

SMART
MACHINE TOOL

NX5000

**Installation
Packet**

1. INSTALLATION

1.1 Foundation

WARNING



CUSTOMERS ARE RESPONSIBLE FOR FOUNDATION & GROUTING.

SUCCESSFUL FOUNDATION AND GROUTING WORKS ARE CRITICAL FOR MAINTAINING THE ORIGINAL MACHINE ACCURACY FOR A LONG PERIOD OF TIME.

DETAILS OF FOUNDATION & GROUTING ARE SPECIFIED ON THE NIIGATA FOUNDATION DRAWINGS SUBMITTED TO YOU IN ADVANCE.

IF YOU ARE NOT COMFORTABLE WITH THESE JOBS, CONSULT WITH YOUR LOCAL SPECIALIST OR CONTRACTOR.

FOUNDATION CONCRETE CURES IN A LONG TIME AND FOUNDATION LEVEL CHANGES GRADUALLY.

CHECK MACHINE LEVEL PERIODICALLY AND RELEVEL, IF NECESSARY.

1.2 Ambient Conditions

If you have a freedom of choice for the installation location, please avoid following locations which are unfavorable to make the most of the M/C:

- (1) Locations with excessive temperature variation such as direct sun shines, near furnaces / heat exchangers and air blow outlet.

Preferable ambient conditions are as follows.

- Ambient temperature: 5°C ~ 40°C
(Average temperature in 24 hours: 35°C or less)
- Humidity: 50% or less (40°C), 90% or less (20°C)

Note: Refer to JIS B6015 for more detailed information. Please keep in mind that severe ambient conditions affect M/C accuracy and life time.

- (2) Dusty area affected by cutting chips, dirty oil or coolant from other machines. M/C slide ways and electrical components are susceptible or damaged and/or their lives shortened.
- (3) Soft soil
If bearing capacity of the soil is not enough, drive bearing piles to establish bearing capacity of 49 kN/m² or more. Refer to the "FOUNDATION DRAWING" submitted or filed in the INSTRUCTION MANUAL.
- (4) Near vibration source (another M/C or units)
In case you cannot avoid vibration from other sources, apply anti-vibration foundation and /or separation grooving around the M/C foundation to shut out vibration to the M/C.
- (5) Other cautions
 - 1) Secure enough room for operator setup jobs around the APC and ATC magazine.
 - 2) Secure door opening space for the main control panel, oil supply and maintenance space for the lubrication unit, pneumatic unit, spindle cooler and hydraulic unit.
 - 3) Secure approx. 500 mm area from the air inlet of the spindle cooler for free airflow.
 - 4) Secure enough space to move out the coolant tank or chip bucket for maintenance and cleaning.

1.3 Ground Fault Circuit Breaker

IN CASE YOU INSTALL A GROUND FAULT CIRCUIT BREAKER ON YOUR POWER SUPPLY LINES TO THE M/C, PLEASE SELECT ONE WITH FUNCTIONING CAPACITY 200 mA OR MORE.

1.3.1 Leakage Current of Machining Centers

HIGH FREQUENCY LEAKAGE CURRENT is flowing from the motor windings, power cables or amplifiers for spindle and axis drive motors because of PWM inverter control on Niigata machining centers, even though power source current is not leaked, If capacity of the leakage breaker is low, it may trip with high frequency leakage current regardless no actual leakage.

Niigata's M/Cs are equipped with 200mA capacity breaker.

If you are going to install a leakage breaker on the power supply lines to the M/C, please select one with 200mA or more ratings.

1.3.2 Importance of the Grounding job

Proper grounding connection is critical for safety of operators, maintenance engineers and those who might physically touch the M/C.

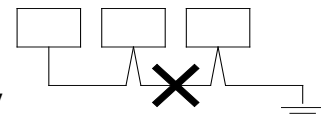
If improper grounding connection between the M/C and earth is provided, the ground fault circuit breaker does not trip even though actual leakage current is output. Also high frequency leakage current will not be carried away to the ground.

