FIG.2-9A TW-20 LEFT SPINDLE DIMENSIONS

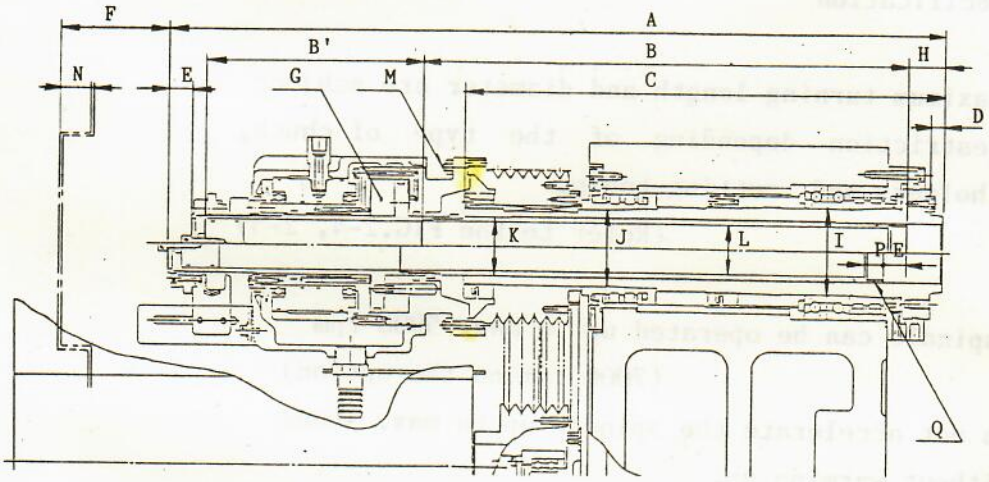
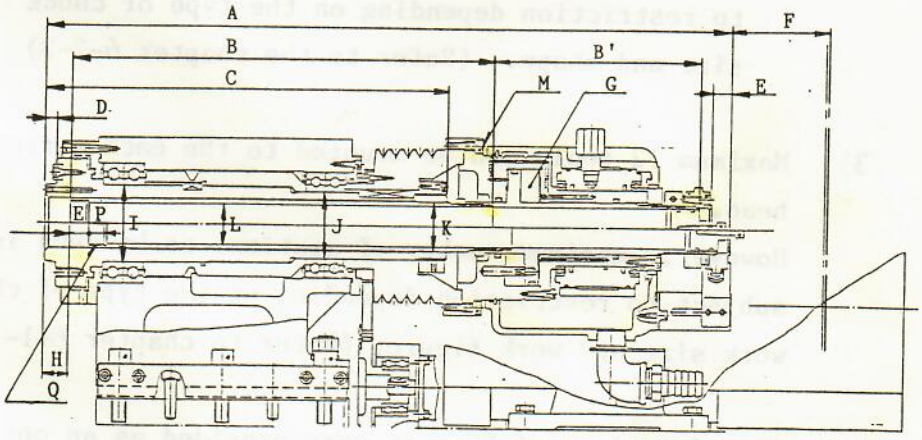


FIG.2-9B TW-20 RIGHT SPINDLE DIMENSIONS



NAME OF DIMENSIONS		LEFT UNIT	RIGHT UNIT
A = Overall length	(mm)	823.7	731.2
B = Draw tube length	(mm)	517.0	451.0
B' = Draw tube length	(mm)	229.0	219.0
C = Spindle length	(mm)	509.7	428.7
D = Length of pilot	(mm)	12.7	12.7
E = Cylinder stroke	(mm)	25.0	20.0
F = Draw tube end			Z-stroke max.680
to machine cover	(mm)	66.3	409.5 to 1089.5
G = Piston area	(cm2)	123.7	94.8
H = Recess to draw tube	(mm)	37.7	27.7
I = Front bearing	(mm)	90.0	80.0
J = Rear bearing	(mm)	80.0	70.0
K = Spindle bore	(mm)	62.0	52.0
L = Draw tube bore	(mm)	52.0	43.0
M = Chuck cylinder	(mm)	6-M8x18.0	8-M8x18 P.C.D.
mounting tap size		P.C.D.165.0	P.C.D.168.0
N = Step of cover	(mm)	120.0	Non
P = Tread and Groove length	(mm)	20.0	20.0
Q = Treading		M58 P1.5	M48 P1.5

2-4 Machine specification

1) The maximum turning length and diameter are subject to restriction depending of the type of chuck, tool holders and cutting tools.
(Refer to the FIG.2-4, 2-5)

2) The spindle can be operated up to max. 5000 rpm
(7000 rpm on the option)
* Do not accelerate the spindle up to max. speed without warming up.
* Max. spindle speed to be operated is subject to restriction depending on the type of chuck size and shape. (Refer to the chapter 6-2-3)

3) Maximum 12 tools can be mounted to the each turret head.
However, maximum number of station to be used is subject to restriction depending on the type of chuck, work size and work figure. (Refer to chapter 6-1-3)

4) Some functions of NC have been provided as an option. NC optional function can not be executed, if they are not ordered.

