

DIAHOB
GC10CNC
GC15CNC



MITSUBISHI **CNC GEAR HOBGING MACHINE**

 **MITSUBISHI**
HEAVY INDUSTRIES, LTD.



HALES MACHINE TOOL

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**TWO NEW MODELS (GC10CNC, GC15CNC) FOR SMALL-SIZE
GEARS FEATURING HIGH-ACCURACY, HIGH-EFFICIENCY
AND UNSURPASSED HIGH OPERABILITY!**



**Space-Saving
GC10CNC**

**Easy-to-Use
GC15CNC**



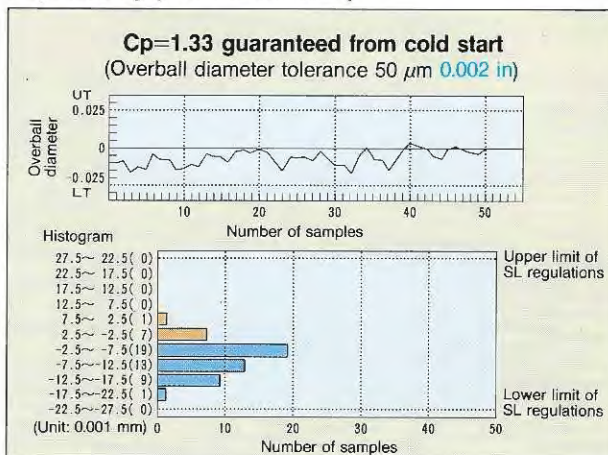
Realization of High Accuracy Gear Hobbing

Machining accuracy: AGMA class 9 for mass production gears, AGMA class 11 for high accuracy gears.

Repeatability: $C_p=1.33$ (from cold start) at overall diameter tolerance of $50\text{ }\mu\text{m}$ **0.002 in.**

- High-speed, high-accuracy synchronization made possible with Mitsubishi's feed-forward servo system.
- Consistent accuracy from cold start guaranteed with the optional thermal distortion compensator.

Repeatability (Overall diameter)



Enhanced Software Replaces Operator Manual

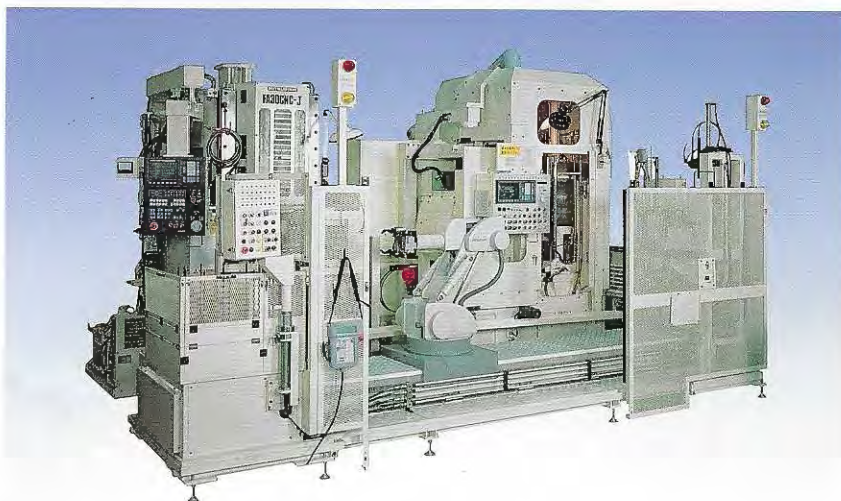
- Standardized conversational "MENU" (Mitsubishi Enhanced Numerical Controlled) programming makes automatic programming easy.
- Maintenance made easy with the enhanced alarm message function.

Machining pattern	Standard
1. Automatic setting of cutting conditions	●
2. Crowning	●
3. Tapering	●
4. Crowning/tapering	●
5. 1-3 step gear hobbing	●
6. 1-3 hob machining	●
7. Customized crowning	●
8. Customized tapering	●
9. Gash milling	●
10. Incomplete gear hobbing	●
11. Skiving	●
12. Phase matching gear hobbing	●

Other special optional programs are available upon request.

FMS, FA Applications

Automatic tool changer (ATC), automatic jig changer (AJC) and gear cell are easily accommodated for the automation compatibility.