If an operator or other people touch the M/C with improper grounding, it can leak through human body. It is quite dangerous.

Grounding work is the customer's responsibility at the time of M/C installation.

1.4 Preparations for M/C Installation and Safety

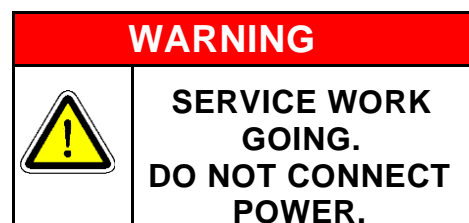
Please refer to the foundation drawings, submitted in advance, to arrange and provide primary electric power and pneumatic sources at timely manner.



- (1) To avoid electric shock, connect grounding wires individually to each grounding terminal in the control cabinet and the grounding rod.
- (2) Power source connection must be executed by authorized personnel. In power wire connection, electric power from your factory side must be shut OFF.

NEVER CONNECT POWER UNTIL WIRE CONNECTIONS COMPLETION AND SECURING HUMAN BODY SAFETY.

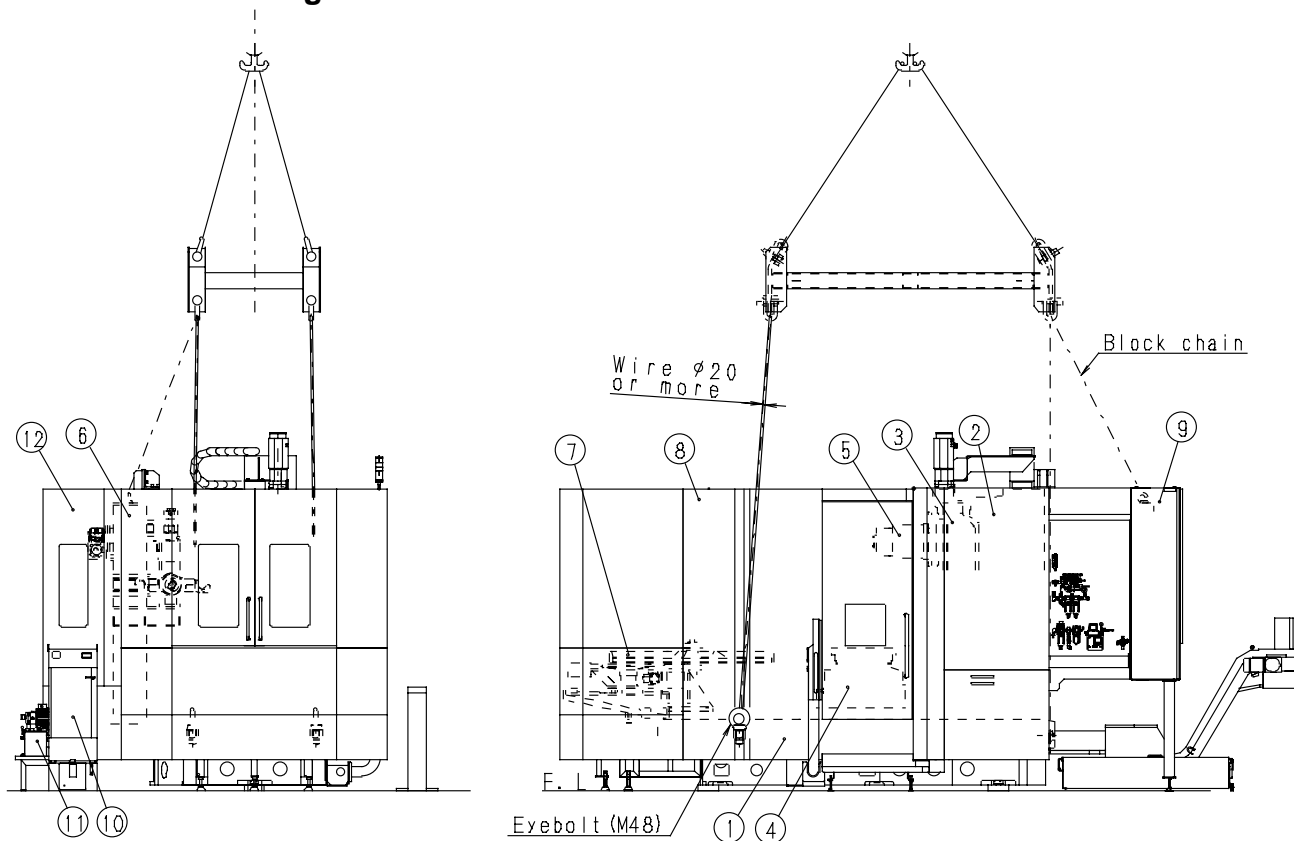
- (3) Stand warning board(s) to notify electric wire connections or grounding works in progress to other people.
- (4) If you plan to move / reinstall the M/C, contact Niigata for proper procedures to avoid accidents.
- (5) In crane and / or forklift operations and other hoisting, working must be executed by authorized personnel.
- (6) Check wire ropes, shackles, and lifting apparatuses before using whether their capacities are suitable for M/C mass.
- (7) In M/C lifting, check no other operator or people around the M/C.



