

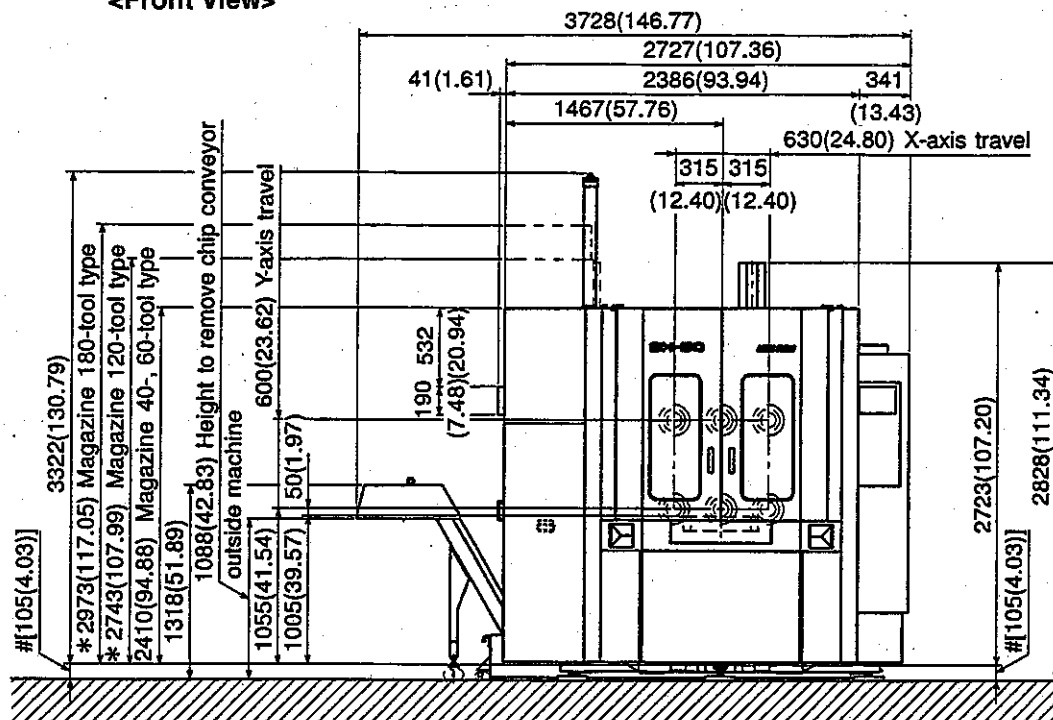
1. GENERAL VIEW



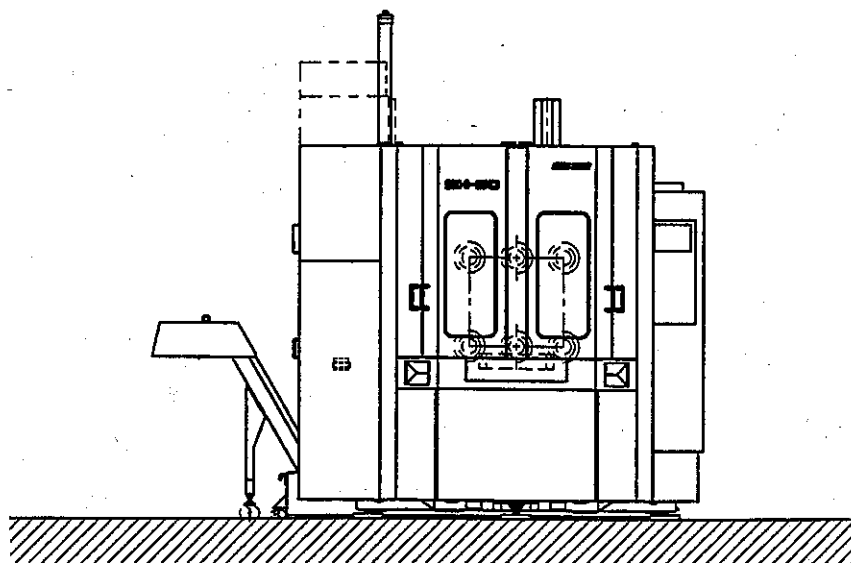
This illustration shows external machine dimensions.

Make sure that the machine can be carried to the installation site without interference and that there is sufficient space around the machine for maintenance.

<Front View>



Front view of 2-station APC type

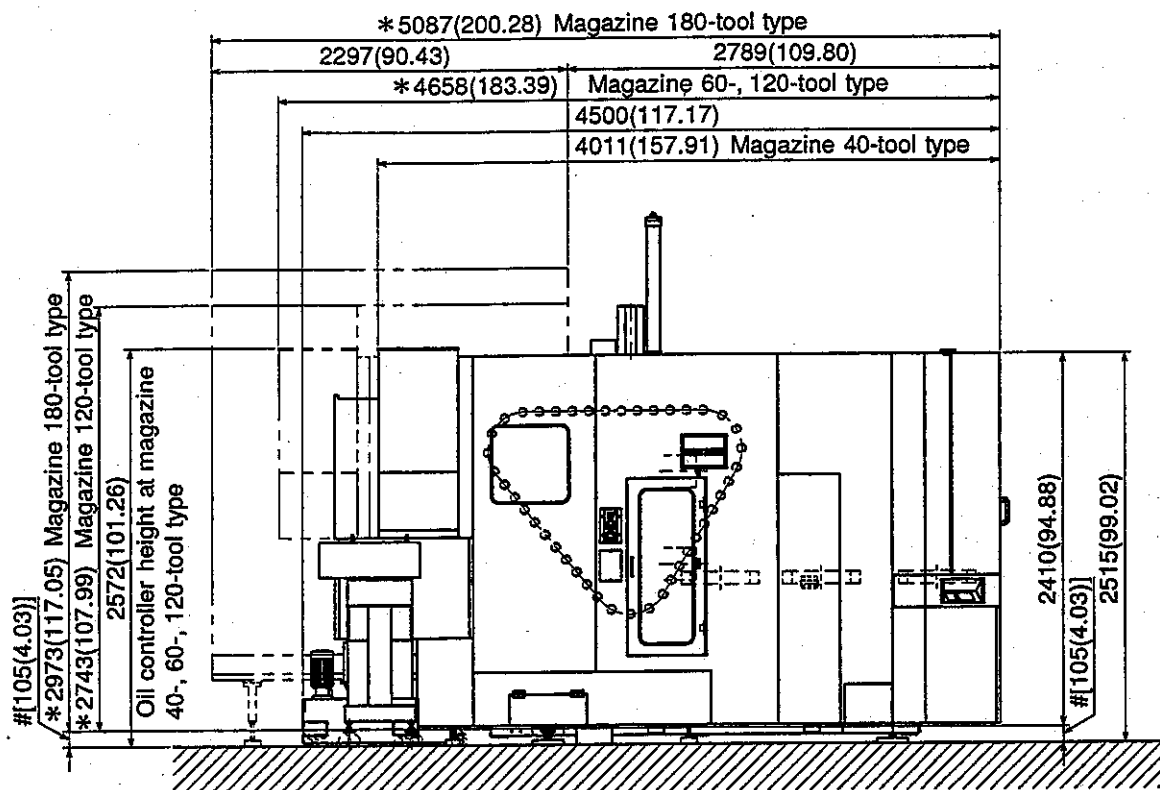


* Front view of 3-station APC type

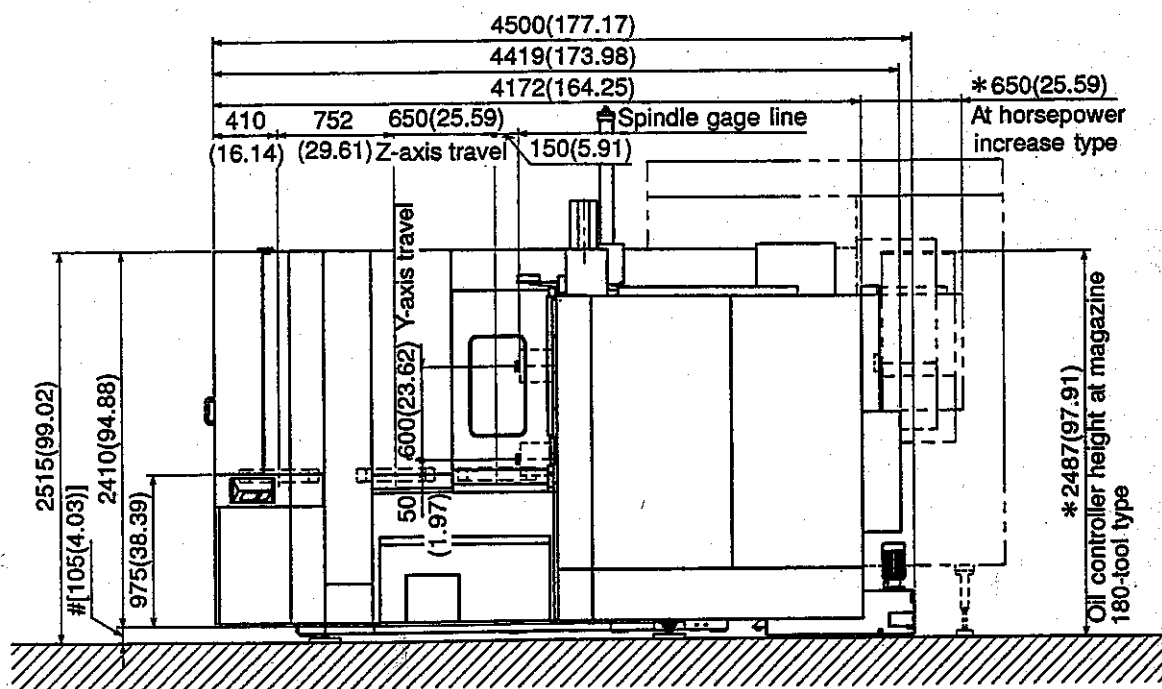


- ① Dimensions marked with "*" indicate option.
- ② Dimensions marked with "#" indicate the distance from the ground surface to the jack bolt fixed surface.
- ③ Dimensions in () are converted from metric system to inch system.