10/TW20IM.2-4

NAKAMURA-TOME CNC TURNING CENTER MODEL TW-20

SPECIFICATIONS Date:1988-04-10

***The specifications, illustrations and descriptions given herein are subject to change without previous notice.**

1.Machine Specification	**Left Unit**	**Right Unit**
I. Standard features		
A. General		
1) Machine dimension less optional chip conveyor		
length	3099mm 122.01"	
width	1745mm 68.70"	
height	1895mm 74.61"	
2) Maintenance area less less optional chip conveyor length x width	3795mm 149.41" x 2759mm 108.62"	
3) Machine weight approx.	5500kg 12100 lbs	
4) Noise level measured at 1.2M high from floor and 1.0M aside from machine	80 dBA	
B. Capacity		
1) Round collet capacity	51mm 2.0"	42mm 1-5/8"
2) Chuck dia.	165mm 6"	165mm 6"
3) Swing over slide covers	220mm 8.661"	220mm 8.661"
4) Swing over saddle	220mm 8.661"	220mm 8.661"
5) Turning dia. standard	100mm 3.94"	100mm 3.94"
max.	165mm 6.50"	165mm 6.5"
	*toolings limited	*toolings limited
6) Turning length standard	125mm 4.82"	125mm 4.92"
max.	200mm 7.87"	200mm 7.87"
	*toolings limited	*toolings limited
7) Distance between main spindle nose and turret face max.	340mm 13.39"	340mm 13.39"
min.	100mm 3.94"	100mm 3.94"

	Left Unit	Right Unit
C. Main Spindle		
1) Drive motor continuous/50% ED	AC 5.5/7.5kw 7.5/10HP	AC 3.7/5.5kw 5/7.5HP
2) Speed range	50-5000rpm	50-5000rpm
constant output	417-5000rpm	417-5000rpm
constant torque	50- 500rpm	50- 500rpm
3) Number of steps	stepless	stepless
4) Designation	rpm direct designation	
5) Spindle nose	A2-5	A2-5
6) Hole through spindle	62mm 2.44"	52mm 2.05"
7) Hole through draw tube	52mm 2.05"	43mm 1.69"
8) Front bearing inner dia.	90mm 3.54"	80mm 3.15"
9) Max. torque at spindle continuous/30 min rating	12.85/17.51kg.m	8.64/12.84kg.m
10) Center height from floor	1000mm 39.37	1000mm 39.37"
11) Access to spindle center from machine guards	440mm 17.32"	440mm 17.32"
12) N-T standard chuck cylinder operation power=piston thrust	*at 90% efficiency	*at 90% efficiency
max.at 25kg/cm2 355psi	2784kg.f	2133kg.f
min.at 4kg/cm2 57psi	445kg.f	340kg.f
13) W2015 Safety interlock for chucking failure		
D. Saddle		
1) Configuration	45° slant bed	
2) Feed motors X axis	AC 1.8kw	AC 1.8kw
Z axis	AC 1.8kw	AC 1.8kw
3) Thrust X axis	500kg.f(on time 300sec.100%ED)<---	
Z axis	500kg.f(on time 300sec.100%ED)<---	
4) Effective slide travel X axis	175mm 6.89"	175mm 6.89"
Z axis	240mm 9.45"	680mm 26.77"
5) Rapid traverse X axis	12m/min 472ipm	12m/min 472 ipm
Z axis	24m/min 945ipm	24m/min 945 ipm
6) Ball screw dia/pitch X axis	32mm 1.26"/6mm 0.24"	32mm 1.26"/6mm 0.24"
Z axis	32mm 1.26"/12mm 0.47"	32mm 1.26"/12mm 0.47"

	Left Unit	Right Unit
7) Distance between slides		
X axis	240mm 9.45"	240mm 9.45"
Z axis	320mm12.60"	320mm12.60"
B. Turret		
1) Turret head type	Dodecagonal drum	Dodecagonal drum
2) Width across flats	365mm 14.37"	365mm 14.37"
2) Turret thickness	80mm 3.15"	80mm 3.15"
3) Tooling clearance	560mm 22.05"	560mm 22.05"
4) No. of tool stations	12	12
5) Tool size square	20mmx20mm 3/4"x3/4"	20mmx20mm 3/4"x3/4"
round	25mm 1.0"	25mm 1.0"
6) Indexing drive with direction logic	Gear+hydraulic motor	Gear+hydraulic motor
7) Indexing time		
for one station approx.	0.2 sec.	0.2 sec.
for 180 degree approx.	0.7 sec.	0.7 sec.
	*measured when hydraulic fluid gets 50°C	
8) Curvic coupling dia.	180mm 7.09"	180mm 7.09"
9) Turret clamping force	4000kg 8800 lbs	4000kg 8800 lbs
F. Hydraulic Unit		
1) Pump motor	AC 2.2kw (4 poles)	
2) Tank capacity	55 liters	
3) Line pressure in normal cutting	35 kg/cm2 498psi	
4) Pump delivery 50Hz/60Hz	21/25 liters/min. + 21/25 liters/min.	
5) W2019 Pressure switch for power fault		
G. Coolant (Cutting fluid) Unit		
1) Pump motor	AC 180 watts(2 poles)	AC 180 watts(2 poles)
2) Tank capacity	170 liters	
3) Pump delivery at outlet of pump		
plain water 50Hz/60Hz	50/67 liters/min.	50/67 liters/min.
at tool		
plain water 50Hz/60Hz	**/** liters/min	**/** liters/min.