NEVER ACCESS UNDER THE M/C AFTER M/C LIFTED UP.

- (8) If you plan to relocate the M/C, please inform to Niigata.
- (9) Keep primary power voltage fluctuation equal to or less than $\pm 10\%$ for rated value.

1.5 Machine Lifting



- | | |
|----------------|-----------------------|
| ① Base | ⑦ 2APC |
| ② Column | ⑧ Splash guard |
| ③ Saddle | ⑨ Control panel |
| ④ Table | ⑩ Spindle oil chiller |
| ⑤ Spindle head | ⑪ Hydraulic unit |
| ⑥ ATC magazine | ⑫ ATC magazine cover |

1.5.1 Machine Mass: Approx. 16,000 kg (for 60 ATC magazine)

1.5.2 Precautions in Machine Lifting

- Four (4) wire hooking points are provided on the base. Furthermore, an additional support wire point is provided at ATC magazine rear side. Attach 2-M48 eyebolts on the base front side and 1-M30 eyebolt on the ATC magazine rear side. (M48 eyebolts are not included in the machine.)
- Be sure to use four wires each with a diameter of $\phi 20$ or more and without damage for each lifting position. Keeping the machine horizontal during lifting is critical. Use block chains at back side wires for length adjustment. Watch that there is no contact between the wires and machine in lifting.
- Never lift the Column (2).

1.5.3 Parts to be Dismantled in Machine Lifting

- Spindle cooling unit ⑪ (remove the piping.)
- Hydraulic unit ⑪
- Two (2) round top covers of splash guard ⑧

