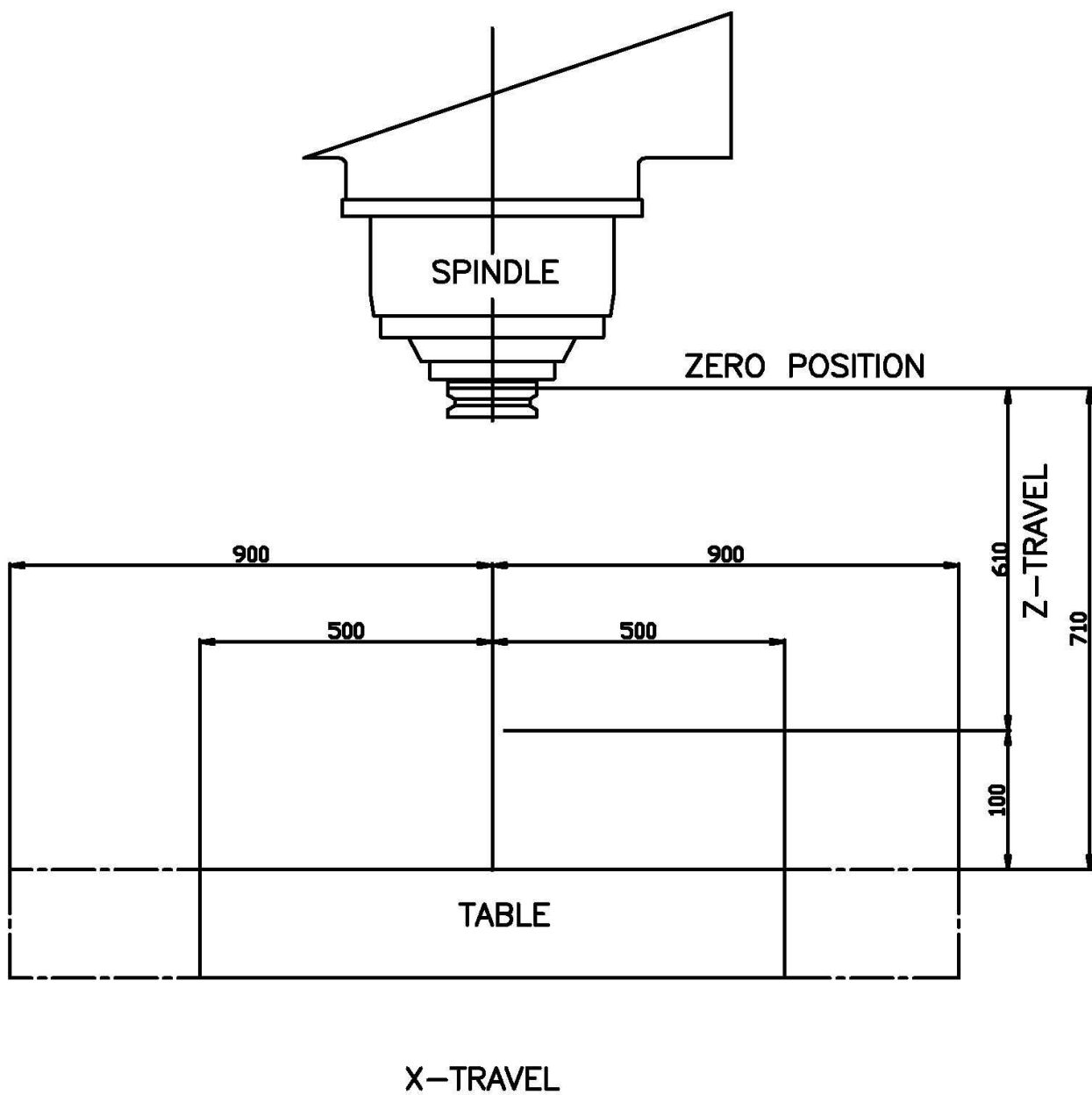
1-3 DIMENSION

FRONT VIEW

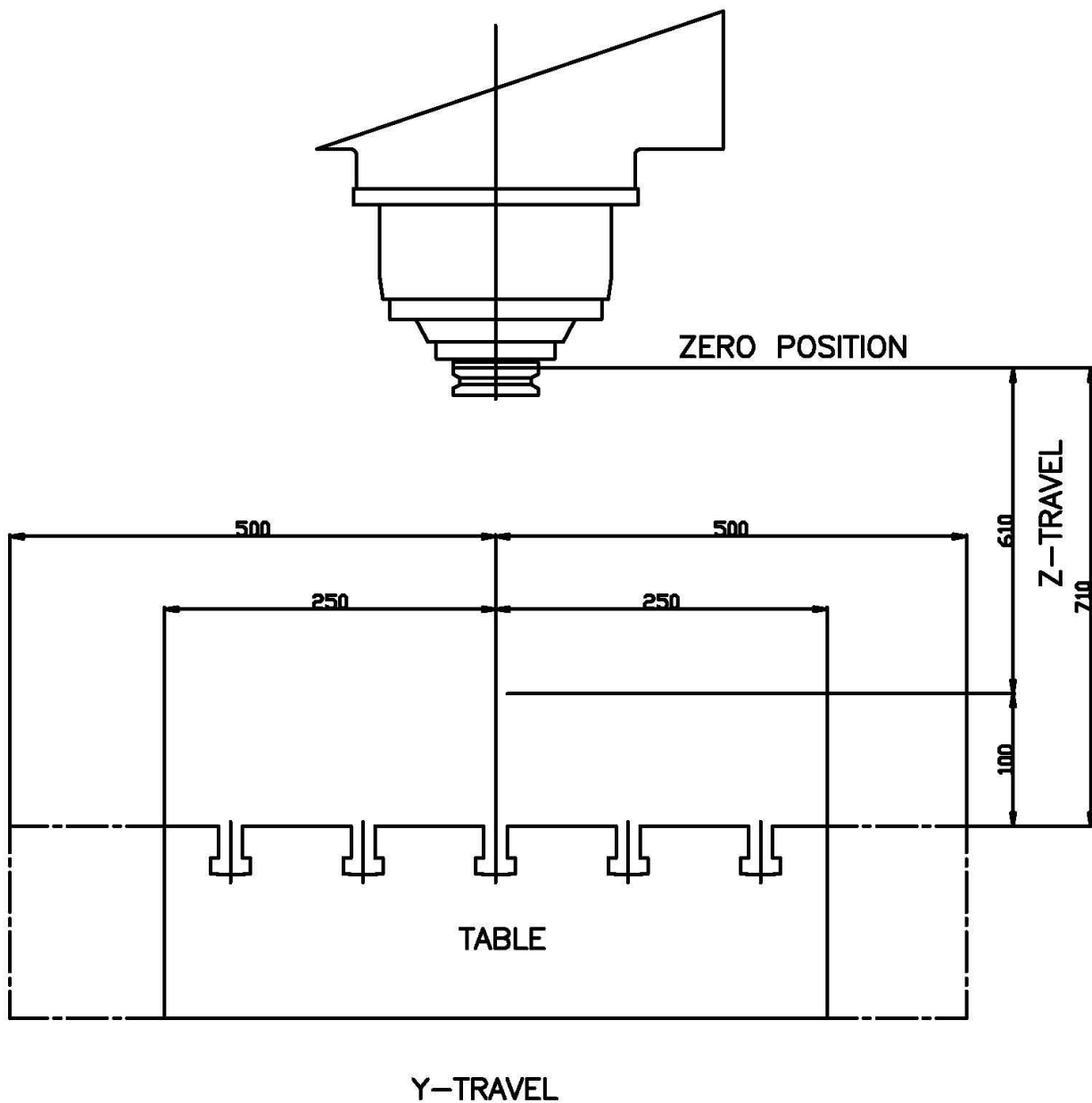
SIDE VIEW



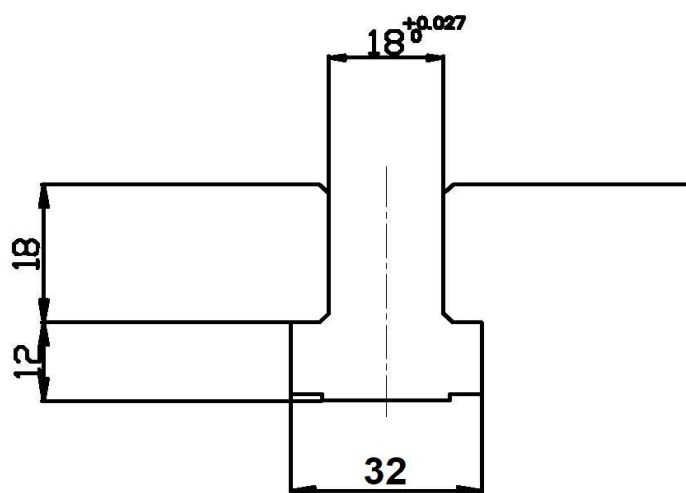
X-Z Axis Travel



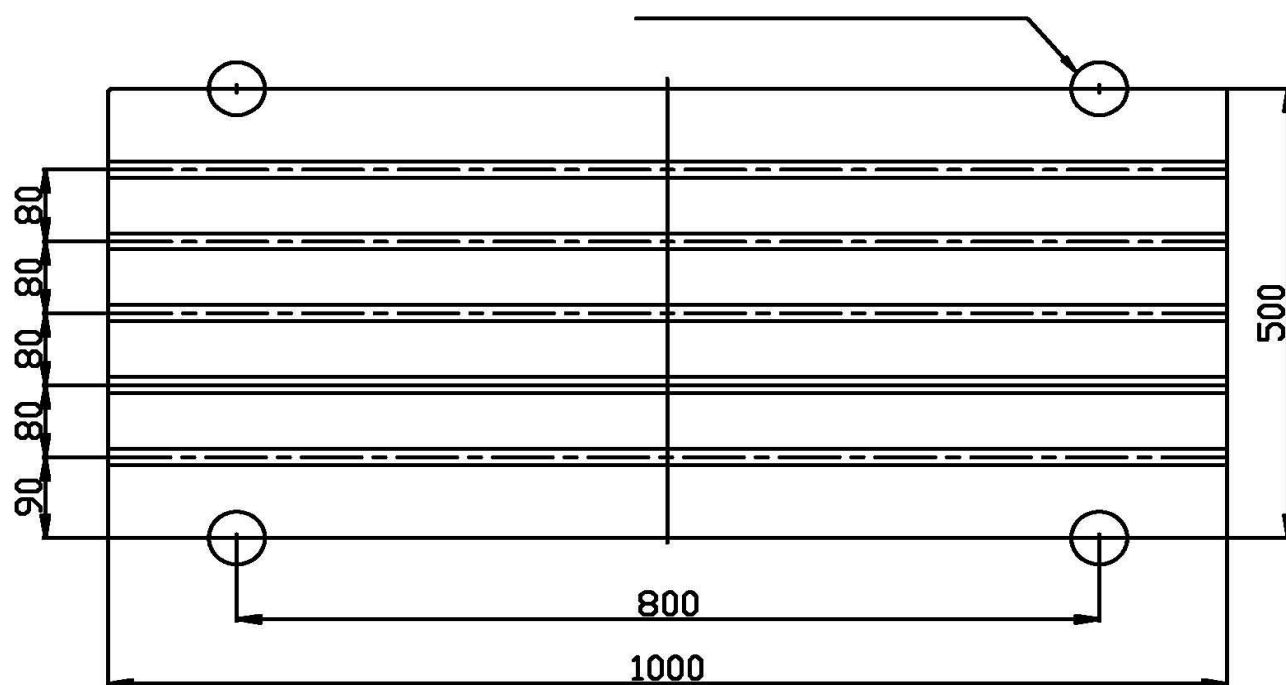
Y-Z Axis Travel



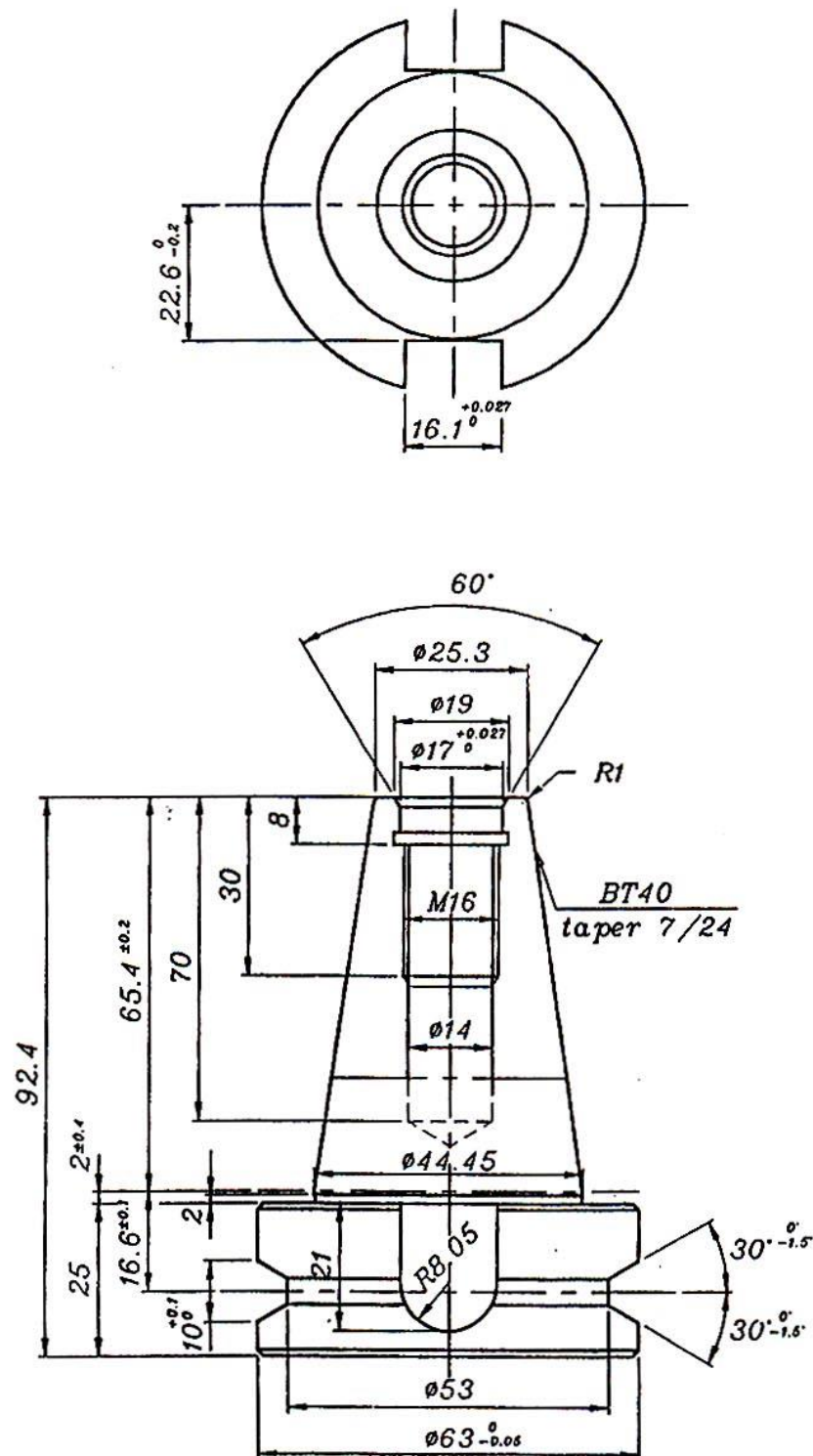
VMC 850 Table & Slot



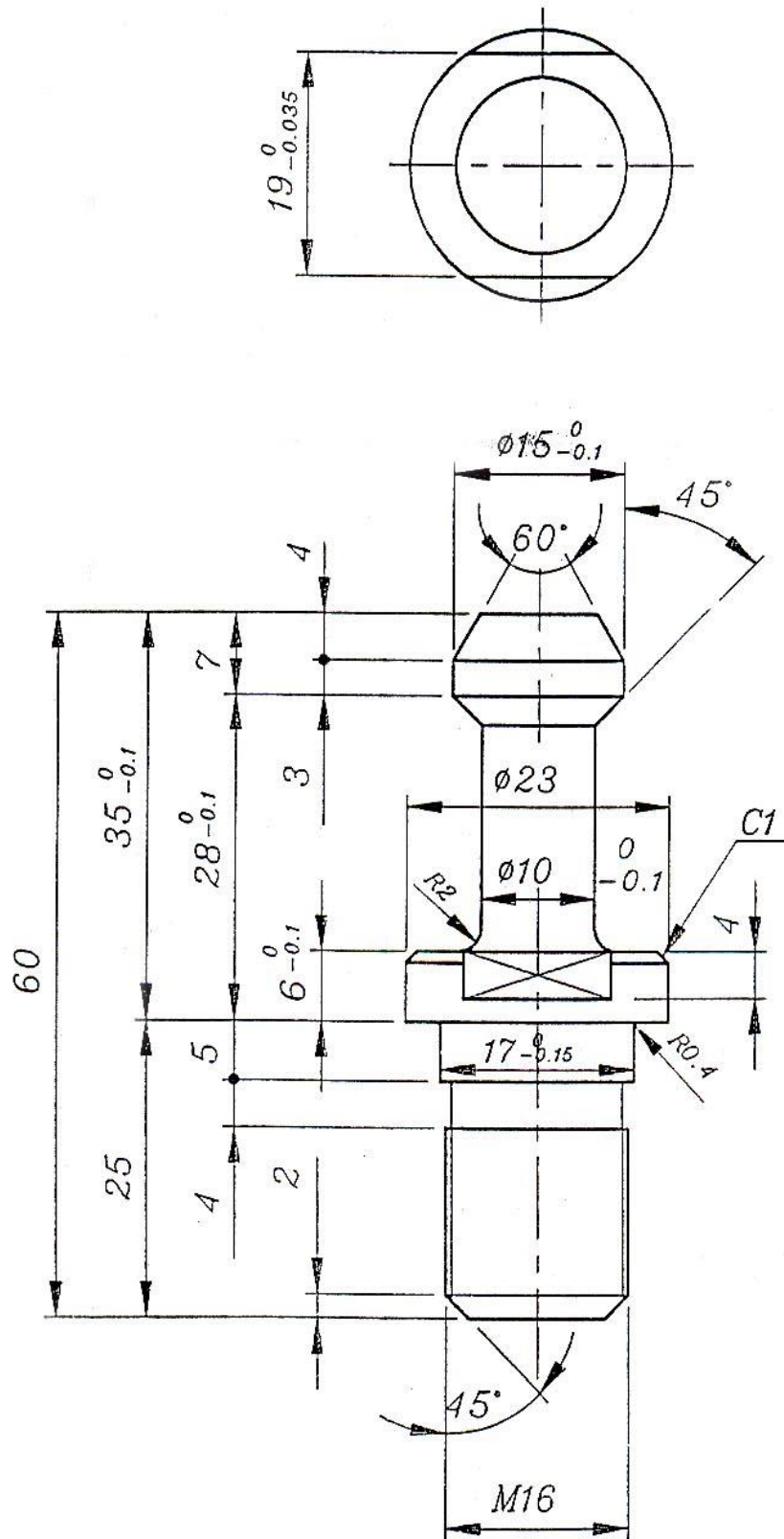
Spindle center



(5) Dimensions Of BT-40 Tool Shank



(6) BT-40 Pull Stud



2. ESTABLISHMENT OF MACHINE FOUNDATION

1- Explanation of Establishing foundation

Correct foundation is very important for machine. Strong foundation will reduce the vibration of machine to avoid defective function, bolt losing & cracks of foundation or destruction. Otherwise, it will influence the precision of machine.

Because of different machine weights, speeds and vibration force, the design of foundation is also different. So we suggest you to do good foundation. (As fig. 8,9)

For convenience to have a level adjustment and avoid causing any vibration, each machine has adjusting blocks & fixing nails of screw enclosed. And an enclosure will reach you before the machine is submitted.

2. Choice of Place for Installing Machine

For Keeping machine life and meeting precise requirements, please choose a suitable place to install the machine. The conditions are as follows:

- (1) Choose the place with small vibration and impact force instead of the place with big vibration and impact force to install the machine.
- (2) Please don't install the machine and digital controller at the place where the sun shines directly or moisture is too big.
- (3) While installing the machine, please keep it away from the place full of powder and corrosive spray.

3. Method of Establishing Foundation:

If necessary, please refer to the foundation figure 8 and start to construct it 15 days before the machine reaches. The working way is as follows:

- (1) Confirm the datum plane of foundation.
- (2) Spread out stones for fixed thickness after foundation is dug to the fixed depth and bottom plane is evented. Fill the space with gravels and pound them completely until no space remains for having strong foundation.
- (3) According to specified sizes, set the mould frame firmly. It can't curve or protrude.
- (4) According to the rate for cement, sand and stone (1:2:4) to make concrete, mix them completely until becoming an uniform color and being full of homogeneous viscosity.
- (5) Please reserve 10 spaces for J-type bolt grooves of foundation before pouring concrete.
- (6) Remove the mould frame, after concrete gets dry. (4-5 days in summer, 8-10 days in winter) Then fill the space until no space remains.
- (7) When the machine reaches the destination and preparation is ready, lift up the machine and make J-type bolts of foundation through level adjusting blocks and adjusting screws. Then lock them with packing rings and nuts. Finally, put the machine on the floor slowly.
- (8) Adjust J-type bolts of foundation at a distance of 150mm from the floor. After correct adjustment, pour concrete into J-type bolt grooves of foundation.
- (9) After concrete gets dry, adjust the level of machine.
- (10) The level adjustment of machine must be made in the 0.02/300mm level degree or higher precision in the directions of X,Z axis.

VMC 850 Foundation

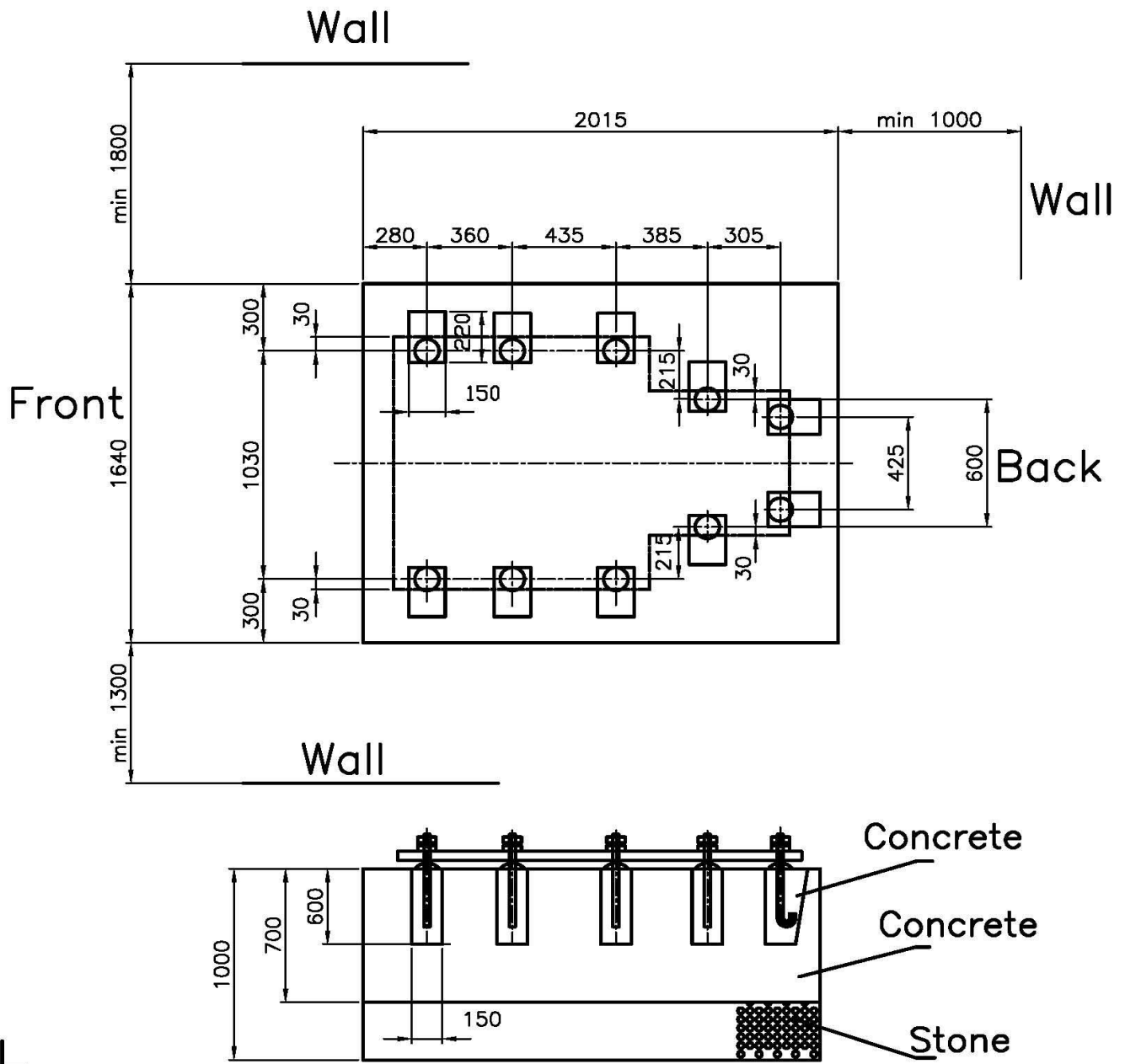


Fig 8

Foundation Boit

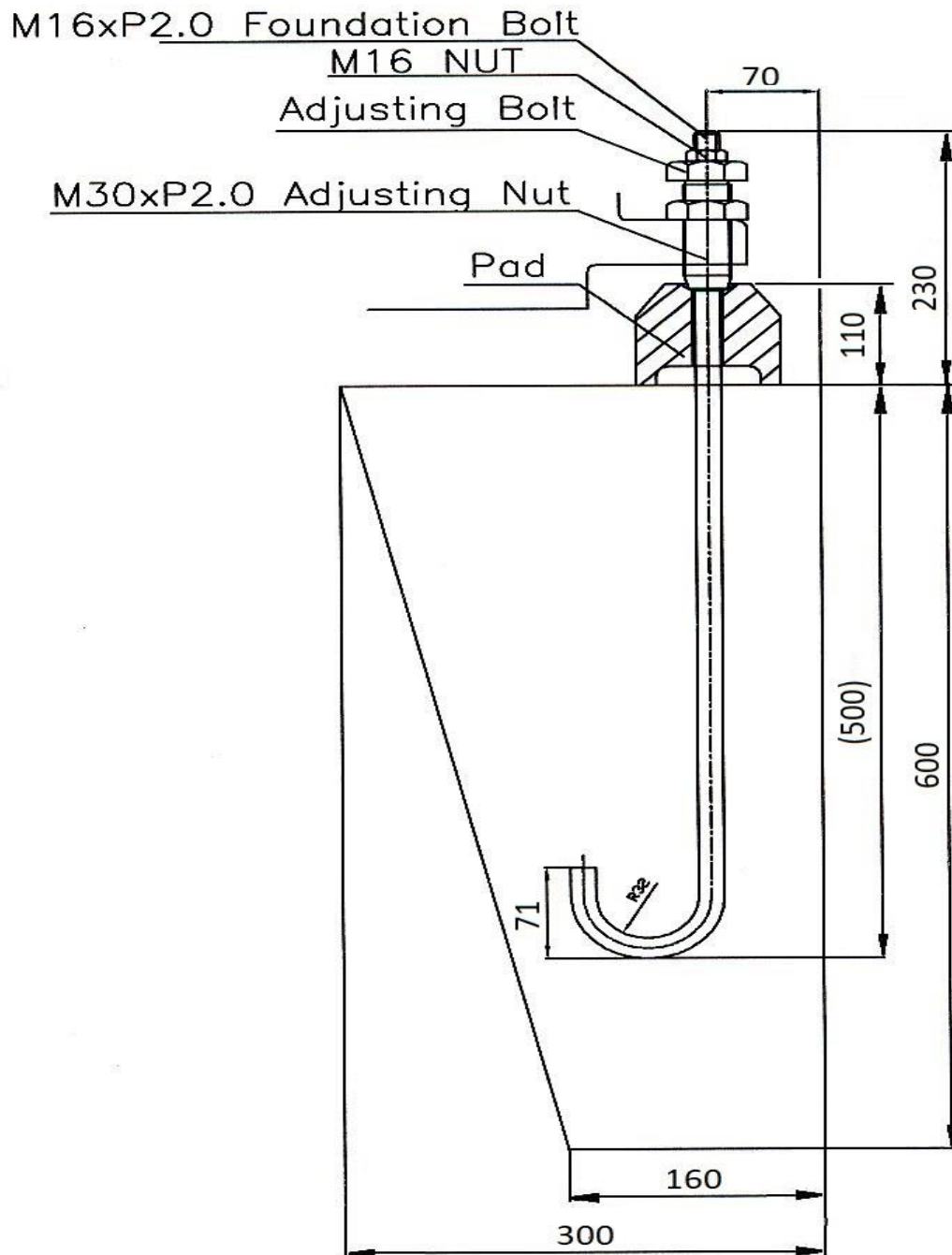


Fig 9

3. PACKING AND FIXING OF MACHINE

For keeping the quality and precision of machine, we take many protection measurements before packing. And the machine must be approved by quality control before transportation.

Packing Way for Domestic Sale:

Fix the machine on the bottom plate and cover it with a thick PE bag. The machine will be sealed in the bag. See fig. 10.

Packing Way for Export:

Fix the machine on the bottom plate and seal it with wooden boards. And take the measurements of water proof and leak proof. See fig. 11.

For reducing the vibration of machine during transportation, all of the components which will vibrate will be fixed before packing in the carton to ensure the safety and precision of machine. The fixing ways and positions are as follows: (See fig. 12.)

- (a) Fix the fixing seat of x-axis ball screws on saddle right side.
- (b) Fix the fixing seat of y-axis ball screws front of base seat.
- (c) Fix the fixing seat of z-axis ball screws under the spindle housing by wooden block.
- (d) Fix the fixing seat of counter weight block or above the column.
- (e) Fix the A.T.C magazine on the tool post left side.
- (f) Fix the computer operating box on the operation box fixed part.

All of fixing blocks have the red color for distinguishing.

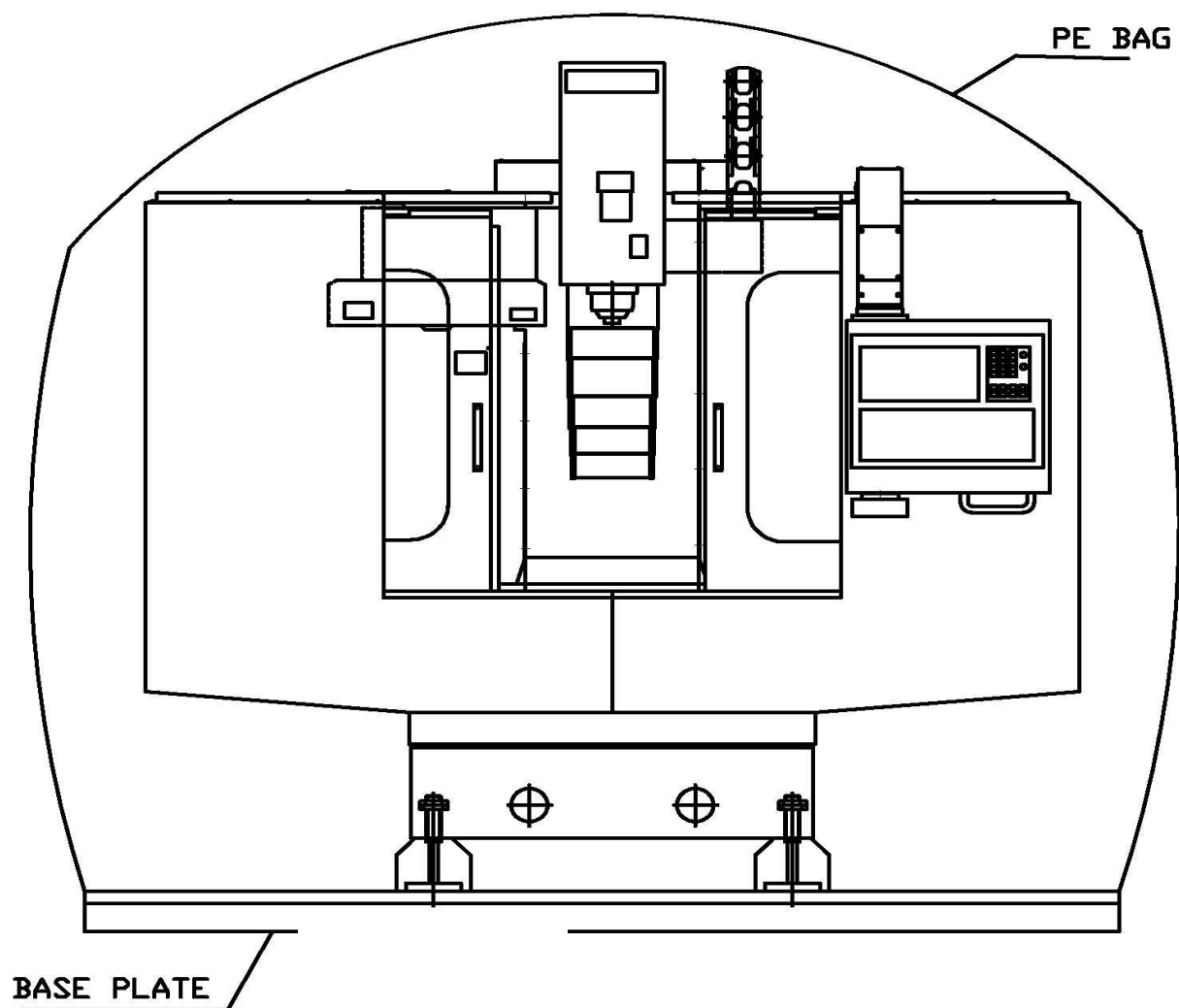
PE Bag

Fig 10

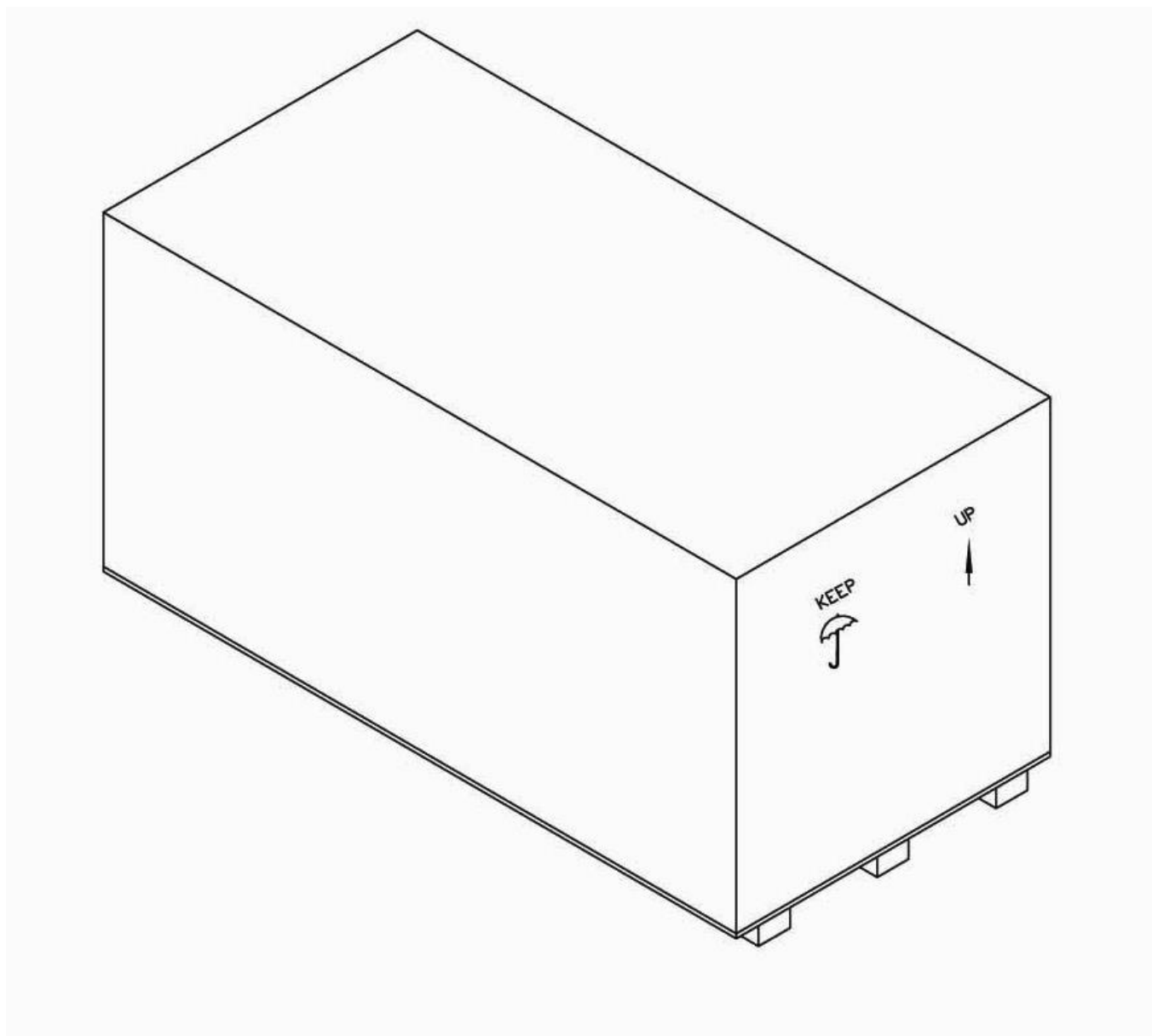


Fig 11

FIXATION BEFORE TRANSPORT

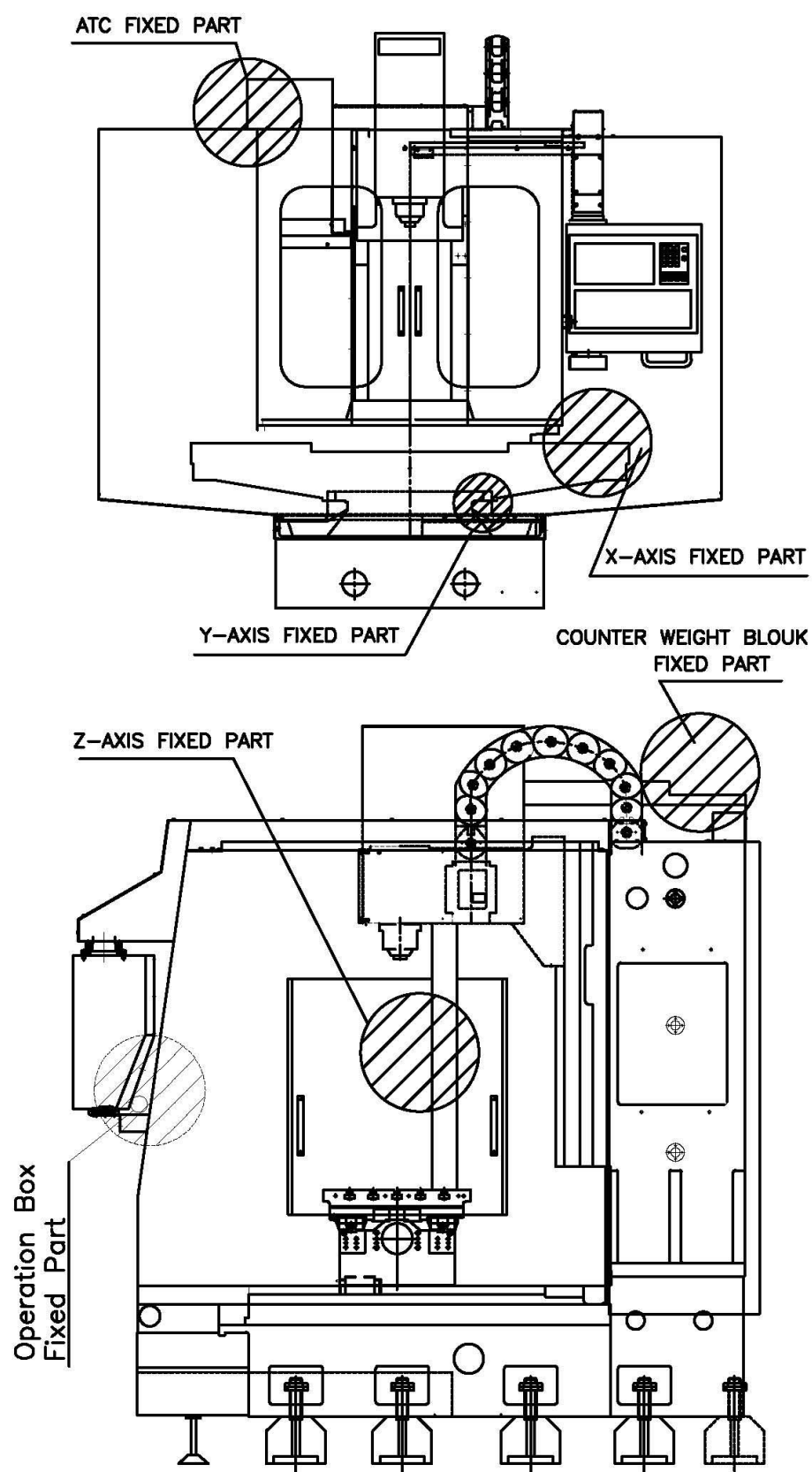


FIG.12

4. DISASSEMBLY AND POSITIONING

When the machine, which is transported in the wooden case, reaches the destination, please disassemble the top plate of wooden case and then face plates. Finally, the bolts fixed on the bottom plate will be removed. Then hang up or move the machine by lifting.

