

**TOYODA**

**GF50Mi  
SERIES**  
CBN Crankshaft Grinders

GF50Mi-70T  
GF50Mi-140T

**JTEKT**



<http://www.jtekt.co.jp>

Information presented in this brochure is subject to change without prior notice.  
Available machines or machines shown may vary depending on optional equipment or periodic design changes.  
The export of products defined as restricted commodities (or technologies) under Japan's "Foreign Exchange and Foreign Trade Act" requires an export license issued by the Japanese Government. Furthermore, similar licenses may be required for re-transfer, re-sale or re-export of such products, therefore please do not fail to contact JTEKT in advance.  
In order to observe laws and regulations and prevent inappropriate export, re-sale and relocation, JTEKT has equipped all of our NC machine tools with devices that detect relocation. If this device is activated, the machine will cease operation and will not restart until it has been checked by JTEKT. JTEKT may refuse to restart the machine should it be deemed that such an action would amount to the inappropriate export of a commodity or technology, or violate export regulations. In such a case, JTEKT will not be liable for any damages arising from the refusal to restart machine operation and do not bear any liability to perform services pertaining to product warranty.  
Please contact your JTEKT representative for details. Always read manuals carefully before using any machinery to ensure safe and proper use.

©JTEKT CORPORATION 2005, 2013  
Cat. No. M2019-5E

Printed in Japan 130707T  
This publication was made using recycled paper for the protection of forests.

**JTEKT**  
JTEKT CORPORATION

**JTEKT**  
Koyo TOYODA

CBN Crankshaft Grinder

# GF50Mi-70T GF50Mi-140T

Crankshaft grinder seeking higher productivity  
and general versatility using two wheels



## High Accuracy

- High accuracy grinding assuring a high quality grinding surface
- Improvement of roundness with an exact grinding wheel diameter

## Increase in Productivity

- Reduction in cycle time
- Secure operation

## Support for Multiple Types of Grinding

- Variety of grinding methods
- Achievement of work requires no setup change

This photo shows GF50Mi-70T.

- U.S. Patent on the machine: 6,419,563 and others
  - This photo shows the machine with special specifications.
- Note : Painting color shall be specified by mutual agreement.





## High accuracy

### Stable high-quality grinding

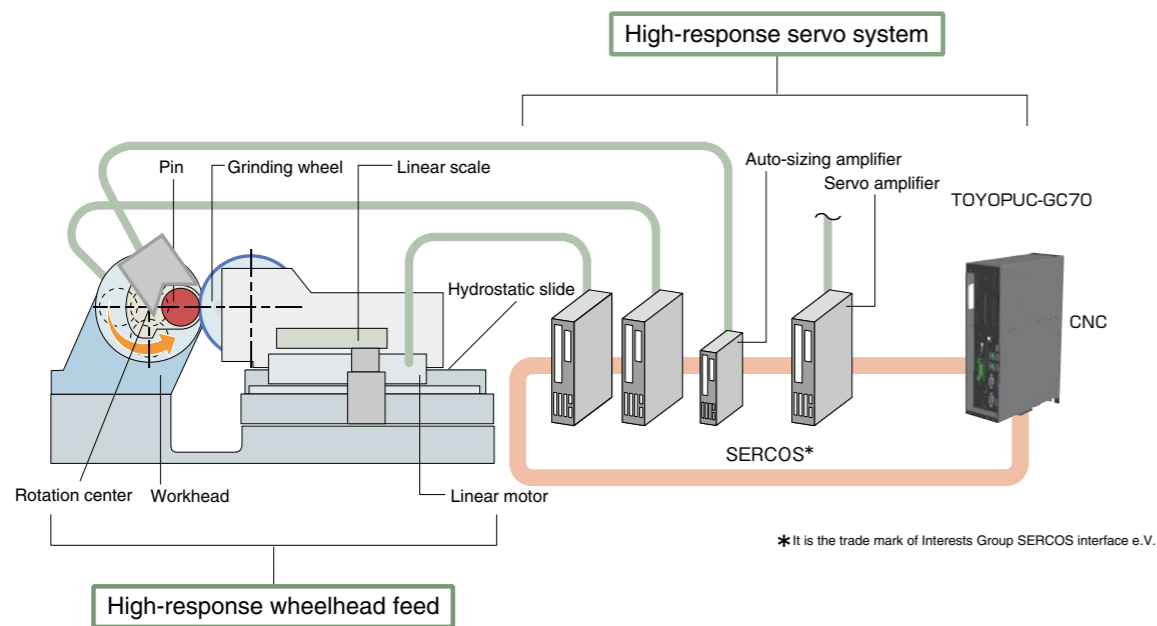
High accuracy grinding assuring a high quality grinding surface.