1.5.4 Fixing of Movable Parts

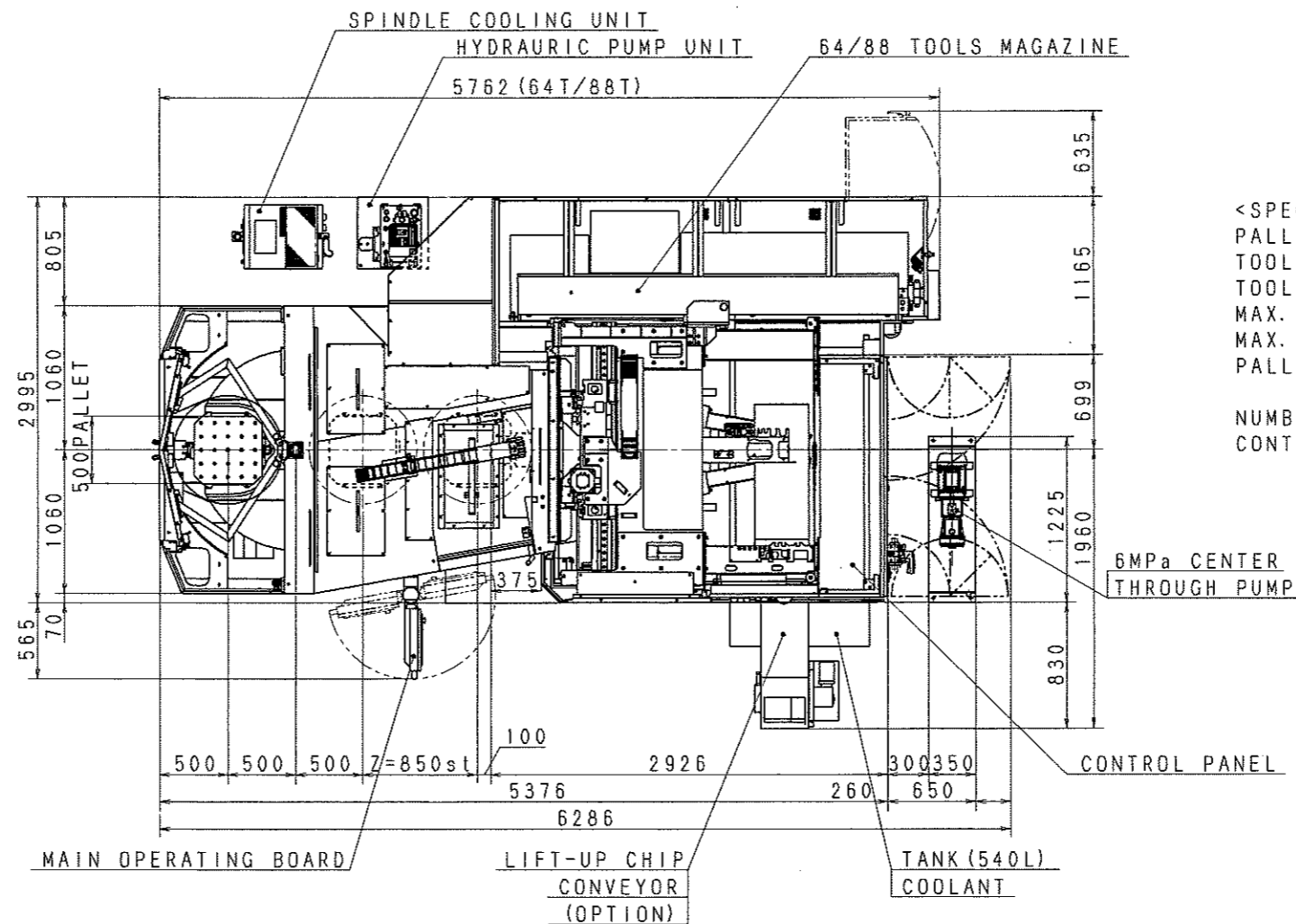
- (1) In transportation, prepare wooden supports or fixtures to securely fix the saddle ③, table ④ and spindle head ⑤.

(Because linear motion bearings are adopted on each axis, frictional resistance is minimal and external forces influence stability of fixed axis units.)