<Side View>



Left side view



Right side view

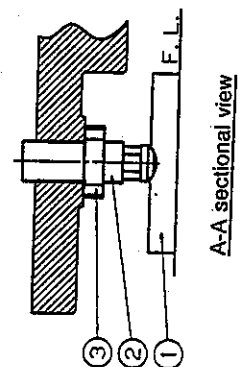
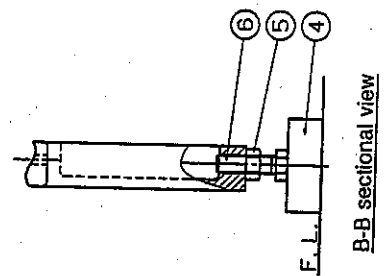
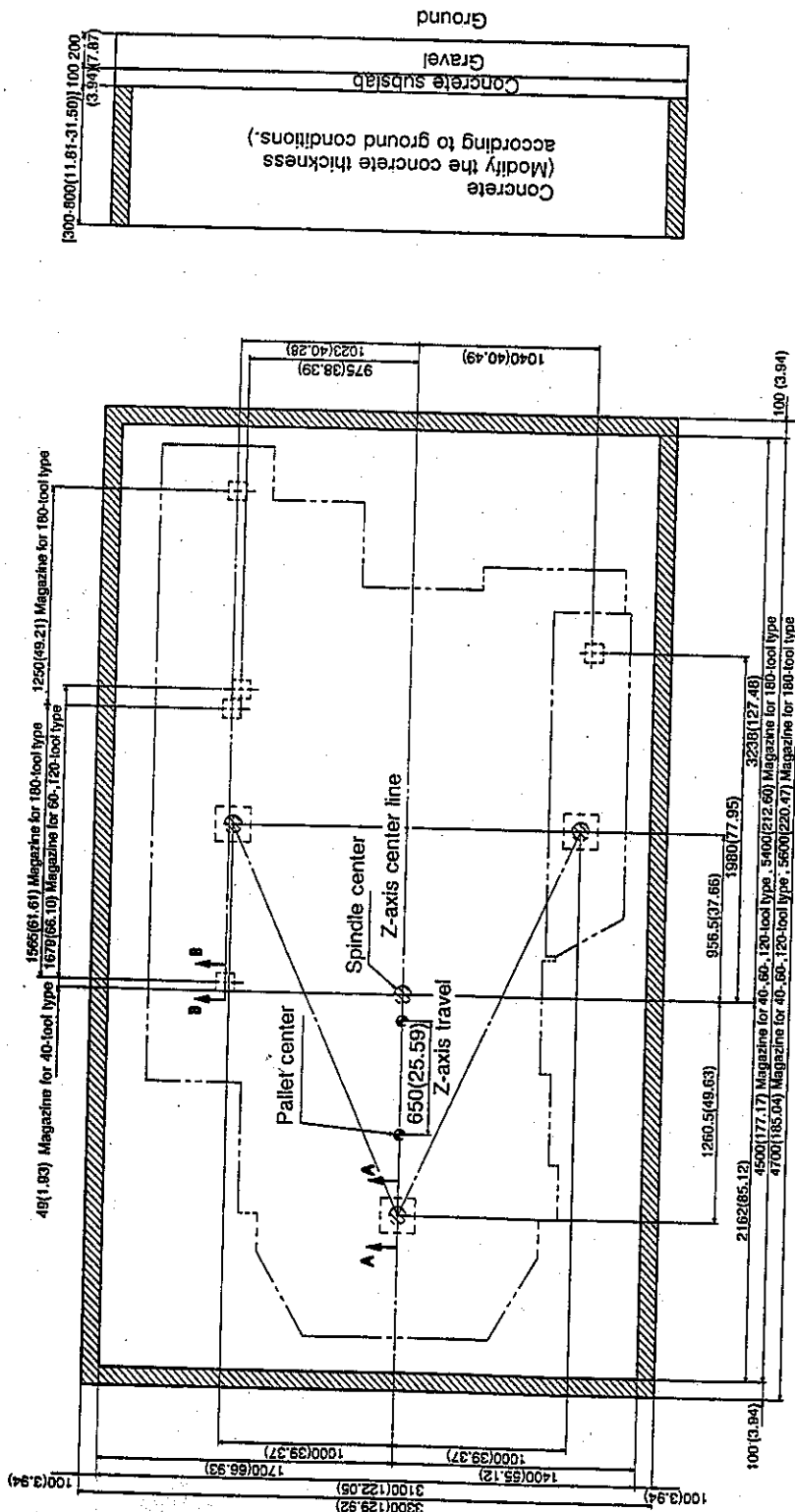


- ① Dimensions marked with "*" indicate option.
- ② Dimensions marked with "#" indicate the distance from the ground surface to the jack bolt fixed surface.
- ③ Dimensions in () are converted from metric system to inch system.

3. FOUNDATION DIAGRAM



- ① Select a place that can support the weight of the machine.
- ② To obtain and maintain the intended levels of accuracy and performance from the machine over a prolonged period of time, perform foundation work carefully and pay attention to machine installation.



No.	Design No.	Part Name	Material	Q'ty				Remarks
				40-tool	60-tool	120-tool	180-tool	
1	B45320	Jack bolt plate	SS400	3	3	3	3	Standard
2	N22024	Jack bolt	SCM435	3	3	3	3	Standard
3	N71021	Lock nut	S45C	3	3	3	3	Standard
4	B43063	Plate	SS400	2	3	3	3	Standard
5	Y60120	Nut, M20 (1 type)		2	3	3	3	Standard
6	Y17620	Cap bolt, M20 × 120 (continuous thread)		2	3	3	3	Standard

Preparation for installation (Foundation/Environment)

Adoption of three-points support structure and sufficient machine rigidity does not require rigidity of the floor as the conventional anchor bolt form. (thickness of concrete: 500 mm or more). For the ordinary factory, available minimum thickness is 300 mm.

However, if the ground is not firm or the other machine may generate vibration, carry out vibration proofing foundation work.

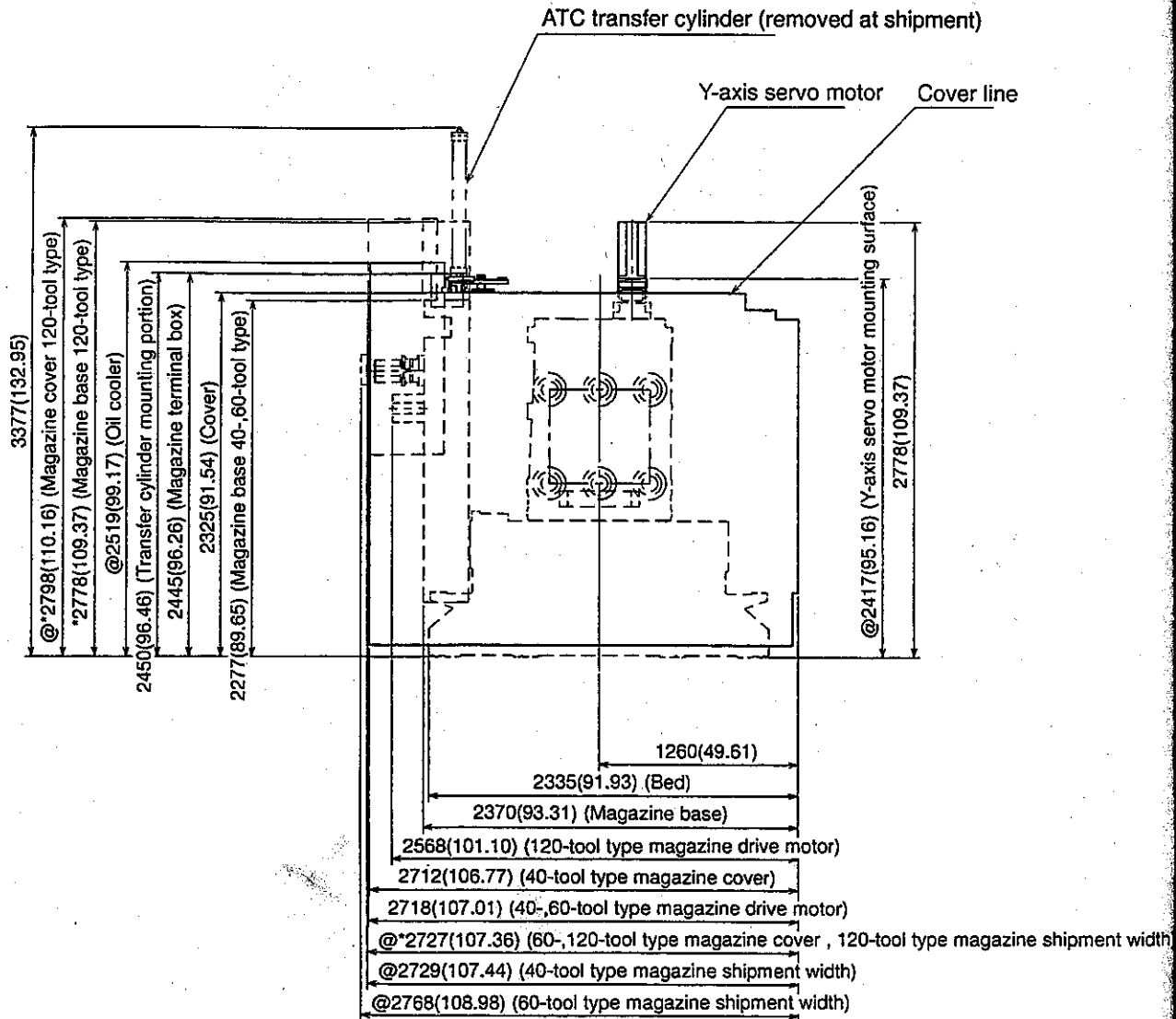
In order to maintain the machine accuracy and make full use of the functions, location must be selected carefully. If the machine is not installed in the constant temperature room, select the location to meet the following conditions:

- ① Location of less temperature change
 - Avoid the place near the entrance and exit of the factory.
 - Not exposed to the direct sunlight. Cover the window or fix the sunshades.
 - Not affected by other heating body. Enclose the machine with the insulating screen.
- ② Location where is not affected by vibration from outside
- ③ Location of little dust
- ④ Location of humidity 75% or less and no dew condensation
- ⑤ Even installation floor with no slope



- ① This drawing shows the standard foundation. Modify the concrete thickness according to ground conditions.
- ② Width of styrofoam: 100 mm (3.94 in.)
- ③ For easy supply of secondary concrete, chamfer the machine's contact point with outside at 100 mm (3.94 in.), with concrete half-dried.
- ④ Applicable concrete subslab is specified as δ_{28} (strength of 28 days after application) = 20.6 MPa (2986.2 psi).
- ⑤ Applicable concrete is specified as δ_{28} = 20.6 MPa (2986.2 psi).
- ⑥ Dig the ground at 100 mm (3.94 in.) in the outer direction of foundation outline (to fitting styrofoam of the ground).

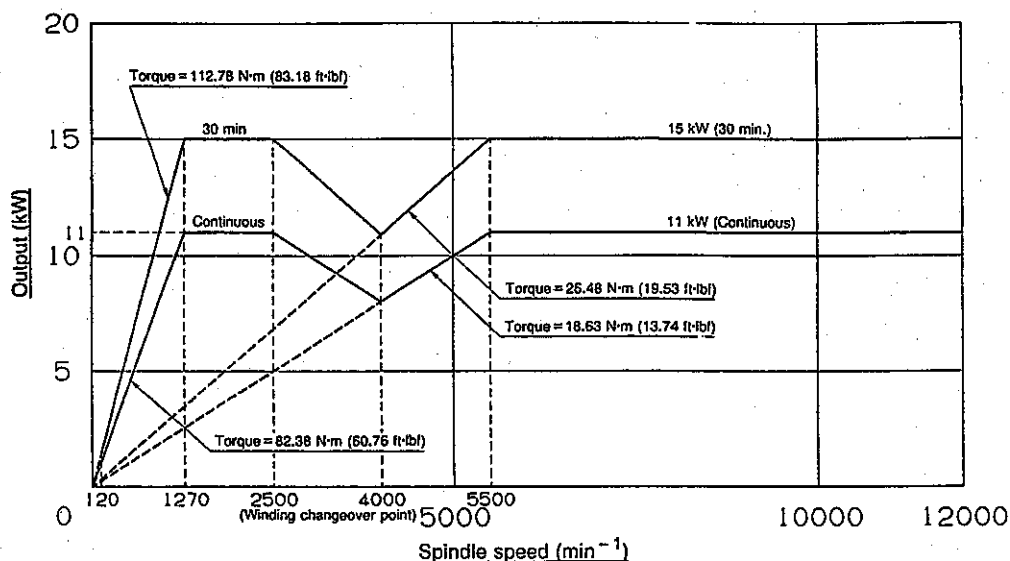
4. DISASSEMBLY DIAGRAM



- ① Dimensions in () are converted from metric system to inch system.
- ② *; optional
- ③ Disassembling the machine into the units smaller than @ marked dimensions is impossible.

5. SPINDLE SPEED OUTPUT DIAGRAMS

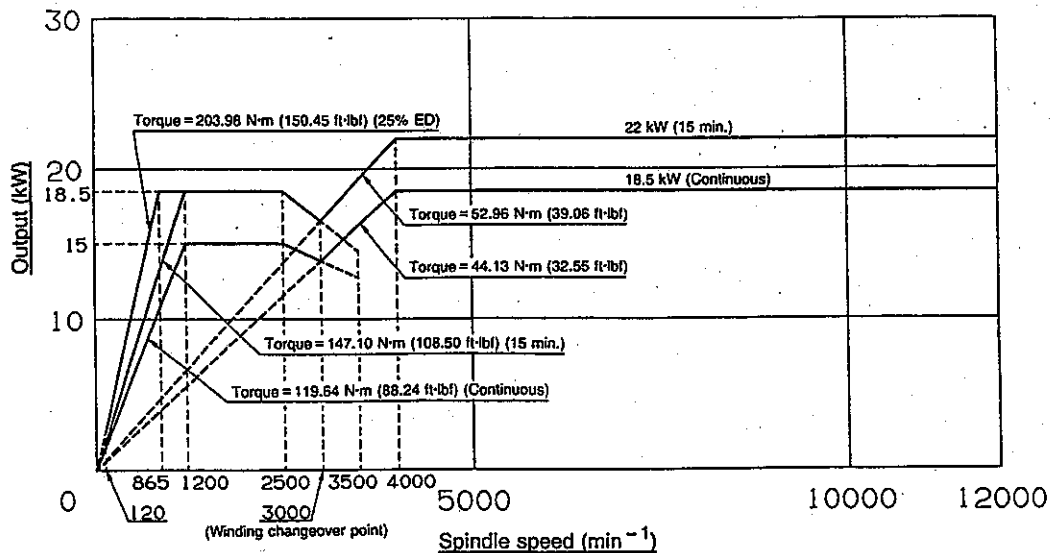
5.1 Standard



Motor specifications	
Output	15/11 kW
Time rate	30 min/continuous
Spindle speed	max. 12,000 min^{-1}
Manufacturer	FANUC

(Q43593 A02)

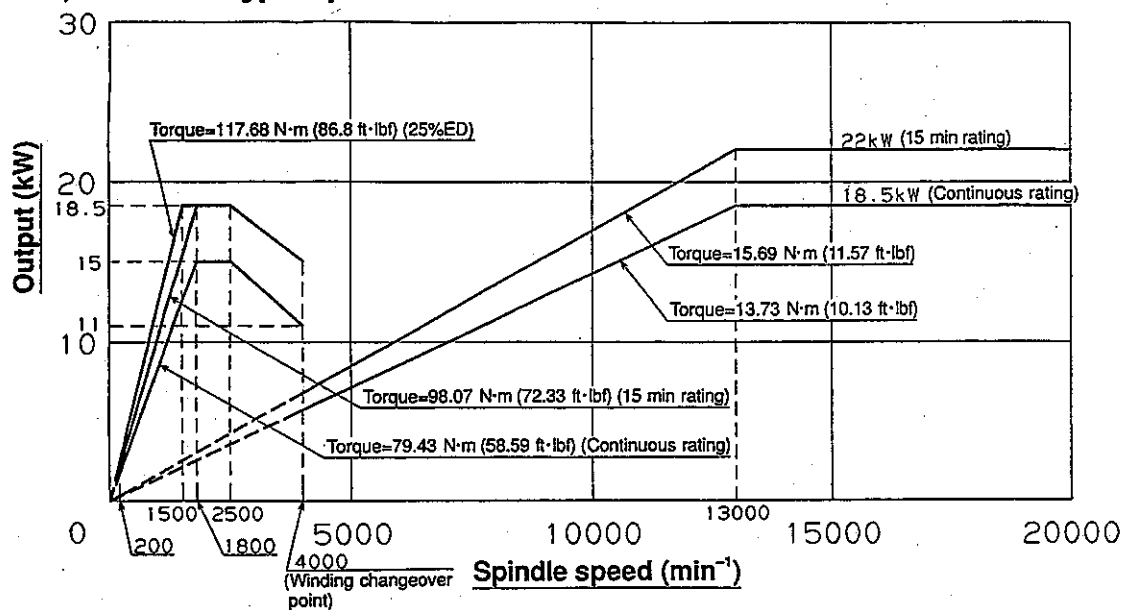
5.2 Horsepower Increase Specification



Motor specifications	
Output	22/18.5 kW
Time rate	15 min/continuous
Spindle speed	max. 12,000 min^{-1}
Manufacturer	FANUC

(Q43566 A02)