- High-response wheelhead feed mechanism
- High-response servo system

Quick-response wheelhead feed mechanism adopting light-weighted wheelhead, static pressure slide way and linear motor drive achieves the wheelhead feed having almost free from lost-motion and backlash.

High response servo system and high response feed mechanism enhance the accuracy and quality of pin and journal grinding surface.

Also contributes to improvement of dimension accuracy through the inclusion of an auto-sizing amplifier within a highly-responsive servo system which allows for optimum control feed.



#### Improvement of roundness with an exact grinding wheel diameter

Measures grinding wheel diameter exactly with a measuring system utilizing a touch probe, and applies the measured value during C-X grinding to improve roundness. Because grinding wheel diameter is correctly measured, CBN grinding wheels are able to be used for even the smallest diameters.



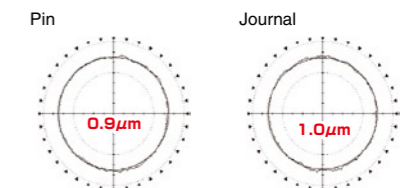
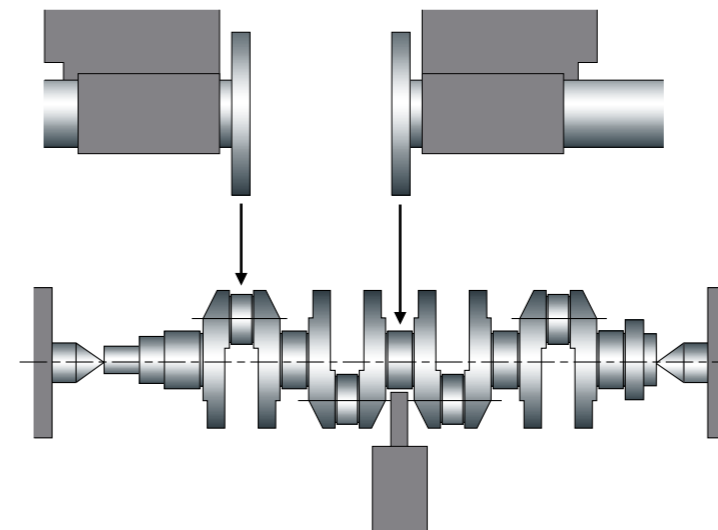
#### An example of high-accuracy grinding

In addition to machine manufacturing technologies, the GF50Mi Series achieves high accuracy machining through the application of roundness correction logic.

##### Grinding Example

| Crankshaft of passenger car |                                 |
|-----------------------------|---------------------------------|
| CBN wheel                   | φ650mm×19mm                     |
| Wheel surface speed         | 120m/s                          |
| Stock removal               | φ0.85mm                         |
| Grinding time               | 18 seconds/2 areas*             |
| Roundness                   | The measured values shown below |

\*Varies depending on workpieces, desired accuracy, etc.

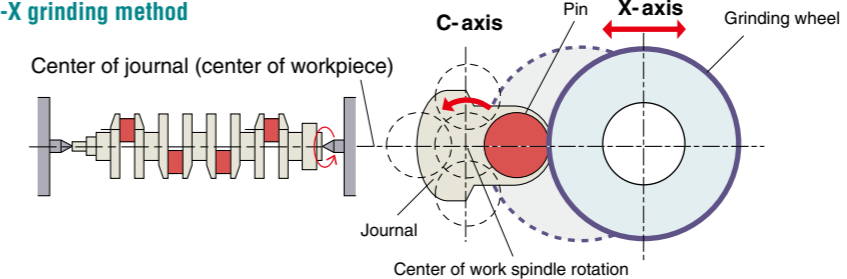


#### Smart grinding method with C-X simultaneous 2-axis control

2-axis simultaneous control of the crankshaft journal center rotation and wheelhead feed allows the wheelhead to follow the rotating pin and the cylindrical portion of pin is generated and ground. Due to this mechanism the conventional eccentric chuck is eliminated and the change such as pin stroke and pin phase became easy.