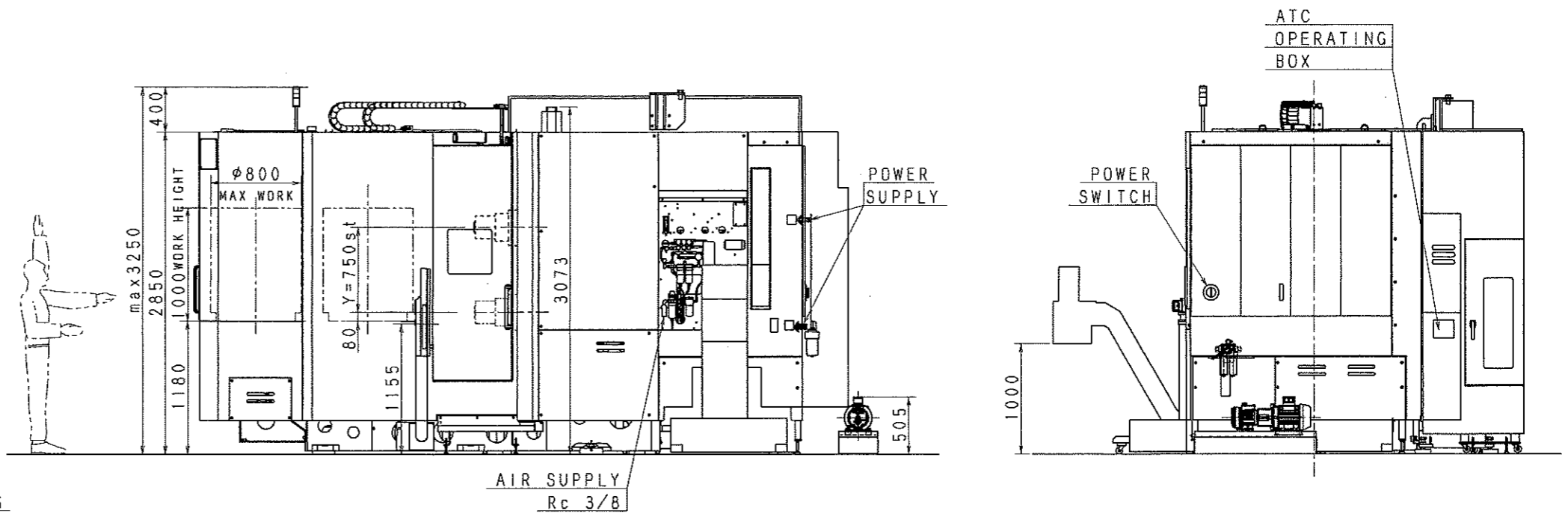
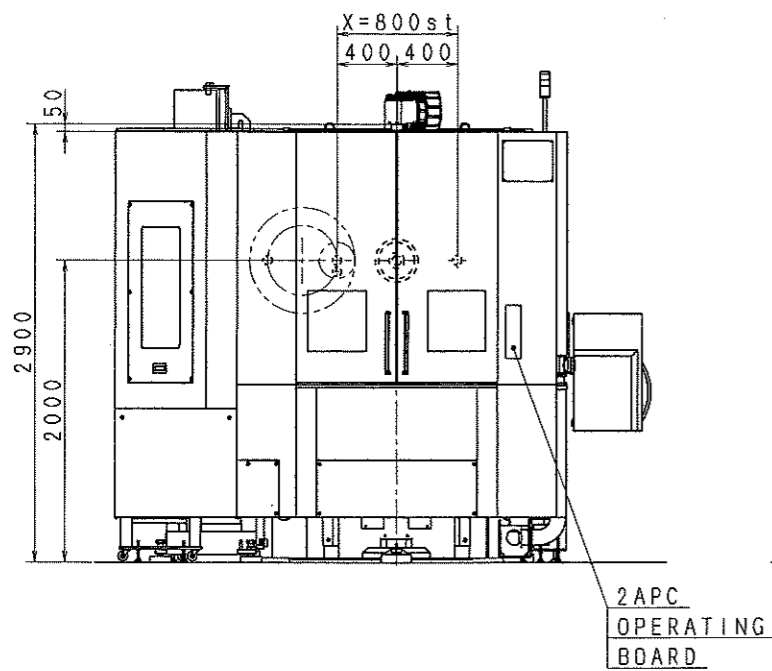
- (2) Fix the saddle ③ at the center in the lateral direction, table ④ in the column direction, and spindle head ⑤ in the downward direction.

1.5.5 Lifting Condition

- The ATC magazine ⑥, control panel ⑩, and splash guard ⑧ can be lifted as assembled with the machine body.