Please pay attention to the followings during transportation for preventing any danger to persons and damage to the precision of machine

(1) Please don't disassemble the case under normal conditions before the machine reaches the destination.

(2) Remove all obstacles on the transportation way for avoid harming the machine and operators.

(3) The transportation after unpacking is referred to the fixing ways , of fig. 13, 14. The bearing strength of mechanism chosen must be able to bear the weight of VMC 850, 5500Kgs.

(4) Keep the balance of machine during lifting for avoid inclination, which may damage the machine or hurt operators.

(5) The machine consists of spindle housing, column, table, saddle, base seat, electrical box, and ATC mechanism accessories. So be sure to fix all parts during transportation to avoid harming the precision, owing to up & down vibration or big vibration.

Positioning of Machine

After the machine is assembled, in M.S.T. area, our domestic business service or local agents will assign technicians to install and position it.

BY CRANE

OVERHEAD CRANE: 10ton

wire rope : $\phi 1 \times 5m$

$\phi 1 \times 2m$

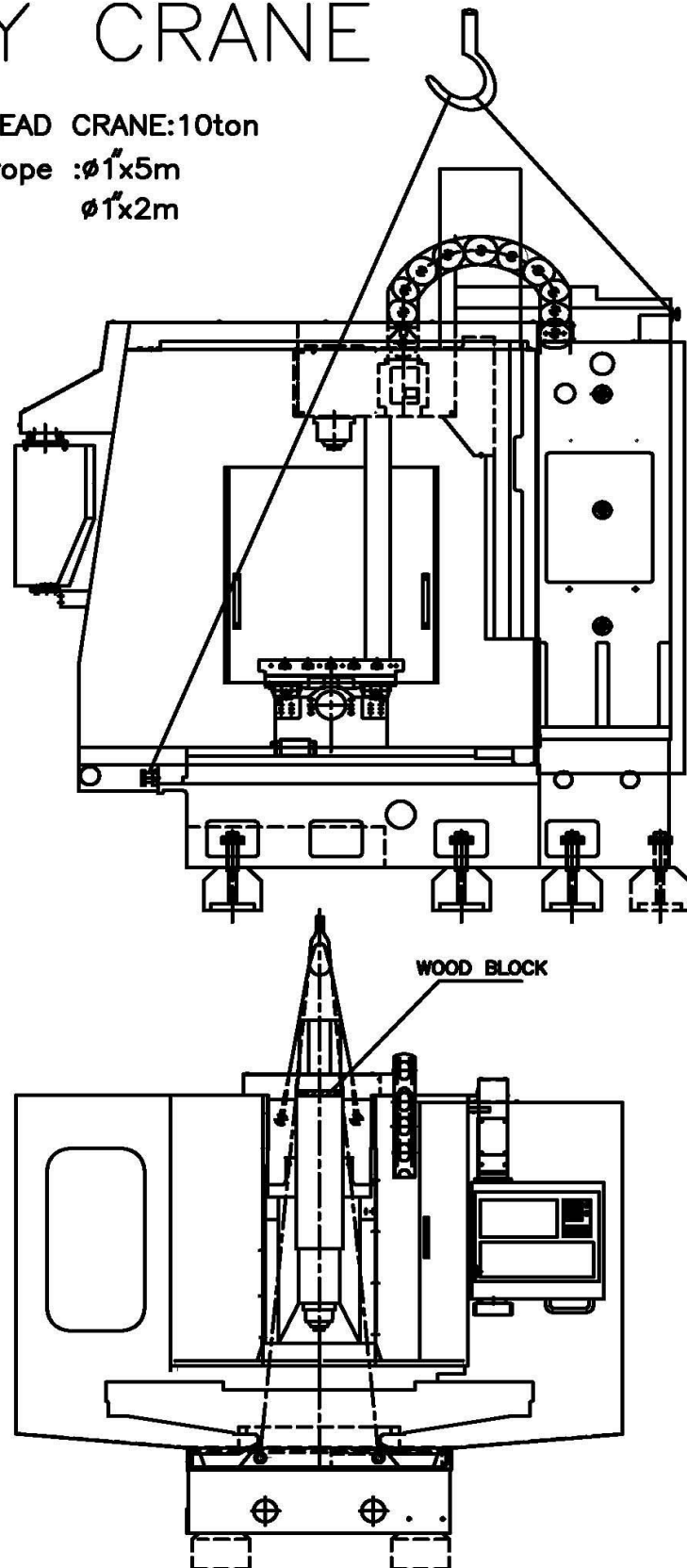


Fig.13

MACHINE TRANSPORTATION

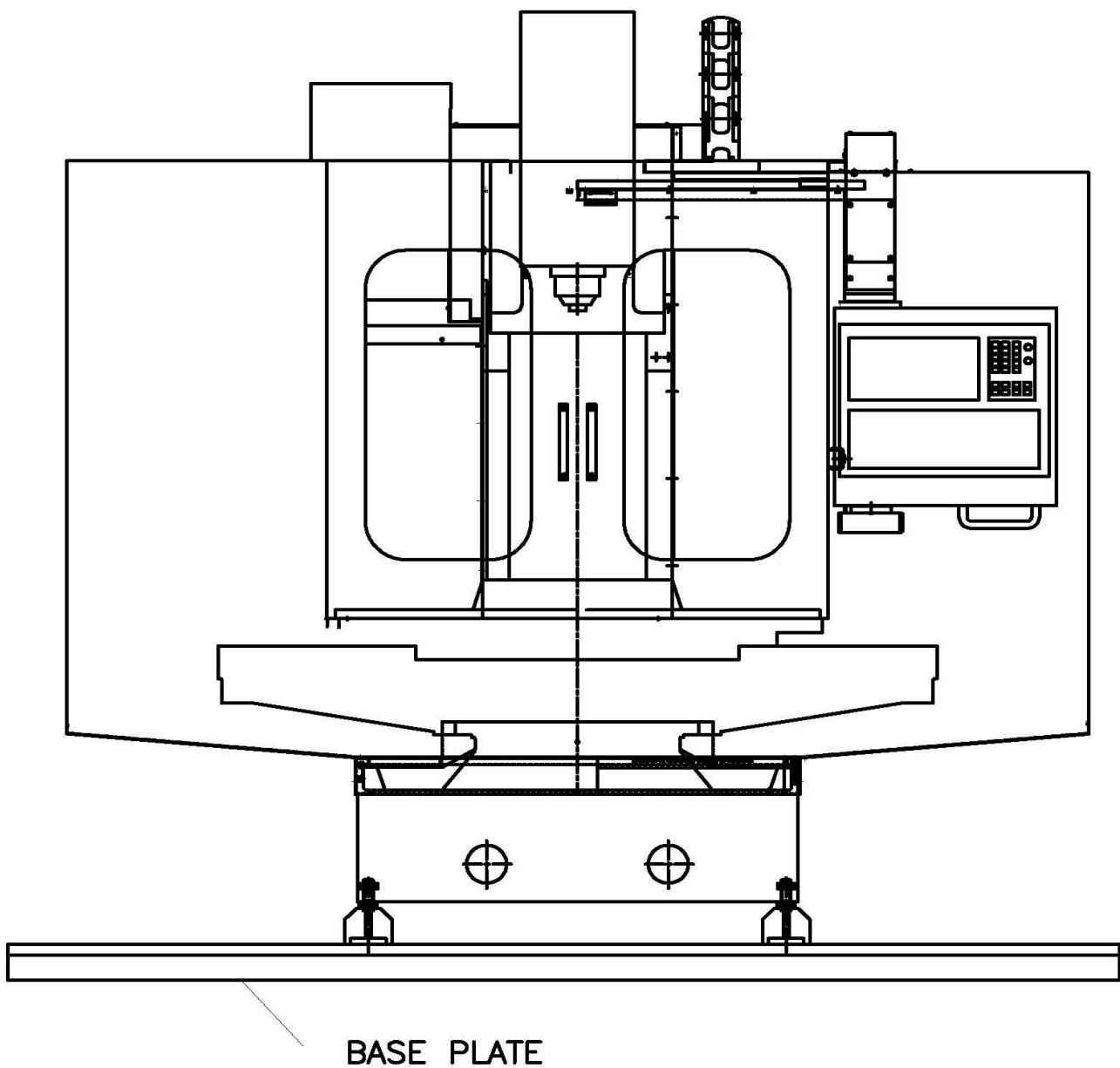


Fig.14

5. NOTES FOR CONFIRMATION BEFORE STARTING MACHINE

5-1 Power Requirements

Power requirements are as follows:

Supply Voltage	380 VAC
Frequency	50 HZ
Capacity	22 KVA
Phases	3
Supply Line Cable Size (incl. Ground wire)	22 sp.mm 4 cores

Note 1: The values in the table above vary depending on the optional specifications.

Note 2: For machine tools, class 3 grounding work (less than 100 Ω grounding resistance) is necessary.

Note 3: Do not connect the power cord and the grounding wire in serial; if attempted, it will give adverse effect to other equipment or cause malfunctioning of the leak breaker etc.

Compressed Air Supply

Specifications of the compressed air supply are shown below:

	Without APC
Pressure	5 to 6 Kgf/cm ² (71 to 100psi)
Air Consumption	500 nl/min (26.4gpm)

Note 1: Air pressure at the primary side should be kept above 5 Kgf/cm² (71Psi).

Note 2: Compressed air should be supplied as free from moisture as possible even though the machine is provided with an air filter.

Lubricating oil

Tank	Oil Type	Amount
Lubricating oil tank	Behran 68K (1)	(0.5 gal)

Note 1: Machines equipped with the optional coolant supply system require coolant that must be prepared before starting actual cutting tests.

For further information concerning the required amounts of coolant and the Recommended types of lubricating oil refer to IV.

MAINTENANCE" 3-1 List of Lubrication Oil"

5-2 Leveling the Machine

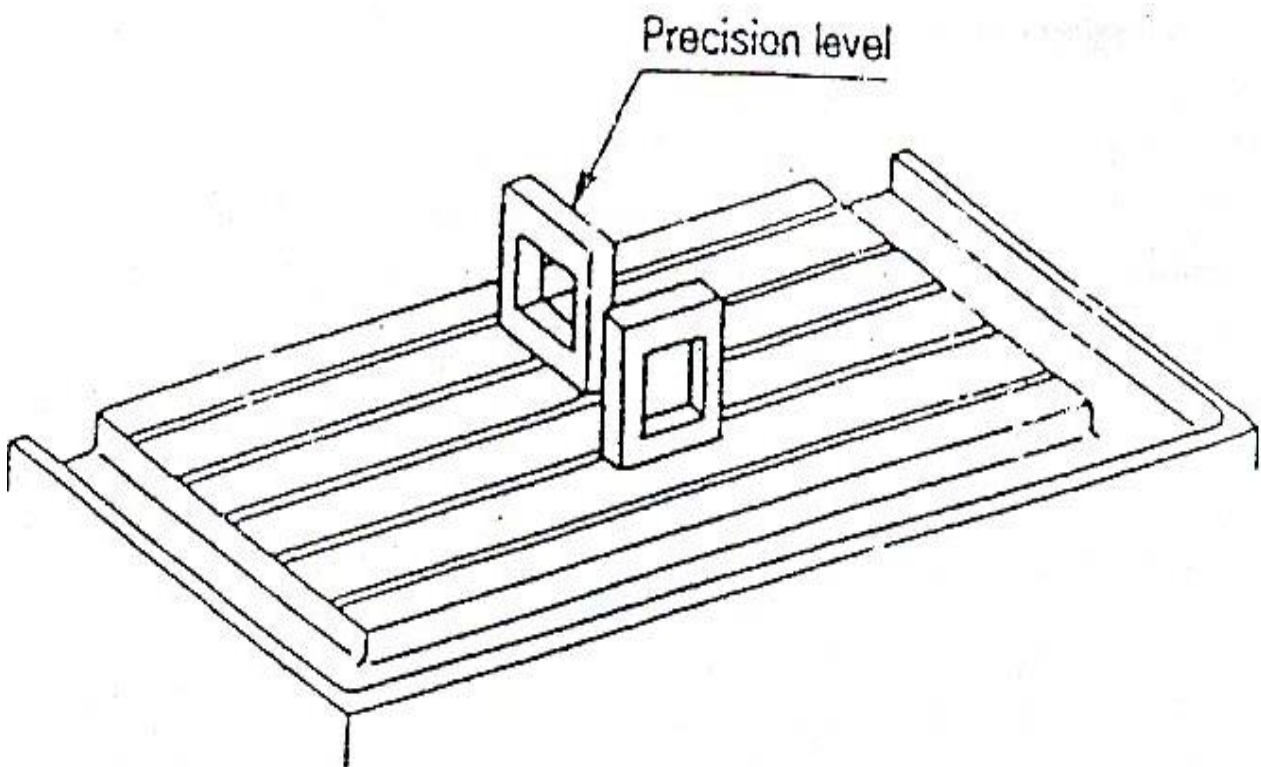
Setting the machine in a level position greatly affects both working accuracy and service life. The machine should be carefully leveled during installation.

Use a precision level (0.02 mm/m per division) to measure the machine level.

Level the machine as follows:

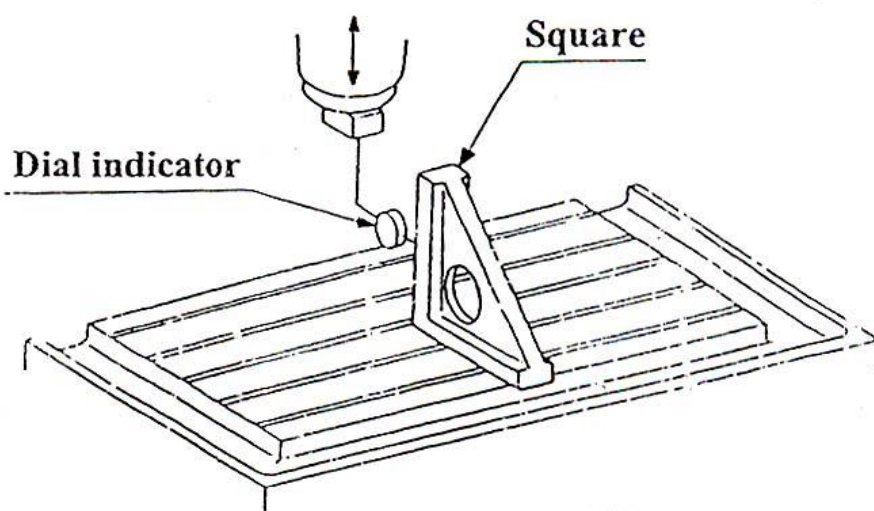
- (1) Position the spindle head at the center of vertical travel (Z-axis).
- (2) Position the table at the center of the saddle where the spindle center line and the table center are aligned.
- (3) Position the saddle at the center of crosswise travel (Y-axis).
- (4) With the saddle level placed near the center of the table along the X- and Y-axis directions, slowly move the table over the full range of both X and Y axis and take readings.

The machine should be leveled to within the permissible limits specified in the Static Accuracy Test Chart supplied with the machine.



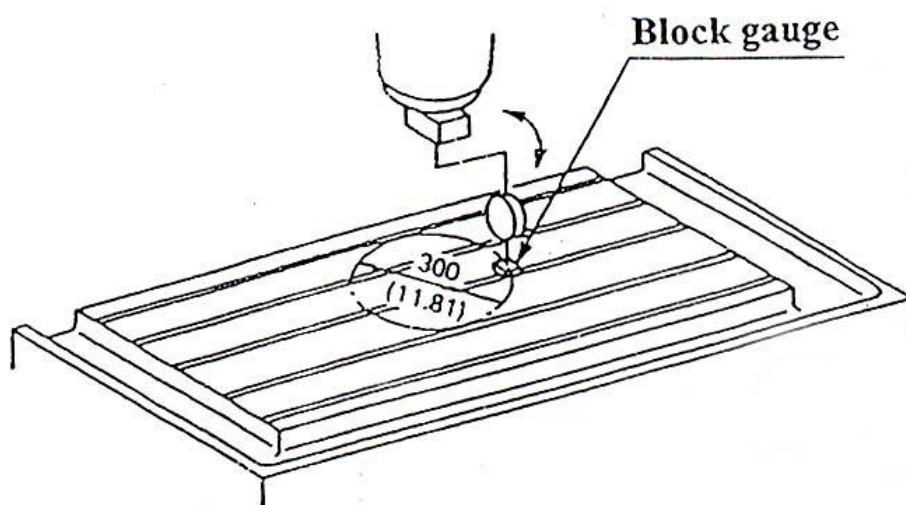
(5) Place a standard test spare on the table, attach a dial indicator to the spindle, and measure the vertical movement (Z-axis) of the spindle head with respect to the X-, Y-, and Z-axis directions.

Adjust the column inclination with the jackscrews at the front and rear of the column to the permissible limits specified in the Static Accuracy Test Chart supplied with the machine.



Also measure in Y- and Z-axis directions.

(6) Apply a dial indicator to the spindle and rotate the spindle by measure the square ness of the spindle center line to the tabletop surface.



(7) Adjust the machine level by using the jackscrews around the bed.

Adjust so that the jackscrews are not loose.

(8) After adjustments, secure the jackscrews with their respective lock nuts tighten the foundation bolts and recheck the machine level.

The lock nuts on the jackscrews must be secured tightly even on Machines not provided with foundation bolts.

(9) Adjust and tighten the jackscrews under the CNC unit.

Note: After the machine has been in use, check the level once a month. Should the level be off, repeat the adjustment procedure.

5-3 For raising working effect and maintaining the quality & precision of machine, please be sure to pay attention to the followings before Start the machine:

- (1) Does power coerce meet the standard requirement 380 V AC?
- (2) Does air pressure meet the requirement?
- (3) Remove all camps fixed on the machine.
- (4) Remove all rust proof protections with kerosene and clean cloth.
- (5) Move away all obstacles in the machine.

Please be sure to confirm all of the above points to ensure the safety of machine and your sell:

5-4 preparing the Machine for operation

5-4-1 Lubrication

Machine parts should be lubricated according to IV MAINTENANCE "3-1 List Of Lubrication Oil".

Check oil level and operation every day.

Prior to shipment, the spindle head lubricating oil tanks and the coolant tank is drained. Fill before installation.

Note: 1. the symbols used in this chart are described in IV.

MAINTENANCE "3-1 List of Lubrication Oil" in this oil types to be used.

2. Use of improper lubricating oils may lead to poor performance or malfunction of the machine.
3. Always supply new lubricating oil when replenishing.
4. Do not supply oil without the filter.

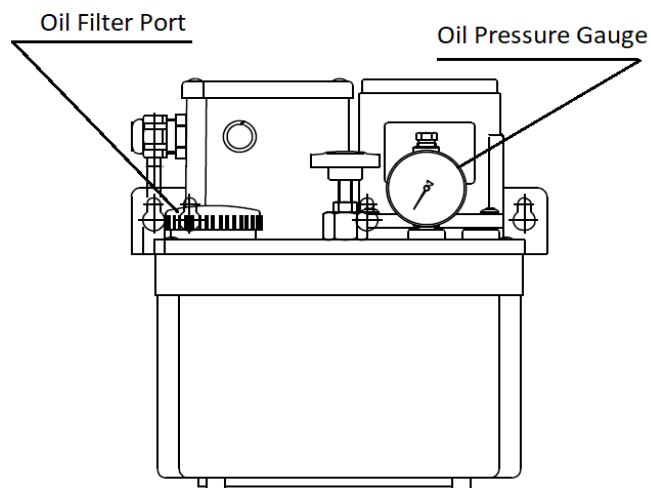
5-4-2 Centralized Lubrication Unit

The centralized lubrication unit, located at the left side of the machine, lubricates the following areas: X-, Y-,Z-axis sideways

X-, Y-, and Z-axis ball screws

The centralized lubrication unit pump operates, at. Preset intervals after power supply to the machine has been turned on. Lubricating oil is fed to the lubricating points through the metering valves installed at the head stock, the saddle and the table.

Electric Lubricating oil-feed Machine:



**REMARKS**

1. Always use the lubricating oil regulation specified. Using another grade of lubricating oil will damage the distributors.
2. Check guide ways and ball screws every six months for proper lubrication.

Note 1: For the alarm concerning the lubrication, refer to 5-4-5 "Lubrication Warning System (Alarm)."

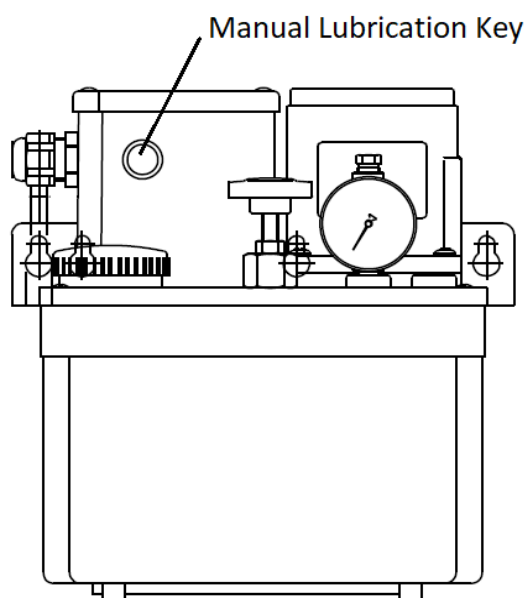
Note 2: If the guide ways have not been lubricated satisfactorily, feed the lubricating oil manually. Refer to 5-4-3 "Manual Lubrication"

Note 3: To change the time setting for the centralized lubrication system, refer to 5-4-4 "Automatic Lubrication: Time Interval Setting."

5-4-3 Manual Lubrication

Lubrication is normally automatic. However, manual mode lubrication is used before machine start-up, in cold weather after long periods of disuse or whenever automatic lubrication seems insufficient.

Press the key, fiat key on the Operator panel. This starts the lubrication unit pump and feeds the lubricating oil; at preset timing intervals, to each lubricating point.



5-4-4 Automatic Lubrication: Time Interval Setting

The time interval of the automatic lubrication cycle, that is, the duration of the "OFF" time, is set as a parameter in the CNC system. Before shipment, the "OFF" time is usually set to 5 minutes and the "ON" time for pump actuation is set to 6 seconds.

Note1: Reducing the lubrication frequency, that is, increasing the "OFF" time interval, to too long an interval may reduce the lubricating oil film on the guide ways and result in machine trouble.

5-4-5 Lubrication Warning System (Alarm)

Poor lubrication affects machine accuracy and causes break downs. As a safeguard, the centralized lubrication unit is provided with an alarm system which is activated under the following conditions:

(1) Low Oil Level in Tank

A float switch located in the tank detects a low lubricating oil level. This switch activates an alarm which is displayed on the CRT when the level in the tank drops below the lower limit.

(2) Insufficient Lubrication Pressure

A pressure switch is used to detect pump output pressure. If the pressure does not rise after the pump has been turned on, an alarm is displayed on the CRT.

(3) Excessive Lubrication Pressure

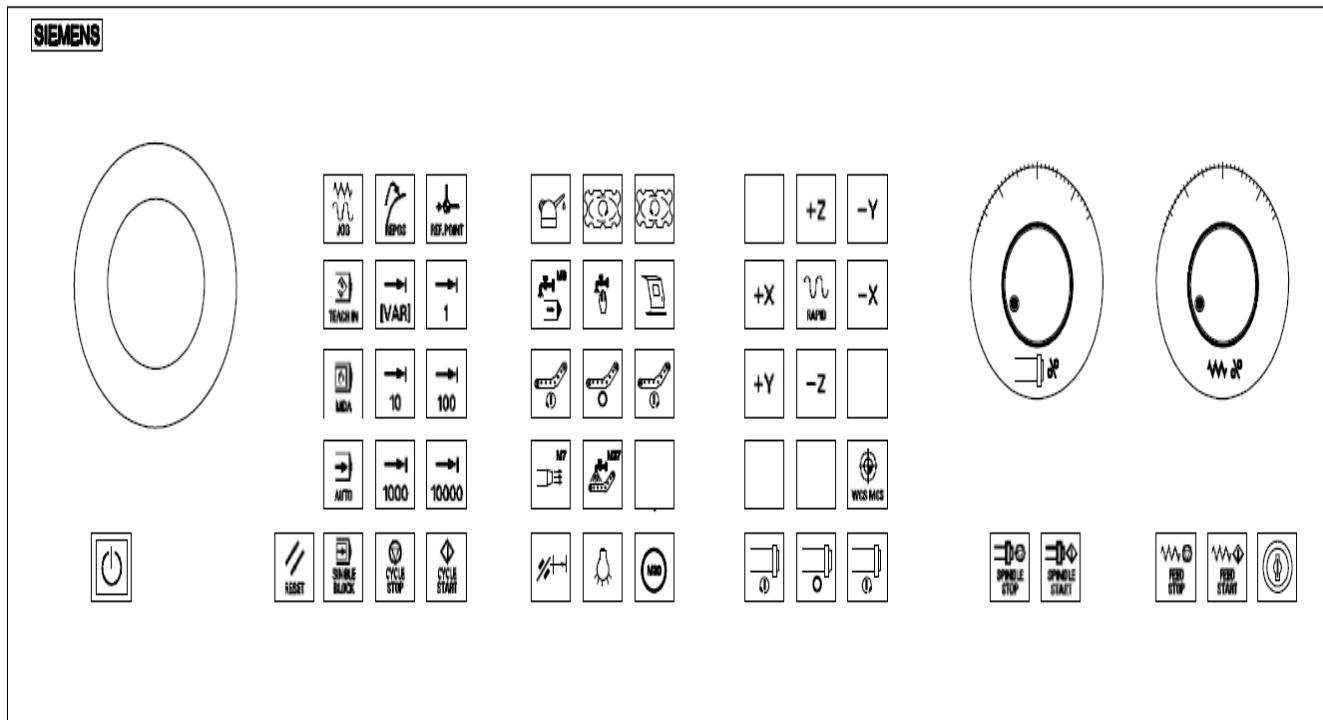
A pressure switch is used to detect pump output pressure. If pressure does not drop after the pump has been turned off, an Alarm is displayed on the CRT.

(4) Tripping of the Overload Protective Relay of the Centralized Lubrication System Pump.

Note 1: When an alarm occurs, check the description of the alarm. Take all measures necessary to reset alarm so that machine accuracy is not affected and serious trouble is prevented.

Note 2: When any of the above 3 alarms occurs, the alarm type is displayed on the CRT with an alarm code.

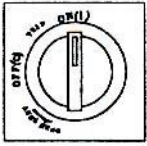
III. DESCRIPTON OF OPERATION




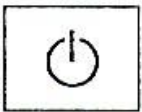
OPERATION MANUAL


1- POWER ORERATION

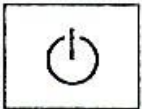
1-1 POWER ON




1. Turn "MAIN POWER SWITCH" of electric cabinet to (ON) position. (May hear coolant fan inside the cabinet start to rotate) The green lamp of  NC ON push button, on control panel, must be lit.



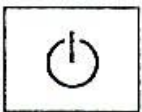
2. Depress  NC ON push button again the power of control system will start and the green lamp must be extinguish.




3. Wait for the completion of starting up. The  NC ON green lamp must be flashed.



4. Release "EMERGENCY STOP" BUTTON.



5. Depress  NC ON push button, the power of machine will be ready and the green lamp must be stop the flashing and lit.

6. The reference is not needed, it is already set in the manufacturer's factory.

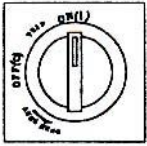
(REF: 3-1) having the machine ready for operation.

1-2- POWER OFF

1. Make sure machine was in safety situation




2. Depress "EMERGENCY STOP" push button to stop Power system and all driving mechanism.

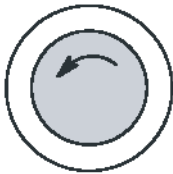


3. Turn MAIN POWER switch on cabinet to " O " ("OFF") position.



4. Or depress  button switch, Input M30. The power be turn off automatically after 1 second..

2. EMERGENCY STOP



When an emergency situation was happening, depressing "EMERGENCY STOP" push button could stop all movements of machine to secure the safety of operator and machine. When it was depressed:

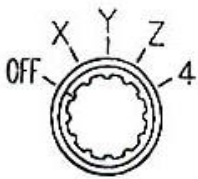
1. Spindle stopped.
2. Axes movements stopped.
3. Coolant stopped.
4. Chip conveyor stopped.
5. "Emergency stop" would be shown on the display monitor.

3. MANUAL OPERATION

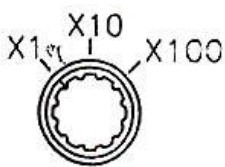
3-1 HANDLE FEED

1. Depress "  " MODE selection button On MCP Panel.

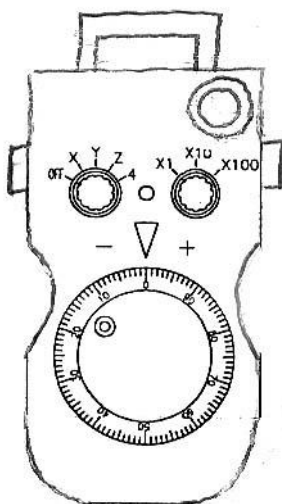
2. Select the axis to be moved by using the select switch on the HANDLE wheel.



3. Select "Multiply Factor" selection switch on the handle wheel to desired position, X1 (0.001mm/scale), x10 (0.01mm /scale) or x100 (0.1mm/scale).

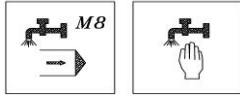


4- Push and hold two enable button simultaneously



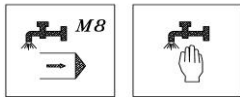
5. Table will move to the suitable position according to speed scale factor of MANUAL PULSE GENERATOR turning direction.


3-2 COOLANT

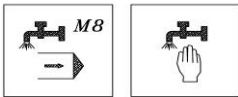



1. Depress once, coolant ON (indicator lits up).

Depress again, coolant OFF (indicator off)



2.a) Depress "  " push button to enable M08, M09 command and indicator in it will lit up.



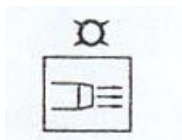
b) Depress  again will terminate M08 command and indicator in it will OFF. In this state, the coolant is not supplied even if M08 is executed.



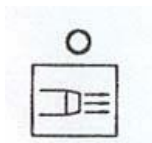
3. When the coolant is supplied through the nozzles, the indicator lits up.

NOTE: Always close the front door before turn on the coolant.

3-3 AIR BLAST



1. Depress once, air blast ON (indicator lits up). (M07)

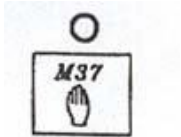


Depress again, air blast OFF (indicator off). (M12)

3-4 CHIP CLEAN (FLUSH CHIP):



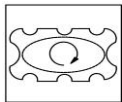
1. Depress once, chip Clean ON (indicator lits up). (M37)



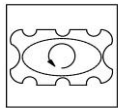
2. Depress again, chip clean OFF(indicator off),(M38)

3-5 TOOL MAGAZINE

3-5-1 MAGAZINE CW AND MAGAZINE CCW PUSH BUTTON



MAGAZINE CW: Under JOG mode; push this button will rotate the tool magazine clockwise.



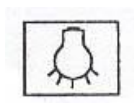
MAGAZINE CCW: Under JOG mode, push this button will rotate the tool magazine counterclockwise.

3-5-2 TOOL UNCLAMP



1. Under JOG mode, push this button will release the tool on the spindle.

3-6 WORK LIGHT



1. Depress once, work light ON (indicator lits up).

2. Depress again, work light OFF (indicator off).

3-7 OVERTRAVEL RELEASE

1. When the machine is in working area, the indicator in the power push button will lit up and O.T. will off.

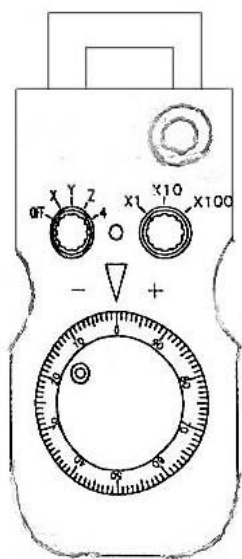
O.T



When the machine was trying to over travel the limit switch, machine will stop and indicator in O.T. push button will flashing.

2. When over travel happening


O.T

a) Depress **O.T** push button, and hold it until moving Axes to safe area.



b). Depress  power push button. And  Reset key.

d) Using "+X,-X,+Y,-Y,+Z,-Z "in JOG mode to move Axes back to safe area.

d) Using " "(HANDLE) to move table back to safety area. (ref:3-2)

e)Release the O.T. button

3-8 AUTO DOOR (OPEN DOOR)



Controlling door opening or closing, when program, spindle or Coolant stopped, door can be open. By depressing the switch, The light in the switch will lit up and door interlock Would be released.

Depress the push button again, light in switch will be off and Door will be interlocked.

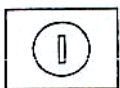
3-9 AUTOMATIC POWER OFF FUNCTION




1. Depress once, the automatic power off function is effective. The power will be OFF automatically when program finished. (M30)



2. Depress again, disable the automatic Power off function.



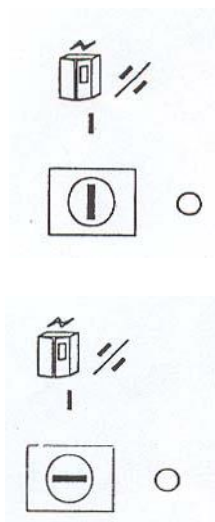
3-10 PROGRAM PROTECTION KEY

If this key switch turn to "  "(OFF).

The edit operation is exhibited.

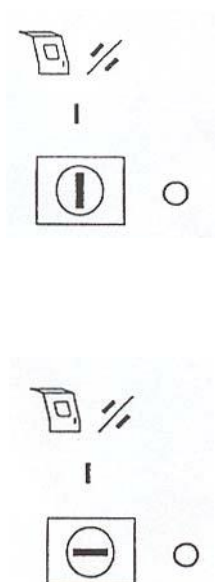
4. OTHER SWITCHES

4-1 ELECTRICAL CABINET APO



1. Electrical cabinet auto power off setting.
2. ON: When cabinet door being opened, AUTO POWER OFF will turn off power to secure safety.
3. OFF: When cabinet door being opened, AUTO POWER OFF will still turn on power for repairing machine. It should not be used in normal condition.

4-2 DOOR INTERLOCK



1. Door interlock setting key.
2. ON: Door interlocks effective. (ref: DOOR INTERLOCK FUNCTIONS)
3. OFF: Door interlock un effective. Door can be opened. Axial movement and spindle rotating will be limited. Program can be executed under Single block mode.

5. DOOR INTERLOCK FUNCTIONS

Door of full enclosure has equipped with magnetically type interlock to secure operator's safety. Please read the following related descriptions carefully to ensure the safety of operations.

(1) CONDITIONS OF TO OPEN AN INTERLOCKED DOOR:

- (1) Spindle stopped.
- (2) Coolant stopped.
- (3) Program stopped.