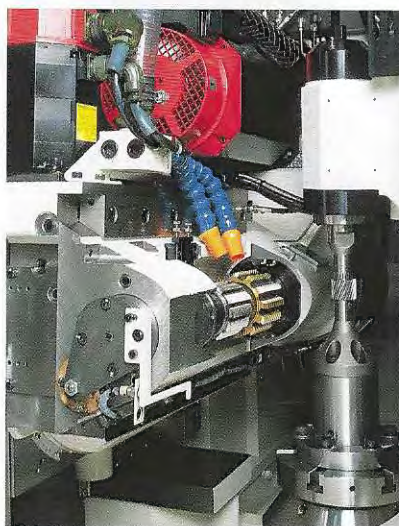
Application example of gear cell

High Efficiency Gear Hobbing

Long-time continuous gear hobbing, rough-finish continuous hobbing and different-type multi-stage gear hobbing made possible with the optional extra-long hob head.

Long hob head (Opt. for GC15CNC only)

- Hob mounting length: 230 mm **9.1 in**
(Standard 180 mm **7.1 in**)
- Mounting of extra-long hob or combination hob possible.



Long hob head

High-Speed Hobbing

Improved hob speed

- Maximum speed 1,500 min⁻¹ for GC10CNC
- Maximum speed 1,200 min⁻¹ for GC15CNC
(3,000 min⁻¹: optional for GC15CNC)

Reduced non-cutting time with compound movement

- 20% reduction compared to our previous model.



Finishing hob

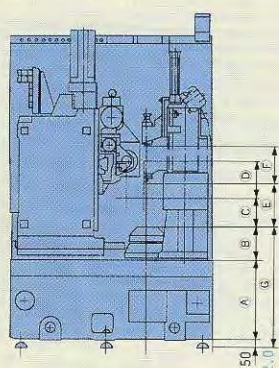
Roughing hob

Combination hob (Rough-finish)

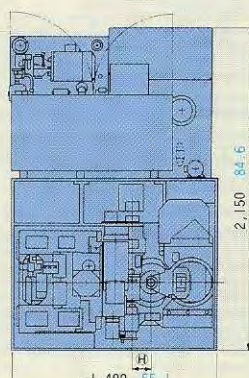
Machine Dimensions

Unit: mm in

GC10CNC



Front view

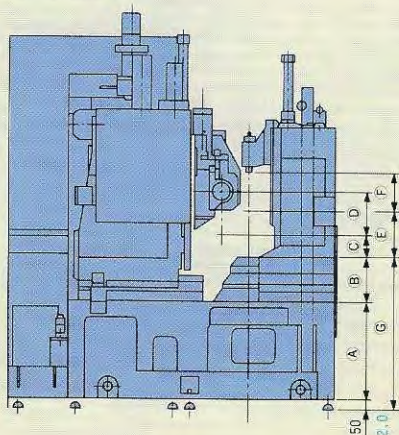


Top view

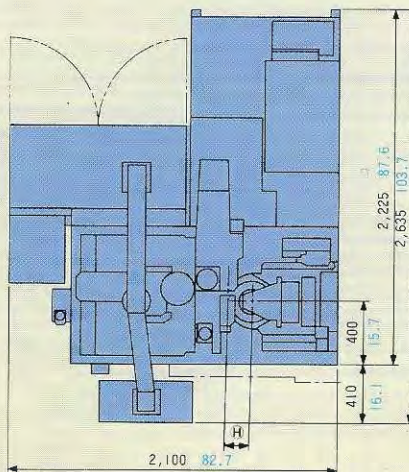
Dimensions (Standard machine)

Symbol	Description	GC10CNC	GC15CNC
A	Distance from bottom of bed to top of bed	550 21.7	605 23.8
B	Distance from top of bed to table top	210 8.3	295 11.6
C	Distance from table top to lowest position of hob center	190 7.5	150 5.9
D	Hob travel (Axial stroke)	250 9.8	250 9.8
E	Distance from table top to lowest position of support center end	290 11.4	250 9.8
F	Travel of support center	220 8.7	250 9.8
G	Distance from floor level to table top	810 31.9	950 37.4
H	Radial travel (Radial stroke)	120 4.7	155 6.1

