

**OPERATING MANUAL  
&  
MAINTENANCE MANUAL**

for

**QUICK TURN 200  
(NC:MAZATROL FUSION 640T)**

PUBLICATION No. : H325WA0012E

Serial No. :

Read this manual carefully before using this machine and equipment to ensure proper operation.

Direct any questions to your nearest Technical/Service Center.

**IMPORTANT NOTICE**

1. Be sure to observe the safety precautions described in this manual and the contents of the safety plates on the machine and equipment. Failure may cause serious personal injury or material damage. Please replace any missing safety plates as soon as possible.
2. No modifications are to be performed that will affect operation safety. If such modifications are required, please contact the nearest Technical/Service Center.
3. For the purpose of explaining the operation of the machine and equipment, some illustrations may not include safety features such as covers, doors, etc. Before operation, make sure all such items are in place.
4. This manual was considered complete and accurate at the time of publication, however, due to our desire to constantly improve the quality and specification of all our products, it is subject to change or modification. If you have any questions, please contact the nearest Technical/Service Center.
5. Always keep this manual near the machinery for immediate use.
6. If a new manual is required, please order from the nearest Technical/Service Center with the manual No. or the machine name, serial No. and manual name.

Issued by *Manual Publication Section, Yamazaki Mazak Corporation, Japan*

## Contents

### Part 1 Preliminaries to Machine Operation

1 Foreword .....	1-1
1-1 List of Related Manuals .....	1-1
1-2 Numbering System for Pages .....	1-1
1-3 Numbering System for Figures and Tables .....	1-2
1-4 How to Distinguish between Standard Specifications and Optional Specifications .	1-2
2 SAFETY PRECAUTIONS.....	2-1
2-1 Rule .....	2-1
2-2 Basic Safety Items .....	2-1
2-3 Clothing and Personal Safety .....	2-3
2-4 Safety Items Related to Operation.....	2-4
2-5 Safety Items Related to Gripping Workpiece and Tooling .....	2-5
2-6 Safety Items Related to Maintenance.....	2-6
2-7 Safety Items Related to Workplace .....	2-7
2-8 Safety Items Related to Chip Conveyor.....	2-7
2-9 Safety Equipment .....	2-8
2-10 Remarks on the cutting conditions recommended by the NC .....	2-9
2-11 Safety Nameplates .....	2-10

## Part 2 Machine Operation

1	Outline of Machine .....	1-1
1-1	Features.....	1-1
1-2	Outline of Machine System.....	1-2
1-3	Outline of Control System.....	1-3
1-4	Positioning of Equipment.....	1-4
1-5	Coordinate Axes .....	1-5
2	Operation Panel and Switch Functions .....	2-1
2-1	Operation Panel.....	2-1
2-1-1	Layout of switches and indicator lamps.....	2-1
2-1-2	Names of switches and outlines of their functions.....	2-2
2-1-3	Names and functions of indicator lamps on the operation panel .....	2-5
2-2	Auxiliary Operation Panel (☆) .....	2-6
2-3	External Data Input/Output Panel (☆) .....	2-8
3	Preparations for Operation.....	3-1
3-1	Pre-start Inspection.....	3-1
3-2	How to Stop Machine Operation .....	3-2
3-3	How to Turn On the Power .....	3-3
3-4	Inspections After the Power Has Been Turned On.....	3-5
3-5	How to Turn Off the Power .....	3-6
3-6	How to Perform Home Point Return .....	3-7
3-7	Warm-up Operation .....	3-10

<b>4</b>	<b>Manual Operation.....</b>	<b>4-1</b>
4-1	Manual Operation Mode .....	4-1
4-2	Operating the Spindle .....	4-2
4-2-1	Starting the spindle .....	4-2
4-2-2	Stopping the spindle .....	4-3
4-2-3	Jogging the spindle.....	4-3
4-3	Turret Rotation.....	4-4
4-3-1	Turret unclamp.....	4-5
4-4	X-axis and Z-axis Feed Operations .....	4-6
4-4-1	Rapid traverse .....	4-6
4-4-2	Cutting feed .....	4-7
4-4-3	Manual pulse handle feed of X- and Z-axis.....	4-8
4-5	Operating the Tail Stock .....	4-9
4-5-1	Checkpoints before operating the tailstock .....	4-9
4-5-2	Extending or retracting the tail spindle .....	4-10
4-5-3	Checking and adjustment of the tail spindle thrust.....	4-10
4-6	Other Manual Operations .....	4-11
4-6-1	Soft limit function and its release .....	4-11
4-6-2	Illuminating light and manual coolant operation .....	4-11
4-6-3	MACHINE SET UP switch.....	4-13
<b>5</b>	<b>Machining Preparations.....</b>	<b>5-1</b>
5-1	Mounting the Tools .....	5-1
5-1-1	Tool holder and tool mounting.....	5-1
5-1-2	Adjusting the direction of the coolant discharge port.....	5-1