(2) METHODS OF OPENNING AN INTERLOCKED DOOR:

- (1) Depress "Door open" push button.
- (2) When machine is reading a command of M00/M01/M02/M30, of a CNC program

(3) RESTRICTIONS OF OPERATION WHEN INTERLOCK DOOR WAS OPENNED:

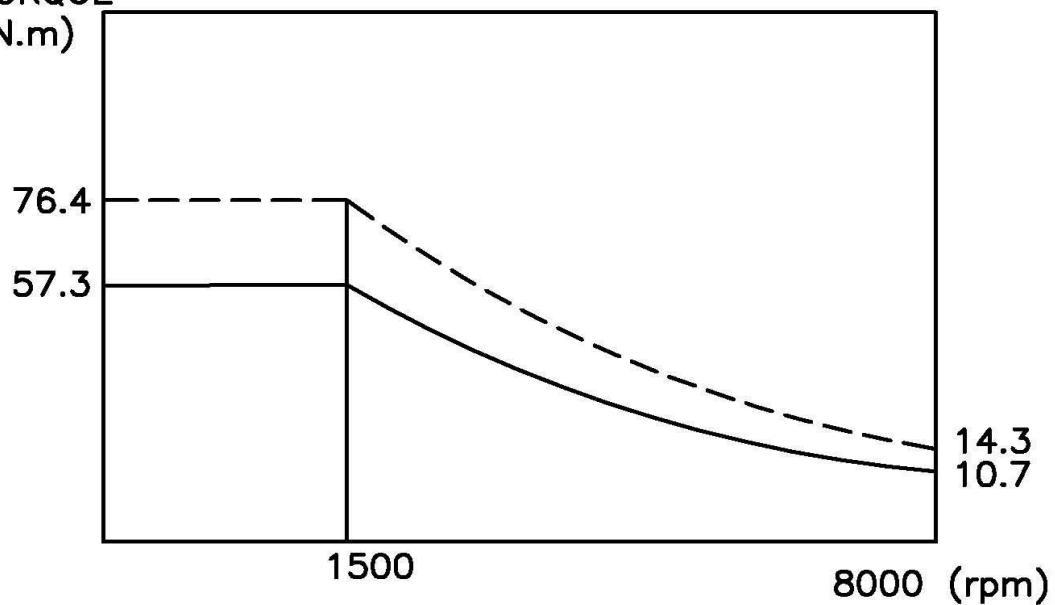
- (1) Spindle speed is limited below 50 rpm.(PAR.35160)
- (2) Axial movement feed rate is limited 80%

IV. MAINTENANCE

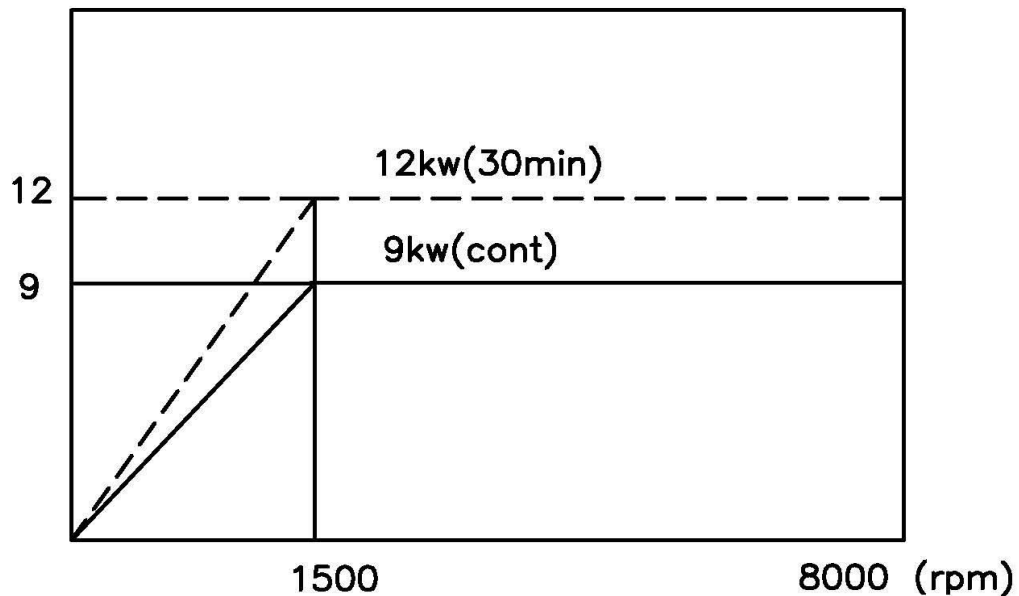
1: TORQUE CHART (BT-40)

For 8000 rpm
Siemens ac spindle motor 1pH8107
 $T=57.3 \text{ NM}$
Rated speed 1500 RPM
MAX speed 9000 RPM
pulley ratio=1:1

SPINDL
TORQUE
(N.m)



power
(kw)



2. PREVENT ION & MAINTENNANCE

2-1 Daily Maintenance

- (1) Check the oil level of every lubricating oil tank. When oil amount is below the standard, fill it anytime.
- (2) Check every lubricating parts and make sure the lubricating situation of oil-is good.
- (3) Check pneumatic gauge maintain the pressure at 6 kg/cm². The desired pressure.
- (4) Air pressure leakage must be repaired immediately.
- (5) Check the oil amount of the service unit; add if it's below standard. Also get rid of water and vapor.
- (6) When machine is started, check if coolant is sufficient and cooling mechanism can work.
- (7) Clear the obstructions on the machine to avoid damaging machine.
- (8) After work is finished every day, please keep the machine clean anytime and apply grease to the exposed slide surface to avoid rusting.
- (9) The spindle taper must be kept tidy all the time. After operation, clean the taper with spindle taper cleaner and apply proper lubrication.
- (10) Pay attention to machine's running anytime. If there is any situation occurring, please stop machine and check it.

2-2 Weekly Maintenance

- (1) Wipe reflector of reading device with clean absorbent cotton or soft gauze to keep it clean and shiny.
- (2) Use detergent and water to clean the air filter of the service unit to maintain the purity and smoothness of air supply.
- (3) Make sure that the spindle tool clamping and unclamping movement is smooth.
- (4) Check if the circulating oiling and centralized oiling of pump is normal.
- (5) Make sure that the ATC's tool changing action is sound and smooth.

2-3- Every Half-A-Year Maintenance:

- (1) Check If range of deflecting oscillation of spindle Is too large and if gap of spindle's bearing is normal.
- (2) Check if screw or nut is loose.
- (3) Check if gap of taper gib of every slide rail is too large.
- (4) Fully check if outer layer of every wiring (connecting point: adapter, socket, switch) is good and clear accumulated dust.
- (5) Fully check insulation resistance and record it.

2-4 Yearly Maintenance:

- (1) Check if every controlling switch on operation panel is sensitive and normal.
- (2) Clear accumulated carbon on all connecting points of relay in electric box and wipes them cleanly.
- (3) Make sure that the counter weight chain is in normal condition.
- (4) Wash coolant tank and replace equivalent coolant.
- (5) Wash centralized lubricating oil tank and replace equivalent new oil.
- (6) Wash forced lubrication oil tank and replace equivalent new oil.
- (7) Correct machine's level every year and maintain machine's accuracy.

2-5 Maintenance Notes:

- (1) Exactly perform maintenance of every glade.
- (2) When parts are replaced or adjusted, please stop machine's running to avoid danger occurring.
- (3) When circuit board in the numerical controlling box is removed for Inspection and repair, don't input electric power, otherwise AC servo motor will lose control and run at high speed that easily results in danger.
- (4) If the maintenance or repair is out, of your ability, please contact the manufacturer to avoid damaging machine's accuracy.
- (5) For all self-done maintenance actions, please first make sure if electricity break should be done for safety.

3. LUBRICATION OF MACHINE

Lubrication of Machine

Performance, reliability and durability of machine depends on

Perfect lubricating system and lubricating management. To secure tribology state of relative motion face, proper inspection, oil feed or replacement with oil at suitable time and place is necessary. The lubricating way of spindle's bearing, gear and slide rail is explained as follows:

Lubrication of Spindle Bearings:

The spindle bearings of this machine adopt grease lubrication with long life, so it doesn't need to add extra lubricant.

Lubrication of Slide Surface:

It adopts the centralized lubrication, so the lubricating oil must have the features of wear resistance, pressure resistance and good adhesive property to reduce wear and vibration. The parts to be centralized lubricated include table, saddle, slide surface of spindle housing, X-Y-Z axis ball screws.

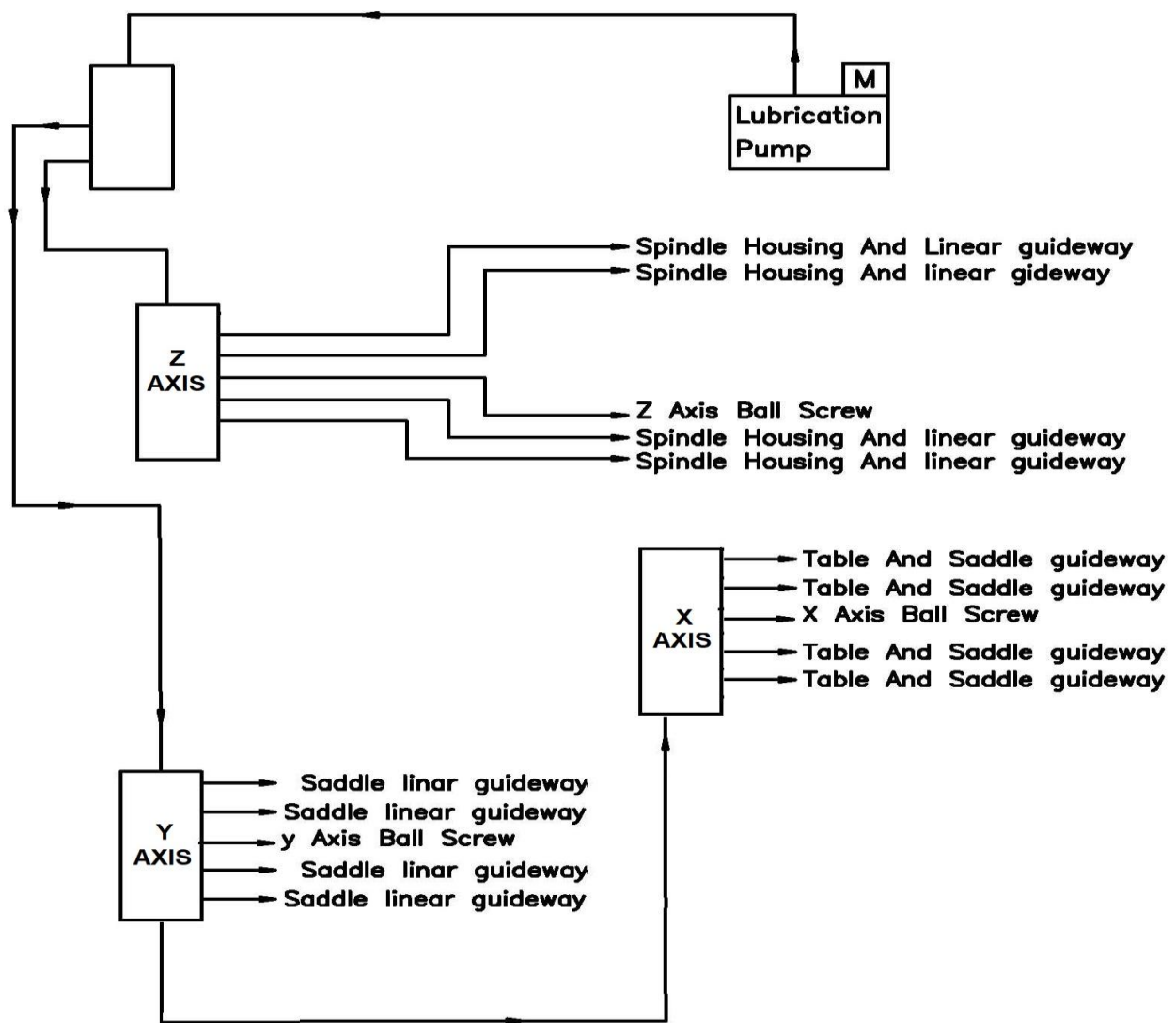
Manual Lubrication:

It's for the places which are not easily lubricated or don't need to be often lubricated. The. Parts to be lubricated include counter weight block chain, sprocket wheel which uses grease lubrication, and movable door and its roller, MAG linear motor roller bearing which uses lubricating oil.

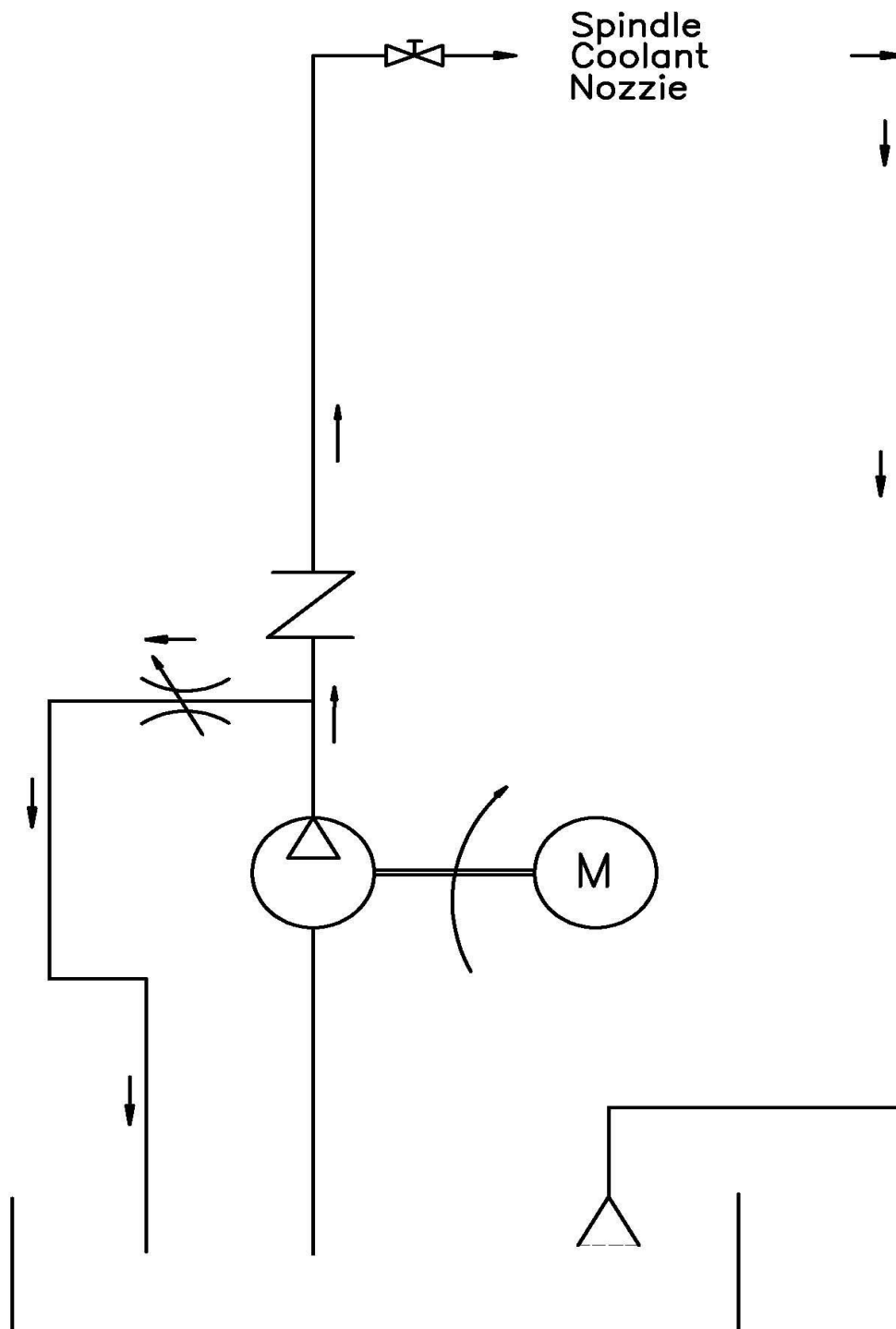
3.1 List of Lubricating oil

Oiling position ITEM	1	2	3	4	5
LUBRICATING POSITION	1) Table. Saddle. Head Stock Linear guide ways 2) X,Y,Z Axis Ball screws	Cutting Tool Coolant	Air Conditioning Unit	Chain	Booster Cylinder
VOLUME	2L	150 L	0.3L	Proper amount	Proper amount
LUBRICATING WAY	Centralized lubrication	Circulating oiling	Air atomizing oiling	Manual grease lubrication	Manual oiling
OIL REPLACING PERIOD	Usually keep Over oil level	Yearly replacement	Usually keep over oil level	Every half a year maintenance	Yearly replacement
OIL'S FEATURE	1) Viscosity: ISOVG68 2) Viscosity index 3) Wear resistance And pressure Resistance 3) Rust proof Anti -bubble Anti-oxidation	1) Large heat transfer 2) Good lubricating property	1) Viscosity: ISOVG32 2) Viscosity index is over 95 3) Rust proof . Anti-bubble Anti-oxidation	Grease	1) Viscosity: ISOVG32. 2) Viscosity index is over 95 3) Rust proof. Anti-bubble Anti-oxidation Anti- emulsification
OIL RECOMMENDED	1) Mobil Volocite Oil .2. 2) Esso Febise K68- 3) Shell Tonna T68. 4) chevron way Lubricant 68 5)Behran k68	1)Esso pennex 47. 2) Shell Dromus B.	1) Mobil DTE oil 26. 2) Shell Tellus 32. 3) Esso Nuto H32 4)Behran 32	1) Esso Beacon 2) Shell Alvania R-2.	1) Mobil DTE oil 26 2) Esso Nuto H32 3) Shell Tellus 32. 4)Behran 32
OONTAINER'S POSITION	In the pneumatic Box	At the Cutting Water tank	At the column Left-Side		

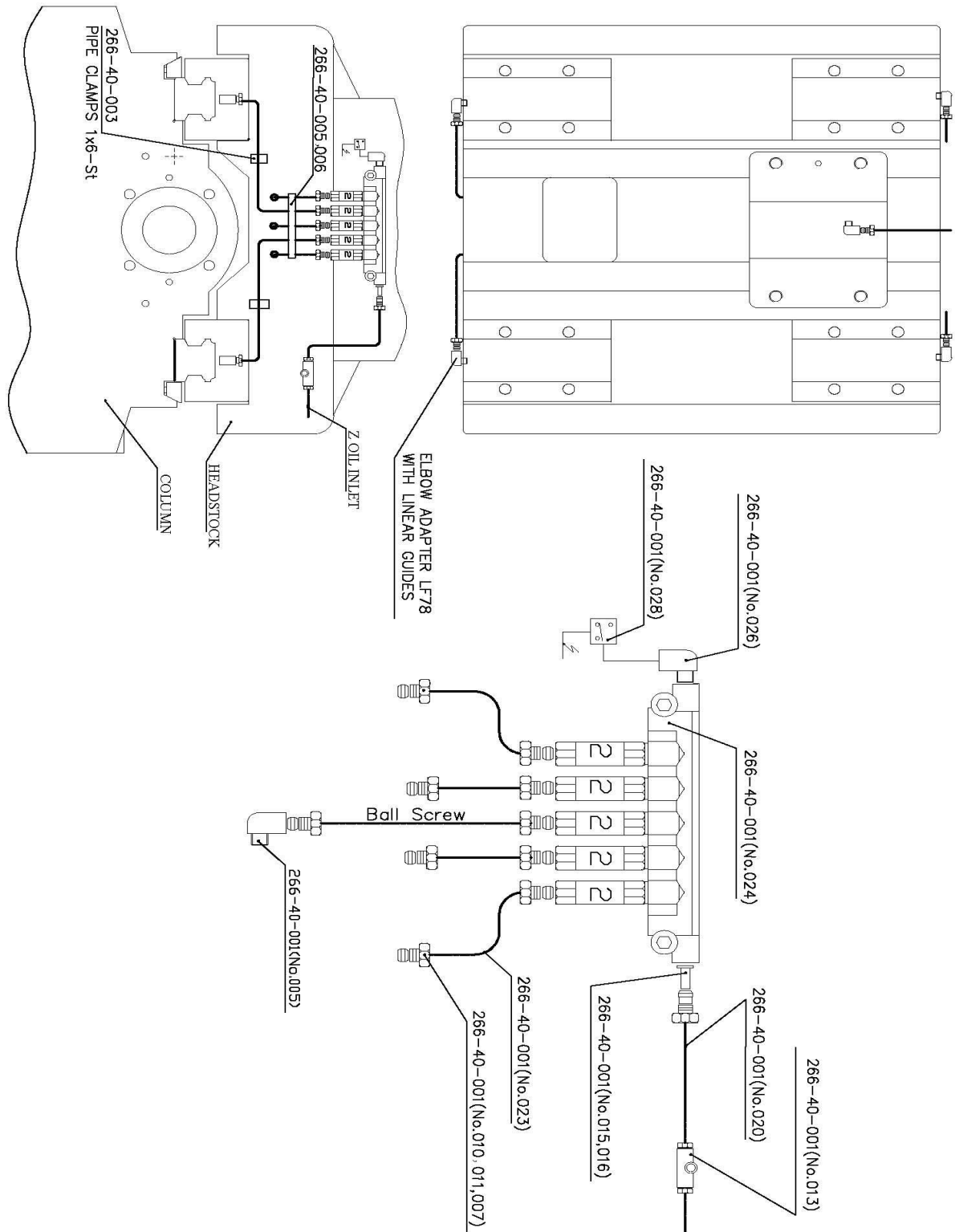
3-2 Centralized Lubrication Loop



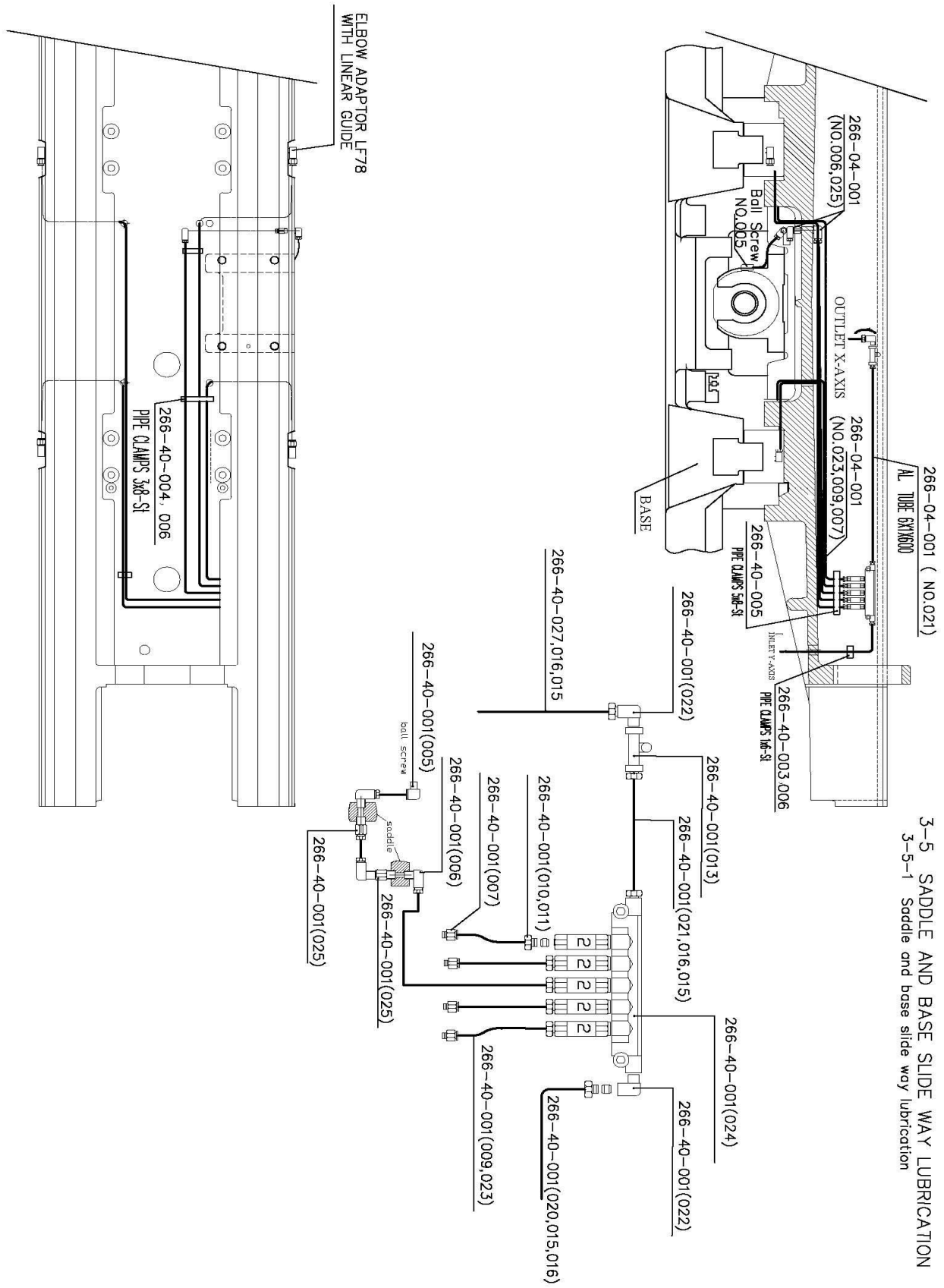
3-3 Coolant



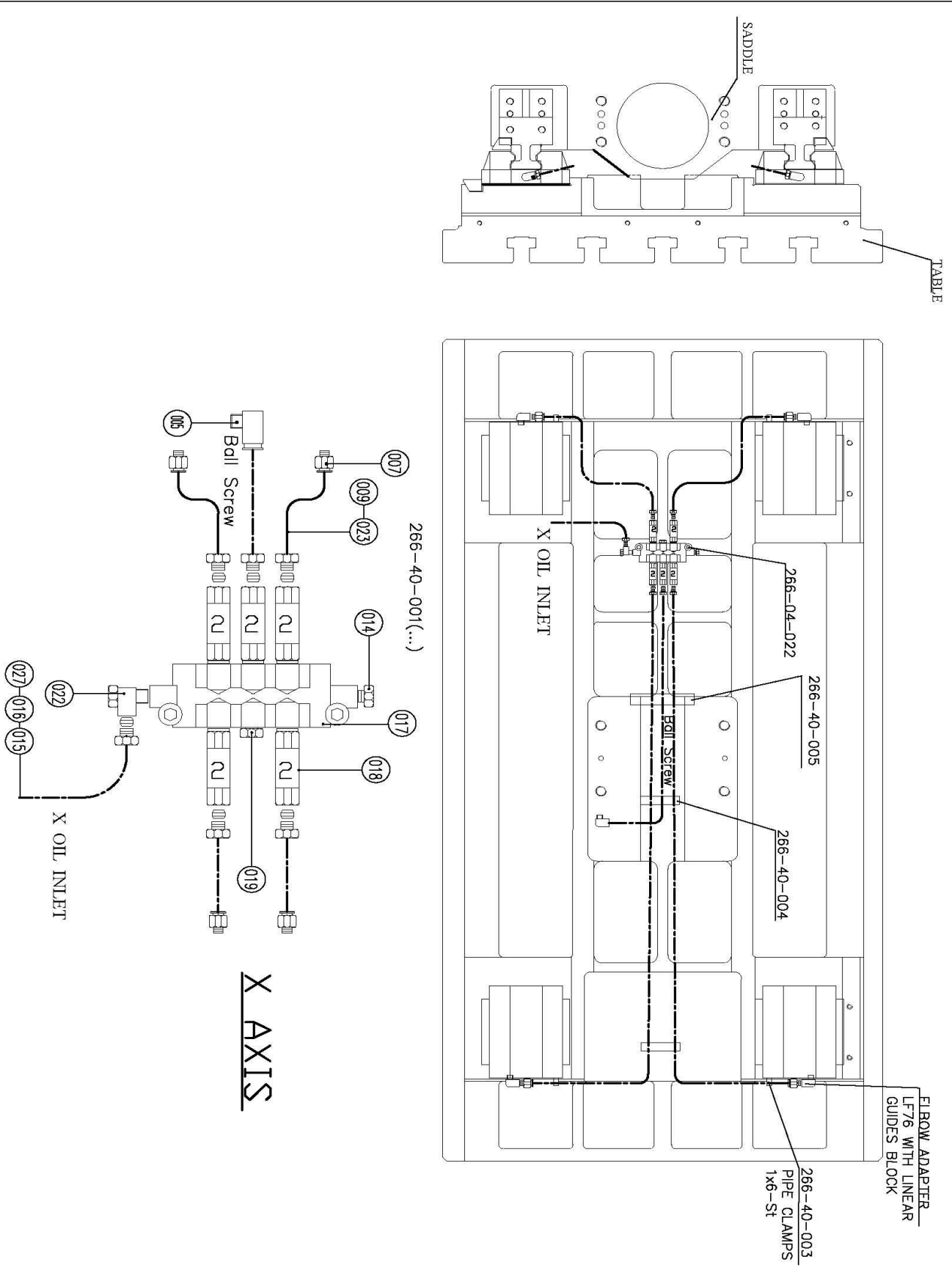
3-4 Spindle Housing And Column Slide way Lubrication



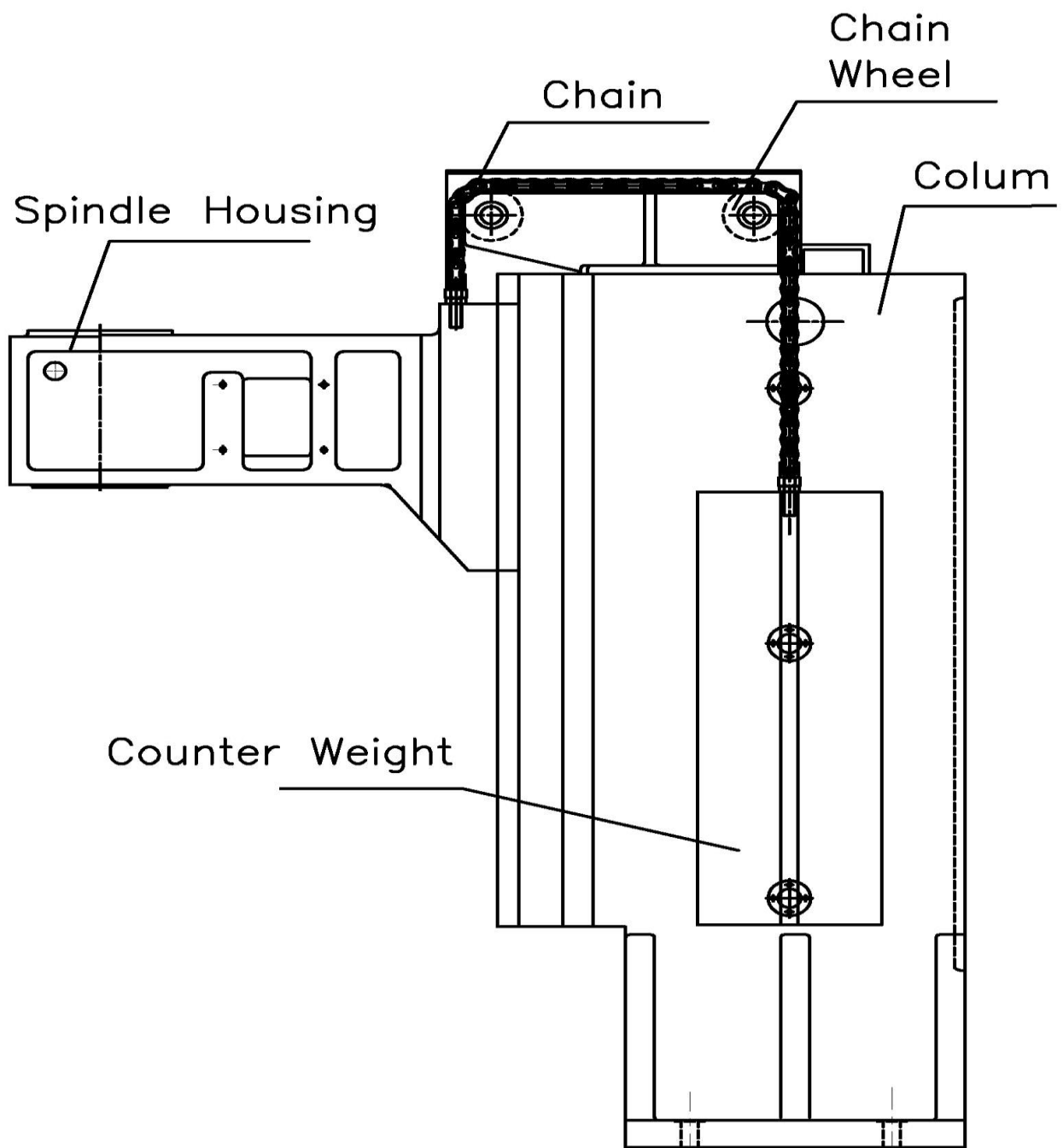
3-5-1 Saddle and Base Slide way Lubrication



3-5-2 Table Slide way Lubrication

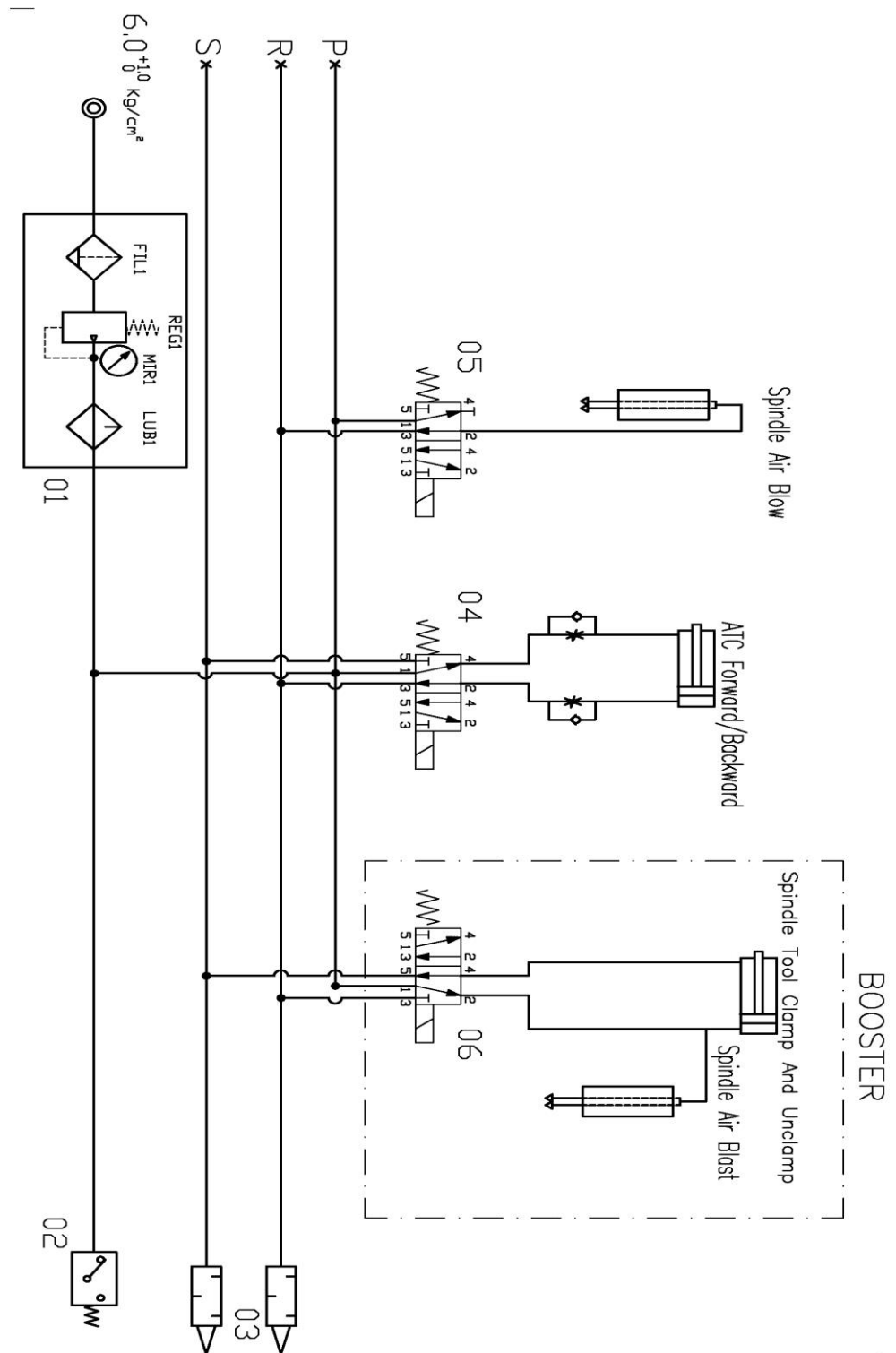


3-6 Manual Lubrication



4 Pneumatic System

4-1 Pneumatic Loop



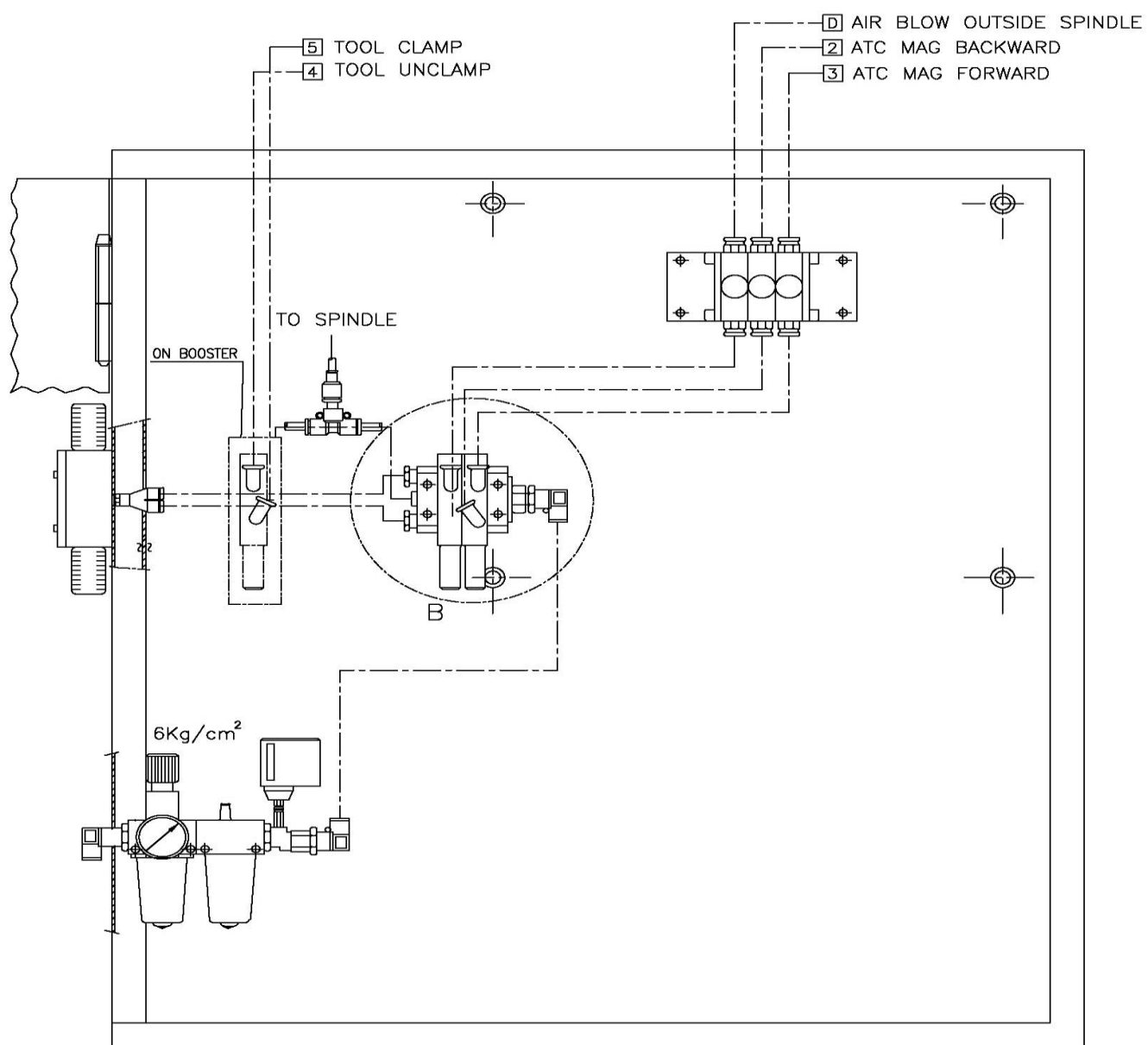
Pneumatic System List

06	MVSD-300-4E1/110V	Electromagnetic Valve	1	
05	MVSD-260-4E1/110V	Electromagnetic Valve	1	
04	MVSD-260-4E1/110V	Electromagnetic Valve	1	
03	u-1/2	Noise Silencer	2	
02	KP.1 060-1101	Pressure Switch	1	
01	FRC-1/2-S-B	Air Conditioning Unit	1	
No.	TAPE	NAME	AMOUND	REMARKS

4-1-1 Pneumatic and Centralized Lubrication System

PNEUMATIC BOX

192-07-001



4-2 Maintenance & Adjustment

The pneumatic system includes the service unit, solenoid, throttle valve, silencer, and cylinder, etc. The performance of these Parts is dependent on-the maintenance and adjustment.