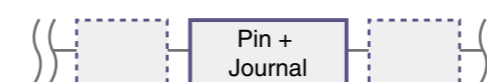
The specialized machine for pins has also integrated the ability to grind journals, as well as other sections.

##### C-X grinding method



##### Support for each operation setup

Aggregation Pin + Journal



Division Pin, Journal

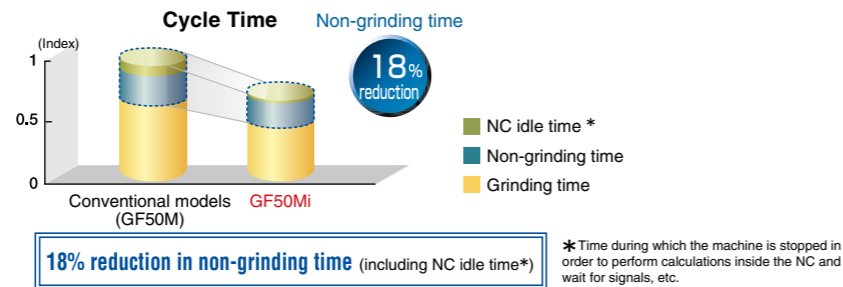


## Increase in Productivity

### Reduction in cycle time

#### 18% reduction in non-grinding time

Contributes to productivity improvement through a built-in TOYOPUC-GC70, which cuts non-grinding time, including crankshaft grinding NC idle time.

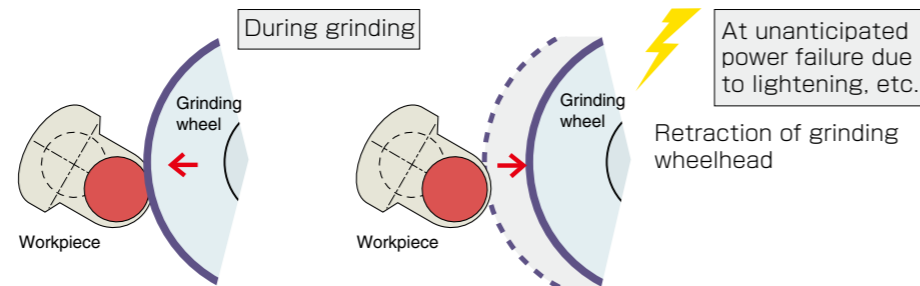


### Secure operation

#### Protection against grinding wheel damage during power failure

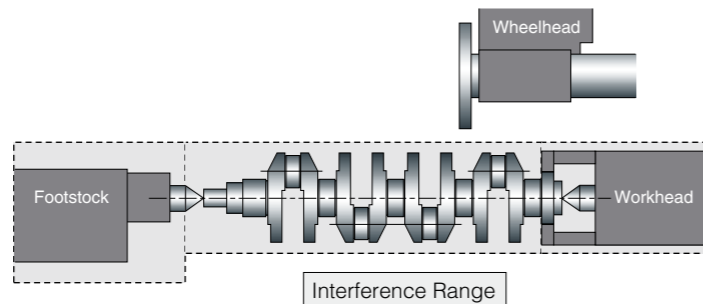
Option

The grinding wheel is separated from the workpiece if a power failure is detected, thereby protecting against grinding wheel damage.



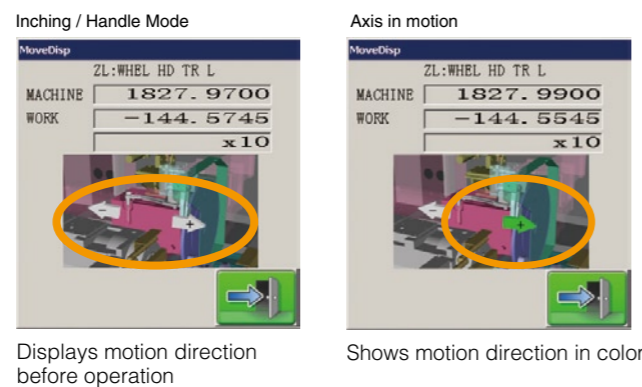
#### Secure operations for initial grinding

During manual operations after setup change, speed is restricted in the previously configured interference range, ensuring secure operation.