<SPECIFICATION>
 PALLET LOADING CAPACITY : 800kg
 TOOL MAGAZINE : CHAIN TYPE
 TOOL STRAGE CAPACITY : 64 / 88 TOOLS
 MAX. TOOL LENGTH : 550 mm
 MAX. TOOL MASS : 30 kg
 PALLET CHANGER : DIRECT ROTARY TYPE
 NUMBER OF PALLET : 2
 CONTROL PANEL DISPLAY : 15"



(参) 4125A09180		No.		変更内容 REVISION		指示書 No. SHEET No.		承認 APPD.		照査 REV.		担当 CHD.		日付 DATE	
材質 MATERIAL	質量 MASS (kg)	熱処理 HEAT TREATMENT	硬度 HARDNESS	承認 APPD.	照査 REV.	担当 CHD.	製図 DWG.	日付 DATE	材料 MATERIAL	質量 MASS (kg)	熱処理 HEAT TREATMENT	硬度 HARDNESS	承認 APPD.	照査 REV.	担当 CHD.
				阿部 吉田	吉田	吉田	間	19/12/27	NX5000	UNIT	スガズ	図名 TITLE	スガズ P2-T64/88		
										図番 DWG. No.	4 1.2 5.A 5.0 0.3 0. 1/1				

NX5000 OIL TABLE (P2-T60&T64&T88, 12000 or 8000 min⁻¹ SPINDLE)

Units or locations for oil supply	Q'ty	Supply method	ISO 3448 Viscosity Grade	JIS B6016 Mark of oils and lubricants	JXTG Nippon Oil & Energy	EXXON MOBIL		SHELL
						ESSO	MOBIL	
Spindle cooling unit	50L	Automatic circulation	ISO VG10	FC10	SUPER Mulpas DX 10	SPINESSTIC 10	MOBIL VELOCITE OIL No.6	SHELL TETRA OIL 10 SP
Spindle oil-air lubricating unit	1.8L	Auto supply (Non-collect)	ISO VG32	FC32	FBK OIL RO32	TERESSO 32	MOBIL DTE OIL LIGHT	SHELL TELLUS S2 M 32
XYZ-axes ball screws and Linear motion bearings ☆	700cm ³	Auto supply (Non-collect)	Maker : LUBE Special grease LHL-X100-7 (700ml of cartridge type)					
1° table	4.0L	Oil bath	ISO VG150	CKC150	BONNOC TS150	SPARTAN EP150	MOBIL GEAR 629	SHELL OMALA S2 G 150
NC table	4.4L				GEAR GRAND GL-5 80W-90	MOBILUBE HD80W-90		
Tool magazine	20cm ³	Grease application	XBC2B2	EPINOC GREASE AP(N)2	BEACON EP2	MOBILUX EP2	SHELL ALVANIA EP GREASE 2	
Sprocket wheel and tool pot chains on tool magazine	100cm ³	Grease application						
Pneumatic lubricator (Oiler)	0.13L	Auto supply (Non-collect)	ISO VG32	HM32	SUPER Mulpas DX 32	NUTO HP32	MOBIL DTE 24	SHELL TELLUS S2 M 32
Hydraulic pump unit	20L	Tank						

☆The dedicated grease, which is high liquidity, is used on X,Y,Z axes ball screws and linier guide way.
Grease other than the specified product must not be used. Otherwise these may break.

TOOL SHANK AND RETENTION KNOB

(CAT50·P50T-2) (2/2)
(BIG PLUS)

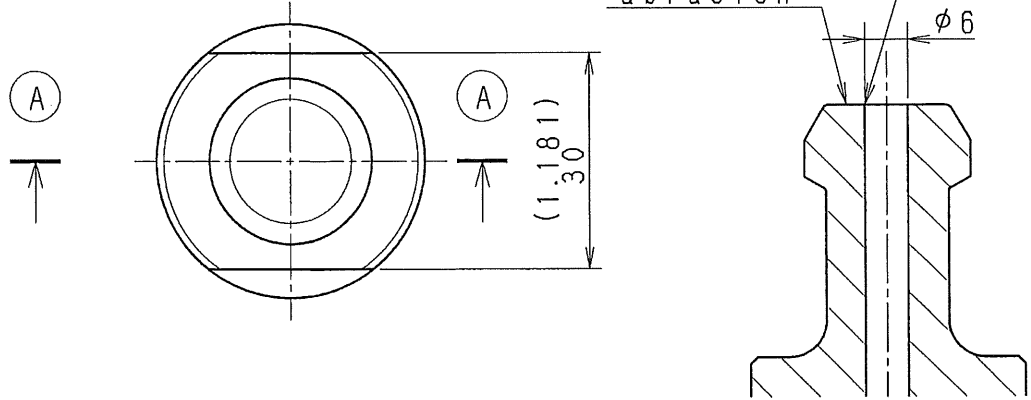
Retention knob : Modified P50T-2 (P50T-2 is based on JMTBA's Technical sheet 21-1988 (same as abolished MAS 403))