Service Unit:

1. Air filter: Remove the remaining dust and water in the air so as to prolong the life of the pneumatic system. When the air pressure and exit's pressure exceeds 1 BAR, it is necessary to clean filter or it has to be cleaned periodically.

Methods for cleaning are:

(1) Remove filter, blow it with compressed air.

(2) Replace it with a new one.

2. Pressure Reduction Valve: The main function is to reduce the pressure of the compressed air to the most proper degree for the pneumatic system. Generally speaking, pressure of the processed air should be 5 kg/cm² or 6 kg/cm² or even smaller. Turn the pressure adjusting hand wheel clockwise to increase pressure, counter clockwise to reduce pressure.

3. Oil Mist Lubricator: When air enters the oil mist lubricator, it will also bring some oil. This little amount of oil will then lubricate all sliding parts so as to prolong their lives. The lubrication will reach air cylinder, solenoid, pneumatic tool clamping, spindle positioning, and ATC.

Don't put too much oil in the oil cup. Too much oil will cause very little air flow, which will slow down the air flow speed of the jet, thus vacuum cannot be created. As a result, lubricant oil can't be pumped out from the oil cup.

Supply oil according to the instruction on the oil cup.

Use correct lubricant oil-iso VG-32 first class turbine oil or oil of the same nature.

4. Notice:

- (1) Pay attention to the pressure limit, never exceed the highest limit. The temperature should be between 5 - 60 C. Avoid Direct sunlight on the unit.
- (2) The containers of the service unit are made of plastics and Should never be exposed to solvent or be cleaned with solvent.
- (3) Assemble the unit vertically and avoid tilting.
Pay attention to the air flow direction.
- (4) Wash the container with mild detergent. Never use gasoline or alcohol.

Solenoid:

The directional control valve provides the basic loop control.

It can control the open/close of the flow loop or the flow direction, or control the starting, stop, movement direction of the activator. Breakdown and Maintenance:

Dust: Dust is the main factor causing breakdown. The sealing tape chips and dust often enter the solenoid or cylinder and cause abnormal operation. Therefore, it is necessary to blow off all the above mentioned substance completely during pipe arrangement.

Sticky: Mainly due to the deterioration of air compressor's lubricant oil. To solve this problem, it is recommended to enhance the lubricant management and periodically check the operation of the rear cooler and the filter.

Winding Burn Down: Caused by the burn down of the winding or broken wires.

Inadequate Installation and Adjustment: Because electricity is sent to the dual winding simultaneously, different voltages or inadequate piping will cause problems. Please pay special attention to the maintenance and re-installation.

Inadequate Lubricant Oil: Caused by the usage of high viscosity lubricant oil such as motor oil. Only ISO VG32 class oil, such as JIS No. 1 turbine oil should be used.

Throttle Valve : (fig. 3)

The throttle valve controls the inflow of pneumatic unit.

It also controls the speed of cylinder and other parts. The speeds of spindle positioning and ATC movement (up-down, back forth) are all controlled by the throttle valve.

Adjustment of throttle valve speed: Release lock nut, then turn the handle rod clockwise to increase the speed, counter clockwise to decrease the speed, After adjusting the speed, be sure the fasten the lock nut.

Notice for throttle valve operation:

- (1) Throttle valve untidy: Clean the throttle valve.
- (2) Internal bushing damaged: Replace the bushing.
- (3) Internal spring broken: Replace the spring.
- (4) Air leaking from the throttle valve: Replace the internal o-ring.

Silencer : (fig. 4)

Silencer is assembled at the gas port to reduce the noise caused by the out-flow air.

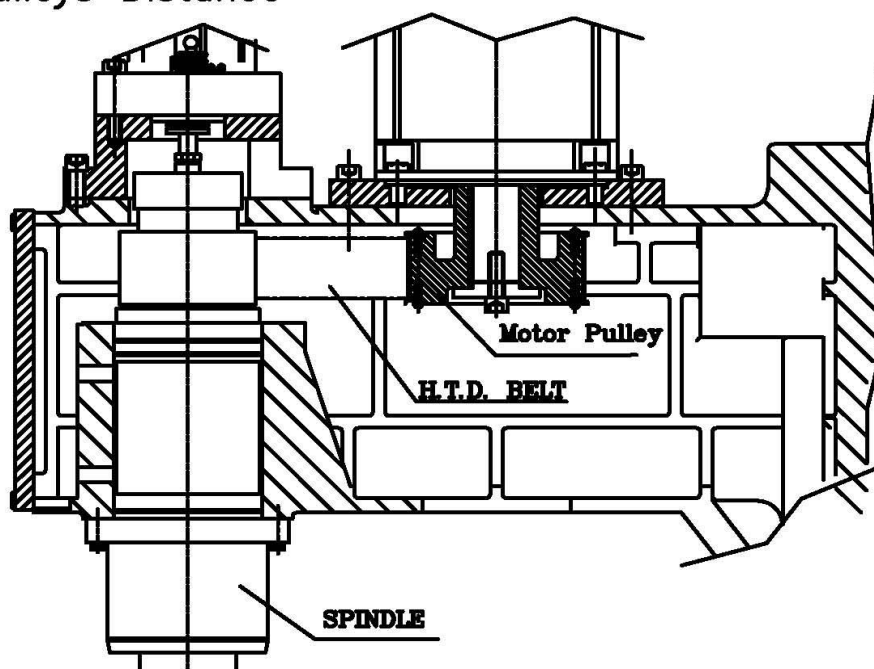
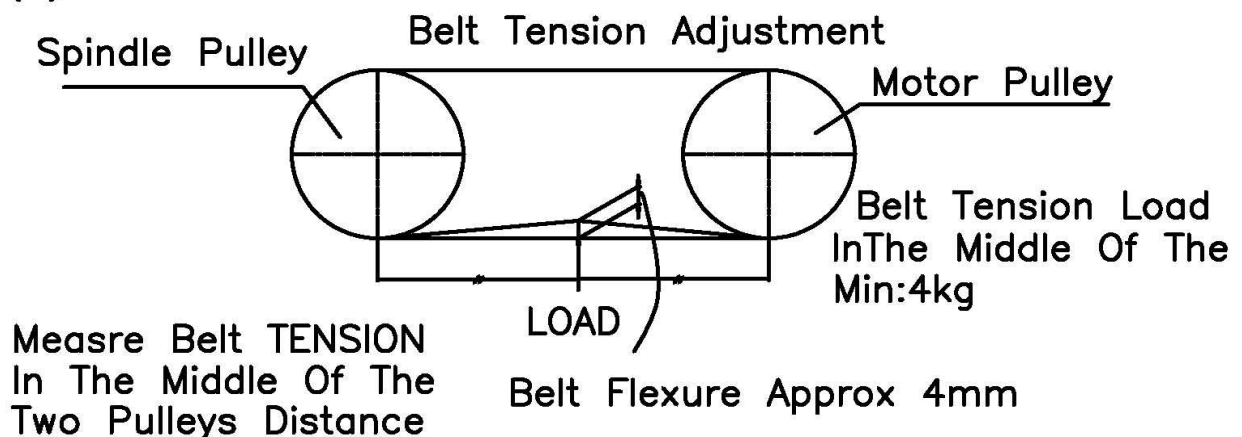
5. Mechanism Adjustment

5-1 Spindle Belt Adjustment

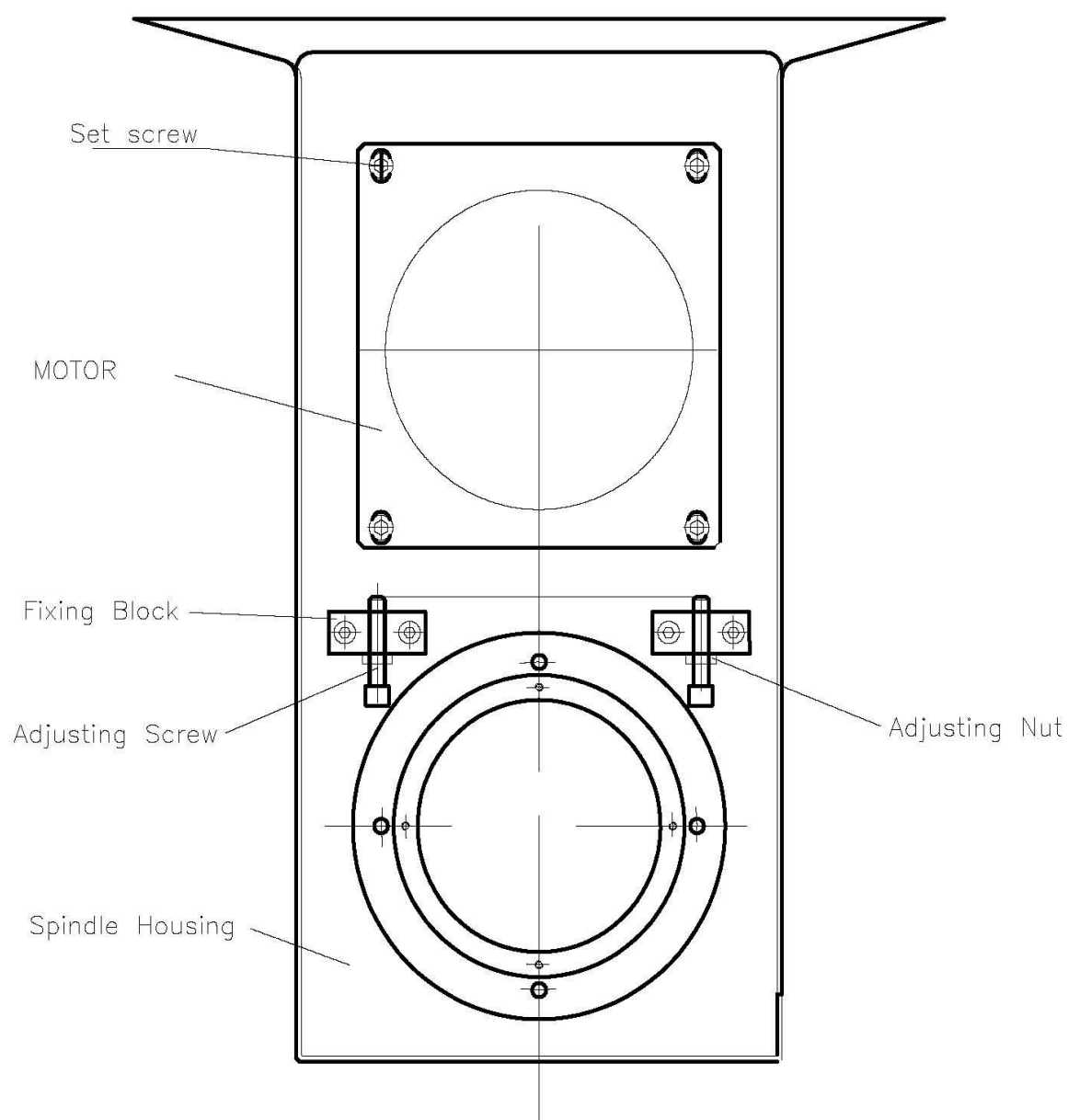
After a Long period of operation, the spindle belt sometimes gets loose, therefore, periodical inspection and adjustment is required.

adjustment Procedure:

- (1) Loosen the four fastening screws on the gear box base and two lock nuts on the adequate tension.
- (2) Adjustment the adjusting bolts to adequate tension.
- (3) Fasten the lock nuts.
- (4) Fasten The Four Screws On The Gear Box.



Adjusting The Spindle Belt



5-2. SPINDLE POSITIONING MECHANISM:

Spindle Positioning By encoder marker.

The mechanism can control the stop of spindle rotation and matching of change tool Position. During positioning, when spindle rotates at high speed and then stops, it will Rescue the rotating speed to the slow speed. When the control senses the marker of Spindle encoder, the spindle controller complete the positioning of spindle.

5-3 ATC MAGAZINE:

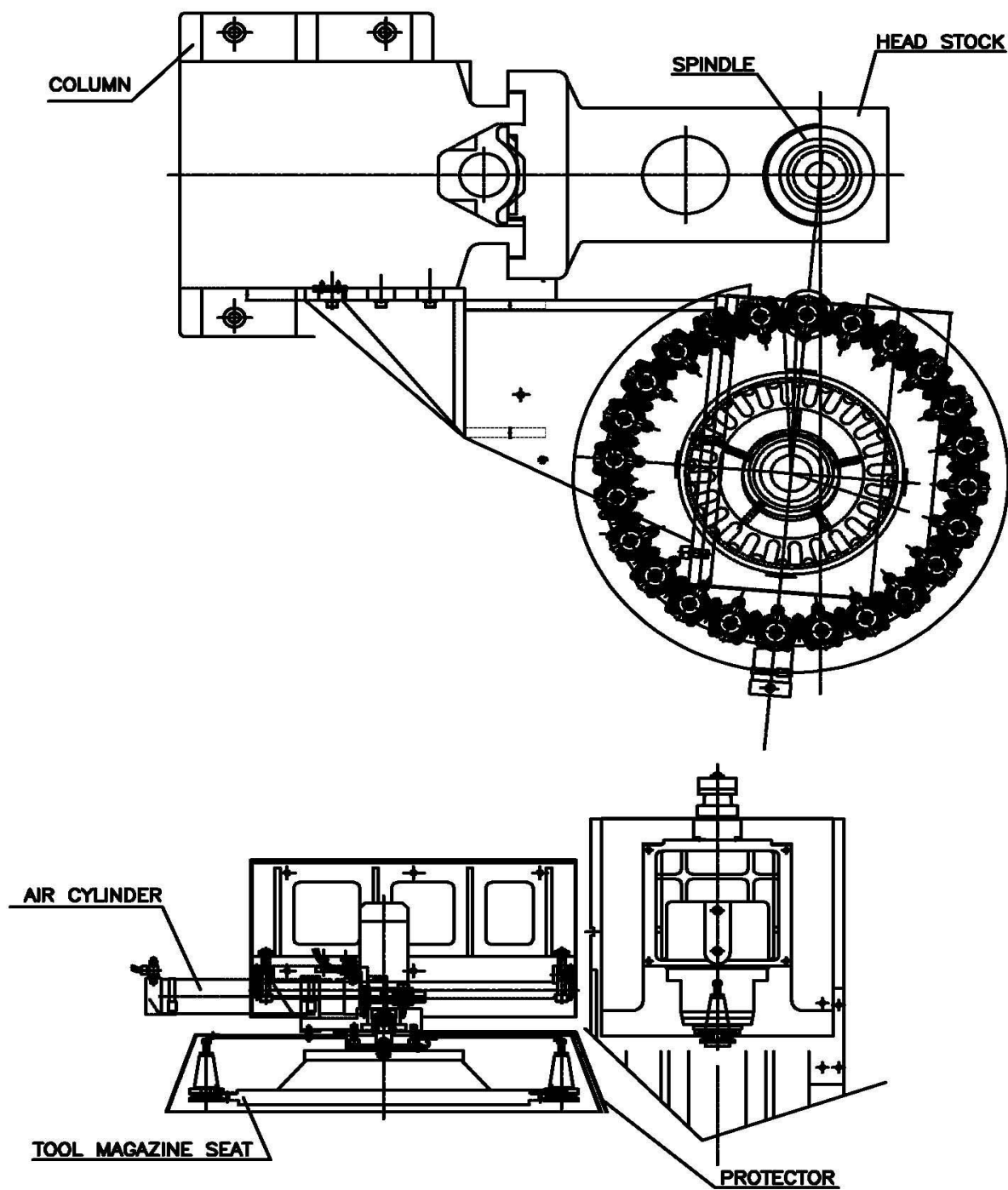
ATC magazine mechanism applies Drum type armless design. The tool magazine can Store 24 pcs of tools. Because it is a simple structure with perfect design, It's easy for operation while running and the maintenance is simple.

The process of tool magazine rotation is as follows:

When controller receives command of change tool, horizontal cylinder will move forwards to the position of empty tool sleeve to receive the tool on the spindle and then the striking cylinder can strike the tool unclamping device to unclamp tool. Furthermore, the Head stock (z axis).goes upward and remove tool from spindle and the speed reducer rotates to activate tool magazine to the desired position of tool. The Head stock (z axis) goes upwards to carry tool to the tool clamping position. The horizontal cylinder returns to the original position. The tool change action is completed.

For more information see operation manual of ATC.

ATC MAGZINE



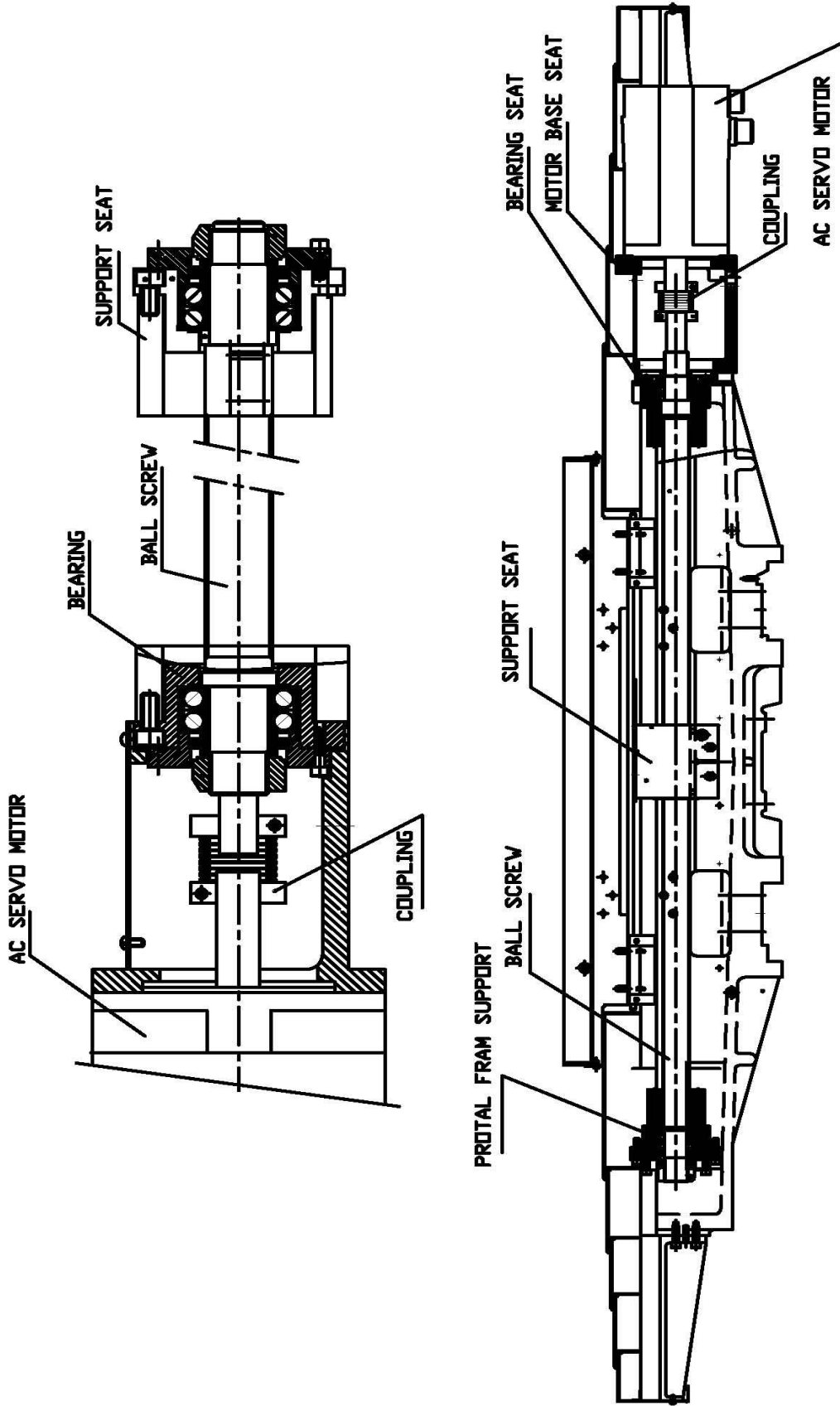
5-4 FEEDING TRANSMISSION MECHANISM:

5-4-1 X,Y,Z Axis Directly Counter Drive:

Way of X, Y, Z axis transmission: AC servo motor directly drive ball screws through coupler to activate work table , saddle and head stock to make them do front/back & left/right and up/down reciprocation motion on saddle's slide way and base's slide way...

Because AC servo motor and ball screws adopts direct connection transmission, machinery features little maintenance and low noise.

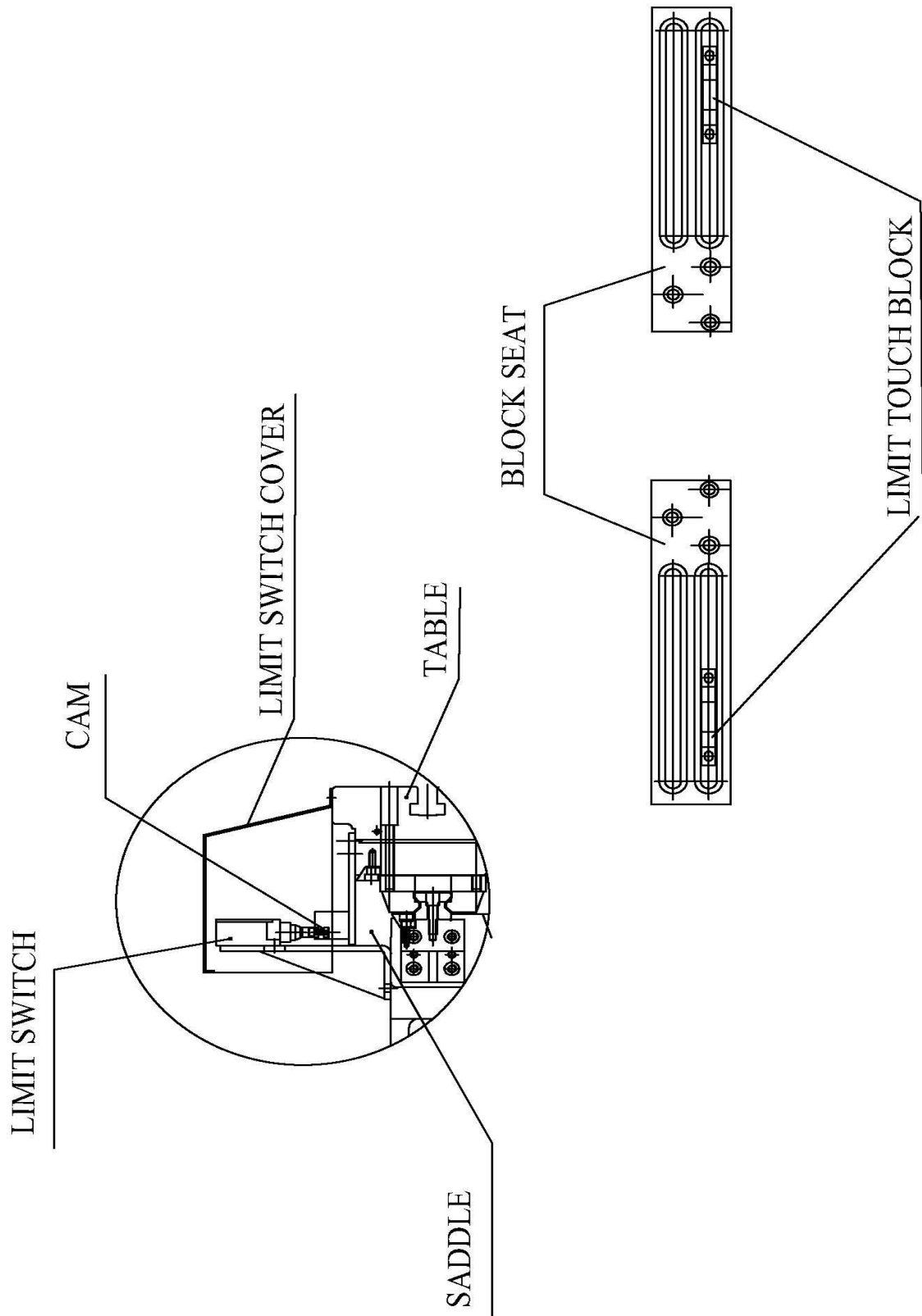
Directly Connter Drive



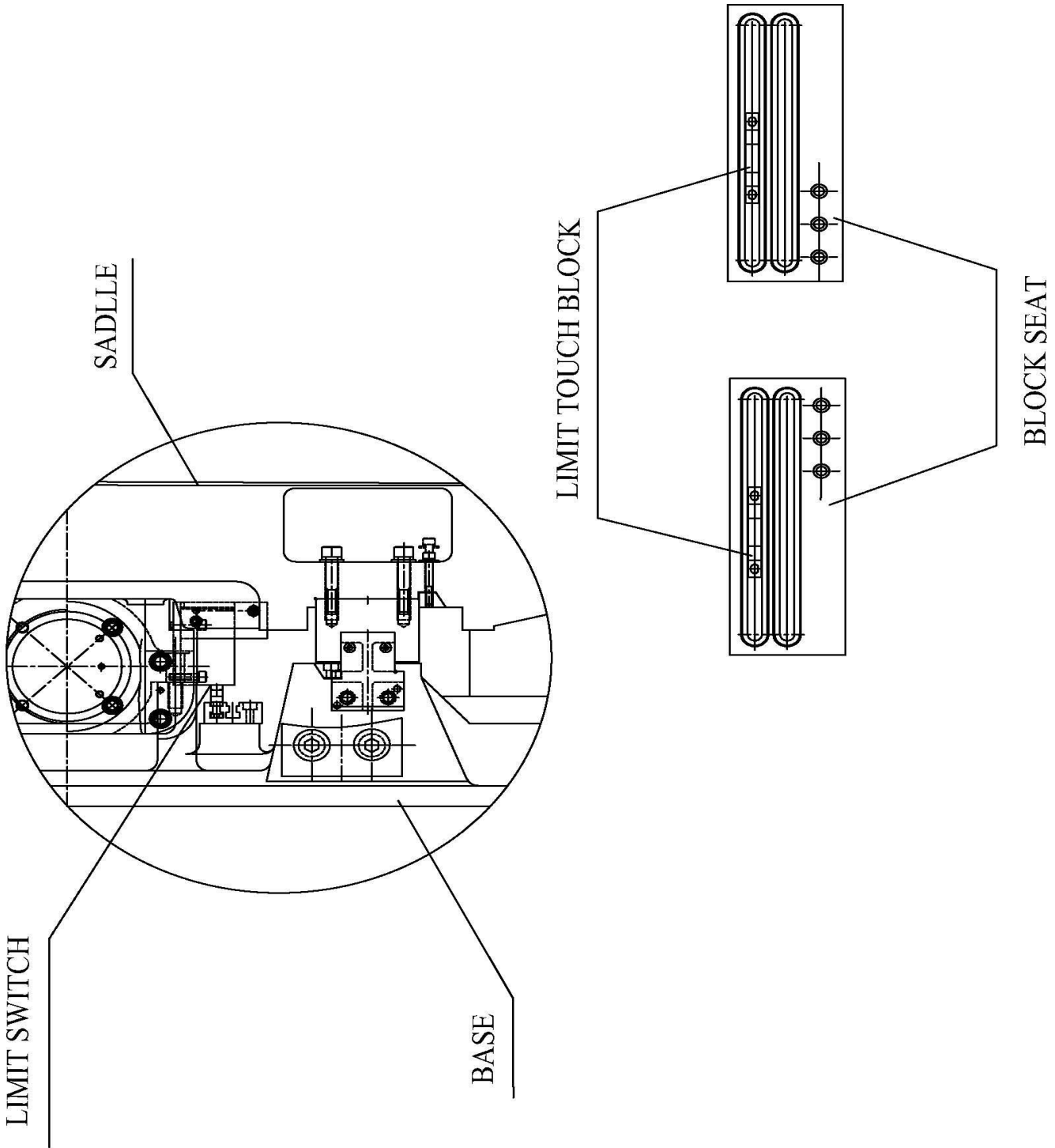
5-4-2 X,Y,Z Axis Positioning Mechanism: (See p4-24,p4-25,p4-26)

The machine is equipped with over travel detecting mechanism which can prevent over travel by the limit switch and the positioning block. Based on the central line of work area and work table surface, the limit switch is fixed on saddle, the fixing seat is fixed on the table and the two ends of the fixing seat are installed with the positioning blocks. When the table reaches the max., travel, the positioning block will touch the limit switch and then the limit switch will signals controller to stop machine running to secure safety of machine.

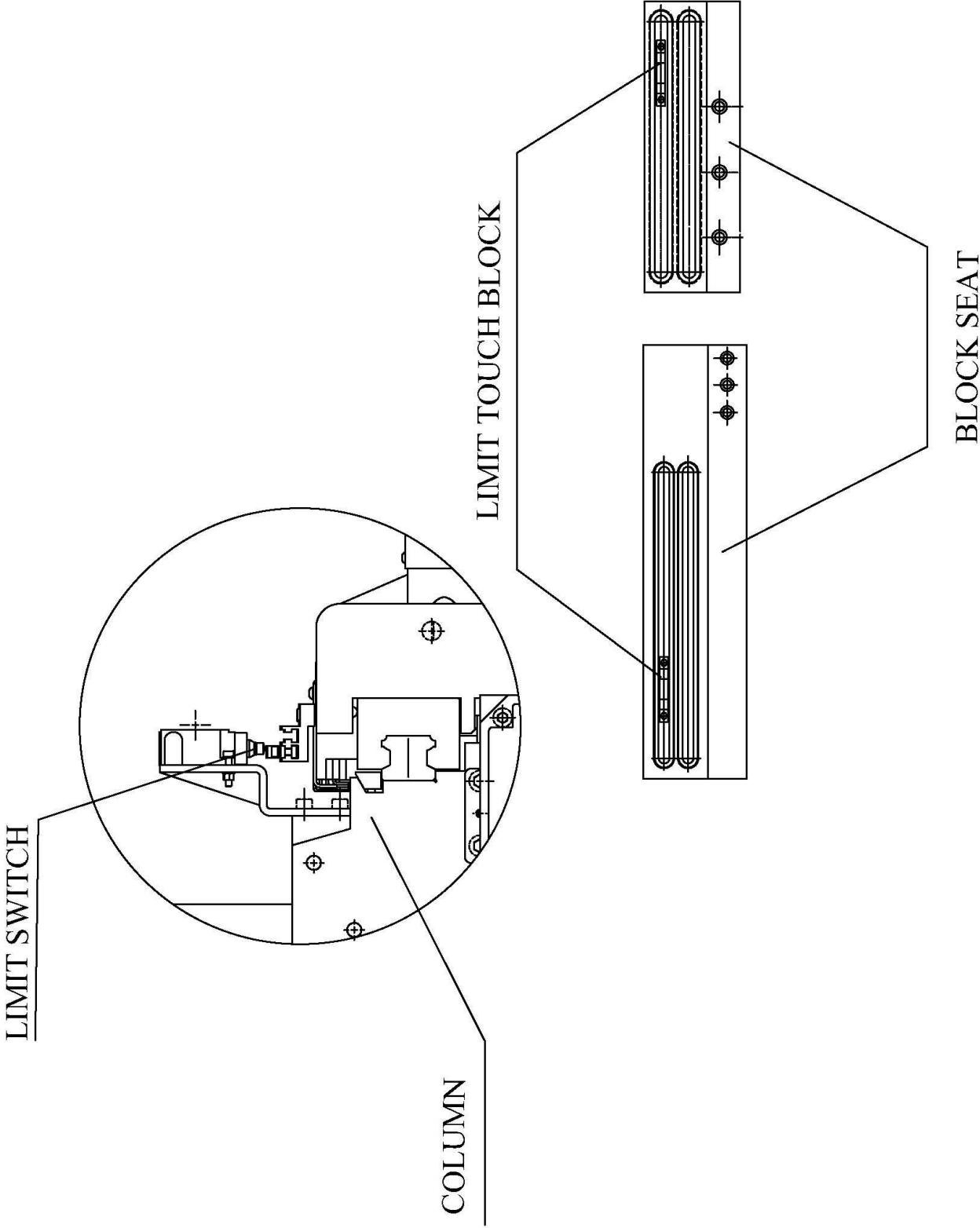
X- AXIS LIMIT SWITCH



Y- AXIS LIMIT SWITCH



Z- AXIS LIMIT SWITCH

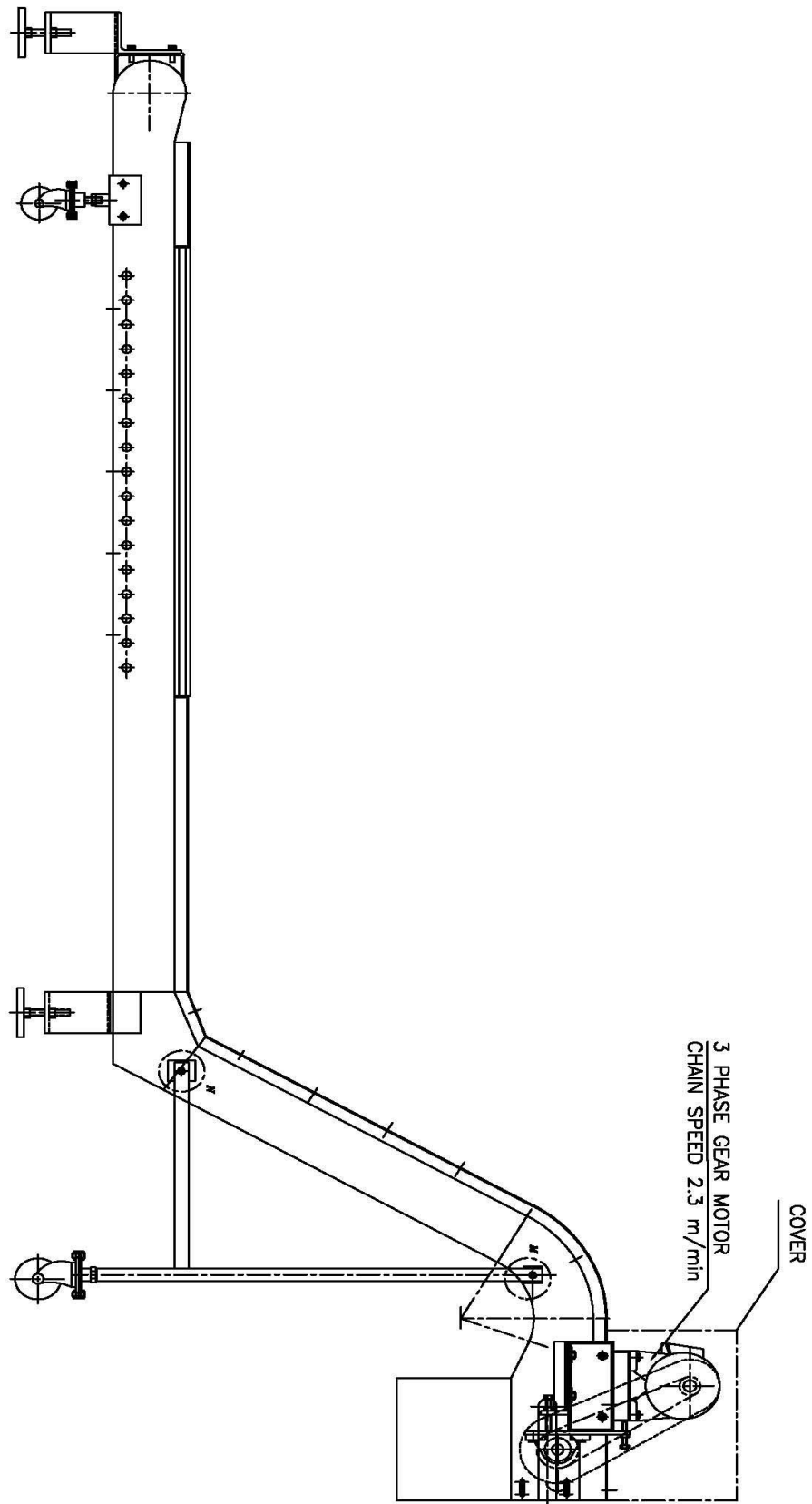


5-5 CHIP CONVEYOR:

Chip convey is driven by gear reduction motor to activate chip spring to continuously clear chips and deliver them into the chip collecting tank.

To prevent too many chips from sticking the chip spring, please open chip convey when chips are cut, otherwise when -too many chips stick the chip convey it will result in the motor burning up or breaking chip spring.