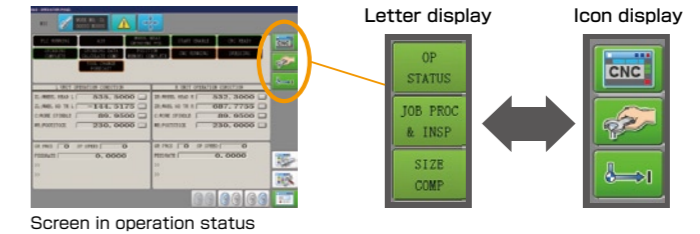
#### Prevention of incorrect manual operation

The GF50Mi Series is equipped with a support function which displays motion direction and notifies the operator of incorrect operations, in order to avoid interference by erroneous operation direction.



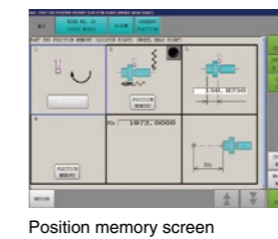
#### Iconized operation buttons

Operations can be easily recognized through iconized operation buttons. Buttons can be switched from icons to letters.



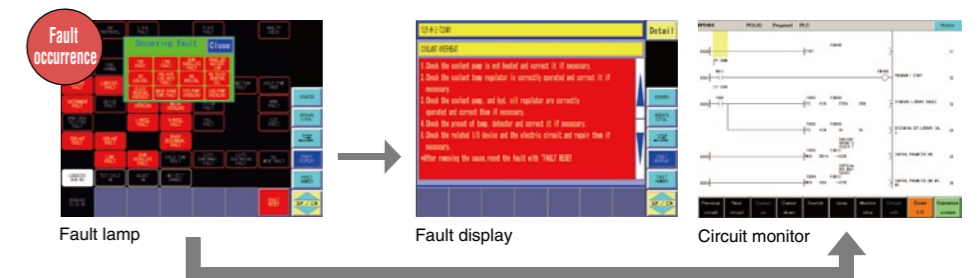
#### Perfected guidance function

Setup change, maintenance details, input data explanation, etc. can be easily understood from the graphical operation screen, and operations can be carried out smoothly.



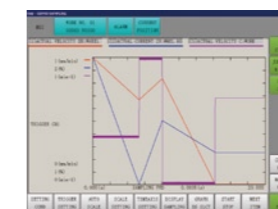
#### Simple fault diagnostics

Fault locations are diagnosed directly on the CNC screen from the error display and the circuit monitor.



#### Perfected preventative maintenance support function

Defective workpieces and machine malfunctions can be discovered early by comparing normal values sampled from electrical current, position deviations, speed data, etc.



#### Data batch backup function

Allows the batch saving of all data, including grinding conditions, compensation data, parameters, etc. This function can also be of use in fault analysis of machine stoppage.

## Support for Multiple Types of Grinding

### Features reducing setup change

#### Variety of grinding methods

All types of crankshafts can be ground using a variety of grinding methods.  
A flexible feature which does not require the changing of grinding wheels for a variety of crankshafts.

● : Standard □ : Optional

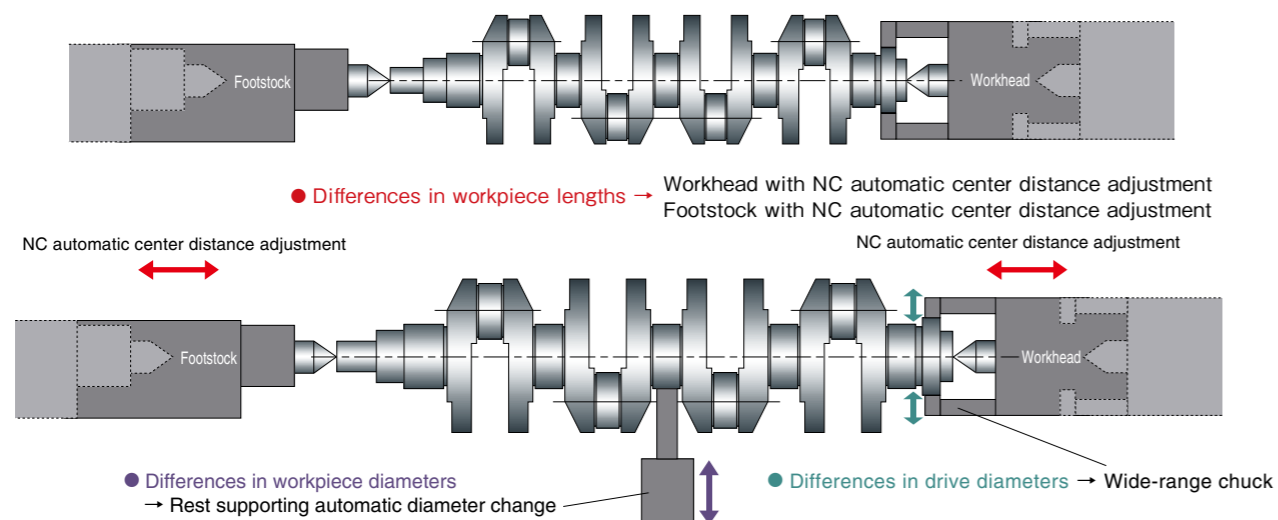
| Type                      | OD grinding |                            |        |                            |
|---------------------------|-------------|----------------------------|--------|----------------------------|
| Name                      | Plunge      | Plunge + traverse grinding | Plunge | Plunge + traverse grinding |
| GF50Mi-70T<br>GF50Mi-140T | ●           | ●                          | ●      | ●                          |
| Shape                     | Fillet      | Fillet                     | R      | R                          |