5.3 20,000 min⁻¹ Type Specification

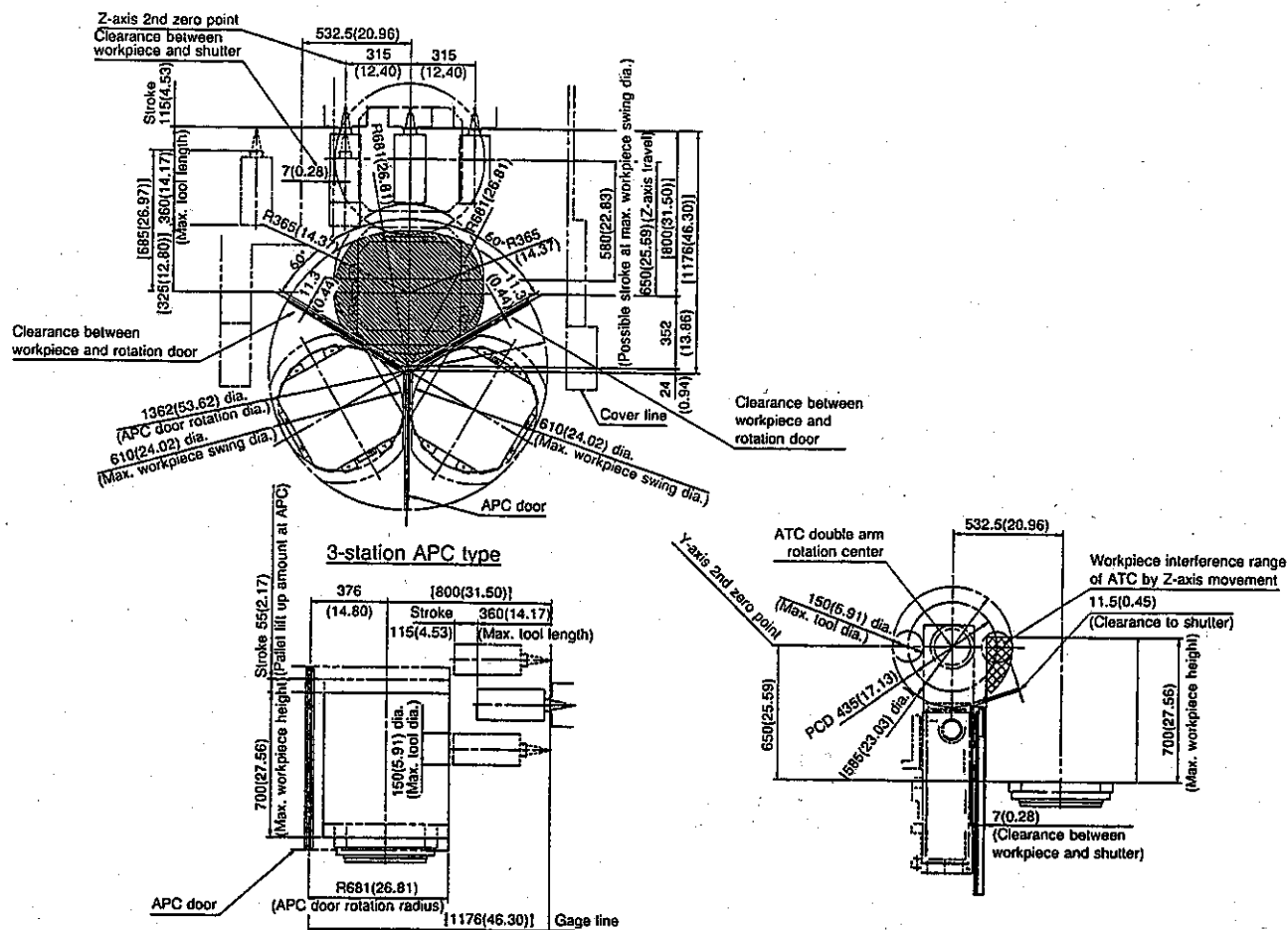


Motor specifications	
Output	22/18.5 kW
Time rate	15 min/continuous
Spindle speed	max. 20,000 min ⁻¹
Manufacturer	FANUC

(Q43602 A01)

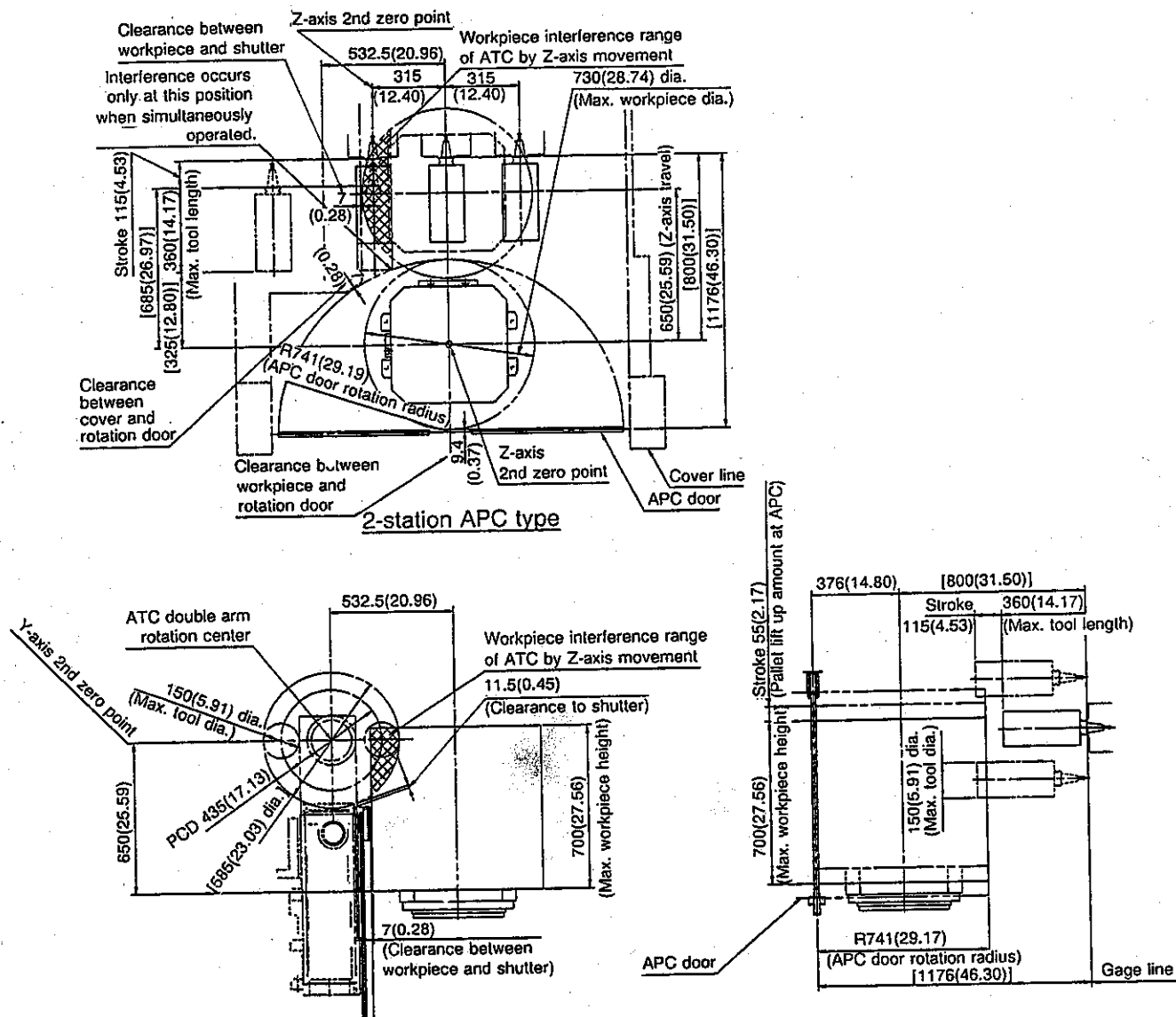
6. INTERFERENCE BETWEEN TOOL AND WORKPIECE

6.1 2-station APC Type



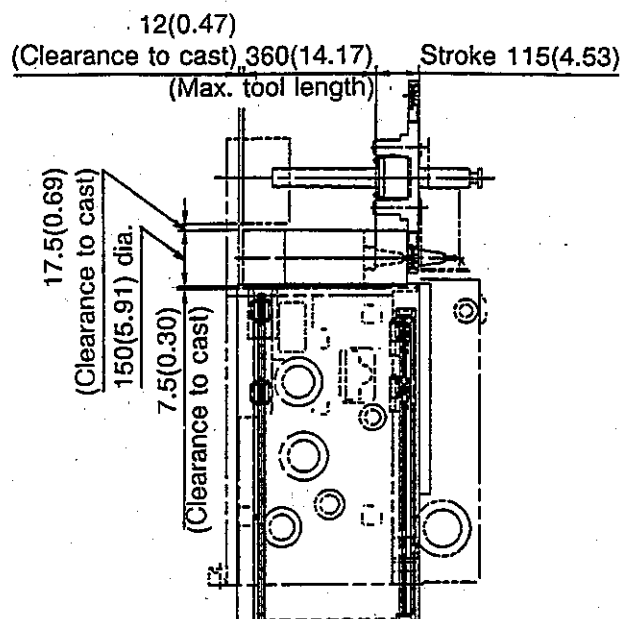
- ① Dimensions in brackets [] are only for reference.
- ② The X-axis 2nd zero point is ATC operation position.
The Y-axis 2nd zero point is ATC operation position.
The Z-axis 2nd zero point is APC operation position.
- ③ When the ATC and APC are simultaneously operated at loading of maximum tool, an interference occurs. (Interference does not occur when the tool length is less than 350 mm (13.77 in.).)
- ④ Dimension in () are converted from metric system to inch system.

6.2 3-station APC Type



- ① Dimensions in brackets [] are only for reference.
- ② The X-axis 2nd zero point is ATC operation position.
The Y-axis 2nd zero point is ATC operation position.
The Z-axis 2nd zero point is APC operation position.
- ③ When the workpiece diameter is in the range of 610 mm to 730 mm (24.01 in. to 28.74 in.), the APC can be operated in the portion marked with slanted line.
- ④ Dimension in () are converted from metric system to inch system.