CHIP CONVEYOR

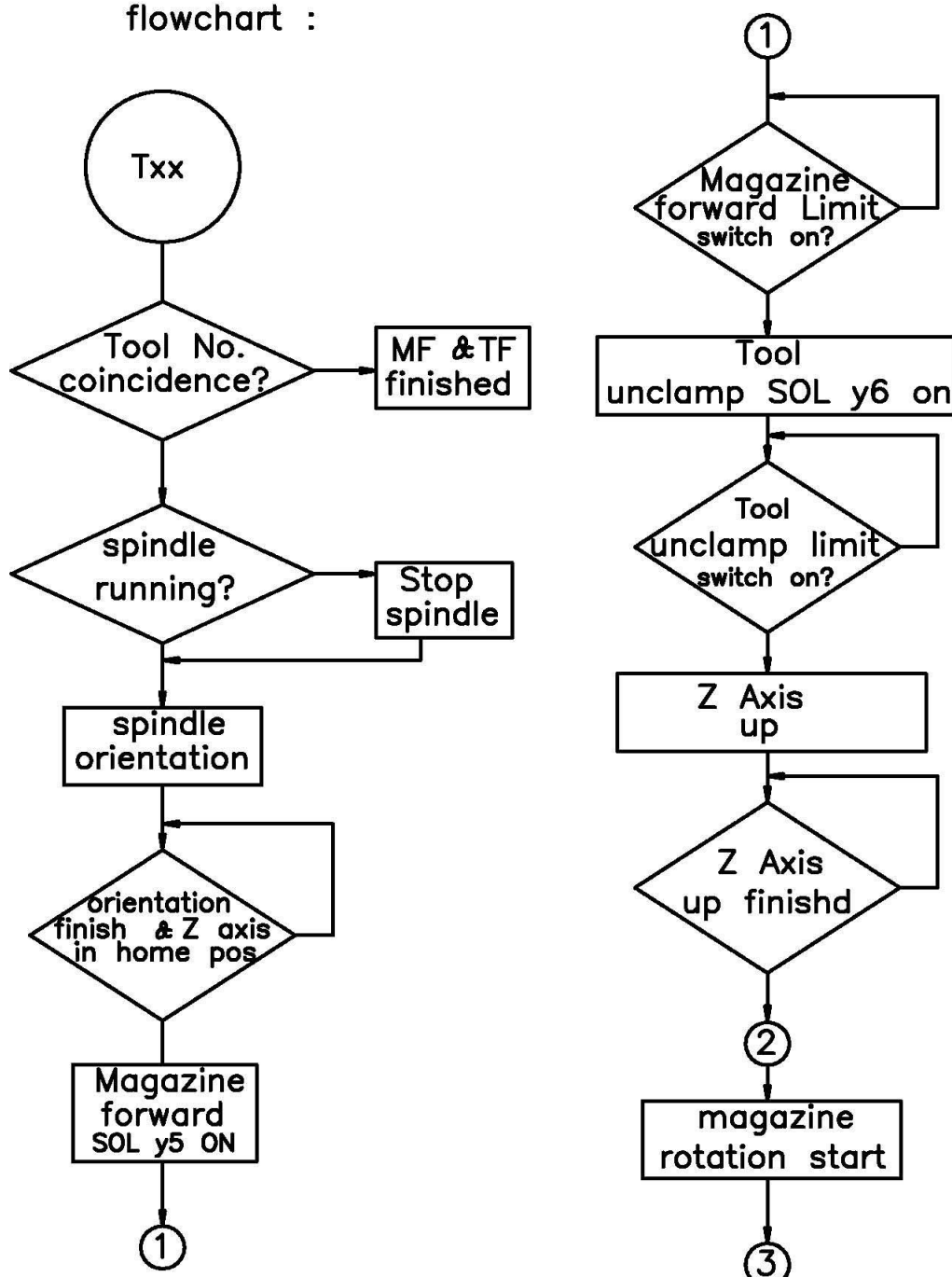


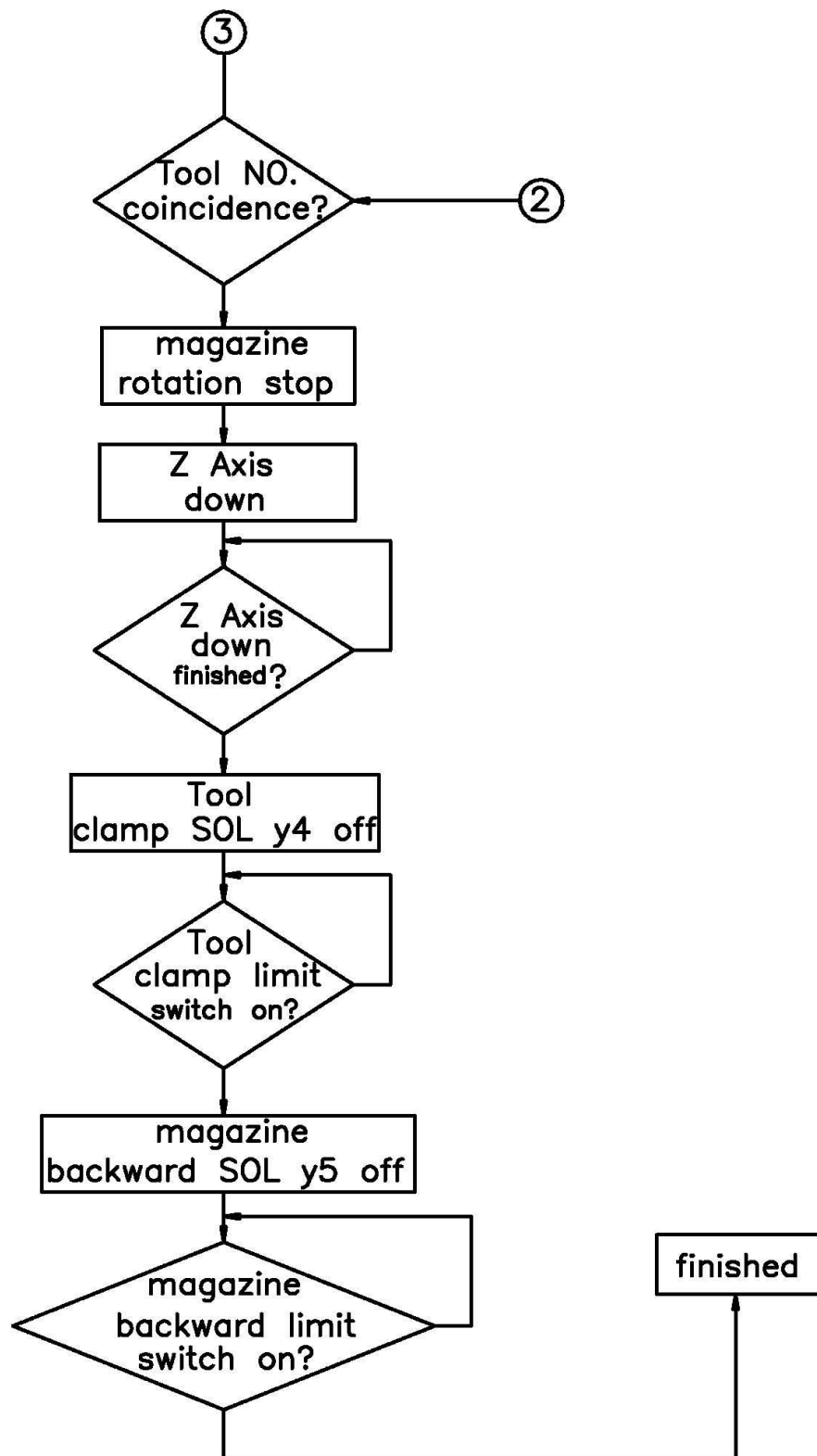
5-6 MAINTENANCE AND TROUBLE SHOOTING

1. ATC UNIT

(1) Tool change sequence

Tool change sequence is according to following flowchart :





(2) If ATC stop at any position , please check:

- a. The inlet air pressure, It must be at 6 ± 0.5 kg.cm
- b. The corresponding function detection limit switch is working ok?
- c. The solenoid valve of next motion is working?
- d. Is the related relay working and its contact in good condition?
- e. Is the cylinder working ok?
- f. Any miss adjustment on ATC mechanism ?
- g. Any air leakage on the air system ?

2. If the spindle is not running.

- a. Is the inlet power supply voltage of the spindle drive
Within $380 \text{ VAC} \pm 10\%$?
- b. Is there any alarm messages display on the spindle drive unit? If any ', please refer the maintenance book.
- c. Is the wiring in good condition?
- d. Is the high-low clutch is working ok?
- e. Is the power GT belts working ok?
- f. Is the spindle tool clamp limit switch working ok?
- g. If machine equipped with mechanical orientation mechanism, is the orientation off limit switch working ok?
- h. If the spindle motor working ok?

3. If the coolant is not working.

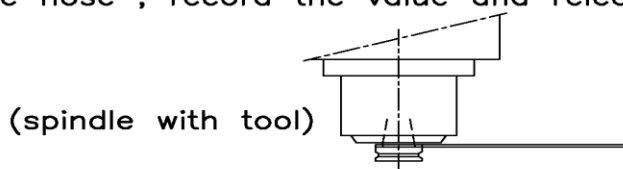
- a. Is the coolant level of coolant tank too low?
- b. Is the coolant system too dirt?
- c. Is the relay & magnetic contactor working ok and its contact in good condition?
- d. Is the coolant motor working ok?
- e. Is the coolant pump working ok and any obstacles to stop the coolant to come out?
- f. Is the wiring in good condition?

4. Align Z axis home position with ATC.

Warning : If customer has removed the Z axis servo motor,
And mounted it back, the home position of Z axis home position will changed. The
following procedures must be performed to align the Z axis home position to ATC unit, or
the ATC will crash to the spindle head and damage to the machine

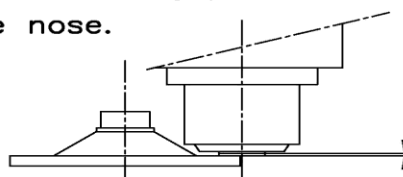
(1) Turn on the power of the machine. If the over travel alarm occurred, set the
parameter No.745 to 9999999 to release the alarm, repertory the return to home operation.

- (2) Set mode switch to JOG mode. Load a standard tool into the spindle.
Use a thickness gauge to measure the gap between tool flange and
the spindle nose , record the value and release the tool.



- (3) Disconnect the air supply to the machine.
(4) Move the magazine to the spindle by hand slowly , be sure there is
no tool on the pocket of magazine and spindle. Check if there is any
obvious interference between tool pocket and spindle. If it is existed
set mode select switch to HANDLE Z , use the manual pulse generator
to move the Z axis untill the interference is vanished. Move the
magazine back.
(5) Connect the air supply to machine.
(6) Operate solenoid valve SOL y5 to move the magazine to the spindle.
(7) Use the thickness gauge to measure the gap between the top surface
of the magazine and the spindle nose.

(measure diagram)



- (8) Use the data step (7) to subustact the data of step (2).Add the result
the value of parameter No.30600(0) , and set the result to the parameter
No.30600(0).

example: data of step(7) 1.200mm
data of step(2) .625mm

.575mm

- (8-1) add the same result to the
second fixpoint parameter

data of parameter 30600(0) -2500
result oflast operation +575

-1925

example:

data of parameter 30600(1) -2200
result oflast operation +575

-1625

*the value of parameter no.30600(0)
must be set to -1925.

- (9) Reperform the axis return haome opration.
(10) Set to MDI mode , perform automatic tool change to check the Z axis
home poision , make correct if it is nessery.

5-7 MAINTENANCE OF ELECTRIC BOX COOLING UNIT:

After electric box cooling unit has been used for a long of time, it can produce vibration, noise or oil accumulated and dirt. so, periodic maintenance must be done to reach working efficiency. Although the heat exchanger only has fan as power which has reduced the maintenance work to the minimum, please still keep periodic maintenance

Please accord to the following list for maintenance:

* Range of work:

(1) Min./Max. temperature: -29/68°C

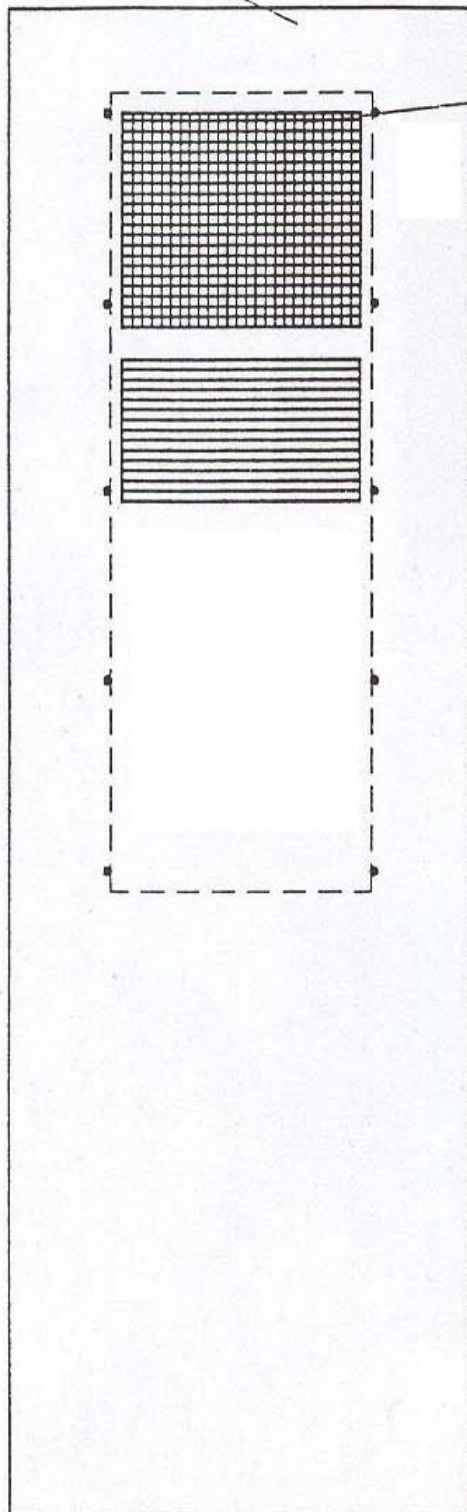
(2) Place of installation:

- Install at cool or waterproofed suitable place.
- Avoid corrosive atmosphere.

TIME	PART	CHECKING POINT	GUIDES
Every day (After initial use)	Inner/outer fan	Check if blades' rotation is normal and if there is noise Or vibration, occurring.	If abnormal is found, find out the cause. If fan is out of order, replace it.
Weekly or monthly	Filter	Oil accumulated, Dirt	(1) For slight dirt, lightly tap filter or clear them by dust extractor. (2) For heavy dirt, wash with neutral cleaner or water and then remove water on filter. After it's dry, return it to the Original place.
Every 6 months or one year. (Please switch off machine)	Outer fan		(1) Remove filter and fan. Clear them with compressed air until they are clean.

* Periodically and-thoroughly-clear filter and fan every time

Electric Box Left Door



Filter

Air IN



Air OUT



Heat Exchanger



→ OUT

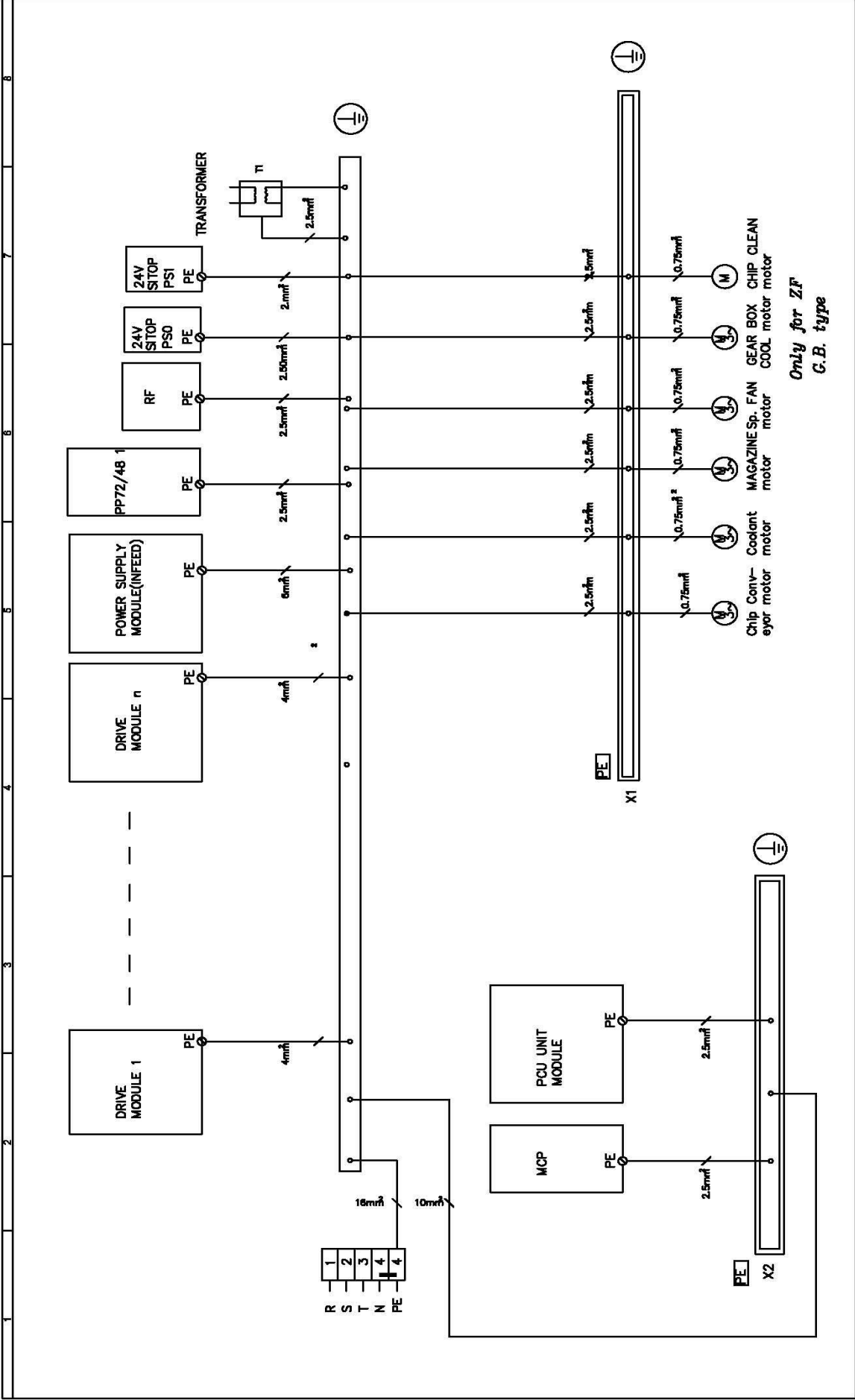
← IN

Internal Air
Convection

Fan

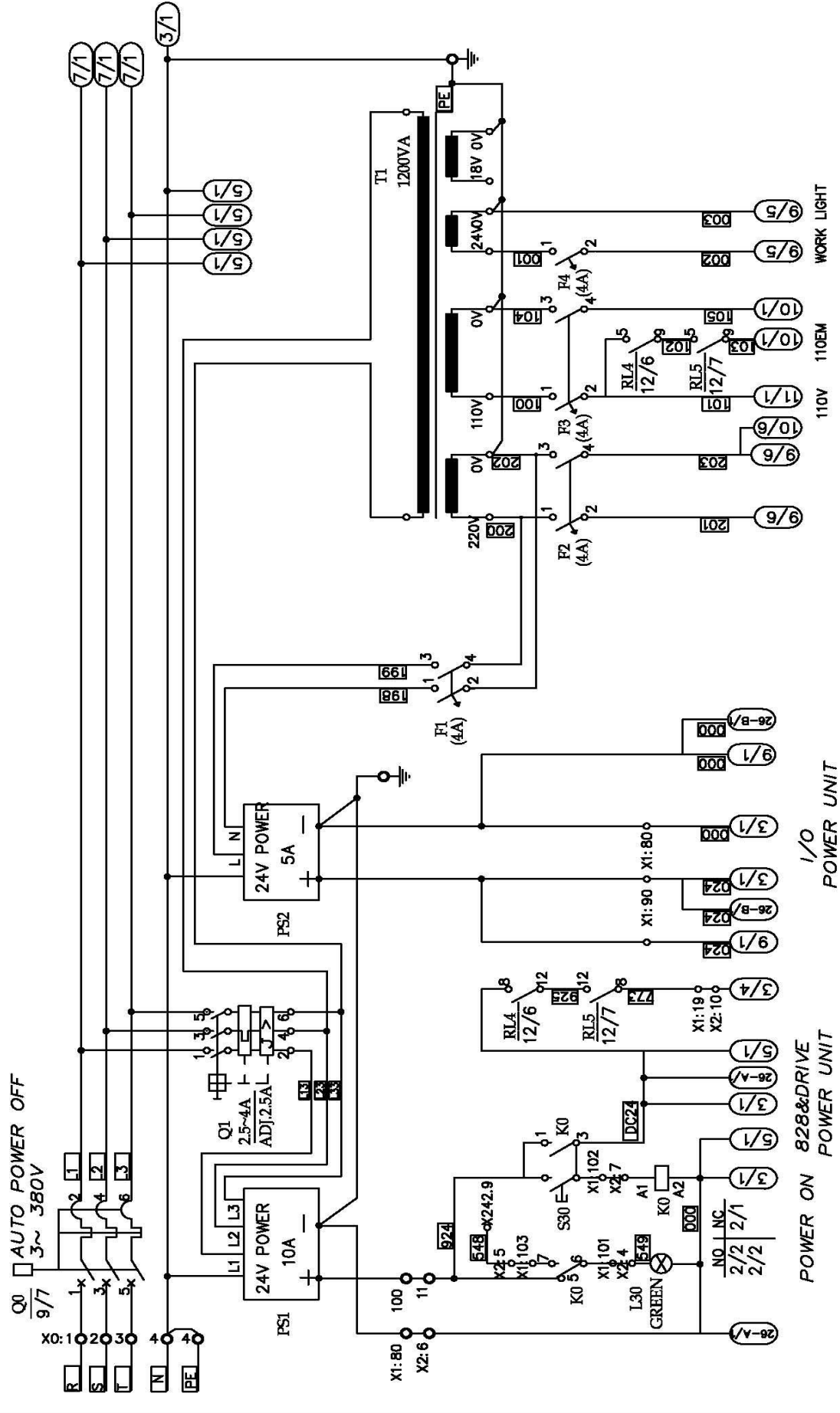
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V. ELECTRICAL DIAGRAM

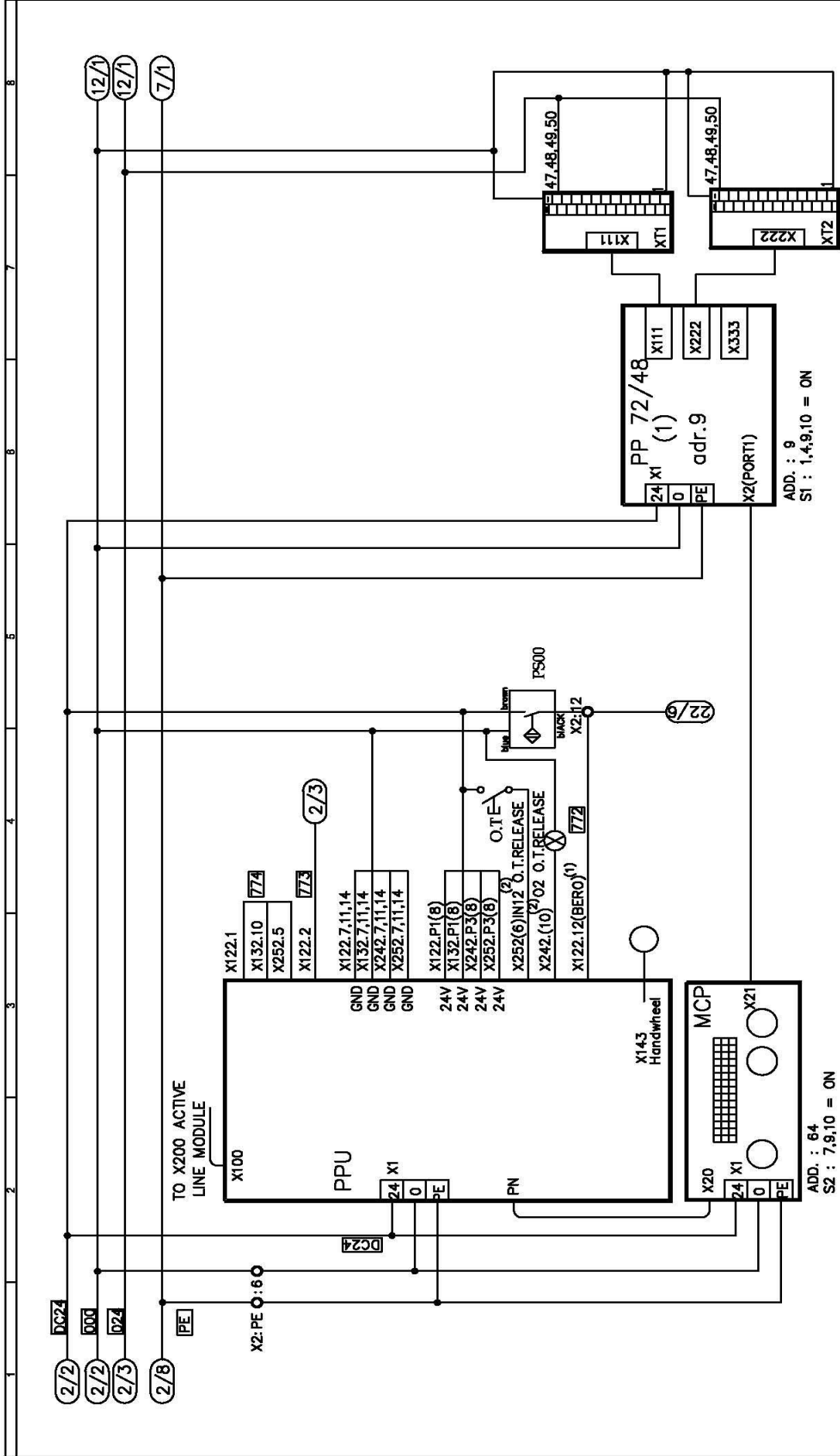


Only for ZF
G.B. type

ALTERATION	DATE	SIGNATURE	INDEX	DRAWN	CHECKED	STANDARD	VERIFIED	APPROVED	SIGNATURE	DATE	SIGNATURE	TITLE:	PROTECTION EARTH	203-56-006	TYPE: VMC 125/SIEMENS828D	Pg. 1	Sh.No. 38
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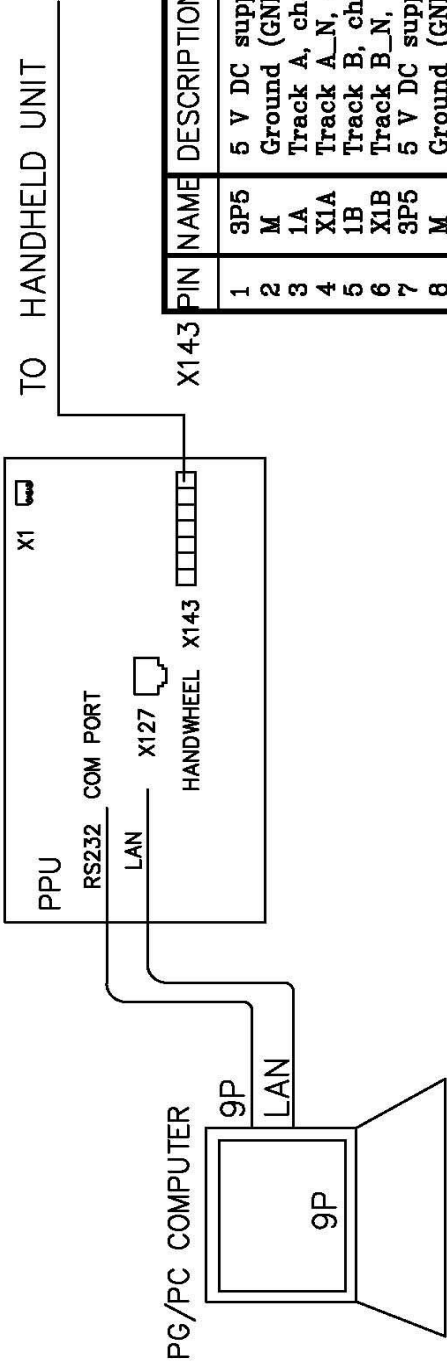


ALTERATION		DATE		SIGNATURE		INDEX		DRAWN		CHECKED		STANDARD		VERIFIED		APPROVED		DATE		SIGNATURE				TITLE: POWER SUPPLY		203-56-006					
																										</					



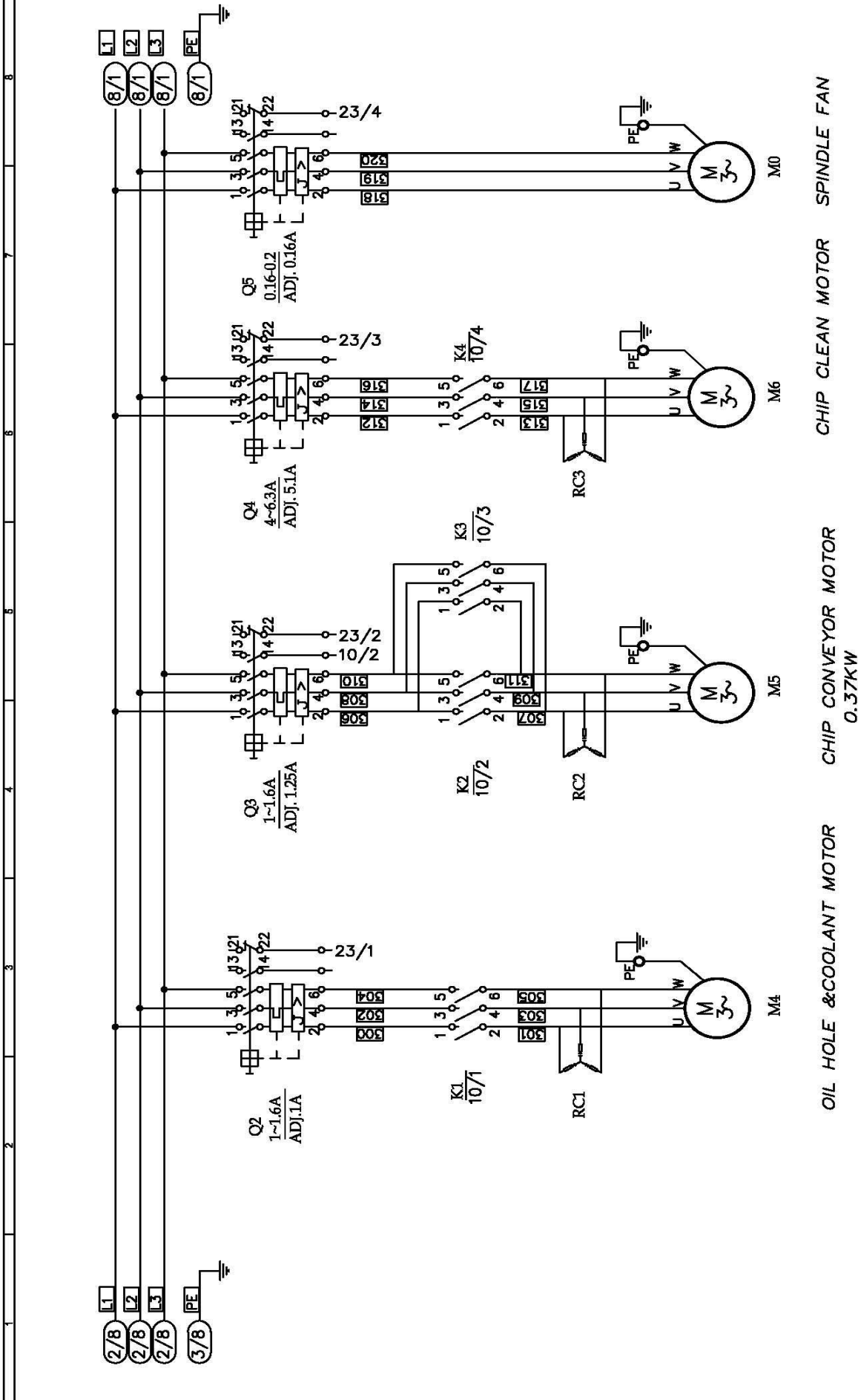
(1): For 1050,1250
(2): For MCP USB

ALTERNATION	DATE	SIGNATURE
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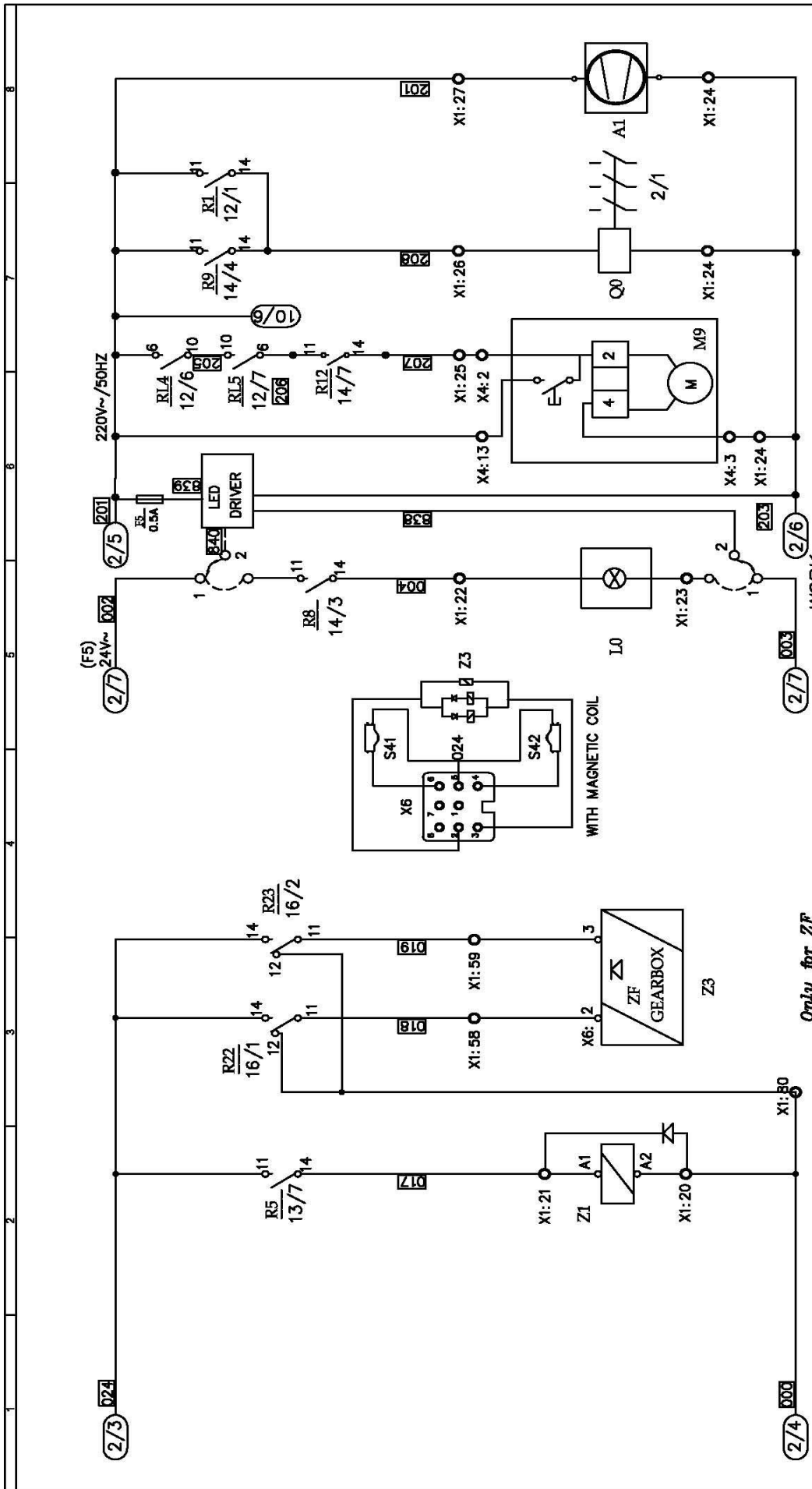


PIN	NAME	DESCRIPTION
1	3P5	5 V DC supply voltage
2	M	Ground (GND)
3	1A	Track A, channel 1
4	X1A	Track A_N, channel 1
5	1B	Track B, channel 1
6	X1B	Track B_N, channel 1
7	3P5	5 V DC supply voltage
8	M	Ground (GND)
9	2A	Track A, channel 2
10	X2A	Track A_N, channel 2
11	2B	Track B, channel 2
12	X2B	Track B_N, channel 2

ALTERATION	SIGNATURE	DATE	SIGNATURE	DATE	DRAWN	CHECKED	STANDARD	VERIFIED	APPROVED	INDEX	TITLE: RS 232		203-56-006		Pg. 4
											REPEATED TYPE:191,192,266		TYPE: VMC 125/SIEMENS828D		Sh.No. 38



ALTERATION	DATE	SIGNATURE	INDEX	DRAWN	CHECKED	STANDARD	VERIFIED	APPROVED	TITLE:		AC MOTORS		203-56-006		REPEATED TYPE: 191, 192, 266		TYPE: VMC 125/SIEMENS828D		Pg. 7	Sl.No. 38



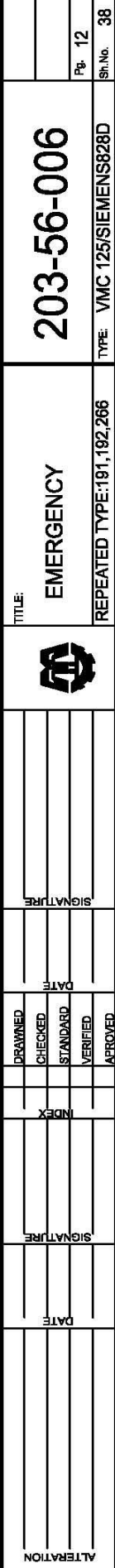
Only for ZF
G.B. type

DOOR INTERLOCK GEAR 1 GEAR 2

1 WITH LED LAMP 24V LAMP
2 WITH 24V LAMPED DRIVER

LUBRICATION AUTO POWER OR CABINET FAN
(HEAT EXCHANGE)