| Type        | OD grinding + shoulder grinding |                            |                  |                                  |
|-------------|---------------------------------|----------------------------|------------------|----------------------------------|
| Name        | Plunge                          | Plunge + traverse grinding | Angle + Traverse | Angle + Traverse + R Contouring* |
| GF50Mi-70T  | □                               | □                          | —                | —                                |
| GF50Mi-140T | □                               | □                          | □                | □                                |
| Shape       | R                               | R                          | R                | R                                |

\*May be restricted by tooling

#### Achievement of work requires no setup change

Equipped with an automatic setup change item that supports different workpiece lengths, diameters, etc.  
Contributes to improvements in productivity by greatly shortening the time required for setup change.



## Machine Specifications

[ ] : option

| Item                     | Unit                    | GF50Mi-70T                               | GF50Mi-140T |
|--------------------------|-------------------------|--|-------------|
| Swing over table         | mm                      | φ500                                     |             |
| Distance between centers | mm                      | 700                                      | 1,400       |
| Center height            | mm                      | 1,250                                    |             |
| Grinding diameter        | mm                      | φ35~φ85                                  |             |
| Max.work diameter        | mm                      | φ220                                     | φ300        |
| Wheel insertion amount   | A                       | mm                                       | 45          |
|                          | B                       | mm                                       | 195         |
|                          | C                       | mm                                       | 110 150     |
| Grinding wheel           | OD                      | mm                                       | φ650        |
|                          | Maximum width           | mm                                       | 50          |
|                          | Surface speed           | m/s                                      | 120         |
| Wheelhead                |                         | Hydrostatic slideway, Linear motor drive |             |
|                          | Rapid feedrate          | m/min                                    | φ40         |
| Wheelhead traverse       |                         | V-slideway, Ball screw drive             |             |
|                          | Rapid feedrate          | m/min                                    | 20          |
|                          | Minimum input increment | mm                                       | 0.0001      |

| Item                 | Unit                           | GF50Mi-70T                          | GF50Mi-140T                           |
|----------------------|--------------------------------|-------------------------------------|---------------------------------------|
| Workhead             |                                | Live spindle (corresponding to C-X) |                                       |
|                      | Center                         |                                     | MT No.5                               |
|                      | [NC stroke]                    |                                     | [220]                                 |
|                      | [Journal datum]                |                                     | [Journal clamp in a both-sides drive] |
| Footstock            | Maximum spindle speed          | min <sup>-1</sup>                   | 250                                   |
|                      | Minimum input increment        | °                                   | 0.0001                                |
|                      | [NC auto-stroke]               |                                     |                                       |
| Drive motor          | Center                         |                                     | MT No.5                               |
|                      | [NC stroke]                    | mm                                  | [350]                                 |
|                      | Wheel spindle                  | kW                                  | 31 (4P) Built-in motor                |
| Power supply voltage | Truing roll                    | kW                                  | 0.75 (2P) Built-in motor              |
|                      | Wheel spindle bearing oil pump | kW                                  | 5.5 (4P)                              |
|                      | Hydraulic oil pump             | kW                                  | 1.5 (4P)                              |
| Tank capacity        | Lubricating oil pump           | kW                                  | 0.75 (4P)                             |
|                      | Spindle bearing lubricant      | L                                   | 105                                   |
|                      | Hydraulic oil                  | L                                   | 68                                    |
| Machine weight       | Lubricant oil                  | L                                   | 50                                    |
|                      |                                | kg                                  | 18,500 20,000                         |

\*The specification may be restrained according to the accessories and the tooling of customer.