GC15CNC



Front view

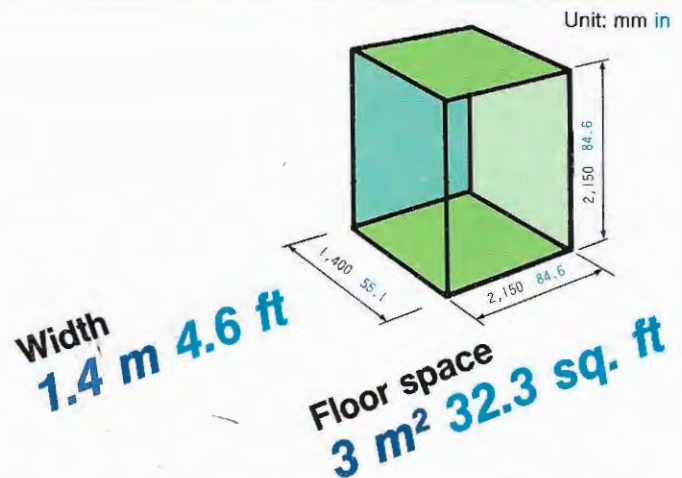


Top view

To cope for the needs of high-speed, high-accuracy and systematic gear cutting technology, Mitsubishi, based on its advanced technology and knowledge of building gear cutting machines and gear cutting tools, has developed two new models. One is the compact-size GC10CNC for small gear hobbing, and the other is GC15CNC for mass gear production.

GC10CNC Compact-Size Hobber for Small Gears

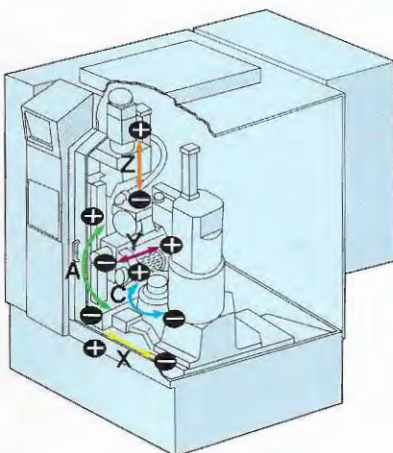
- ① **Narrow width machine saves floor space**
 - Multiple-machine usage made possible.
 - High operability
- ② **High-speed cutting with small diameter hob**
 - Maximum hob speed: 1,500 min⁻¹
 - Maximum table speed: 150 min⁻¹
- ③ **Totally enclosed casing prevents oil mist dispersion**



GC15CNC Mass Production Type Hobber for Small Gears

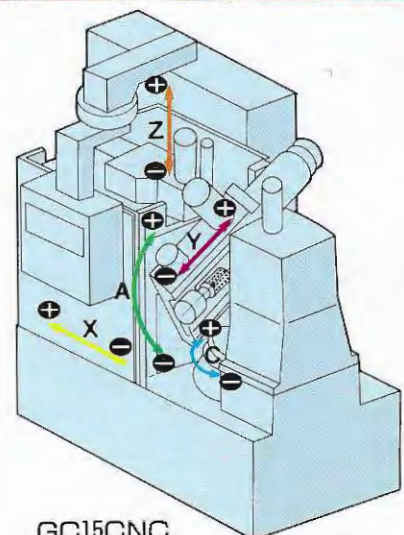
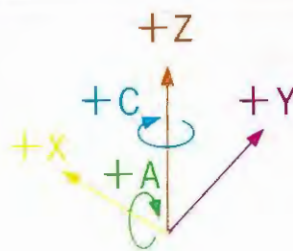
- ① **High rigidity**
 - Rigidity improved by applying preload to the axial and radial slideways.
- ② **High speed**
 - Maximum hob speed: 1,200 min⁻¹ (3,000 min⁻¹: optional)
 - Maximum table speed: 150 min⁻¹ (300 min⁻¹: optional)
- ③ **Various gear hobbing patterns**
 - Long-time hobbing, hobbing different types of workpieces or roughing-finishing made possible by using the optional extra-long hob head.
- ④ **Abundant FMS/FA options**
 - Various FMS/FA options are available, such as automatic tool changer (ATC), automatic jig changer (AJC), and auto-loader.

Variations of CNC-Controlled Axes (3-, 4-, 5-Axis)



GC10CNC

Controlled axes		3	4	4	5
X	Radial feed	○	○	○	○
Z	Axial feed	○	○	○	○
C	Table rotation	○	○	○	○
Y	Hob shift	—	○	—	○
A	Hob head swivel	—	—	○	○