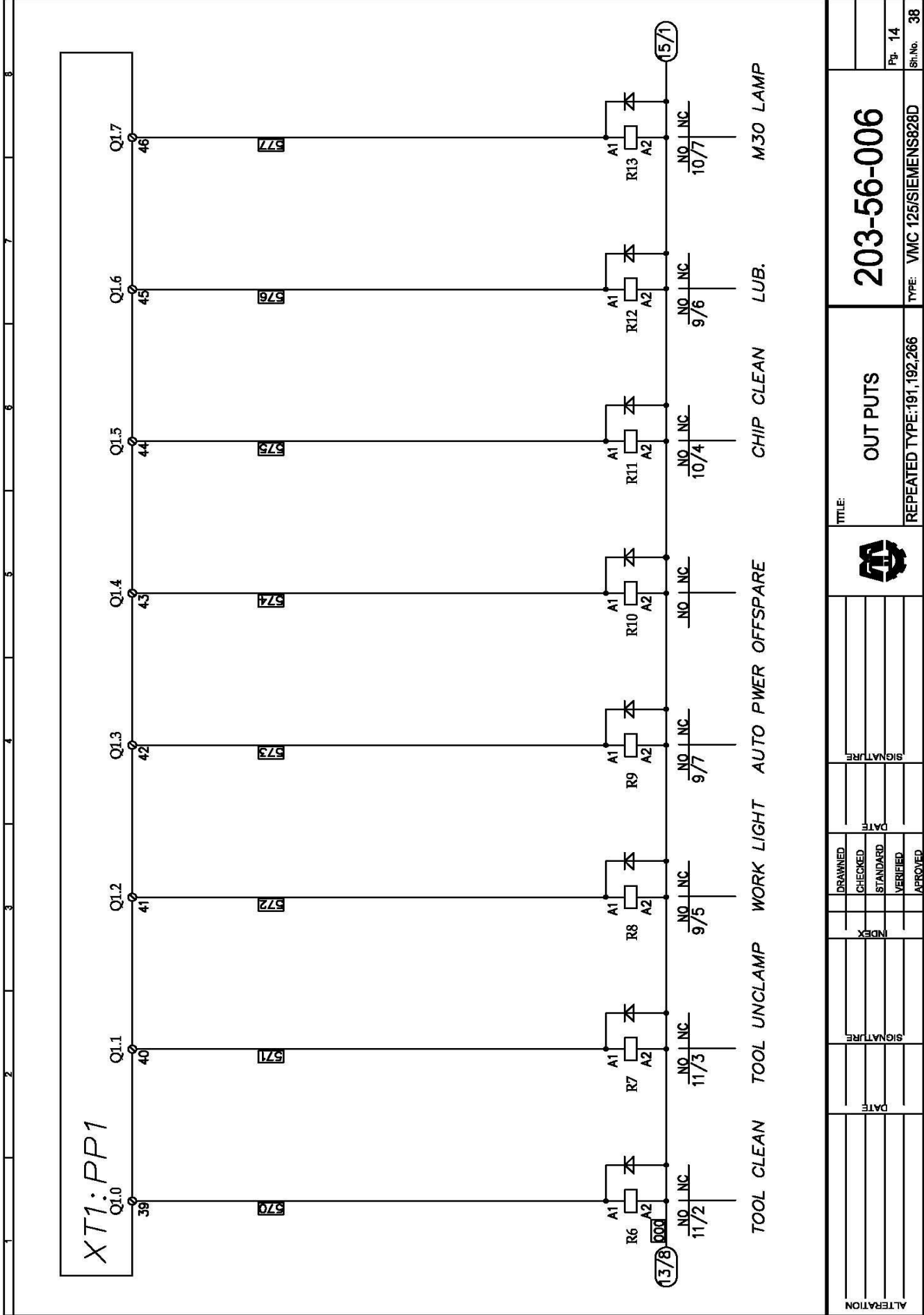
ALTERATION	DATE	SIGNATURE	INDEX	DRAWN	CHECKED	STANDARD	VERIFIED	APPROVED	DATE	SIGNATURE	TITLE:	Z BRKE & MOTORS	203-56-006	TYPE: VMC 125/SIEMENS828D	Pg. 9	Sp. No. 38
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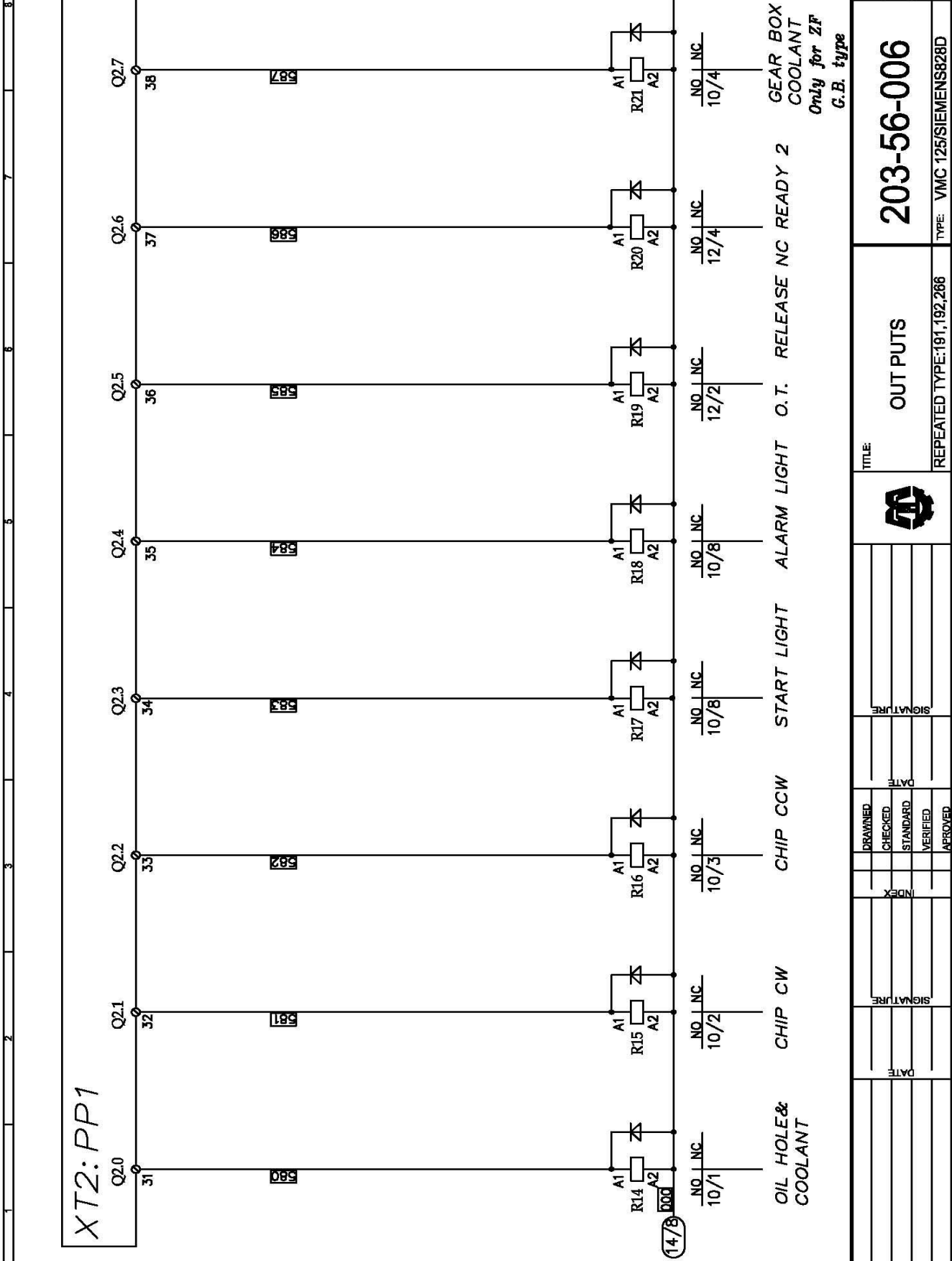


Only for mag. type A

[illegible]



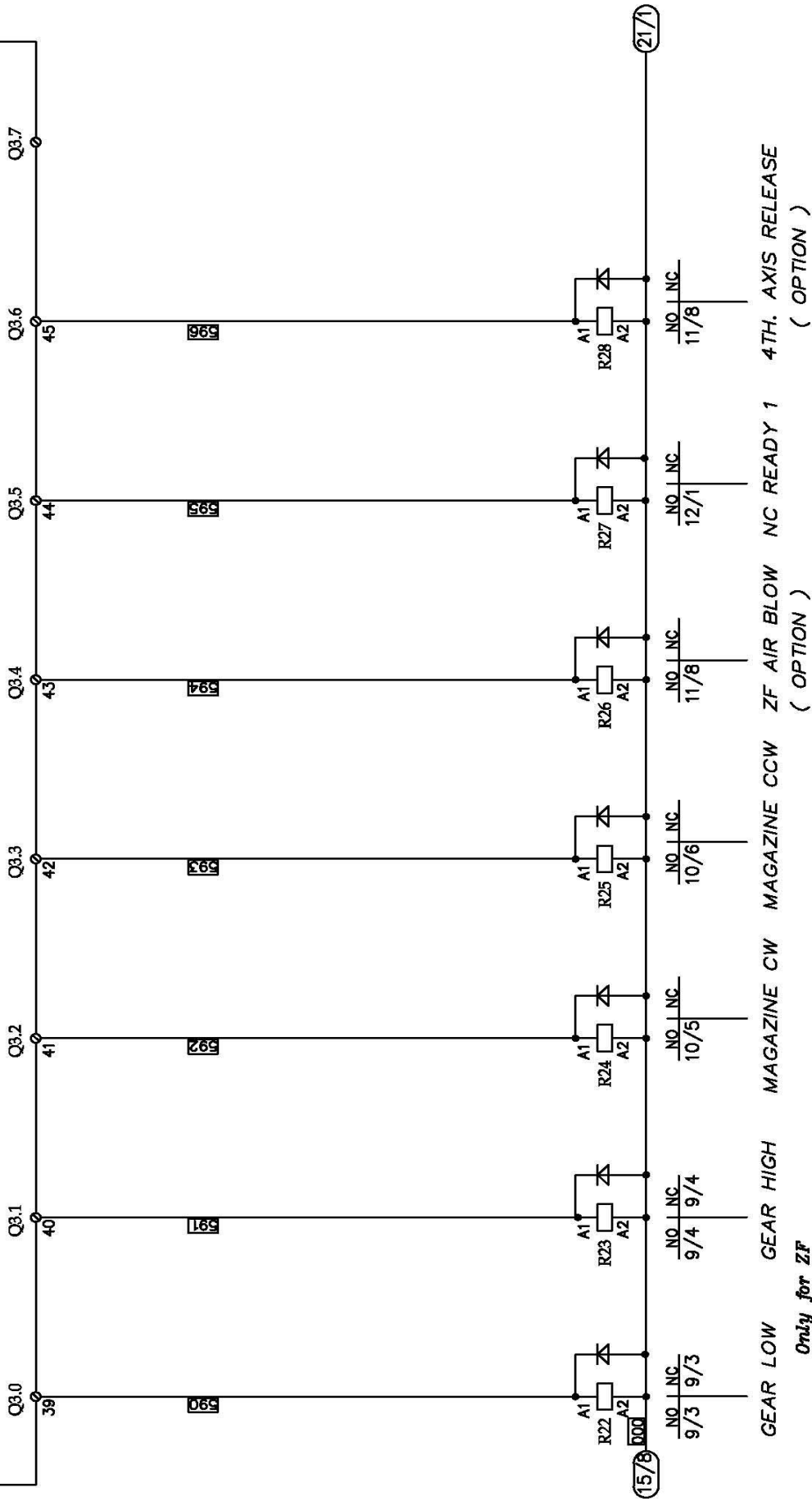
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1	2	3	4	5	6	7	8
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ALTERATION	DATE	SIGNATURE	INDEX	DRAWN	CHECKED	STANDARD	VERIFIED	APPROVED	DATE	SIGNATURE	TITLE	203-56-006	OUT PUTS	REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Pg. 15	Sh.No. 38
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XT2:PP1



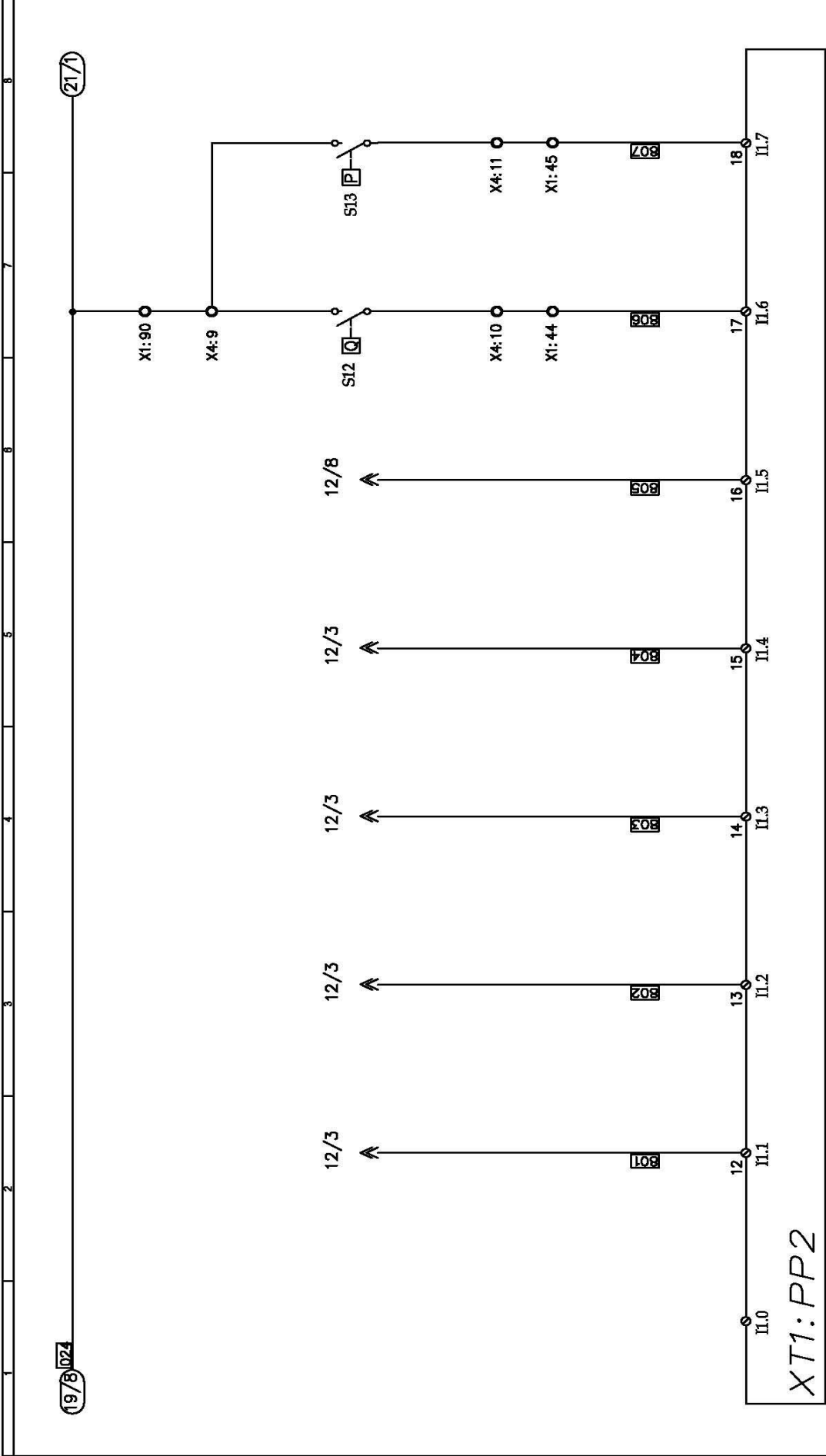
GEAR LOW GEAR HIGH MAGAZINE CW MAGAZINE CCW ZF AIR BLOW NC READY 1 4TH. AXIS RELEASE
(OPTION) (OPTION)

Only for ZF
G.B. type

ALTERATION	DATE	SIGNATURE	INDEX	DRAWN	CHECKED	STANDARD	VERIFIED	APPROVED	SIGNATURE	DATE	TITLE	203-56-006	REPEATED TYPE: 191,192,266	TYPE: VMC 125/SIEMENS828D	Pg. 16	Sl.No. 38
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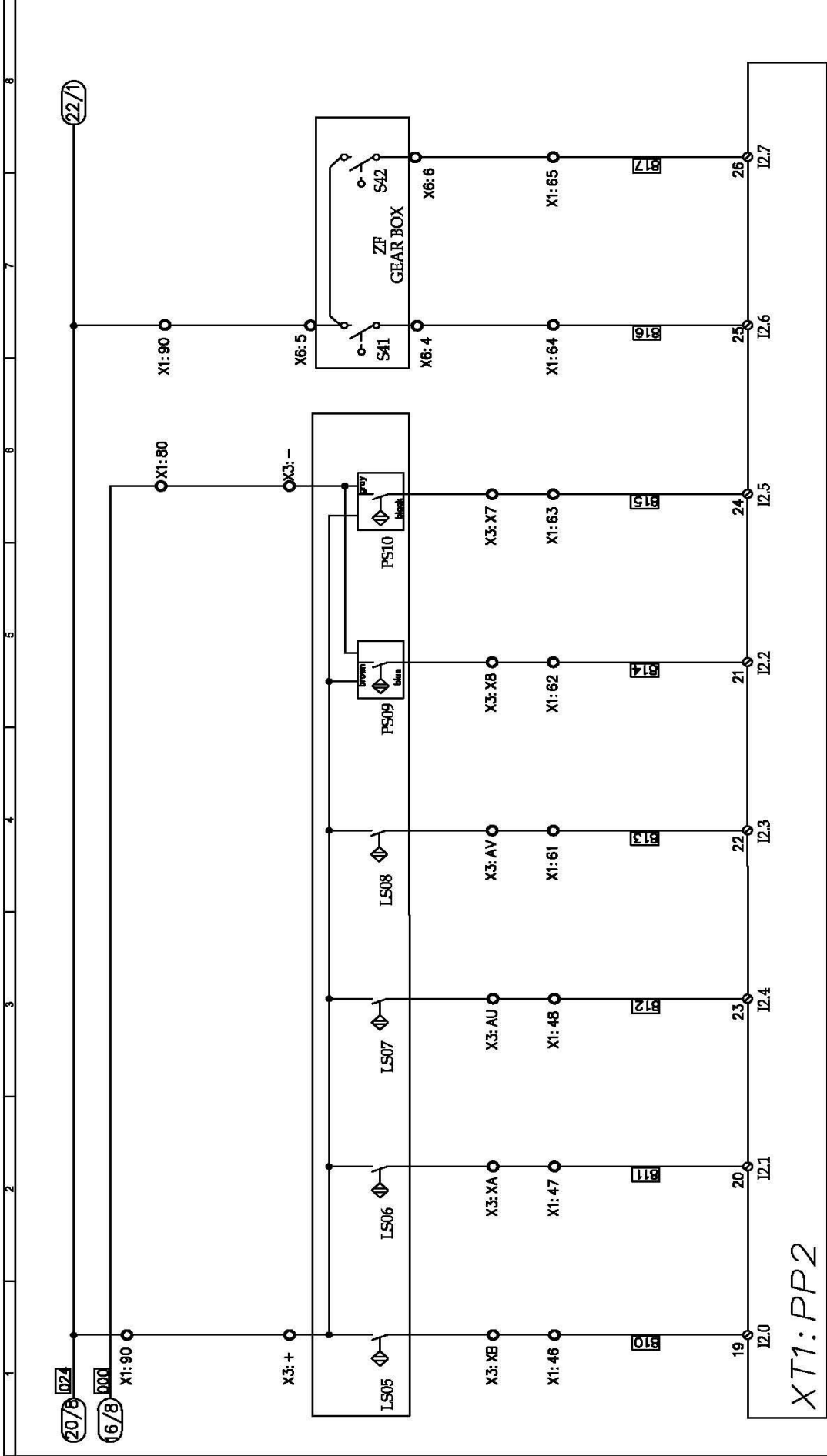
RESERVE

ALTERATION		DATE		SIGNATURE		INDEX		DRAWN		CHECKED		STANDARD		VERIFIED		APPROVED		DATE		SIGNATURE		TITLE		203-56-006		Pg. 17-18		Sh.No. 38			
																										TYPE: VMC 125/SIEMENS828D					
																										REPEATED TYPE:191,192,266					



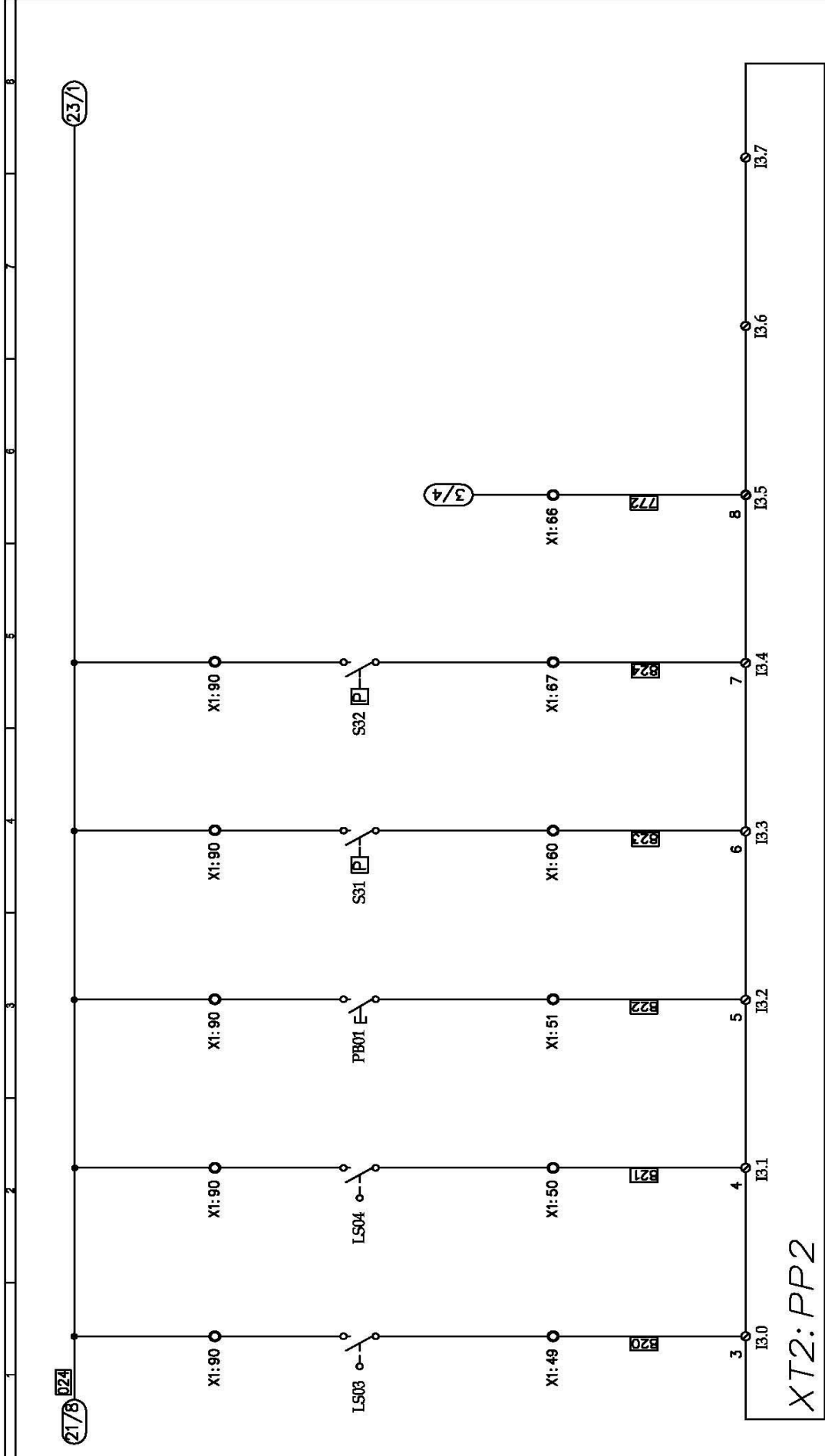
EMERGENCY STOP X LIMIT Y LIMIT Z LIMIT EMERGENCY OK LUB LEVEL AIR LOW

ALTERNATION		DATE		SIGNATURE		INDEX		DRAWN		CHECKED		STANDARD		VERIFIED		APPROVED		DATE		SIGNATURE		TITLE		INPUTS		203-56-006		TYPE: VMC 125/SIEMENS828D		Pb. 20		Sh.No. 38	
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MAG. FORWARD MAG. BACKWARD MISC. DOWN LS MAG. UP LS COUNTER PROXY MAG. REF PROXY GEAR *Only for ZF* GEAR 2 C.B. type

ALTERATION		SIGNATURE		DATE		INDEX		SIGNATURE		DATE		SIGNATURE		DATE		TITL:		INPUTS		203-56-006		Pg. 21		Sh.No. 38	
		DRAWN		CHECKED		STANDARD		VERIFIED		APPROVED								REPEATED TYPE:191,192,266		TYPE: VMC 125/SIEMENS828D					



TOOL CLAMP LSTOOL UNCLAMP LBDOL UNCLAMP LUB.PRESURE LUB.PRESURE SWITCH

GEAR BOX COOLING PROXY

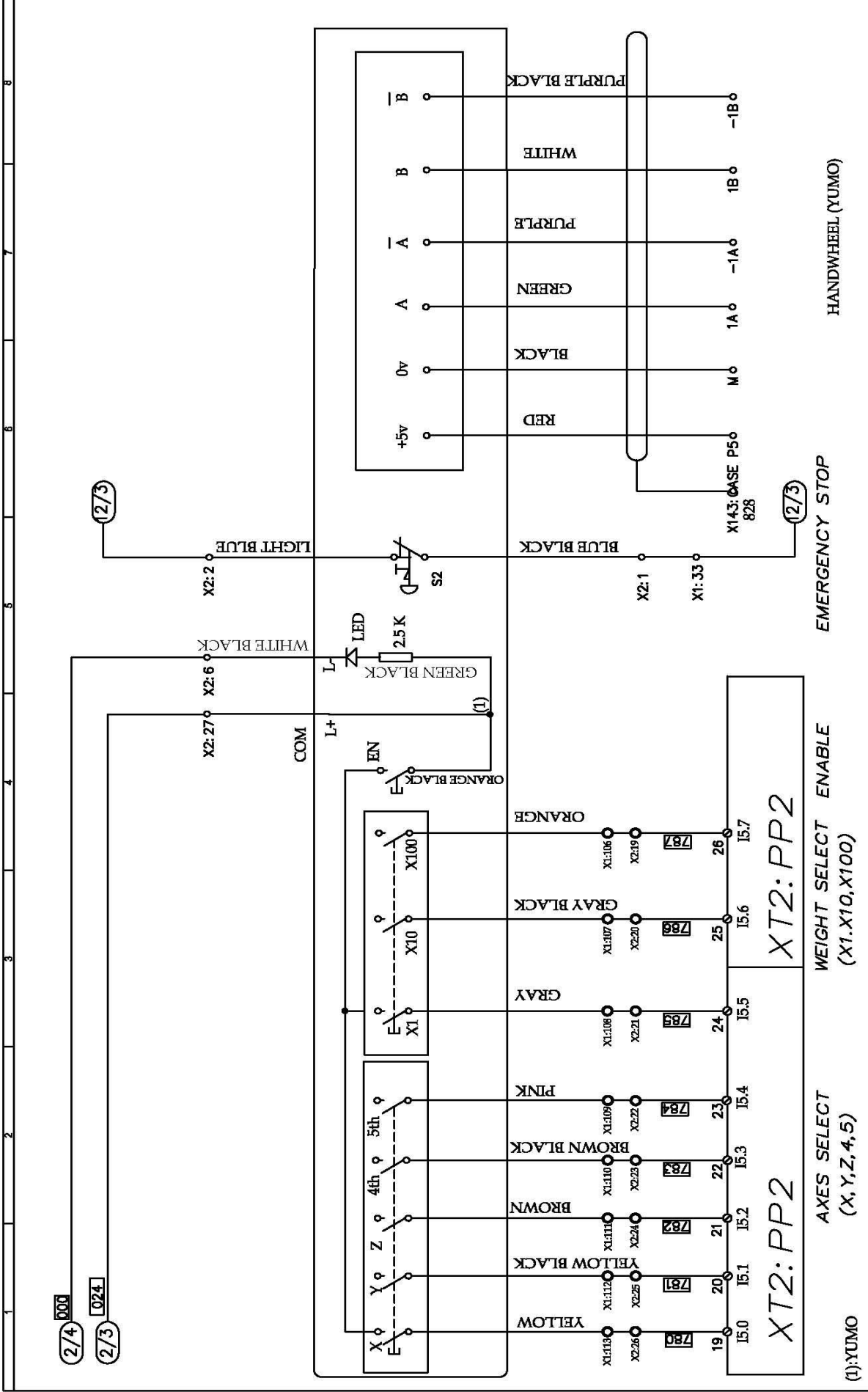
(For 1050,1250)

ALTERATION	DATE	SIGNATURE	INDEX	DRAWN	CHECKED	STANDARD	VERIFIED	APPROVED	DATE	SIGNATURE	TITLE	INPUTS	203-56-006	REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Pg. 22	Sh.No. 38
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ALTERATION		DATE		SIGNATURE		INDEX		DRAWN		DATE		SIGNATURE		TITLE		203-56-006		Pg. 24-25		Sh.No. 38	
								CHECKED						REPEATED TYPE:191,192,266		TYPE: VMC 125/SIEMENS828D					
								STANDARD													
								VERIFIED													
								APPROVED													

RESERVE

1 2 3 4 5 6 7 8



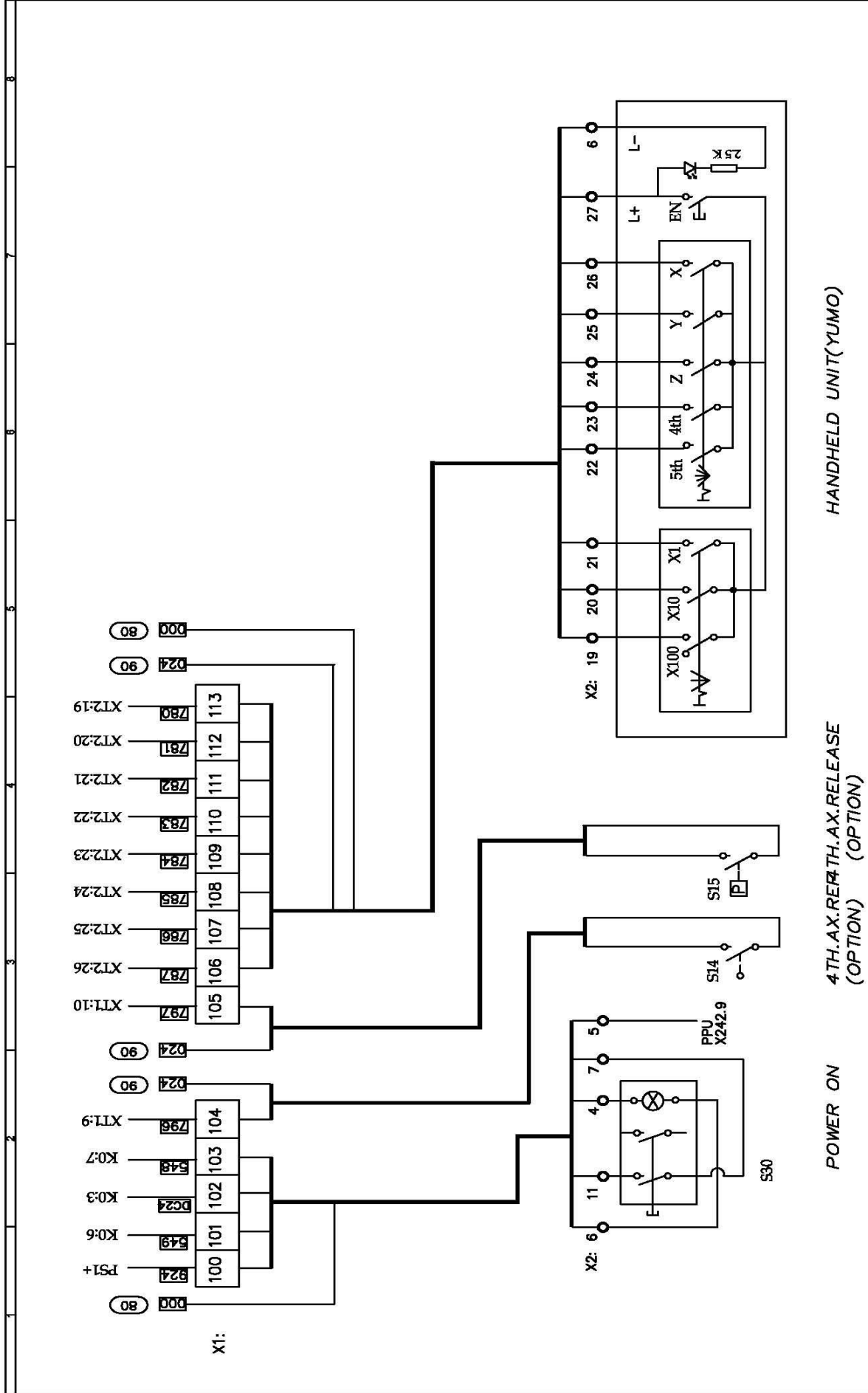
ALTERNATION		DATE		SIGNATURE	
DRAWN		CHECKED		STANDARD	
INDEX		VERIFIED		APPROVED	
TITLE:		HAND HELD UNIT		203-56-006	
REPEATED TYPE: 191, 192, 266		TYPE: VMC-125/SIEMENS828D		Pg. 26 - B	
Sh. No. 38					

RESERVE

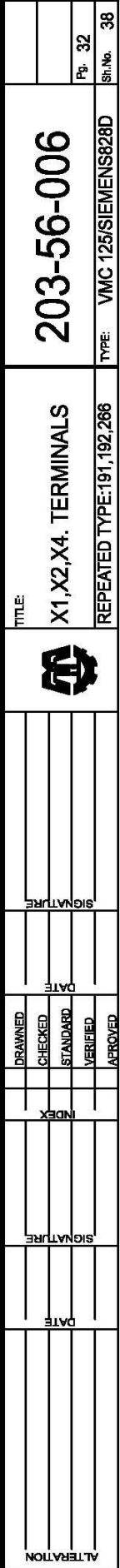
1 2 3 4 5 6 7 8

ALTERATION		SIGNATURE		DATE		INDEX		DRAWN		CHECKED		STANDARD		VERIFIED		APPROVED		SIGNATURE		DATE		TITLE		203-56-006		Pg. 27		Sh. No. 38	
																								REPEATED TYPE:191,192,266		TYPE: VMC 125/SIEMENS828D			

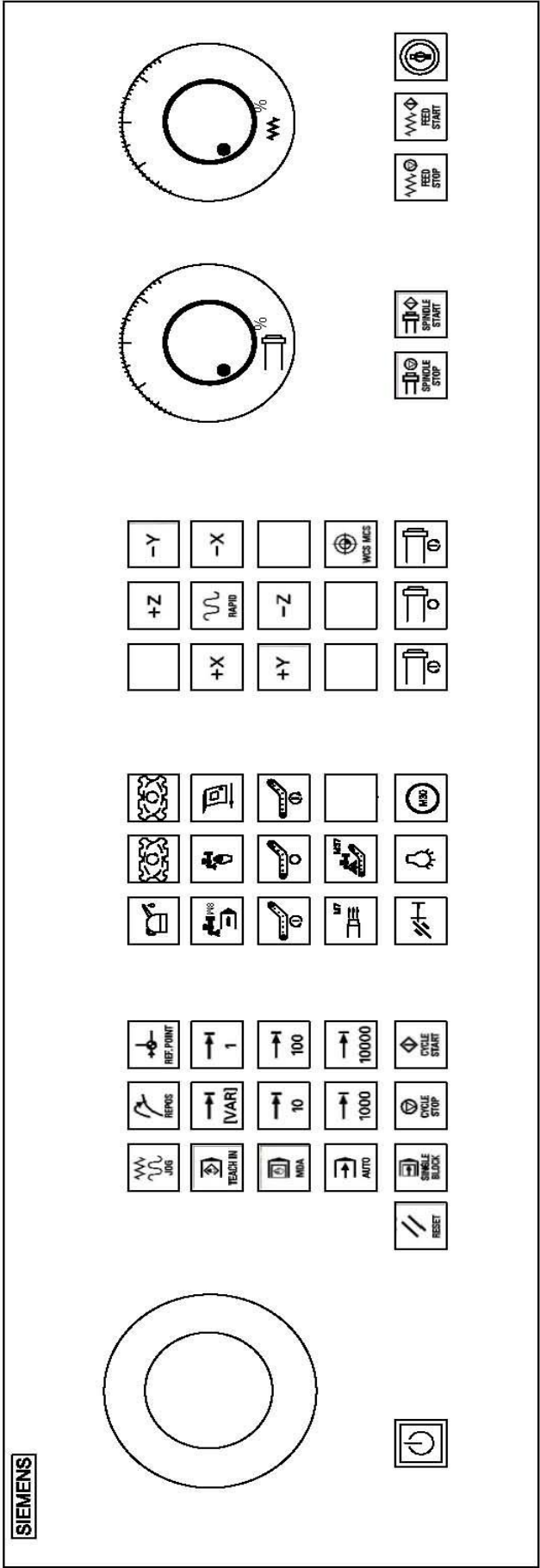




ALTERATION		DATE		SIGNATURE		INDEX		DRAWN		CHECKED		STANDARD		VERIFIED		APPROVED		DATE		SIGNATURE		TITLE		X1 TERMINAL		203-56-006		TYPE: VMC 125/SIEMENS828D		Pg. 31		S.No. 38	
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1 2 3 4 5 6 7 8



ALTERNATION		SIGNATURE		DATE	
INDEX		SIGNATURE		DATE	
DRAWN	CHECKED	STANDARD	VERIFIED	APPROVED	
DATE		SIGNATURE		DATE	
TITLE:		MCP LABEL		REPEATED TYPE: 191,192,266	
203-56-006		TYPE: VMC 125/SIEMENS828D		Pg. 33	
				Sh. No. 38	

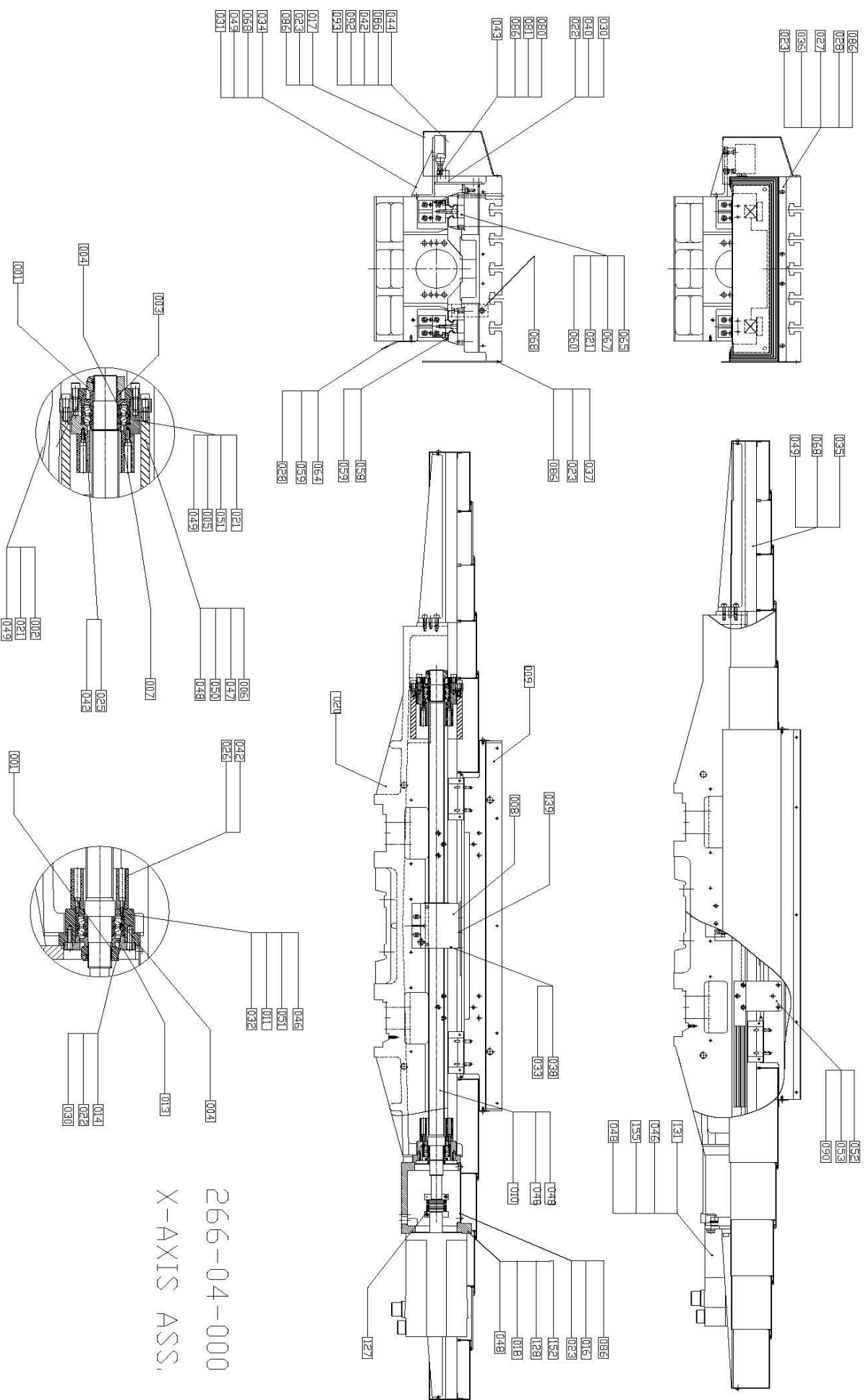
RESERVE

ALTERATION		DATE		SIGNATURE		INDEX		DRAWN		CHECKED		STANDARD		VERIFIED		APPROVED		DATE		SIGNATURE		TITLE		203-56-006		Pg. 34-38		Sh.No. 38	
																								REPEATED TYPE:191,192,266		TYPE: VMC 125/SIEMENS828D			