6.3 Interference between ATC and Tool



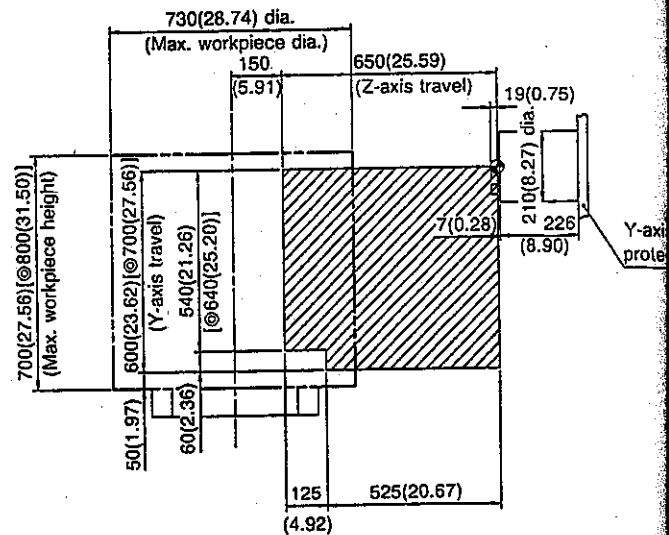
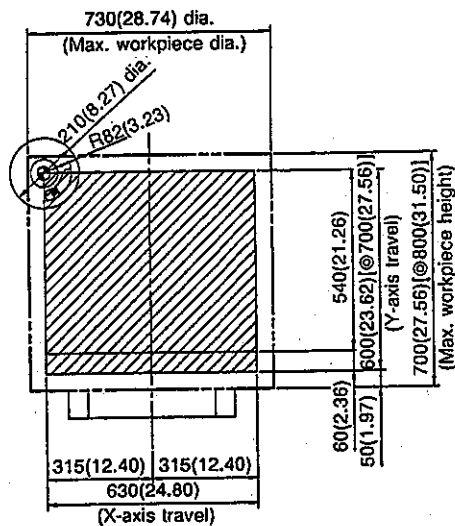
Interference diagram
between ATC and tool



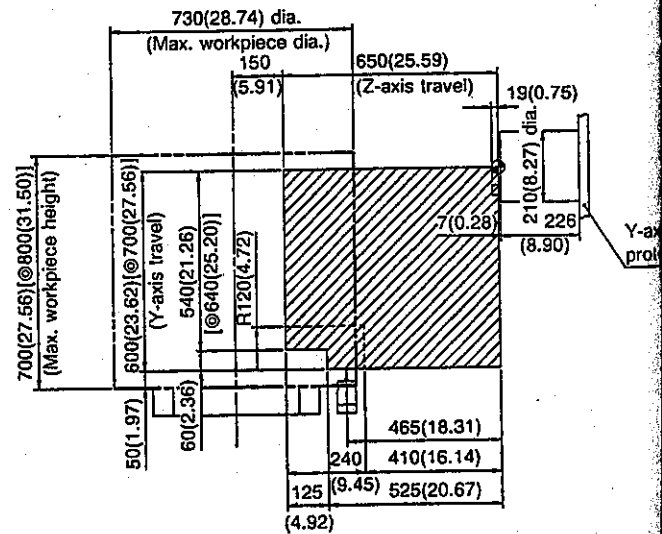
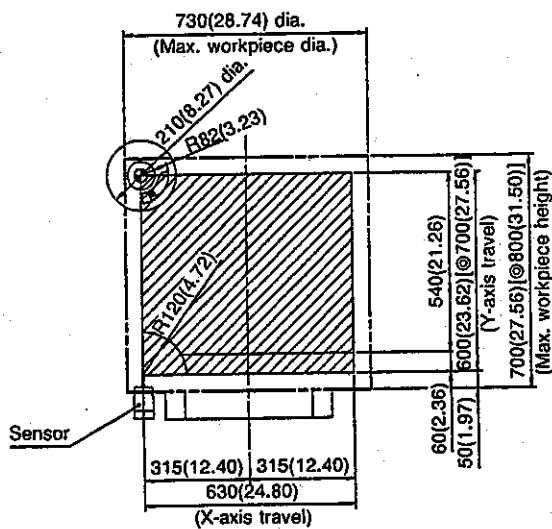
- ① When the workpiece diameter is in the range of 610 mm to 730 mm (24.01 in. to 28.74 in.), the APC can be operated in the portion marked with slanted line.
- ② Dimension in () are converted from metric system to inch system.

(Q53065 A03)

7. AXIS TRAVEL DIAGRAMS



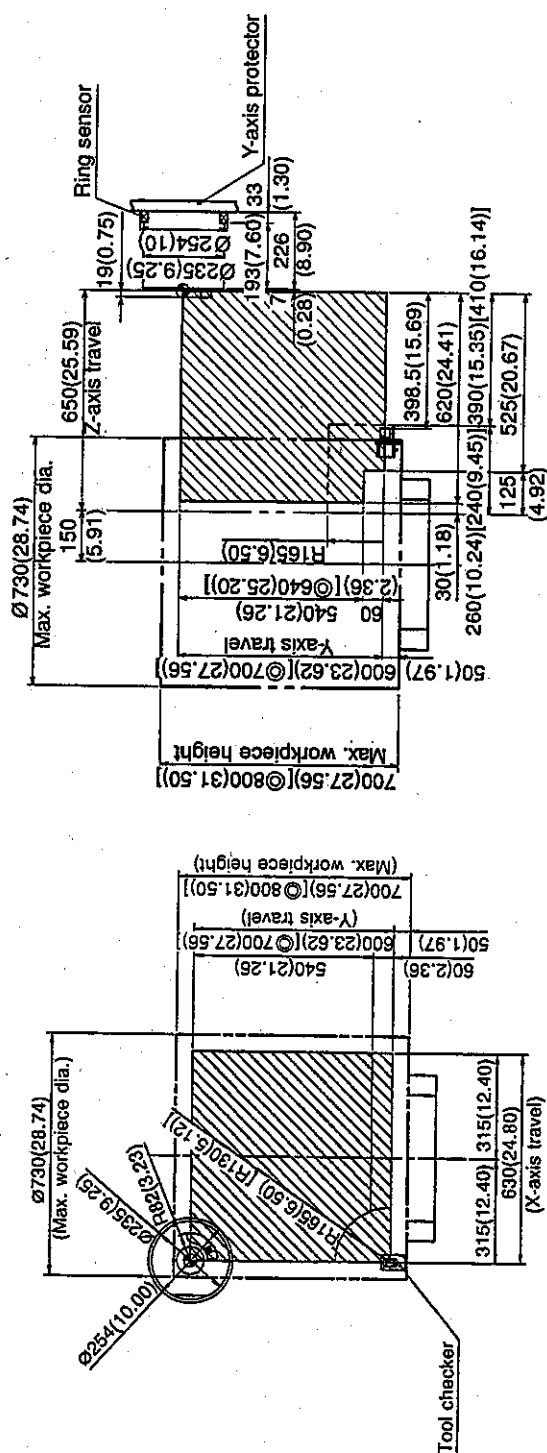
Axis travel range (standard)



Axis travel range (tool length measurement type sensor specification)

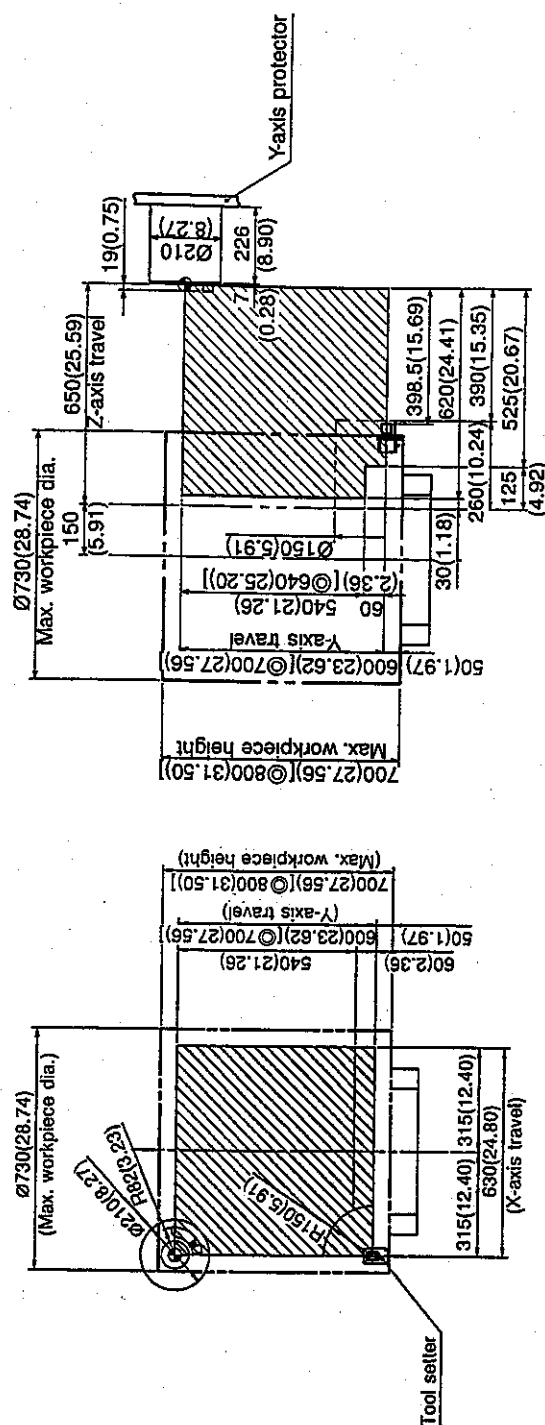


- ① Drawing indicates machine travel range. Takes into consideration spindle head and pallet interference at B-axis zero point. Interference with edge locator, etc. is not included.
- ② ● indicates machine zero point.
- ③ ◎ indicates the length for raised column specifications.
- ④ Dimension in () are converted from metric system to inch system.