## TOYOPUC-GC70 CNC specifications

● : Standard □ : Optional

| Division              | Item  |   |
|-----------------------|---|---|
| Display unit          | 12" color TFT   | ● |
| File management       | Structured data management (pregrinding, grinding, maintenance)         | ● |
|                       | Lift data memory : 500  | ● |
|                       | Grinding data patterns : max.64   | ● |
|                       | Max.processes : 30 processes/pattern                                    | ● |
| Coordinate setting    | Position memory (wheel OD, lateral locator face, diamond roll position) | ● |
| Compensation function | Wheel diameter follow-up compensation                                   | ● |
|                       | Measuring error correction function                                     | ● |
| Display               | Profile measurement function  | □ |
|                       | Operation monitor   | ● |
|                       | Manual operation switch, lamp   | ● |
|                       | Operation procedure   | ● |
|                       | Sequence circuit monitor&edit   | ● |
|                       | Back light off function   | ● |
| Operation             | Inspection, maintenance item  | ● |
|                       | Canned cycle  | ● |
|                       | Test cycle  | ● |
|                       | In-process start-up function  | ● |
|                       | Single block  | ● |
| Others                | Rapid feed override   | ● |
|                       | Grinding feed override  | ● |
|                       | Manual pulse generator  | ● |
|                       |   |   |

| Division           | Item   |   |
|--------------------|--|---|
| Maintenance        | Wheel replacement prediction / min. wheel dia. display | ● |
|                    | Self-diagnosis function                                | ● |
|                    | Alarm history display                                  | ● |
|                    | Production maintenance data output                     | ● |
|                    | Batch saving   | ● |
| Counter            | Servo sampling function                                | ● |
|                    | Production counter                                     | ● |
|                    | Wheel truing counter                                   | ● |
| Cycle time display | Quality check counter                                  | ● |
|                    | Processing cycle time                                  | ● |
|                    | Grinding cycle time                                    | ● |
| Others             | Wheel truing cycle time                                | ● |
|                    | MDI on/off switch                                      | ● |
|                    | USB flash drive I/F                                    | ● |
|                    | Automatic workpiece data changeover                    | □ |
|                    | Computer link  | □ |
|                    | Retraction of wheelhead at power failure               | □ |

# Accessories

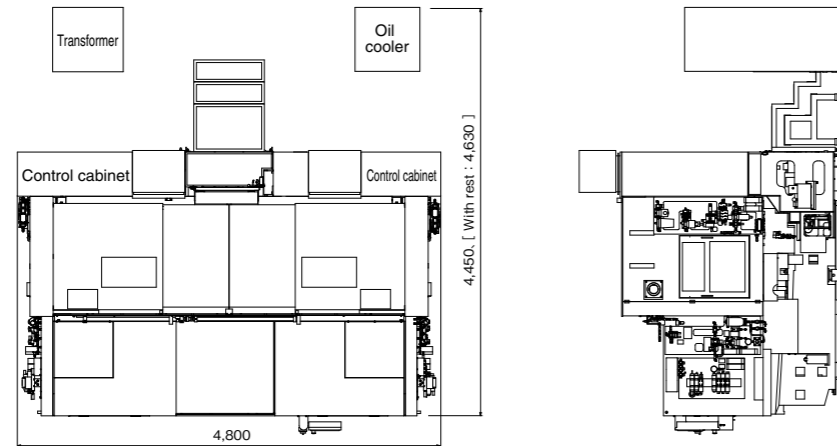
● : Standard □ : Optional

| No. | Unit name   | GF50Mi-70T | GF50Mi-140T |
|-----|---|------------|-------------|
| 1   | Live spindle workhead (Center datum)                                | ●          | ●           |
| 2   | Live spindle workhead (Journal datum)                               | □          | —           |
| 3   | Live spindle workhead with NC automatic center distance adjustment  | □          | □           |
| 4   | Hydraulic footstock   | ●          | ●           |
| 5   | Live spindle footstock with NC automatic center distance adjustment | □          | □           |
| 6   | Wheel spindle (120m/s)  | ●          | ●           |
| 7   | Wheel spindle motor (31kW)  | ●          | ●           |
| 8   | Truing unit   | ●          | ●           |