VI. PART LIST

	266-02-000	PART LIST : Y AXIS
Position	Drawing No.	Title Dimension
001	19202001	BEARING CAP
002	DIN 912	SCREW M8X25
003	19202003	BEARING SEAT
004	19202004	BEARING SUPPORT SEAT
005	19202005	COLLAR
006	19202006	BALL SCREW AND NUT
007	19202007	NUT BRACKET
008	19202008	BEARING SUPPORT SEAT
009	20202013	COLLAR
010	19202010	BEARING CAP
011		LOCKING NUT
012		SCREW M5x8
013	19202013	COVER PLATE
016		SCREW M12x45
017		PIN A6
018		SCREW M6x20
019		BALL BEARING 3572
020	20206035	LIMIT TOUCH BLOCK
022	26602022	TAPER GIB
023	26602023	TAPER GIB
024	26602024	LINEAR GUIDE WAY
025		PIN A6
026		SCREW M5x20
027		WASHER B 5.3
028		SPRING WASHER B5
029		SCREW M5X10
031	26602031	TOUCH BLOCK
032		SCREW M5X16
033		SCREW M20x55
034		SCREW M10X25
035	26602035	TOUCH BLOCK
037	26602037	TELESCOPIC COVER
038		LIMT SWITCH
039	26602039	TELESCOPIC COVER
040	19202040	MACHINE LEG SEAT
041	20202028	ANCHOR BOLT

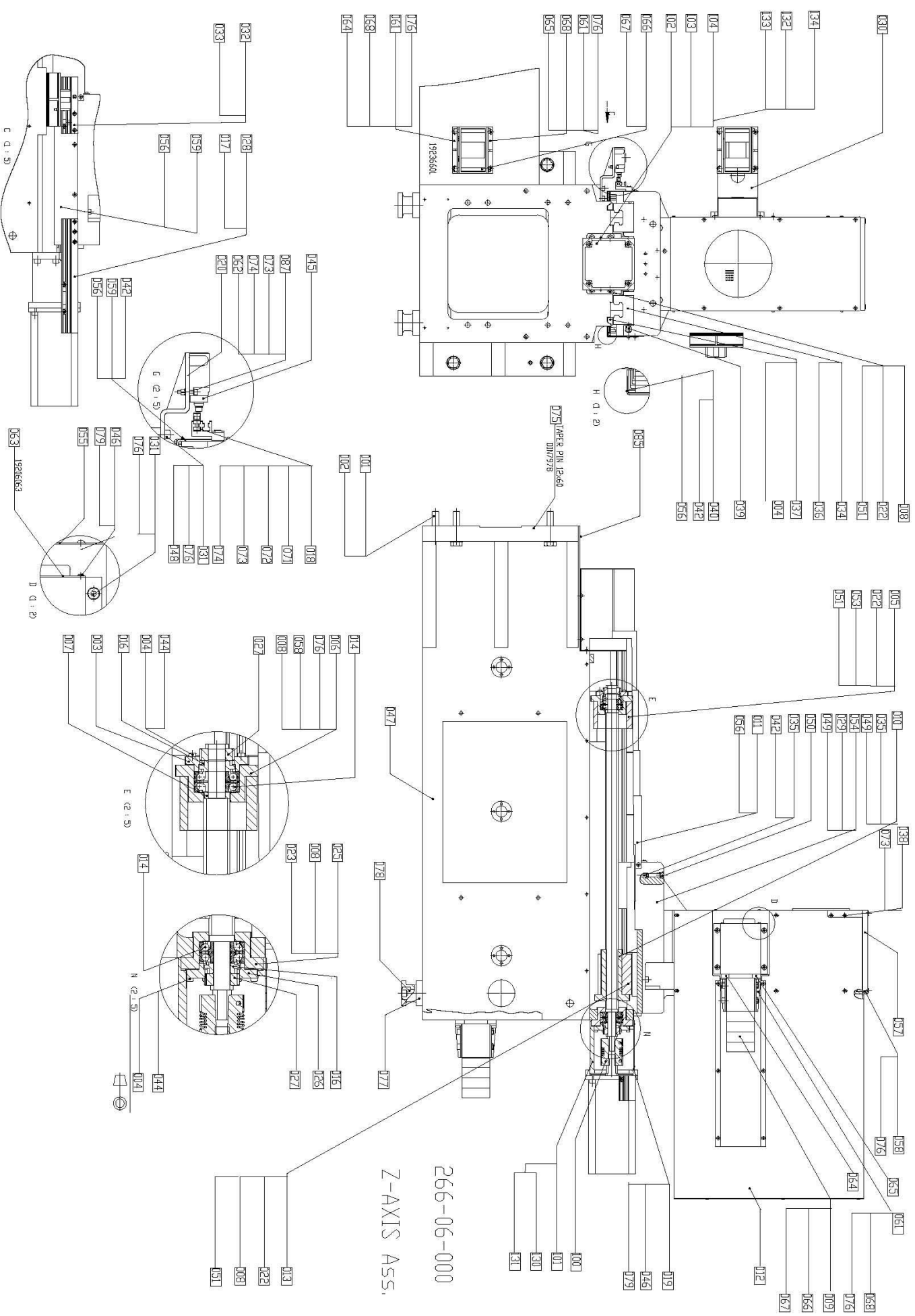
Position	Drawing No.	Title Dimension
042		NUT B M30
043	26602043	BASE
044		SCREW M8X20
045	26602045	TELESCOPIC COVER BRACKET
046		SCREW M6X25
047	26602047	TOUCH BLOCK ADJUSTING PLATE
048		SCREW M5X14
049	26602049	LIMIT SWITCH SEAT
050	19202050	BEARING SEAT
051		SCREW M5x30
052		SCREW M6x55
053		SCREW M6X45
054		WASHER B6.4
055		SPRING WASHER B6
056		SCREW M5X45
057		PIN A8
058		PIN A6
059		PIN A10
061	20206063	LIMIT TOUCH BLOCK
062		SPRING WASER B12
063	26602063	TOUCH BLOCK ADJUSTING PLATE
064		SPRING WASHER B8
065		SCREW M10x55
066		SCREW M12X50
067		SCREW M10X30
068		SPRING WASHER B10
069		NUT M5
070		SCREW M12x35
071	26602071	SHEET
072	26602072	TELESCOPIC COVER BRACKET
073		SCREW M10x65
074		GREASE
106		COUPLING
107	19202015	MOTOR BRACKET
108		Y-AXIS MOTOR



266-04-000
X-AXIS ASS.

	266-04-000	PART LIST : X AXIS
Position	Drawing No.	Title Dimension
001		LOCKING NUT
002	20202002	SHAFT COVER
003	20202003	COLLAR
004		BALL BEARING 3572
005	19104005	BEARING SEAT
006	20202006	BEARING SUPPORT SEAT
007	20202007	COLLAR
008	19202007	NUT BRACKET
009	26604009	TABLE
010	26604010	BALL SCREW AND NUT
011	19104011	BEARING SEAT
013	20202013	COLLAR
014	20202014	BEARING CAP
016	20202016	MOTOR BRACKET COVER
017	19104017	FRONT COVER
018		SCREW M10x40
020	26604020	SADDLE
021		SCREW M8X30
022		SCREW M6X25
023		SCREW M5X10
025	26604025	TOUCH BLOCK
026	26604026	TOUCH BLOCK
027		SCREW M6X10
028		WASHER B6.4
030		SPRING WASHER B6
031		WASHER B8.4
032		SPRING WASHER B14
033		SPRING WASER B12
034	26604034	LIMIT SWITCH SEAT
035	26604035	TELESCOPIC COVER BRACKET
036	26604036	TELESCOPIC COVER
037	19104037	PROTECTION COVER
038		SCREW M12x40
039		PIN A6X50
040	20204040	TOUCH BLOCK ADJUSTING PLATE

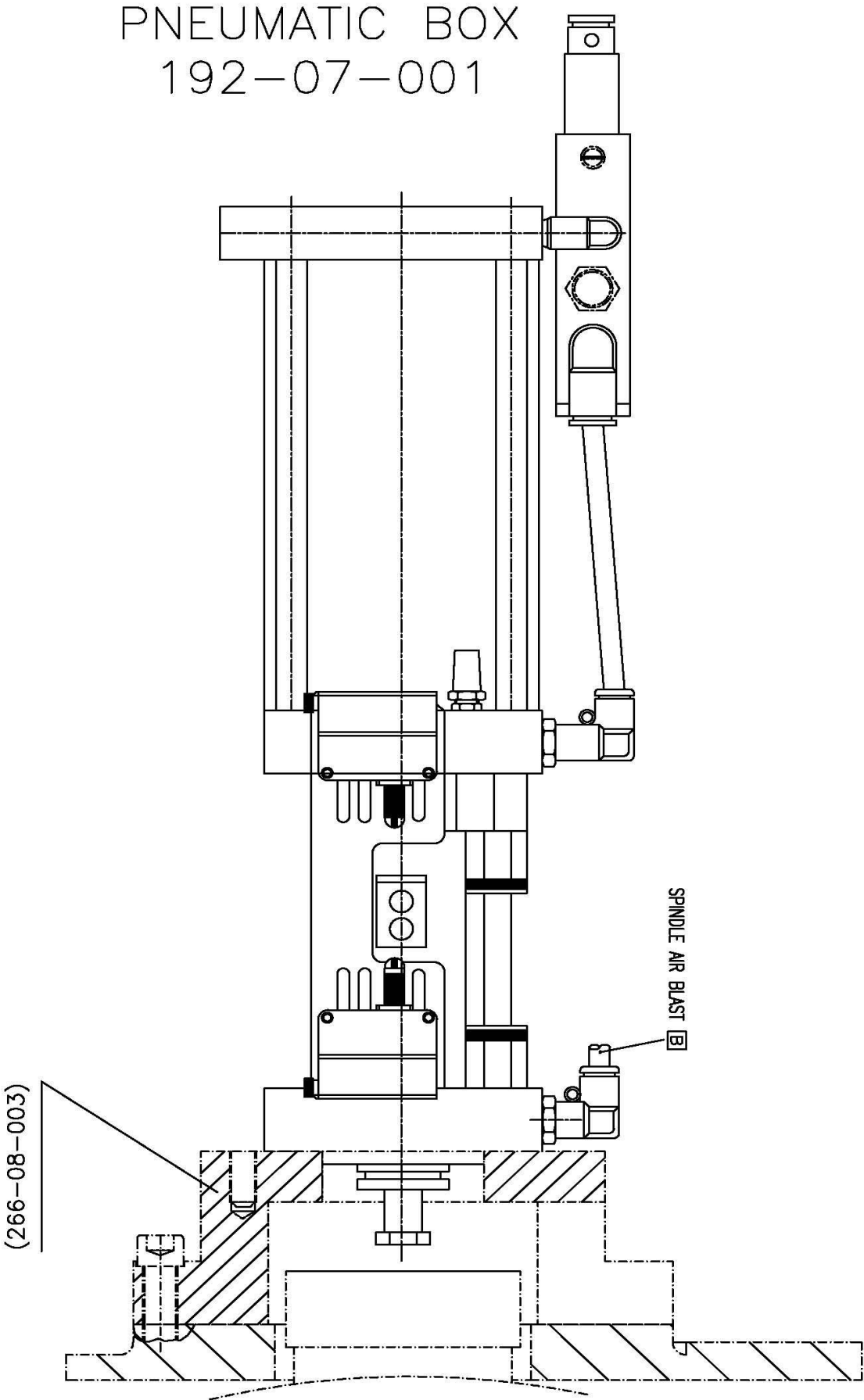
Position	Drawing No.	Title Dimension
042		SCREW M5x20
043	20206035	LIMIT TOUCH BLOCK
044		LIMIT SWITCH
046		SCREW M10X35
047		SCREW M14X55
048		SPRING WASHER B10
049		SPRING WASHER B8
050		PIN A10X50
051		PIN A8x40
052	26604052	LEFT SHEET SUB ASS.
053	26604053	RIGHT SHEET SUB ASS.
054	26604054	LEFT HSEET
055	26604055	RIGHT SHEET
057	26604057	SHEET
058	26602022	TAPER GIB
059		SCREW M6x20
060	26604060	PIN
064	19204064	COVER
065	26604065	LINEAR GUIDE WAY
067		SCREW M10X60
068		SCREW M8X25
069		GREASE
080	20206063	LIMIT TOUCH BLOCK
081		SCREW M5X14
0860		WASHER B 5.3
090		SCREW M6x30
092		NUT M5
093		SPRING WASHER B5
127		COUPLING
128	19204128	MOTOR BASE SEAT
131		X-AXIS MOTOR



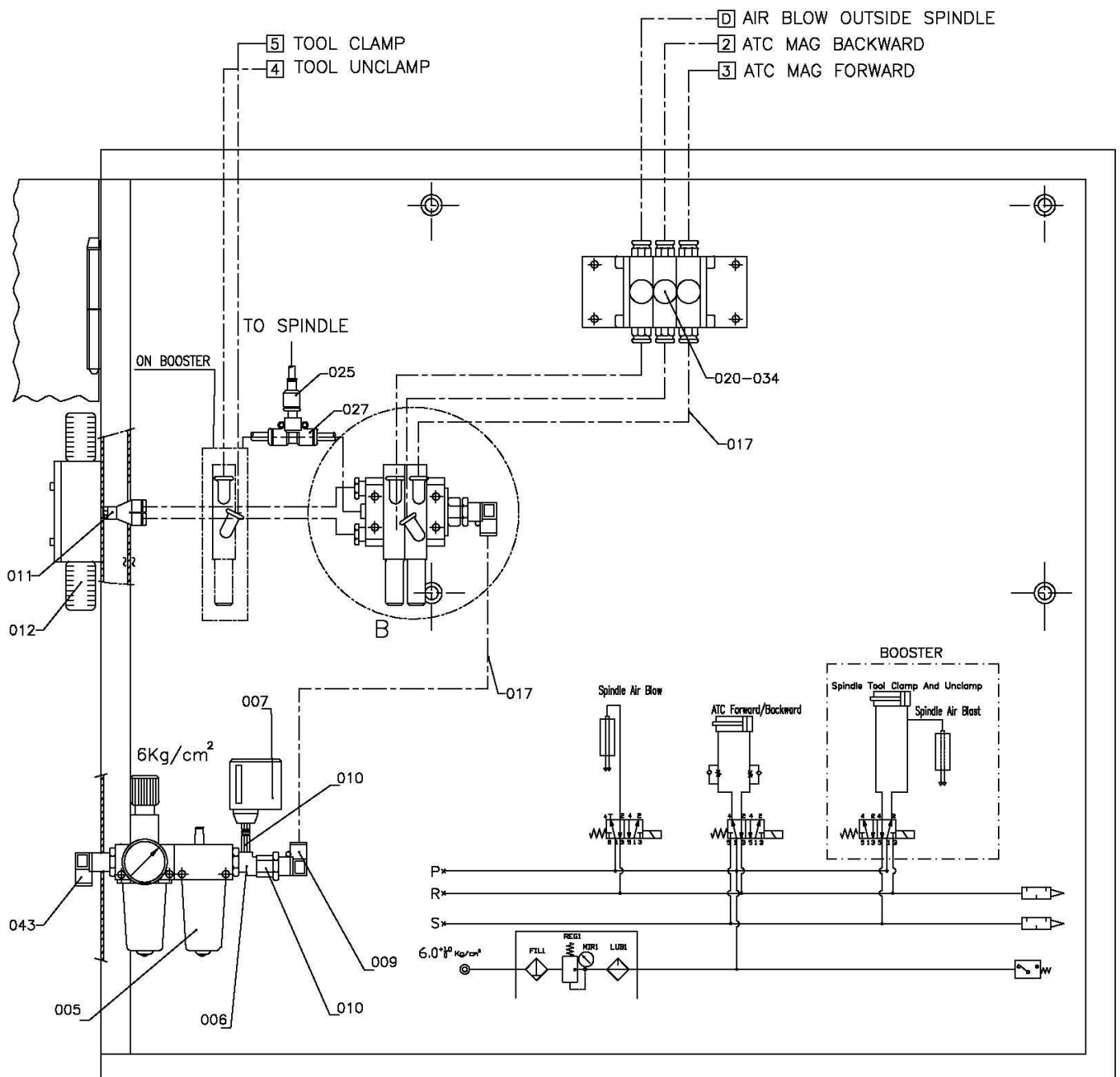
	266-06-000	PART LIST : Z AXIS
Position	Drawing No.	Title Dimension
001		SCREW M20x80
002		SPRING WASHER
003	19202001	BEARING CAP
004		SCREW M6x20
005	19202004	BEARING SUPPORT SEAT
006	19202003	BEARING SEAT
007	19202005	COLLAR
008		PIN A6
009		CABLE CARRIER
010	19206010	BALL SCREW Z-AXIS
011	26606011	TELESCOPIC COVER
012	26606012	FRONT COVER
013	19202007	NUT BRACKET
014		BALL BEARING 3572
016	20202013	COLLAR
018	20206035	LIMIT TOUCH BLOCK
019	19206019	COVER PLATE
020	26606020	LIMIT SWITCH SEAT
022		SCREW M12x45
023		SCREW M10X30
025	19202050	BEARING SEAT
026	19202010	BEARING CAP
027		LOCKING NUT
028	20206038	TOUCH BLOCK ADJUSTING PLATE
029		SCREW M10x80
030	19206030	COIL PIPE FIXING BLOCK
031		SCREW M8X30
032	20206042	TOUCH BLOCK ADJUSTING PLATE
033		SCREW M6X16
034	26606034	LINEAR GUIDE WAY
035		SCREW M10x40
036		SCREW M12x35
037	26602022	TAPER GIB
038		SCREW M5X10
039		SET SCREW M10X25
040	26606040	COVER
042		WASHER B6.4
044		SPRING WASHER
045		LIMIT SWITCH
046		SCREW M4x8
047	26606047	COLUMN
048		WASHER A8.4

Position	Drawing No.	Title Dimension
049		SPRING WASHER
050	26604060	PIN
051		SPRING WASER
053		PIN A8x45
054	26606054	HEAD STOCK
055	19206055	COVER PLATE
056		SCREW M6X10
057	19206057	COVER PLATE
058		SCREW M8X25
059	26606059	COVER
061	26606061	CABLE SUPPORT
062		NUT M5
063	19206063	COVER
064	26606064	PLATE
065	26606065	PLATE
066		SCREW M10x100
067		NUT M10
068		SCREW M8x14
071	20206063	LIMIT TOUCH BLOCK
072		SCREW M5X14
073		WASHER B 5.3
074		SPRING WASHER
075		PIN A12
076		SPRING WASHER
077	20202165	EYE BOLT
078		SCREW M24
079		WASHER B4
080		GREASE
085	26606085	PLATE
086	91731005	HEX. BASE
087		SCREW M5x25
094	20206094	SHEET
100		COUPLING
101	19206029	MOTOR BRACKET
102		SCREW M10X30
103		SPRING WASHER
104		Z-AXIS MOTOR

PNEUMATIC BOX
192-07-001



192-07-001

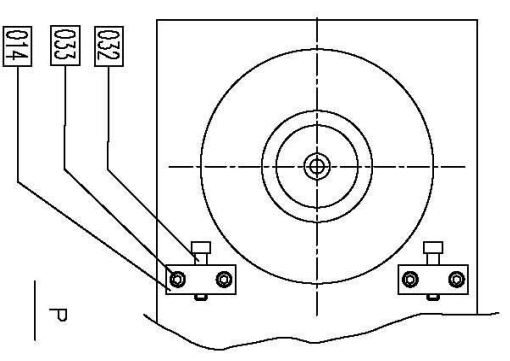
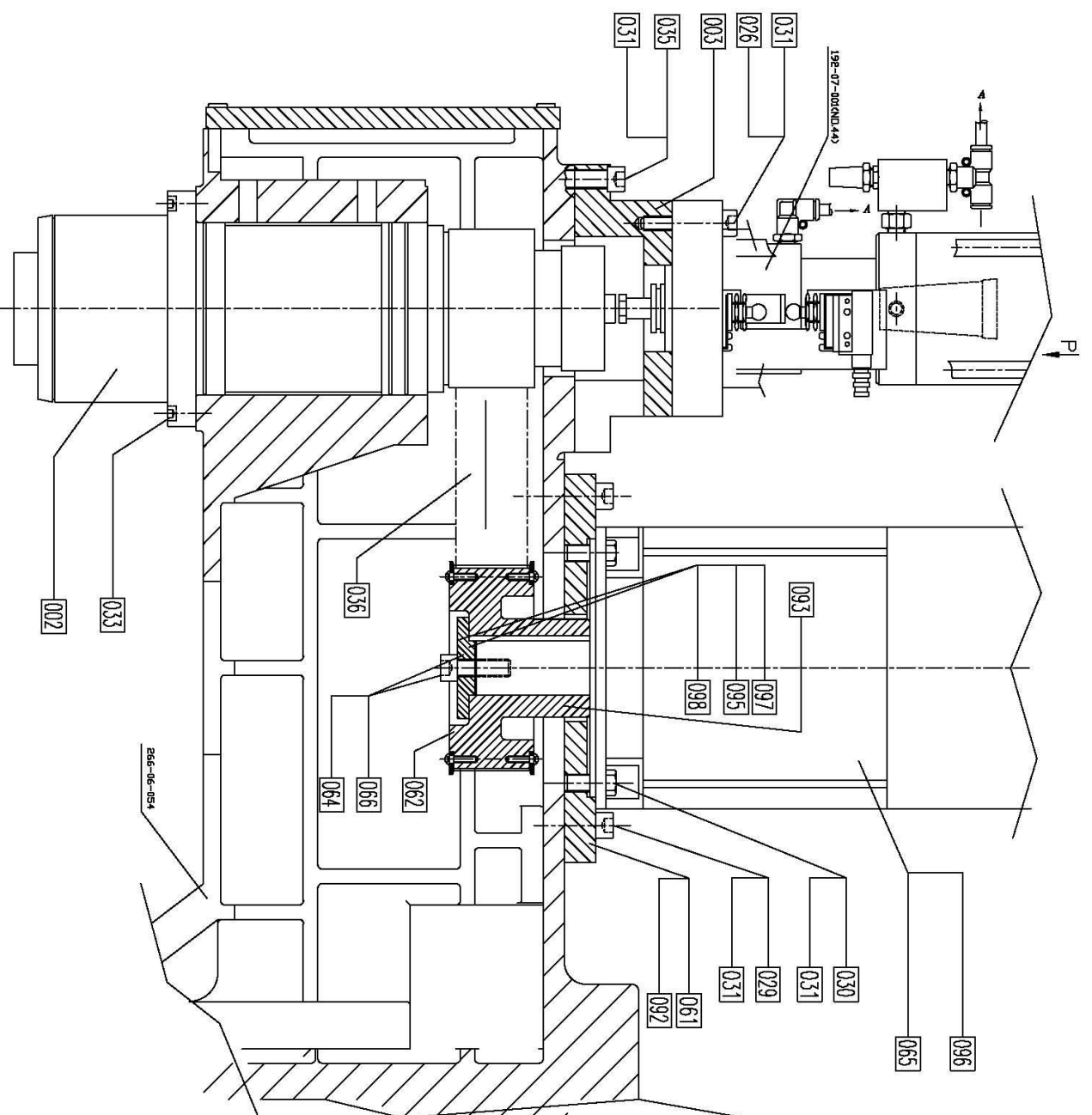


PNEUMATIC BOX

192-07-001

POSITION	TITLE DIMENSIONS
001	
002	
003	
004	
005	SERVICE UNIT FRC-1/2-S-B
006	TEE JOINT 2092-08
007	PRESSURE SWITCH KP.1 060-1101
008	
009	ELBOW TYPE QUICK CHANGE JOINT SPL10-02
010	STRAIGHT COPPER JOINT 1863 21 13
011	Y PIECES 314 10 13
012	SILENCER U-1/2
013	
014	
015	
016	
017	PLASTIC TUBE 10x6.5x16000mm TYPE PU COLOR OF RED
018	
019	
020	PNEUMATIC SPEED REGULATOR FL-6002
021	
022	
023	
024	
025	QUICK 2 WAY ADAPTOR 3166 06 10

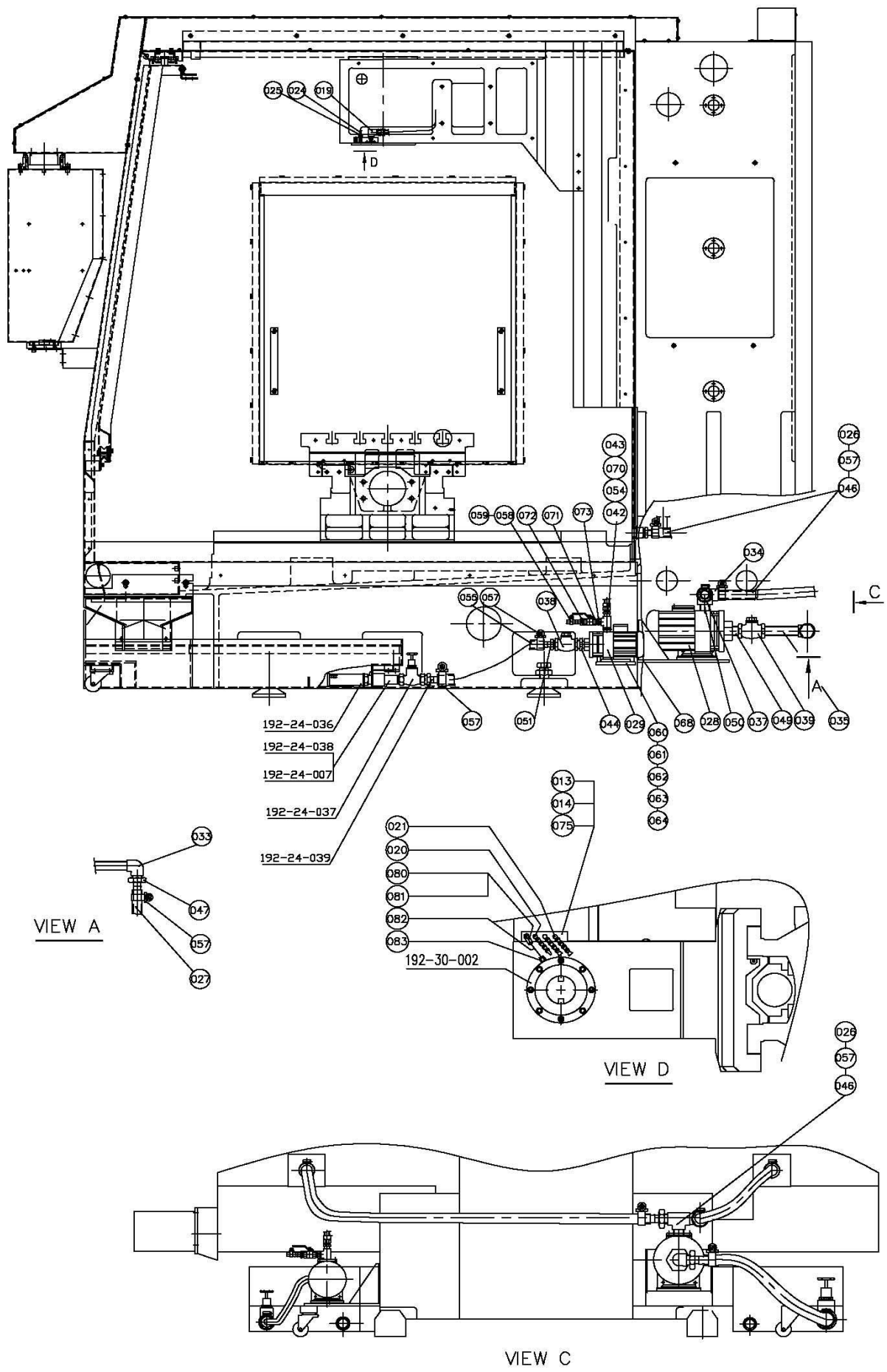
POSITION	TITLE DIMENSIONS
026	
027	Quick 3 way Adaper 3104 10 00
028	
029	
030	
031	STRAIGHT FITTING 1821 17 13
032	ELBOW TYPE QUICK CHANGE JOINT 1002
033	
034	QUICK CHANGE JOINT SPC 10-02
035	MANIFOLD BN 2608A-M5
036	
037	
038	PLUG PT1/4"
039	ELECTRO MAGNETIC VALVE MVSD-260-4E1 110V
040	
041	KEY FOR BOX Zx403A
042	
043	EXTENDED ELBOW 3129-12-21
044	PNEUMATIC BOOSTING CYLINDER G-5000
045	
046	
047	
048	
049	
050	



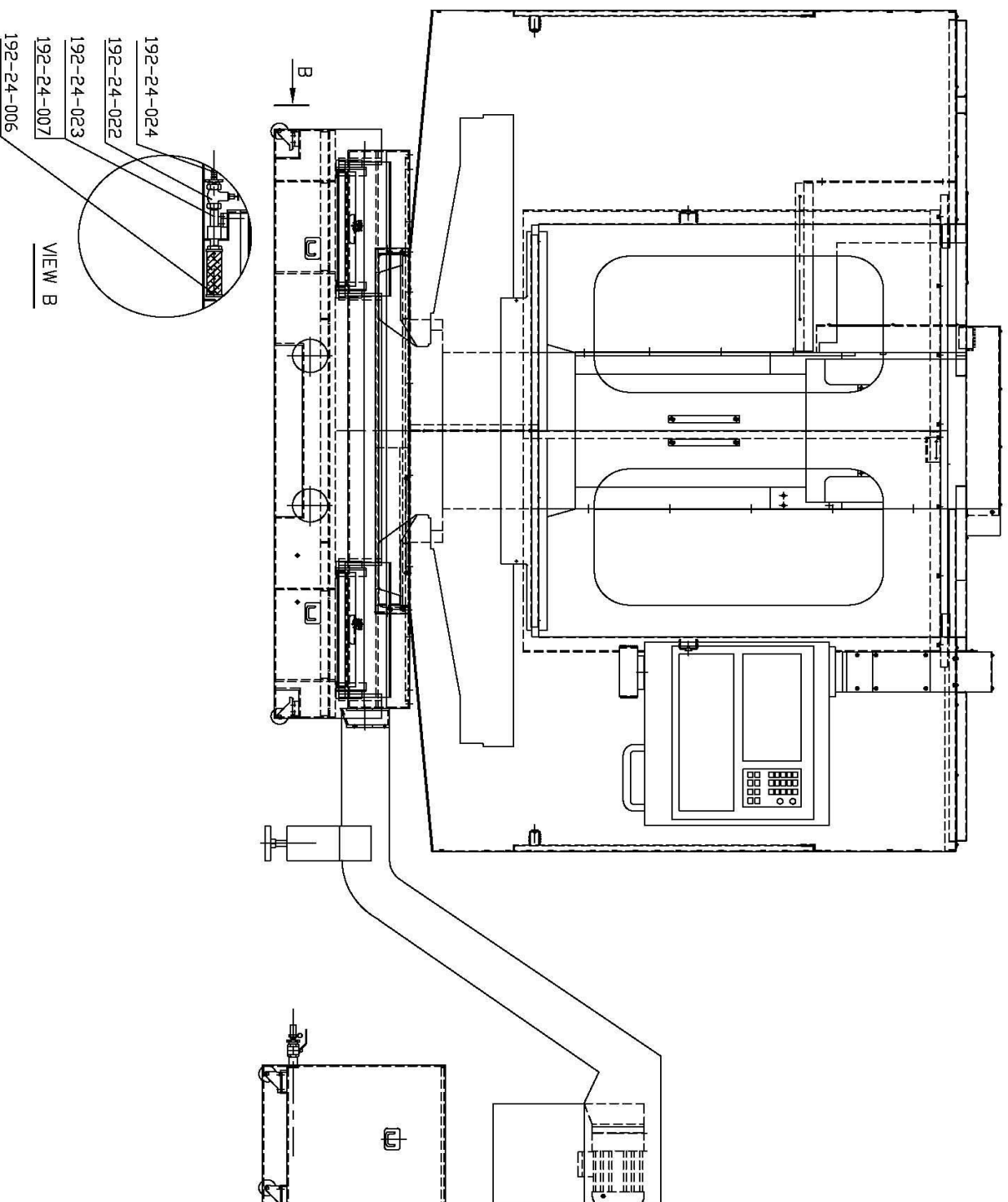
266-08-000
SPINDLE ASS.