Axis travel range (metal contact type sensor)

Remark: Dimensions in bracket [] are axis travel range for the models equipped with the tool length measurement sensor instead of the tool checker for metal contact type sensor.



Axis travel range (table mount type sensor)



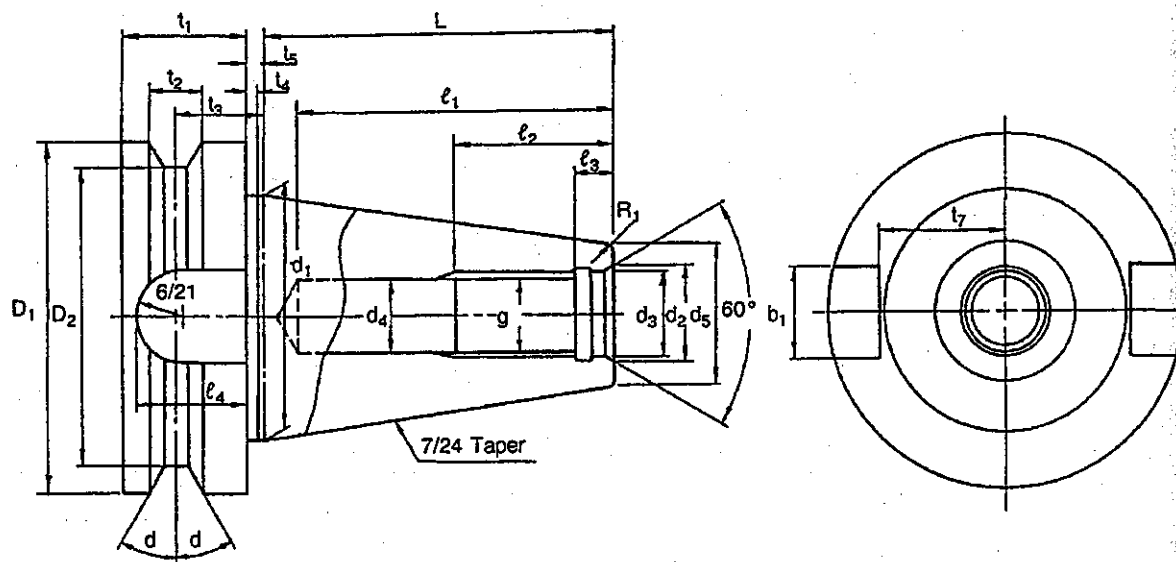
- ① Drawing indicates machine travel range. Takes into consideration spindle head and pallet interference at B-axis zero point. Interference with edge locator, etc. is not included.
- ② indicates machine zero point.
- ③ indicates the length for raised column specifications.
- ④ Dimension in () are converted from metric system to inch system.

8. TOOL SHANK DIMENSIONS



The dimension given below are for reference purposes only. For details, consult the individual tool makers.

8.1 MAS BT-40



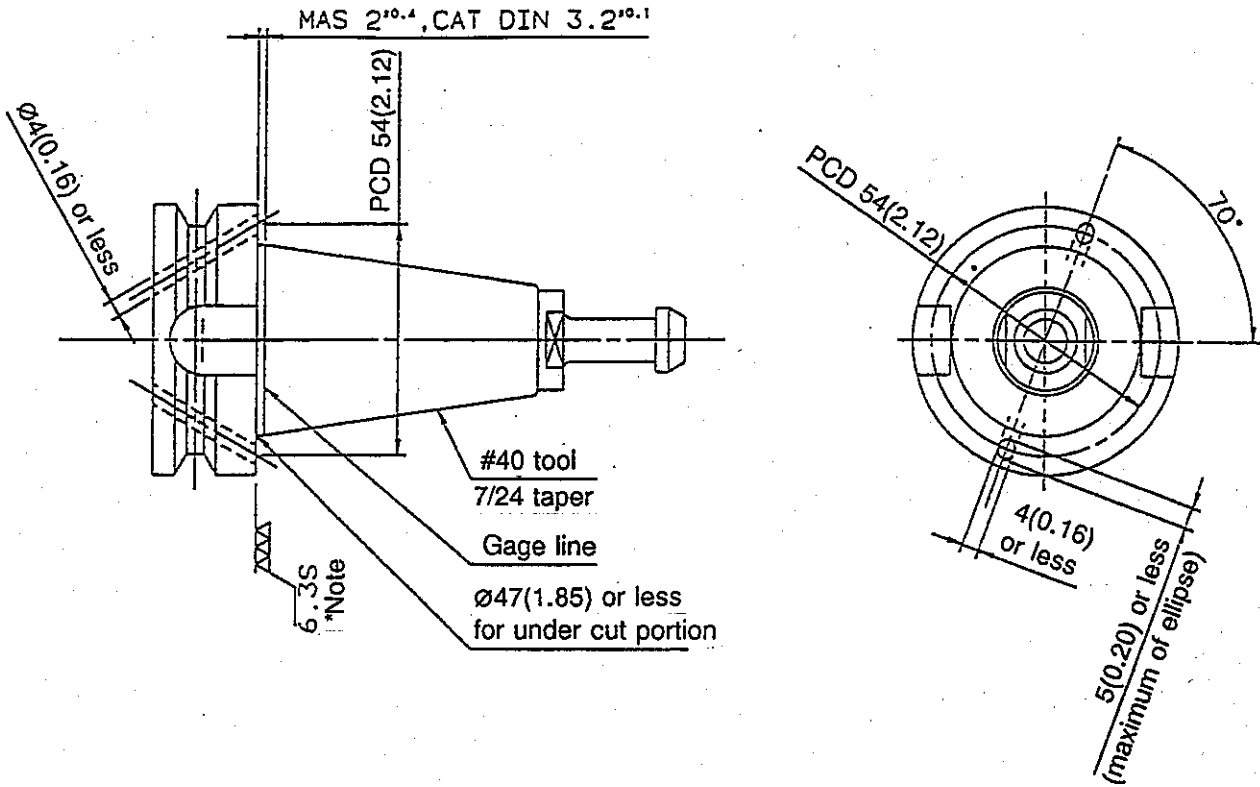
Dimensions Unit: mm (in.)

	D ₁		D ₂	t ₁	t ₂		t ₃		t ₄	t ₅	
	Dimen- sions	Tolerance			Dimen- sions	Tolerance	Dimen- sions	Tolerance		Dimen- sions	Tolerance
BT-40	63 (2.48)	0 -0.05 (-0.002)	53 (2.09)	25 (0.98)	10 (0.39)	+0.1 (+0.004) 0	16.6 (0.65)	±0.1 (±0.004)	2 (0.08)	2 (0.08)	±0.4 (±0.02)

	d	d ₁	d ₂	d ₃		d ₄	L		l ₂	l ₃	g
				Dimen- sions	Tolerance		Dimen- sions	Tolerance			
BT-40	30 (1.18)	44.45 (1.75)	19 (0.75)	17 (0.67)	+0.027 (+0.001) 0	14 (0.55)	65.4 (2.57)	±0.2 (±0.008)	30 (1.18)	8 (0.31)	M16

	l ₄	b ₁		t ₇		d ₅	l ₁
		Dimen- sions	Tolerance	Dimen- sions	Tolerance		
BT-40	21 (0.83)	16.1 (0.63)	+0.18 (+0.007) 0	22.6 (0.89)	0 -0.2 (-0.008)	25.3 (1.00)	43 (1.69)

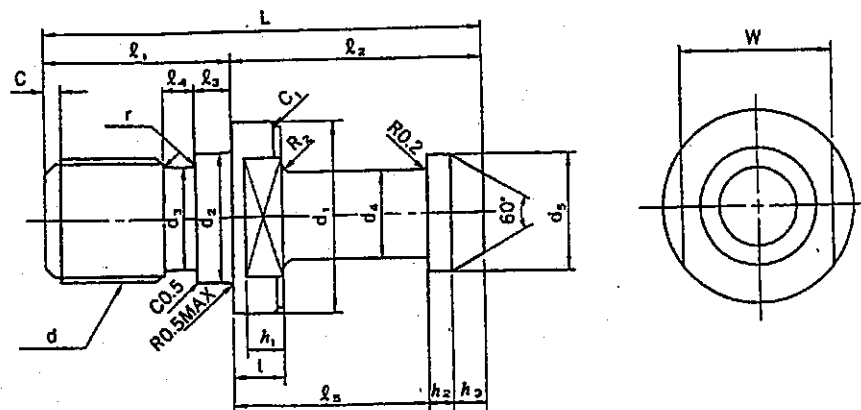
8.2 Tool Shank for Through-spindle Coolant System



If surface finish accuracy is not adequate, coolant leak problem might occur.