(inch)

Unit: mm
S=1/1

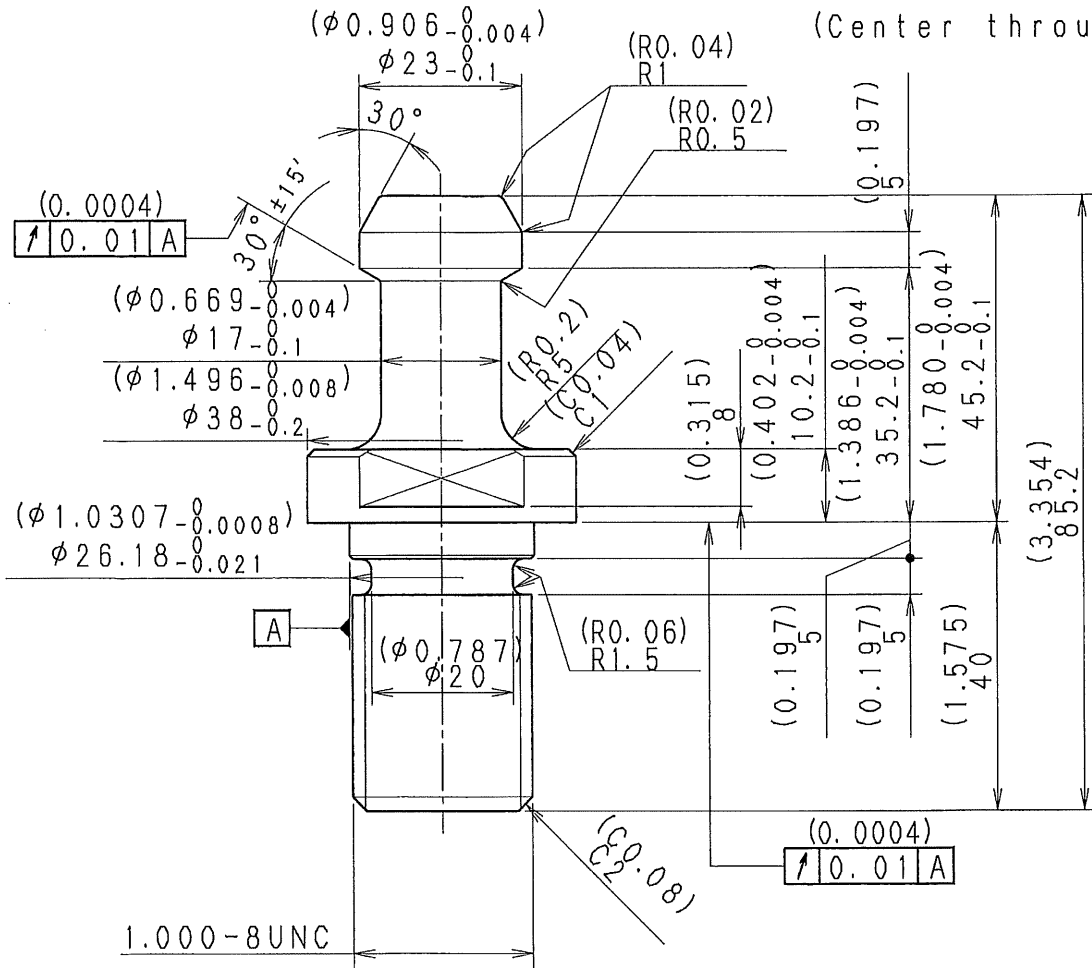
Must not chamfer

End face abrasion



①—① 断面

(Center through type)



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