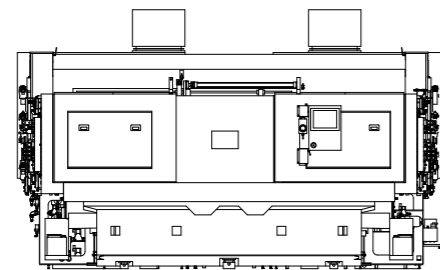
| No. | Unit name                                 | GF50Mi-70T | GF50Mi-140T |
|-----|---|------------|-------------|
| 9   | Wide-range chuck                          | □          | □           |
| 10  | Rest supporting automatic diameter change | □          | □           |
| 11  | Phasing device                            | ●          | ●           |
| 12  | Auto-sizer on wheelhead                   | ●          | ●           |
| 13  | Touch trigger probe                       | ●          | ●           |
| 14  | Manual open/close door                    | ●          | ●           |
| 15  | Manual open/close door + shutter          | □          | □           |
| 16  | Operation panel with 12-inch touch panel  | ●          | ●           |

## Machine layout & dimensions

### GF50Mi-70T

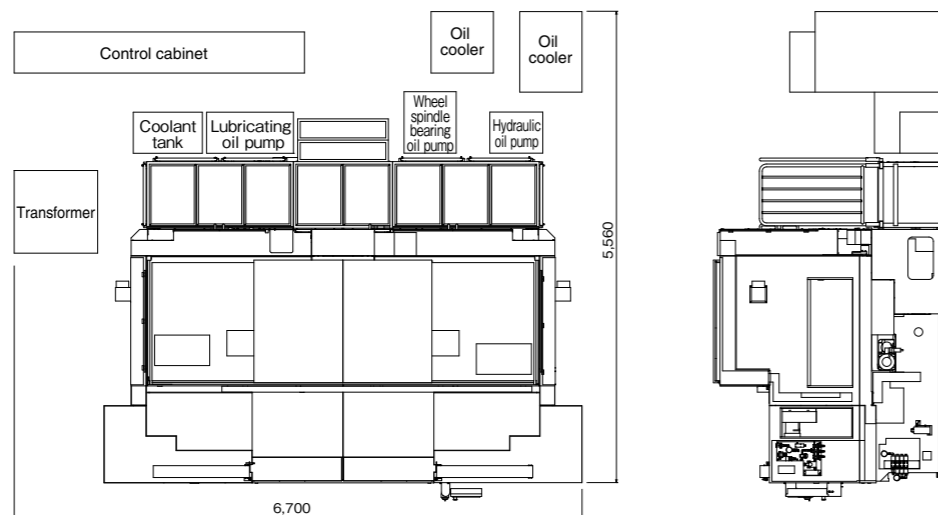


※The above sketch does not include coolant tank. ※It might be changed due to equipped units and tooling.

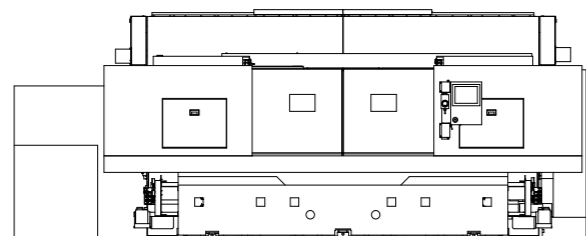


[Unit : mm]

### GF50Mi-140T



※It might be changed due to equipped units and tooling.



[Unit : mm]

# JTEKT JTEKT CORPORATION

## NAGOYA HEAD OFFICE

No. 7-1, Meieki 4-chome, Nakamura-ku, Nagoya, Aichi Pref., 450-8515, JAPAN TEL: (81)52-527-1900 FAX: (81)52-527-1911

## OSAKA HEAD OFFICE

No. 5-8, Minamisemba 3-chome, Chuo-ku, Osaka, 542-8502, JAPAN TEL: (81)6-6271-8451 FAX: (81)6-6245-3712

## SALES & MARKETING HEADQUARTERS

No. 5-8, Minamisemba 3-chome, Chuo-ku, Osaka, 542-8502, JAPAN TEL: (81)6-6245-6087 FAX: (81)6-6244-9007