(Q81005 A03)

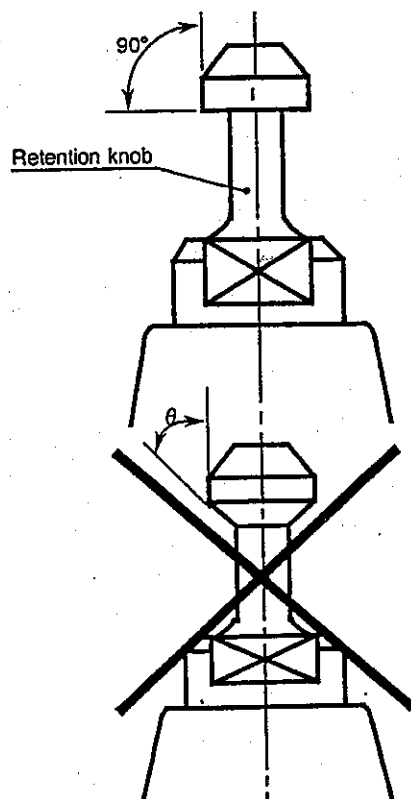
8.3 Retention Knob Dimensions



Dimensions Unit: mm (in.)

	L	ℓ_1	ℓ_2		d_1	t		h_1	$d_2 (h_7)$		ℓ_3	d_3	ℓ_4
			Dimen- sions	Tolerance		Dimen- sions	Tolerance		Dimen- sions	Tolerance			
BT-40	60 (2.36)	25 (0.98)	35 (1.38)	0 -0.1 (-0.004)	23 (0.91)	6 (0.24)	0 -0.1 (-0.004)	4 (0.16)	17 (0.67)	0 -0.011 (-0.0004)	5 (0.20)	13 (0.51)	4 (0.16)

	r	d	c	ℓ_5		d_4		d_5		h_2	h_3	W	
				Dimen- sions	Tolerance	Dimen- sions	Tolerance	Dimen- sions	Tolerance			Dimen- sions	Tolerance
BT-40	1 (0.04)	M16	2 (0.08)	28 (1.10)	0 -0.1 (-0.004)	10 (0.39)	0 -0.1 (-0.004)	15 (0.59)	0 -0.1 (-0.004)	3 (0.12)	4 (0.16)	19 (0.75)	0 -0.35 (-0.01)



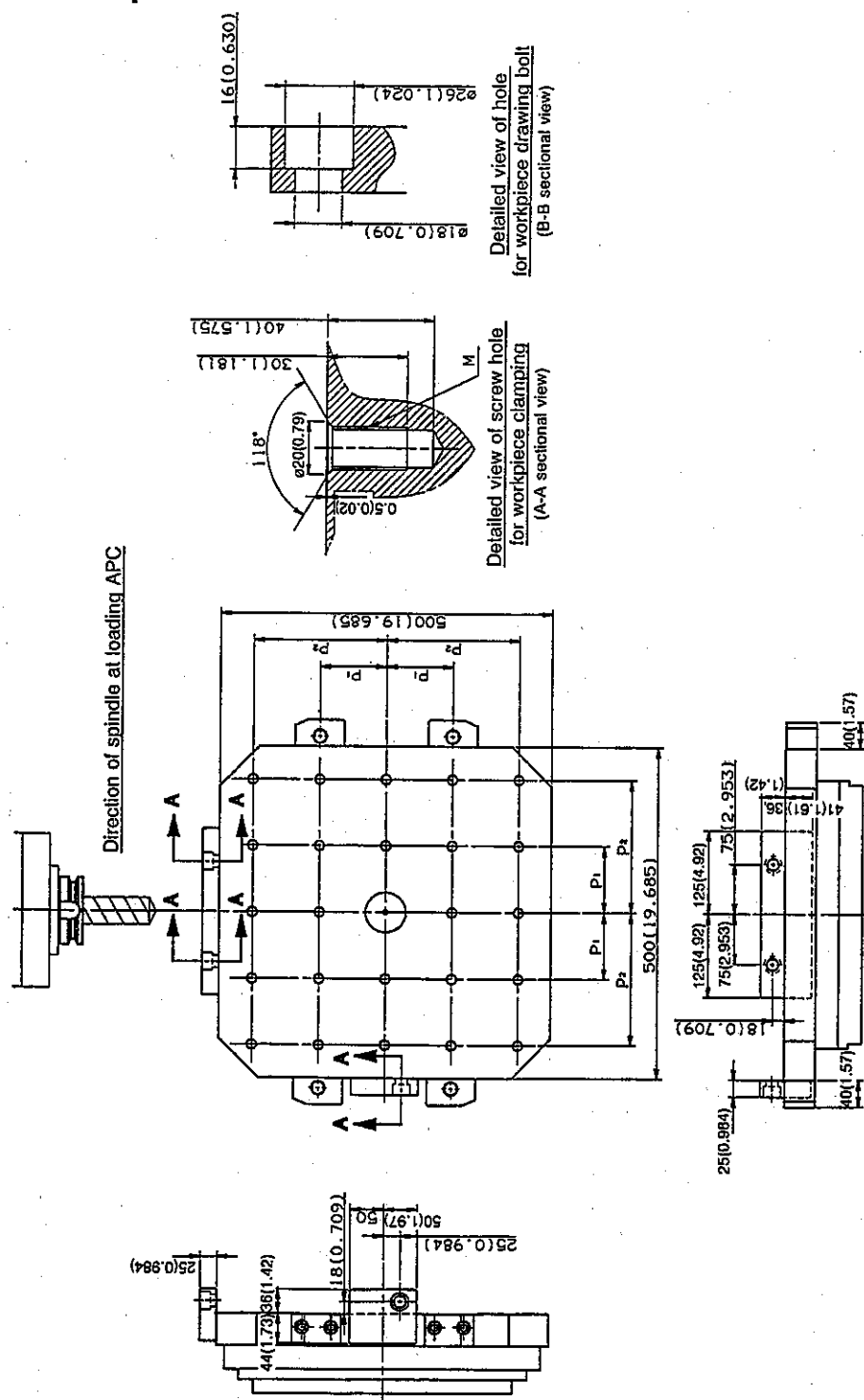
Only use Mori Seiki's special retention knob when using BT or CAT specification tools.

The retention knob illustrated below requires a different tool clamping mechanism and should not be used. If it is used, the collet will break and unexpected damages will be caused.

$\theta = 45^\circ$ MAS I type
 $\theta = 60^\circ$ MAS II type

9. PALLET DIMENSIONS

9.1 Tap Pallet



Pallet Spec.	M	P ₁	P ₂
Metric tap	M16	100 mm	200 mm
Inch tap	1/2-13 UNC	4"	8"

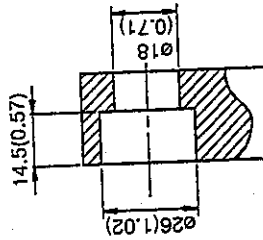
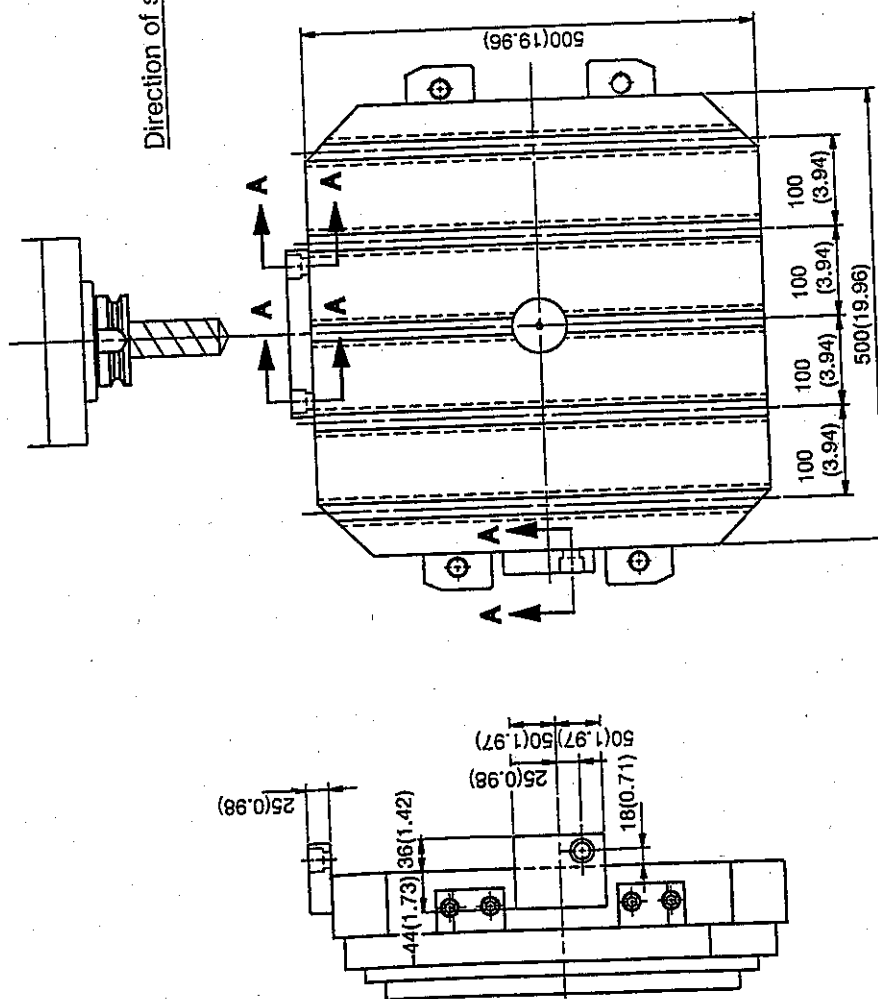


() indicates inch specification.