GC15CNC

MITSUBISHI CNC GEAR HOBBING MACHINE

GC10CNC GC15CNC

Rick Reenan
708-860-4220

3 AXIS 209,500.00
5 AXIS 252,000.00

3 AXIS 238,400.00
5 AXIS 288,800.00

Machine Specifications

Item		Model	GC10CNC	GC15CNC
Maximum workpiece diameter		mm in	φ100 φ3.9 (φ150 φ5.9)	φ150 φ5.9 (φ200 φ7.9)
Maximum workpiece module/diametrical pitch			3 8.47 D.P.	4 6.35 D.P. (6 4.23 D.P.)
Axial travel		mm in	(250 9.8 [190 7.5-440 17.3])	250 9.8 [150 5.9-400 15.7]
Radial travel	Standard	mm in	(120 4.7 [15 0.59-135 5.3])	155 6.1
	Heavy-duty type	mm in	(95 3.7 [40 1.6-135 5.3])	155 6.1
Hob size (Maximum diameter × length)		mm in	φ100 φ3.9 × 150 5.9	φ120 φ4.7 × 180 7.1 (φ130 φ5.1 × 230 9.1)*
Hob shift amount		mm in	100 3.9	130 5.1 (180 7.1)*
Hob speed		min ⁻¹	150-1,500	150-1,200 (3,000)
Hob head swivel angle (Right, left)		deg.	45°	45°
Indexing number (Number of gear teeth/Number of hob teeth)			4-1,000	4-1,000
Axial	Feedrate	mm/min. ipm	1 0.04-400 15.7	1 0.04-400 15.7
	Rapid traverse	mm/min. ipm	5,000 196.9	5,000 196.9
Radial	Feedrate	mm/min. ipm	1 0.04-300 11.8	1 0.04-300 11.8
	Rapid traverse	mm/min. ipm	5,000 196.9	5,000 196.9
Hob shift rapid traverse		mm/min. ipm	1,250 49.2	1,250 49.2
Maximum table speed		min ⁻¹	150	150 (300)
Main motor	Standard	kW hp	5.5 7.3 [30 min. rating]	5.5 7.3 [Continuous rating]
	Heavy-duty type	kW hp	(5.5 7.3 [Continuous rating])	(7.5 10 [Continuous rating])
Total power consumption		kVA	35	35
Floor space (Width × length)		mm in	1,400 55.1 × 2,150 84.6	2,100 82.7 × 2,225 87.6
Machine weight		kgf lb	5,000 11,000	6,000 13,200
Type of numerical control			FANUC 0-MC+Mitsubishi CNC	FANUC 0-MC+Mitsubishi CNC

Note 1: Figures in parenthesis () show options.

Note 2: Asterisk * options for GC15CNC are for long hob head application. Other options are for GC20CNC.

Standard Equipment

- Flood coolant device
- Hydraulic/lubricating system
(Equipped with automatic oil temperature control system)
- Automatic hob head swivel/Clamping device
- Door interlock device
- Automatic hob shift
- NC-controlled axes
 - X-axis: Radial feed/Rapid traverse
 - Y-axis: Hob shift (4-axis, 5-axis models)
 - Z-axis: Axial feed/Rapid traverse
 - A-axis: Hob head swivel (4-axis, 5-axis models)
 - C-axis: Table rotation
- Radial cutting position setting
- Axial cutting position setting
- Constant position compensation function
- Cutting condition memory function
- Hob shift position memory function
(4-axis hob shift model/5-axis model)
- Conversational MENU programming
- Hob arbor with tapered ends
- Work counter/Tool counter (Shown on CRT screen)
- Machine stop indicating lamp
- Work light outlet
- Coolant guard door (Manual sliding type)
- Hob arbor power clamping device
- Double palm control
- RS232C punch interface (GC15CNC)
- Maintenance tool kit

Optional Equipment

- Hydraulic part clamping device
- Fixture power clamping device
- Support center power clamping device
- Roller type chip conveyor
- Automatic closing coolant guard door
- Oil mist collector
- Long hob head (GC15CNC)
- Fixture
- Rough locator, Work rest
- Deburring device (Fixed type, mobile type)
- Intelligent loader
- Various automatic part loaders
- Part transport system, part stocker
- Automatic tool changer (ATC)
- Automatic jig changer (AJC)
- Sub-table
- Overball diameter measuring device
- High speed hob/table rotation (GC15CNC)
- Thermal distortion compensator
- Anti-power failure system
- High counter column
- Hob arbor set-up device
- Additional hob arbor
- Fixture cleaning device
- Sub-control panel
- Double palm start button
- Automatic power shut-off
- Circuit breaker
- Work light, Machine light
- RS232C punch interface (GC10CNC)
- Hob speed indicator
- Hob ammeter
- Custom program
- Heavy-duty model
- Carbide hob model

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