	266-08-000	PART LIST: SPINDLE ASS.
Position	Drawing No.	Title Dimension
002		SPINDLE
003	26608003	SLAP RING SEAT
007	26608007	WASHER
014	19208055	ADJUSTING BLOCK
026		SCREW M12X55
029		SCREW M12x35
030		SCREW M12x35
031		SPRING WASER
032		SCREW M10x40
033		SCREW M8X30
035		SCREW M12x40
036		TIMING BELT
037		SCREW M5X10
061	19208052	MOTOR BASE PLATE
062	26608062	PULLEY SUB ASS.
063	26608063	PULLEY
064	26608064	CLAMPING PIN
065		SPINDLE MOTOR
066		SCREW M12x35

COOLANT ASS. 266-13-000



COOLANT ASS. 266-13-000 II

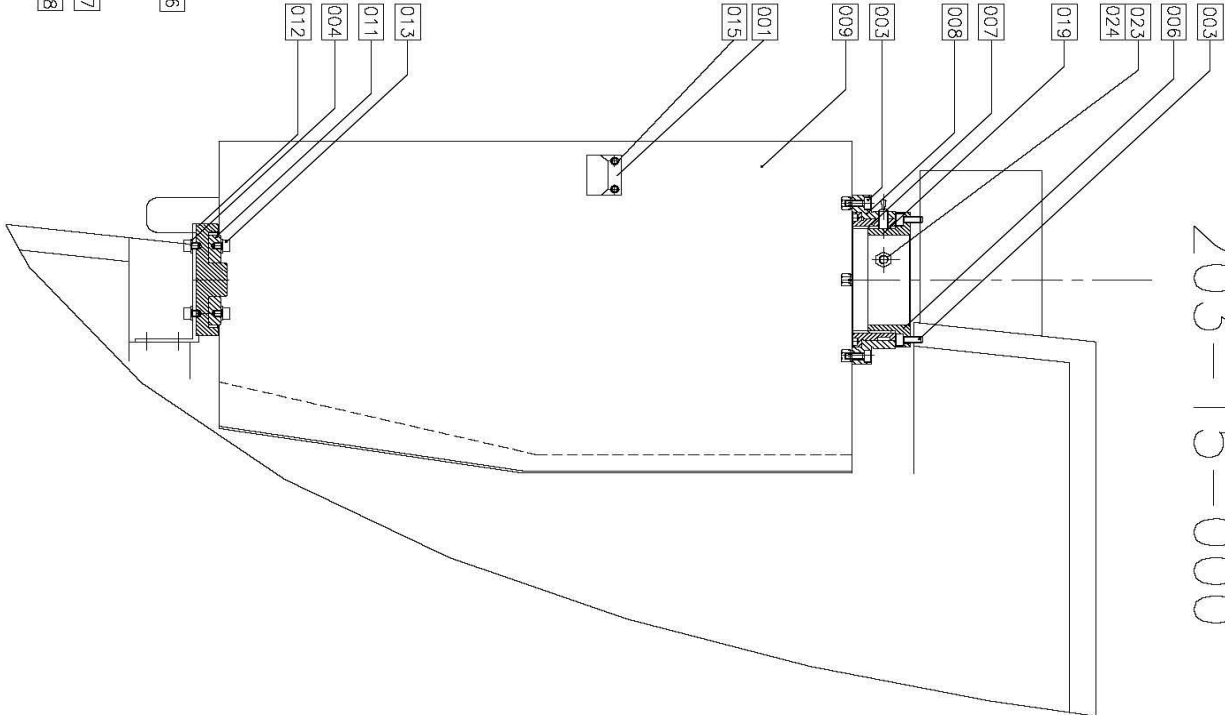
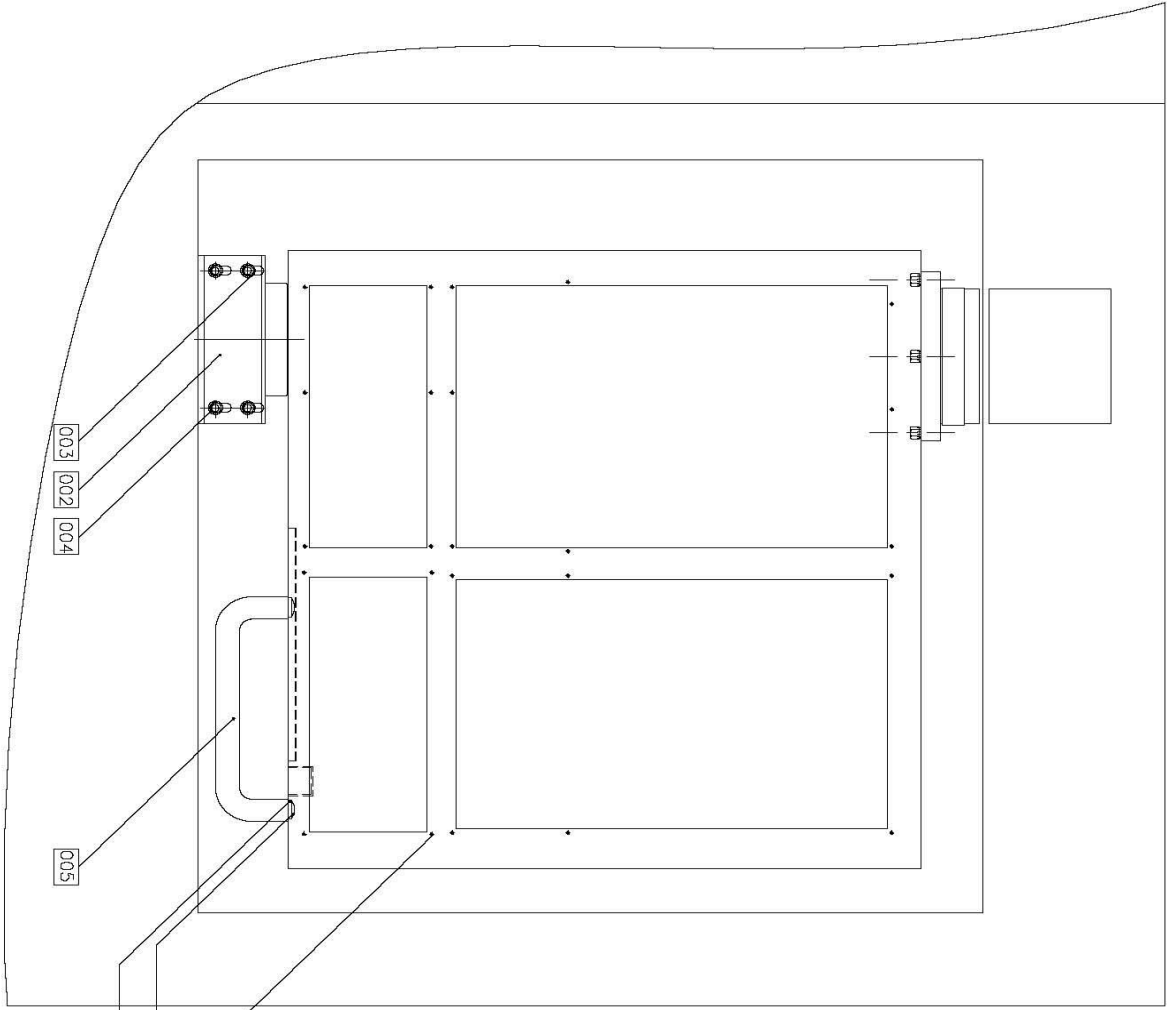


	266-13-000	PART LIST: COOLANT ASS.
Position	Drawing No.	Title Dimension
013		SCREW M6X40
014		WASHER A6.4
019		90 MALE ELBOW
020		ADJ.COOLANT HOSE PT3/8
021		ADJ.COOLANT HOSE PT3/8
024		NYLON TUBE 10x6.5
025		QUICK COUPLING
026		STEEL WIRE HOSE
027		STEEL WIRE HOSE
028		TROTTERED PUMP
029		TROTTERED PUMP
033		ELBOW 1 1/2"-A1
034		ELBOW 1 1/4
035		STRAIGHT HOSE JOINT 1,1/2"
037		T JOINT 1,1/4"
038		CHECK VALVE 1"
039		CHECK VALVE 1,1/2"
042		90 MALE ELBOW
043		NIPPLE
044		NIPPLE
046		STRAIGHT HOSE JOINT 1,1/4
047		STRAIGHT HOSE JOINT PT1,1/2
049		STRAIGHT HOSE JOINT 1,1/2
050		REDUCING NIPPLE 1,1/2
051		STRAIGHT HOSE JOINT 1"
054		HIGH PRESSURE HYDRAULIC
055		MESH PLASTIC SPRING HOSE
057		HOSE CLIP SA 32-50
058		HOSE CLIP SA 20-32
059		MESH PLASTIC HOSE 3/4"

Position	Drawing No.	Title Dimension
060	20213085	BASE MOTOR SUB ASS.
061		SCREW M8X30
062		SPRING WASHER B8
063		NUT M8
064		WASHER B8.4
065	20213090	SHEET
066	20213091	SHEET
068	26613068	PUMP SEAT
069		SCREW M8X20
070		T JOINT 3/4"
071		IV BALL VALVE 12
072		STRIGHT HOSE JOINT 3/4"
073		DOUBLE END TREAD JOINT 3/4"
075	26613075	BLOCK
080		QUICK ELBOW
081		FLOW REGULATOR PUSH-IN FITTING TUBE
082		NYLON PIPE N6
083		QUICK STRAIGHT

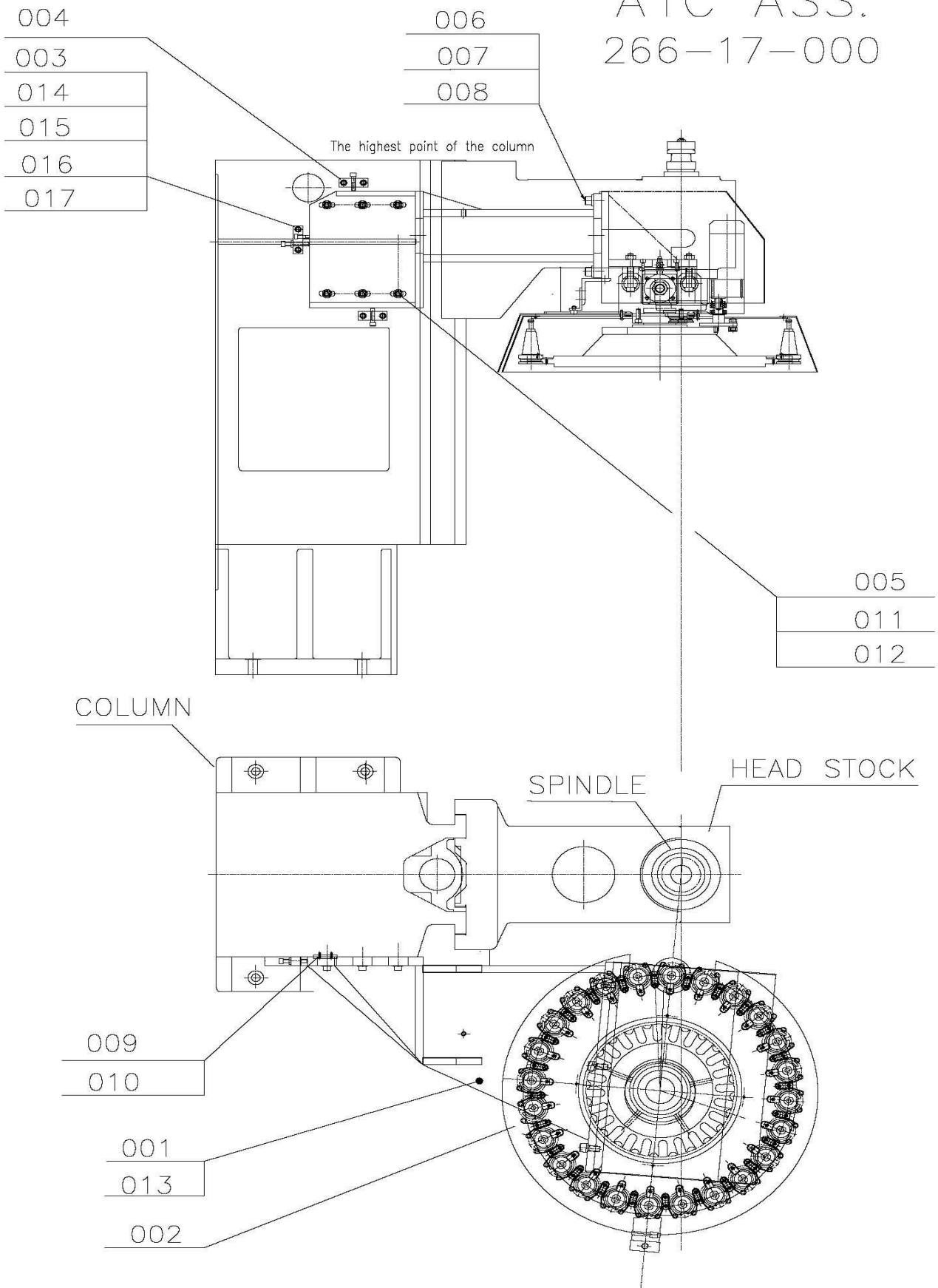
OPERATION BOX ASS.

203-15-000



	203-15-000	PART LIST: OPERATION BOX ASS.
Position	Drawing No.	Title Dimension
001	20320001	FIXING SEAT
002	20215002	FIXING SEAT
003		SCREW M6x20
004		WASHER A6.4
005		U-HANDLE
006	20215006	CRT RADIAL ARM
007	20215007	LOCKING NUT
008	20215008	ROTATING SEAT
009	21656649	SUB ASS.
010	21656652	PANNEL
011	20215025	LINING SLEEVE
012	20215026	ROTATING SEAT
013		SCREW M6X10
014	21616651	COVER
015		SCREW M5X10
016		SCREW M4X10
017		SCREW M8X14
018		WASHER 8.4
019		SCREW M8x16
023		SET SCREW M8X20
024		NUT BM8

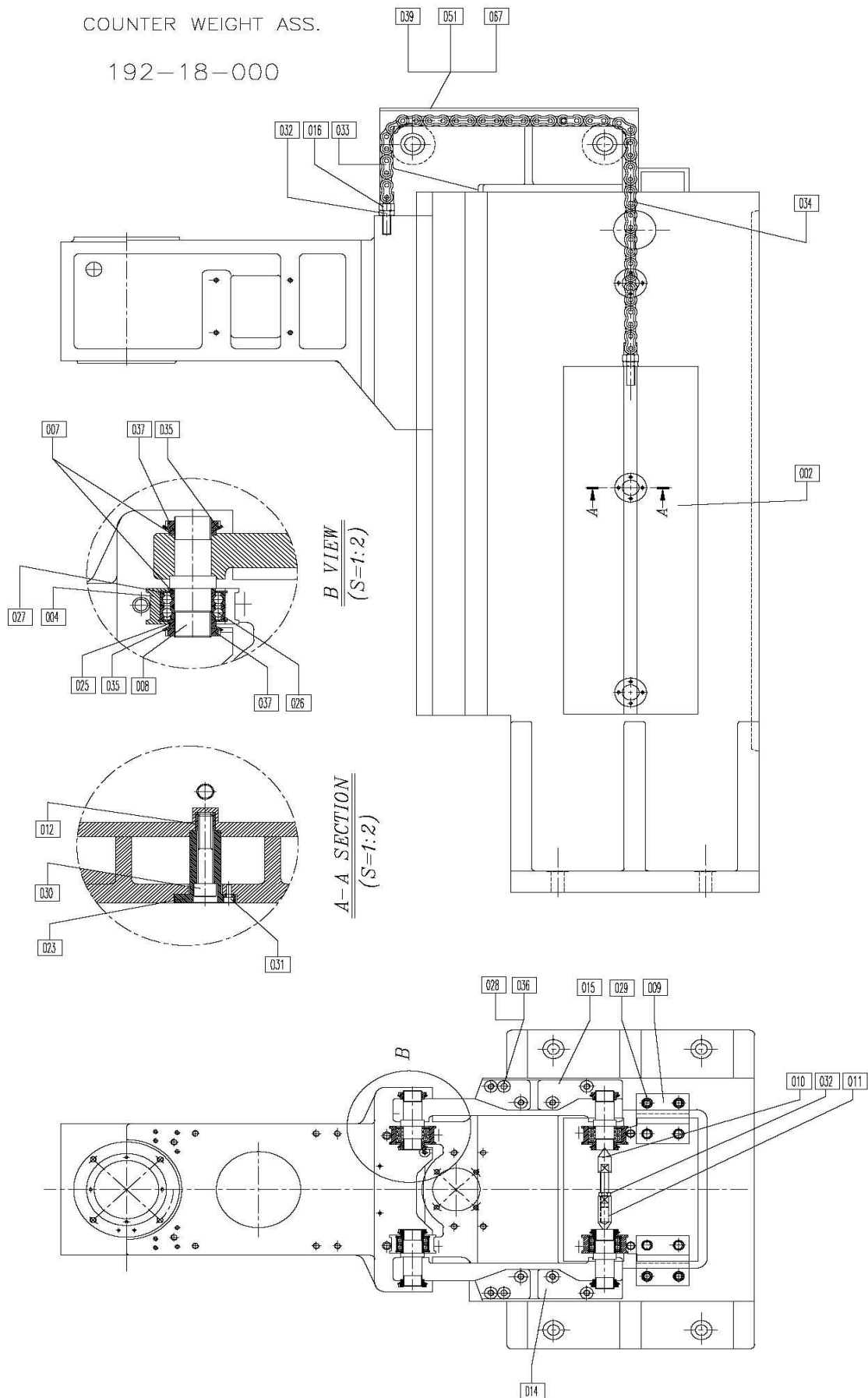
ATC ASS.
266-17-000



	266-17-000	PART LIST: ATC ASS.
Position	Drawing No.	Title Dimension
001	26617001	BRACKET
002	20237002	ATC CATCHARM
003	20237003	ADJUSTING BLOCK
005		SCREW M12x45
006		SCREW M16x50
007		WASHER B17
008		SPRING WASHER B16
009	20237009	ADJUSTING KEY
010		SCREW M5X16
011		WASHER B13
012		SPRING WASER B12
013		PIN A10X40
014		SCREW M12X50
015		SCREW M12x75
016		NUT M12
017		SCREW M12x75

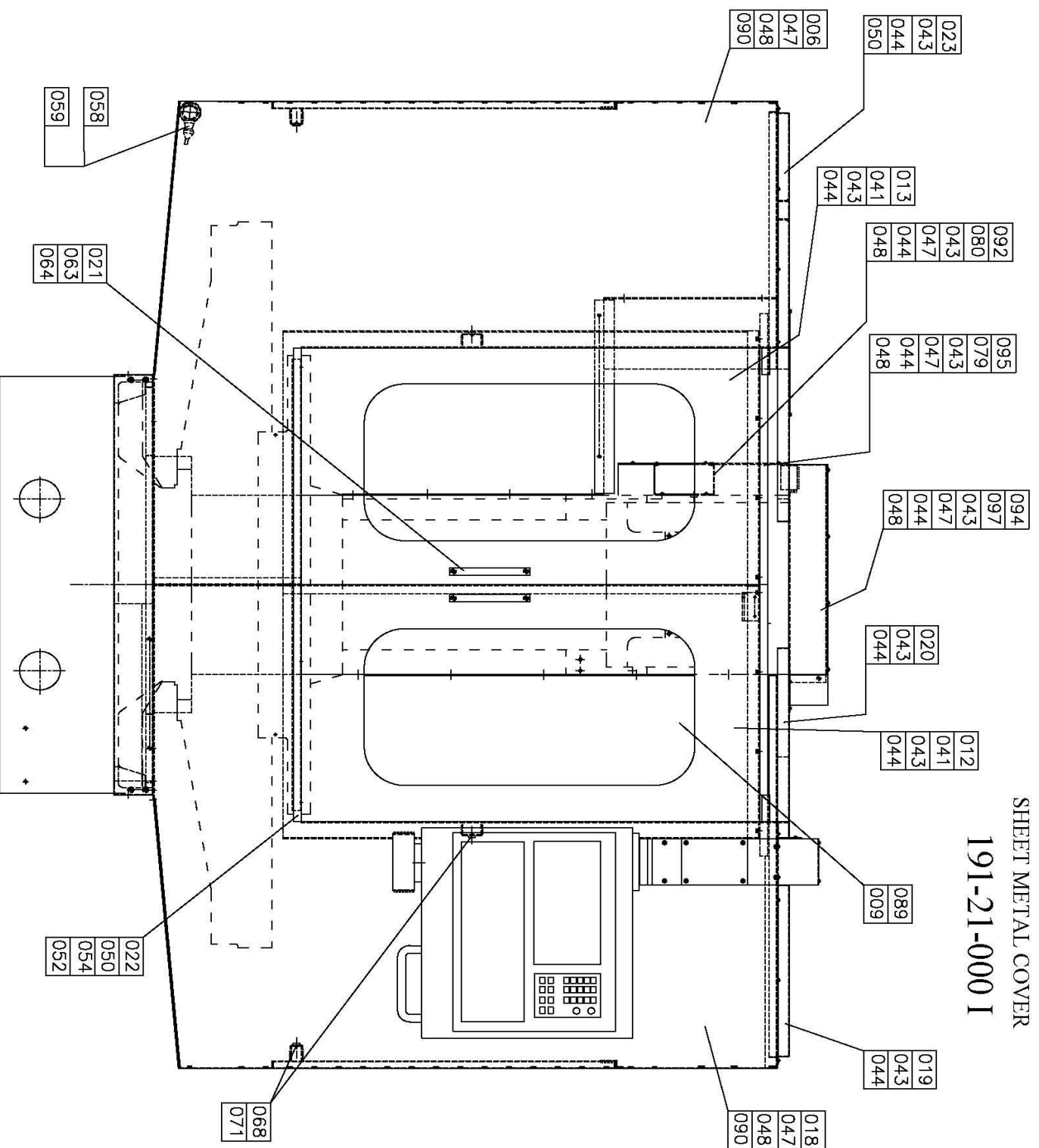
COUNTER WEIGHT ASS.

192-18-000

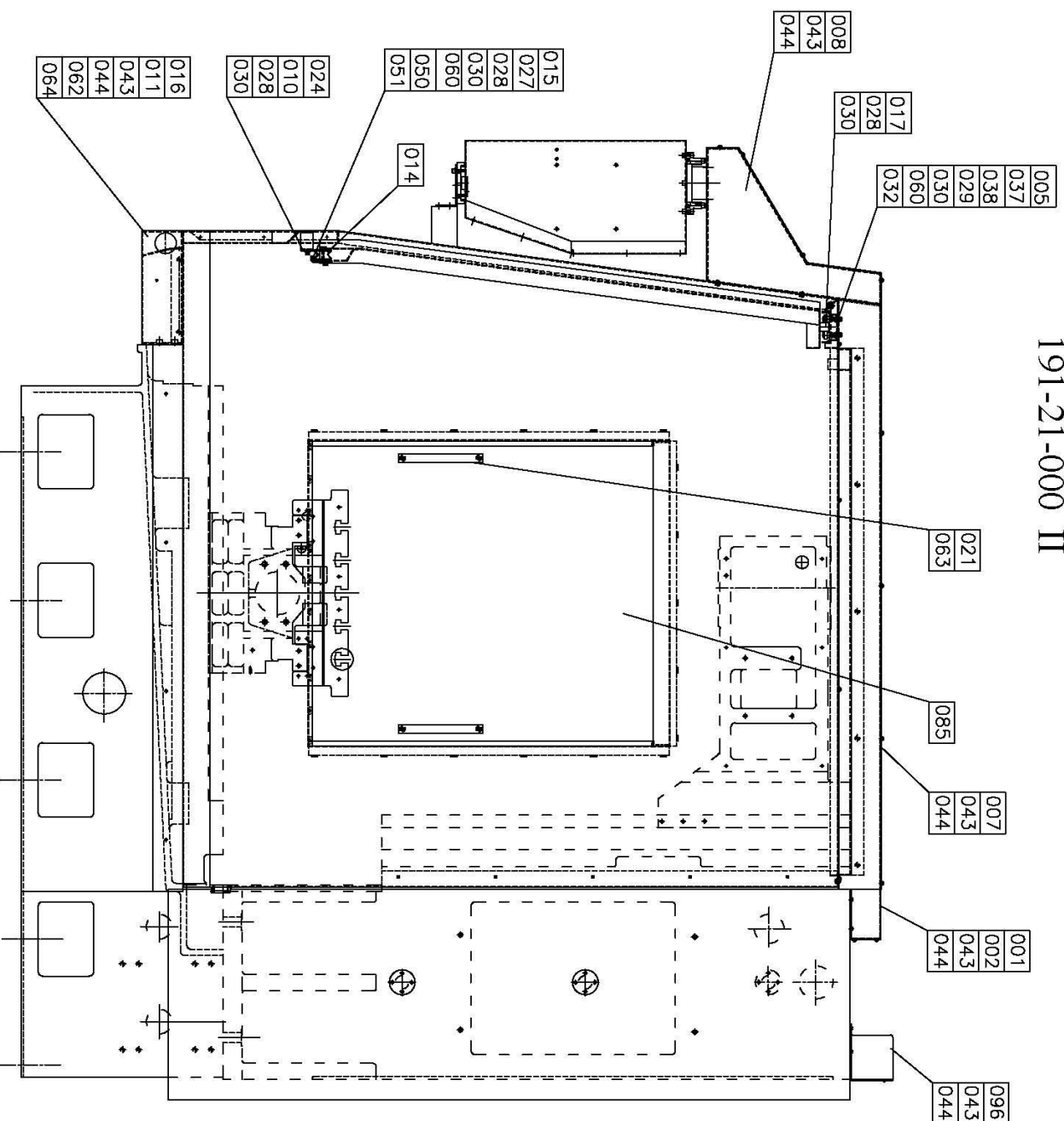


	192-18-000	PART LIST: COUNTER WEIGHT ASS.
Position	Drawing No.	Title Dimension
002	19218002	COUNTER WEIGHT SUB ASS.
003	19218003	COUNTER WEIGHT
004	19218004	SPROCKET WHEEL
007	20218007	WASHER
008	20218010	SPROCKET GEAR SHAFT
009	19218009	FIXING SEAT SUB ASS.
010	20218018	SUPPORT SHAFT
011	20218019	NUT
012	19218012	COUNTER WEIGHT GUIDE
014	20218014	TOP HEAD
015	20218015	TOP HEAD
016	19218016	LIFTING BOLT
023	19218023	SUPPORT SHAFT
025	20218025	WASHER
026		BEARING 6007
027		CIRCLIP 62X2
028		SCREW M12x40
029		SCREW M14x40
030		SCREW M14x75
031		SCREW M6X14
032		NUT M16
033		CHAIN CONNECTING SECTION
034		SILENT CHAIN
035		LOCK WASHER
036		SPRING WASHER B12
037		LOCK NUT
038		EYE BOLT M16
039		SCREW M5X12
040		WASHER B15
051	19218051	TOP HEAD

191-21-000 I



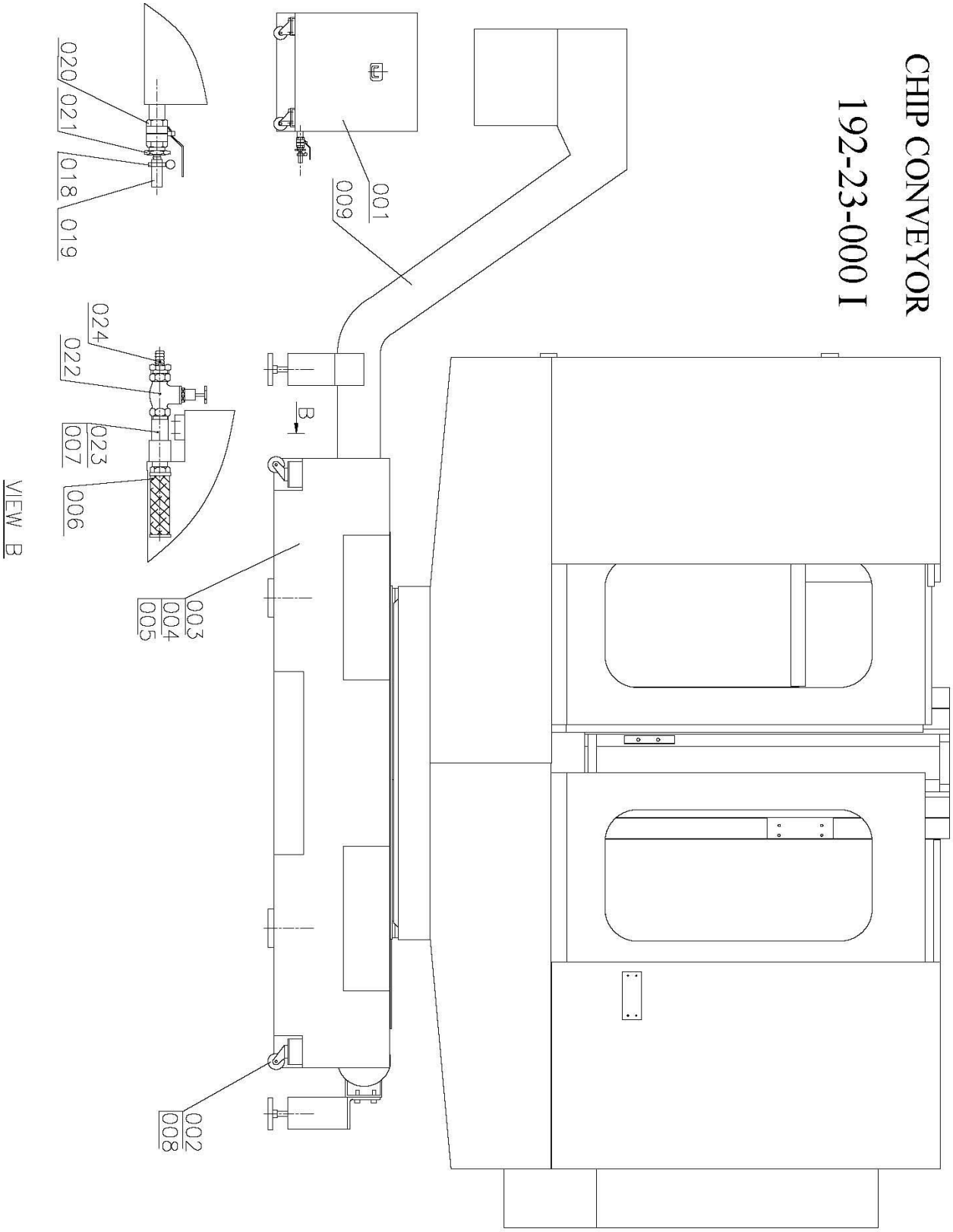
SHEET METAL COVER
191-21-000 II



	191-21-000	PART LIST: SHEET METAL COVER ASS.
Position	Drawing No.	Title Dimension
001	19221001	WIRE SLOT
002	19221002	COVER PLATE
005	19221005	BEARING SEAT
006	19121006	LEFT GUARD COVER
007	19221007	COVER PLATE
008	19221008	WELDING WIRE SLOT
009	19221009	ACRYLIC PLATE
010	19221010	RIGHT LOWER GUIDE WAY
011	19221011	PLATE
012	19221012	RIGHT FRONT DOOR
013	19221013	LEFT FRONT DOOR
014	20221014	DOOR ROLLER SEAT
015	19221015	TELESCOPIC COVER BRACKET
016	19221016	FIXING SEAT
017	19221017	UPPER GUIDE WAY
018	19121018	RIGHT GUARD COVER
019	19221019	COVER
020	19221020	COVER
021	GANTER	U-HANDLE GN 625-179-SW
022	19221022	PROTECTION ENCLOSURE
023	19221023	COVER
024	19221024	LEFT LOWER GUIDE WAY
025	19221025	CARRIER TUBE
026		NUT M10-6
027	20221015	MANDREL
028		SCREW M6x8
029		SCREW M6x12
030		WASHER 6.4
032		SPRING WASHER B6
033	19221033	RIGHT DOOR
034	19221034	LEFT DOOR
035	19221035	PLATE
036	19221036	PLATE
037	19221037	BUSH
038	19221038	MANDREL
041	19221041	PLATE
043		SCREW M5X16
044		WASHER A5.3

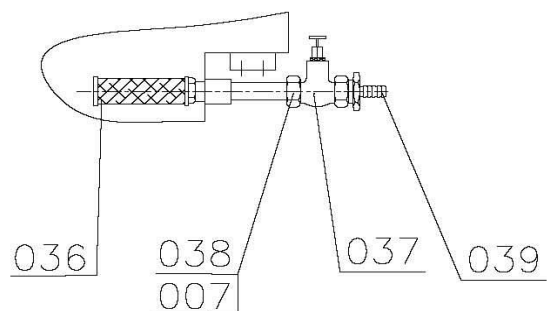
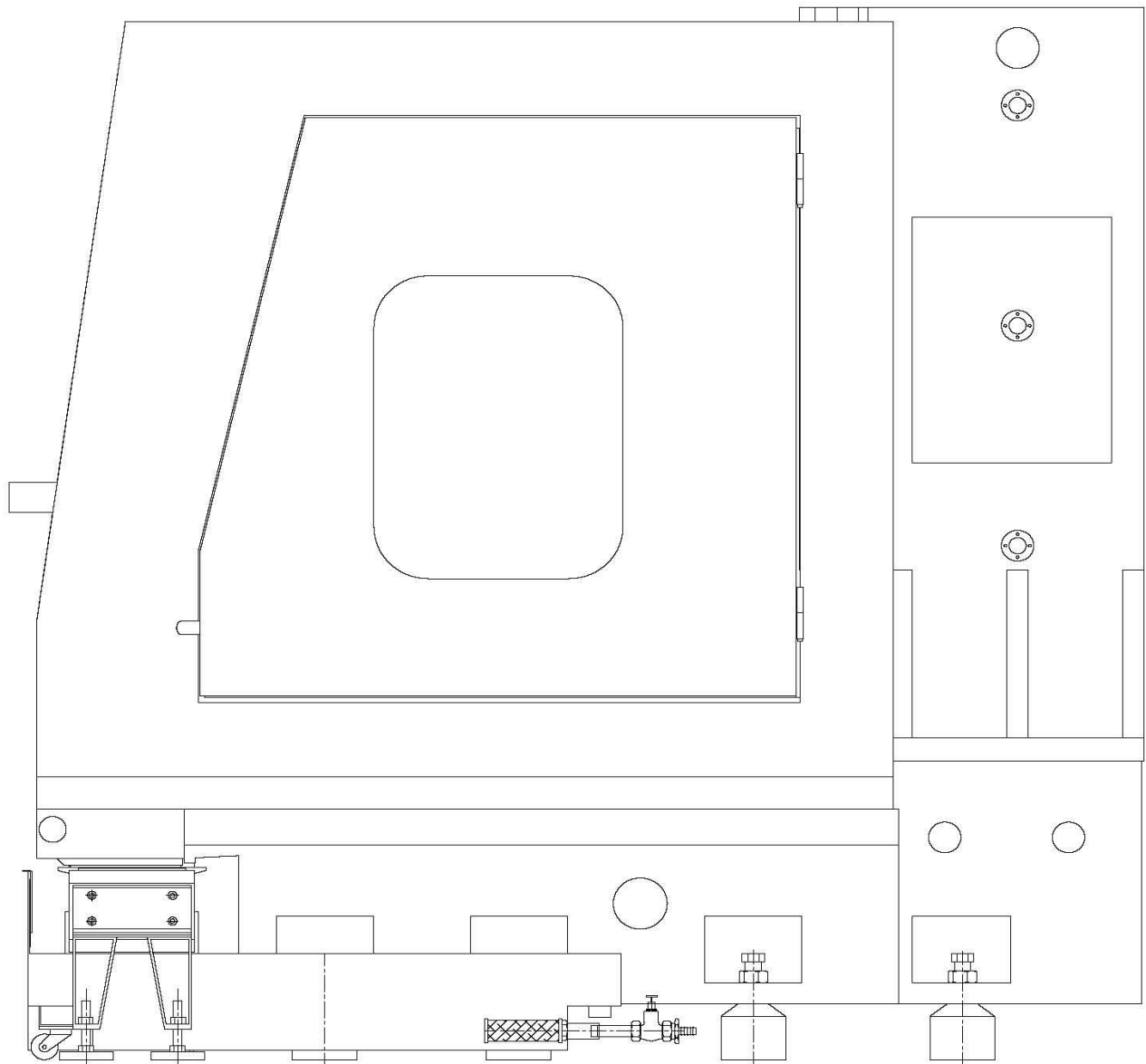
Position	Drawing No.	Title Dimension
047		SCREW M6X16
048		WASHER B6.4
050		SCREW M4X10
051		WASHER 4.3
052		NUT BM4
054		WASHER A4.3
058		CONNECTORS PART
059		1.1/4" FLARE NOZZLES PART
060		BEARING 626
062		SCREW M8x12
063		SCREW M8x16
064		WASHER B8.4
067	19221067	STOPER PLATE
068	19221068	STOPER
070	19221070	LIMITED PLATE
071		SCREW M5x12
073	19221073	LEFT FRONT PLATE
074	19221074	RIGHT FRONT PLATE
078	19221078	U FORM
079	19221079	COVER
080	19221080	COVER
085	20221011	ACRYLIC PLATE
089	13101033	PACKING
091	19221091	WIRE SLOT
092	19221092	CABLE CANAL
094	19221094	CABLE CANAL
095	19221095	CABLE CANAL
096	19221096	CABLE CANAL
097	19221097	COVER
098	19221098	WIRE SLOT
099	19221099	WIRE SLOT

CHIP CONVEYOR
192-23-000 I



CHIP CONVEYOR

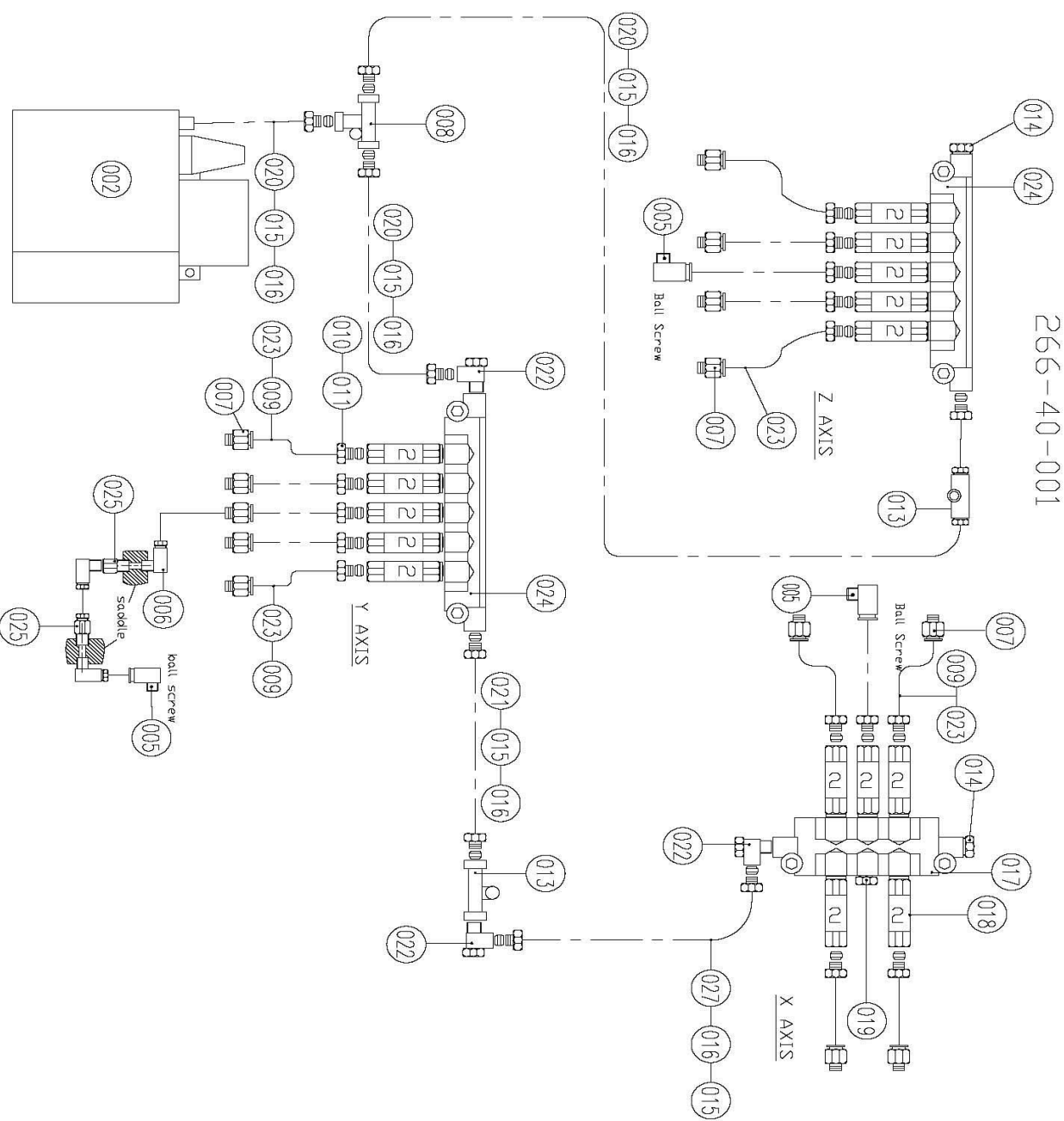
192-23-000 II



	192-23-000	PART LIST: CHIP CONVEYOR ASS.
Position	Drawing No.	Title Dimension
001	19224001	CHIP COLLECTOR SUB ASS
002		CASTER D=50
003	19224003	COOLANT TANK
004	19224004	COOLANT TANK FILTER
005	19224005	COOLANT TANK FILTER
006		OIL FILTER MF-10
007		PLUG 1/2"
008		SCREW M6X16
009	19223009	CHIP CONVEYOR
013	19224013	SHEET
014	19224014	SHEET
015	19224015	SHEET
016	20224016	PIPE
017	20224017	NET PLATE
018		HOSE CLIP SA 20-32
019		NET PLASTIC HOSE 1/2"
020		IV BALL VALVE 08
021		STRAIGHT HOSE JOINT PT1/2"
022		GATE VALVE S 40
023		STRIGHT HOSE JOINT 1,1/2"
024		STRAIGHT HOSE JOINT PT1,1/2"
036		OIL FILTER
037		GATE VALVE S 25
038		STRAGHT HOUSE JOINT TYPE 2084 PT1"-120
039		STRAIGHT HOSE JOINT PT1"

LUBRICATION CIRCUIT

266-40-001



LUBRICATION CIRCUIT

266-40-001

TITLE DIMENSIONS	POSITION
LUBRICATION PUMP	002
ELBOW PUSH IN FITTING 03.255.6	005
ELBOW ADAPTER PH-408	006
STRAIGHT PUSH IN FITTING 03.255.2	007
3-WAY JUNCTION PKD-6	008
SPRING SG-41800	009
COMPRESSION SLEEVE PB-4	010
COMPRESSION BUSHING PA-4	011
2-WAY JUNCTION JD-6	013
CLOSURE PLUG PUNOM 100-2	014
COMPRESSION SLEEVE PB-6	015
COMPRESSION BUSHING PA-6	016
AE6-6-4 TYPE DISTRIBUTOR	017
CAB-1-2 TYPE DISTRIBUTOR	018
CLOSUR PLUG PG-004	019
NYLON PIPE N-6	020
ALUMINIUM TUBE 6x1x600mm	021
SWIVEL ELBOW ES-601	022
NYLON PIPE N-6	023
VOLUME DISTRIBUTOR CAB-5-2 2 2 2 2	024
STRAIGHT JOINT PD-408	025
FLEXIBLE HOSE	027