## — GLOBAL NETWORK —

### MACHINE TOOLS & MECHATRONICS BUSINESS OPERATIONS

#### MACHINE TOOLS & MECHATRONICS OVERSEAS SALES DEPT.

1, Asahimachi 1-chome, Kariya, Aichi Pref., 448-8652, JAPAN  
TEL: (81)566-25-5171 FAX: (81)566-25-5467

#### OVERSEAS AFFILIATED COMPANIES

**TOYODA MACHINERY USA CORP. HEADQUARTERS**  
316 W.University Drive,  
Arlington Heights, IL 60004  
U.S.A.  
TEL: (1)847-253-0340  
FAX: (1)847-577-4680

**TOYODA MACHINERY (DALIAN) CO., LTD. BEIJING OFFICE**  
Room 1017, Fortune Building No.5 Dong  
San Huan North Road Chaoyang,  
Beijing, 100004 CHINA  
TEL: (86)-10-6590-9356~58  
FAX: (86)-10-6590-9359

**TPA ENGINEERING CORP.**  
84BL-19Lot,  
Namdong Industrial Complex,  
675-18, Gojan-Dong, Namdong-ku,  
Incheon, KOREA  
TEL: (82)-032-822-0305  
FAX: (82)-032-822-0306

**TOYODA MACHINERY USA CORP. AUTOMOTIVE PRODUCTS & SPECIAL MACHINES DIVISION**  
51300 W. Pontiac Trail  
Wixom, MI. 48393-1003  
U.S.A.  
TEL: (1)248-624-5755  
FAX: (1)248-624-8597

**TOYODA MACHINERY (DALIAN) CO., LTD. SHANGHAI OFFICE**  
Room 25B3, V-Capital Building 333 Xianxia  
Road Changning District,  
Shanghai, 200336 CHINA  
TEL: (86)-21-5178-1088  
FAX: (86)-21-5178-1099

**TOYODA MACHINERY S.E. ASIA CO., LTD.**  
313, Bangna-Trad Road, KM.1  
Kwang Bangna, Khet Bangna,  
Bangkok, 10260 THAILAND  
TEL: (66-2)361-8250~1  
FAX: (66-2)361-8252

**TOYODA MACHINERY AND ENGINEERING EUROPE SAS**  
2 Grande Allee P.A des Petits Carreaux  
94380 Bonneuil sur Marne, FRANCE  
TEL: (33)1-49.56.85.80  
FAX: (33)1-43.77.47.50

**TOYODA MACHINERY (DALIAN) CO., LTD. FOSHAN OFFICE**  
2 Wushaxinhui Road, Daliang Street Shunde  
District, Foshan,  
Guangdong, 52833 CHINA  
TEL: (86)-757-2232-6651~52  
FAX: (86)-757-2232-6650

**PT.JTEKT INDONESIA**  
MM2100 Industrial Town  
Jl. Halmahera Block DD-3  
Cikarang Barat, Bekasi 17520 INDONESIA  
TEL: (62)21-8998 3275  
FAX: (62)21-8998 3274

**TOYODA MACHINERY EUROPE GmbH HEADQUARTERS**  
Bischofstr, 118 47809 Krefeld GERMANY  
TEL: (49)2151-5188-300  
FAX: (49)2151-5188-333

**TOYODA MACHINERY (DALIAN) CO., LTD. CHONGQING OFFICE**  
701 Lanmei Dadao (Lanmei Avenue) Hi-Tech  
Zone, Chongqing, 400039 CHINA  
TEL: (86)-23-6171-1133  
FAX: (86)-23-6171-1133

**TOYODA KOKI DO BRASIL INDUSTRIA E COMERCIO DE MAQUINAS, LTDA.**  
Rua Rego Barros 1319,  
Vila Antonieta, Sao Paulo-SP, BRASIL  
TEL: (55)11-6724-5711  
FAX: (55)11-6727-3450

**TOYODA MACHINERY (DALIAN) CO., LTD. HEADQUARTERS**  
46 Developing Zone In DaLian, 116600 China  
Dalian, CHINA  
TEL: (86)-411-8733-4601  
FAX: (86)-411-8733-4602

**TOYODA MICROMATIC MACHINERY INDIA LIMITED**  
Plot No.550-E, 2nd Floor  
Place City-II, Sector-37, Gurgaon 122 001  
INDIA  
TEL: (91)-124-4264601/02/03  
FAX: (91)-124-4288355