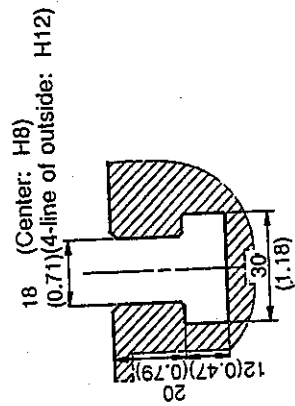
(Q51882 A01)

9.2 T-slot Pallet

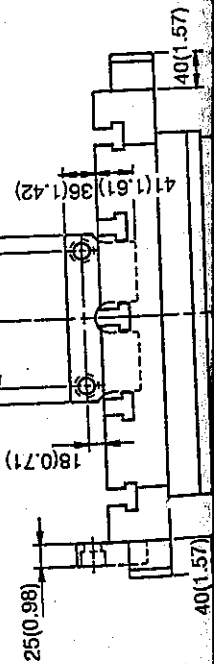
Direction of spindle at loading APC



Detailed view of hole for workpiece drawing bolt
(A-A sectional view)

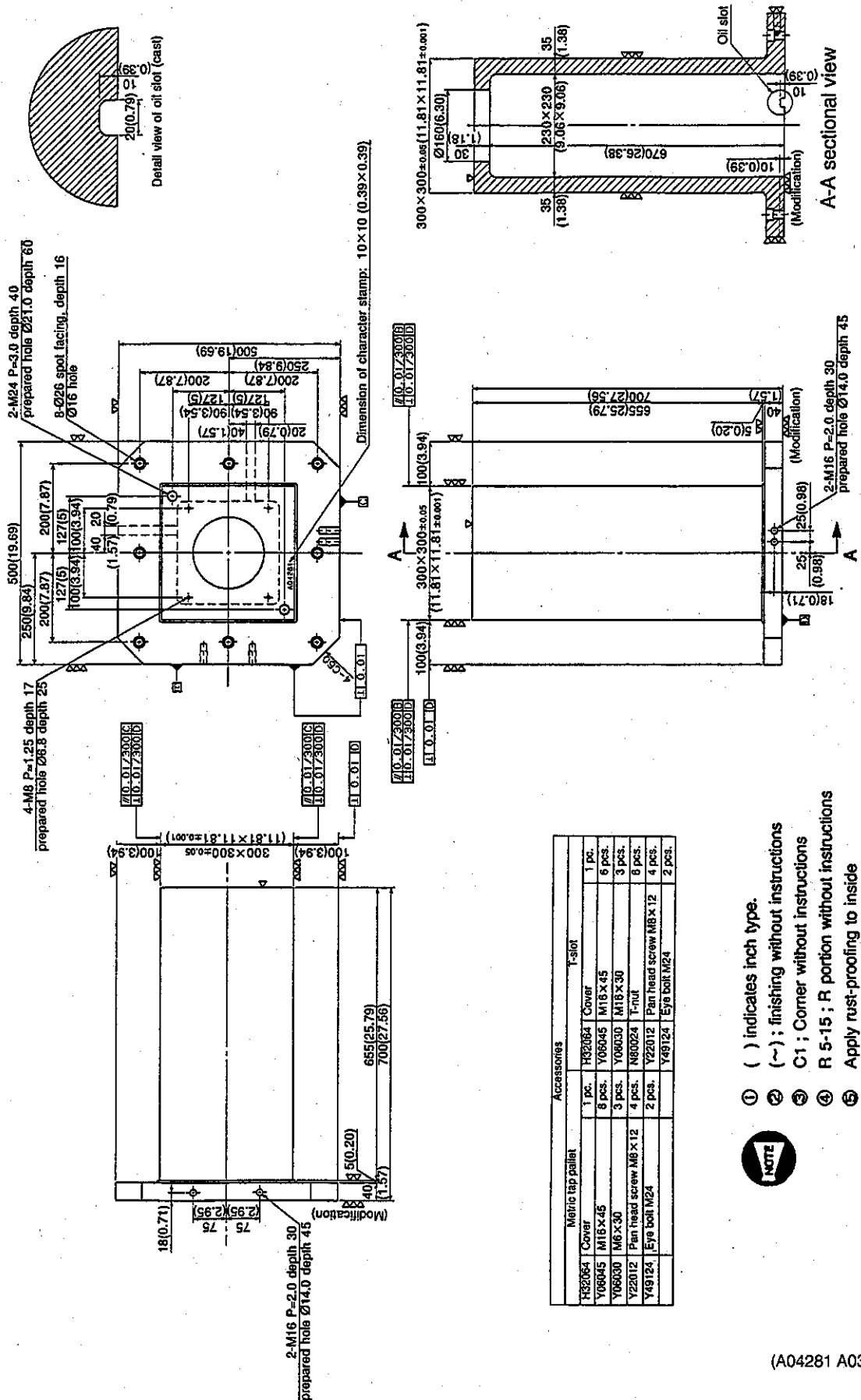


Detailed view of T-slot

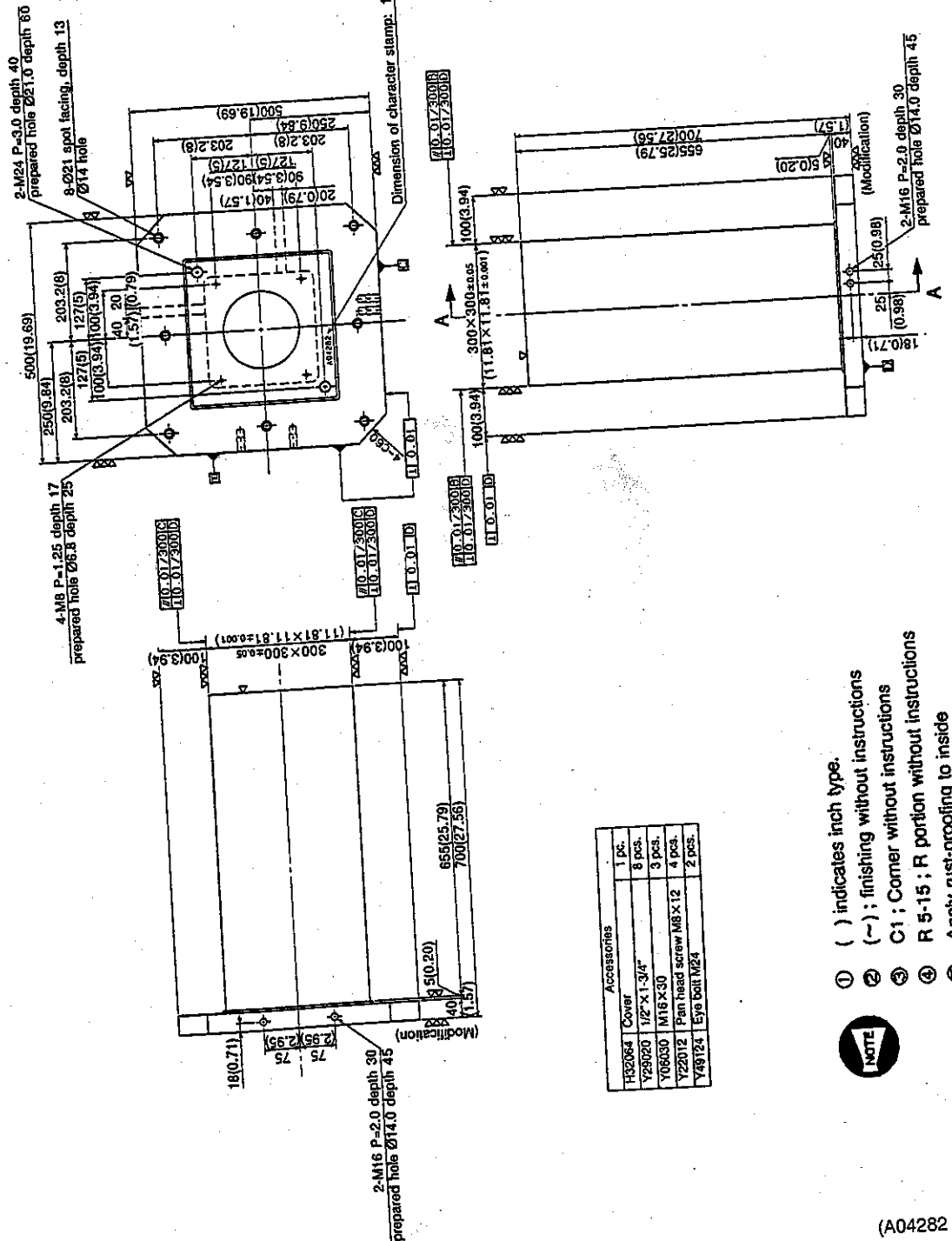
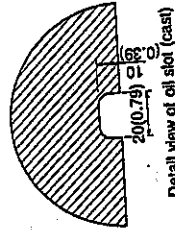


10. FOUR-SIDE CLAMPING BLOCK DIMENSIONS

10.1 T-slot Pallet



10.2 Tap Pallet



Accessories	1 pc.
H32064 Cover	8 pcs.
Y29020 1/2"×1-3/4"	3 pcs.
Y06030 M16×30	4 pcs.
Y22012 Pan head screw M8×12	2 pcs.
Y49124 Eye bolt M24	

- ① () indicates inch type.
- ② () indicates finishing without instructions
- ③ C1; Corner without instructions
- ④ R 5-15; R portion without instructions
- ⑤ Apply rust-proofing to inside