5-2	Preparing to Grip the Work .....	5-2
5-2-1	Opening and closing the chuck .....	5-2
5-2-2	Adjustment of chuck pressure.....	5-4
5-2-3	Forming the soft jaw .....	5-5
5-3	How to Use the Manual Tool Eye (☆) .....	5-8

## Part 3 Machine Maintenance

1 Maintenance and Inspection Procedures .....	1-1
1-1 List of Maintenance and Inspection Items .....	1-1
1-1-1 Daily maintenance and inspection items .....	1-1
1-1-2 Weekly (or every 60 hours) maintenance and inspection items .....	1-2
1-1-3 3-monthly (or every 750 hours) maintenance and inspection items.....	1-2
1-1-4 6-monthly (or every 1500 hours) maintenance and inspection items.....	1-2
1-1-5 Annual (or every 3000 hours) maintenance and inspection items .....	1-2
1-2 Removal of Chips inside Machine.....	1-3
1-2-1 Door rail area .....	1-3
2 Maintenance of Main Units.....	2-1
2-1 Headstock.....	2-1
2-1-1 Hydraulic chuck (☆).....	2-1
2-1-2 Collet chuck (☆) .....	2-6
2-2 Tool rest.....	2-9
2-2-1 Configuration and outline of operation .....	2-9
2-3 Tail stock.....	2-10
2-3-1 Configuration and outline of operation .....	2-10
2-3-2 Removing the center.....	2-11
2-3-3 Oil supply and lubrication.....	2-11
2-3-4 Adjustment.....	2-11
2-4 Hydraulic unit .....	2-12
2-4-1 Lubrication .....	2-12
2-4-2 Pressure adjustments .....	2-15

2-5 Lubrication unit .....	2-16
2-5-1 Replenishing the oil.....	2-16
2-5-2 Cleaning the suction filter.....	2-17
2-6 Coolant Unit .....	2-18
2-6-1 Replenishing the oil.....	2-18
2-6-2 Exchanging the coolant.....	2-19
2-6-3 Purging the coolant unit .....	2-19
2-7 Air Unit (☆) .....	2-20
2-7-1 Air control .....	2-20
2-7-2 Replacing the air filter element.....	2-20
2-8 Electric Control Cabinet .....	2-21
2-9 Work Light (Machine Light).....	2-22
2-9-1 Replacement.....	2-22
2-10 Turret .....	2-23
2-10-1 Reference position of turret indexing .....	2-23
3 Troubleshooting .....	3-1
3-1 Headstock .....	3-1
3-2 Tool Rest .....	3-2
3-3 Chuck.....	3-3
3-4 X axis, Z axis.....	3-3
3-5 Tail Stock .....	3-4
3-6 Hydraulic Unit.....	3-4
3-7 Coolant Unit.....	3-4

3-8 Lubrication Unit.....	3-5
3-9 Air Unit (☆).....	3-5
3-10 Chip Conveyor (☆) .....	3-5
3-11 Tool Eye (☆).....	3-5

## Part 4 Appendix

1	General Data on the Main Machine Unit .....	1-1
1-1	Main Specifications.....	1-1
1-2	Shape of Spindle Nose.....	1-3
1-3	Spindle Specifications.....	1-4
1-4	Stroke Diagram.....	1-5
1-5	Hydraulic Circuit Diagram .....	1-13
1-6	Air Circuit Diagram (☆).....	1-14
1-7	Tooling .....	1-15
1-7-1	Tooling system.....	1-15
1-7-2	Tool interference diagram.....	1-19
1-8	Tool eye (☆).....	1-23
1-8-1	Concerning the handling of the tool eye.....	1-23
1-8-2	Chuck and tool eye interference diagram.....	1-24
1-8-3	Dimensions of tool eye and chuck and distances between them .....	1-25
1-9	Auto Parts Catcher (☆).....	1-26
1-9-1	Flow of operations during cut-off.....	1-26
1-9-2	Machine with collet chuck .....	1-28
2	Relocation .....	2-1
2-1	Conditions for Relocation.....	2-1
2-2	Power Supply Requirements .....	2-2
2-3	Pneumatic Requirements .....	2-2
2-4	Relocation .....	2-3

2-5 Trial Run .....	2-6
3 Other.....	3-1
3-1 M Codes .....	3-1
3-2 Alarm list.....	3-3

0.1	Temperature measured 0.1 °C
0.2	Temperature measured 0.2 °C
0.3	Temperature measured 0.3 °C
0.4	Temperature measured 0.4 °C
0.5	Temperature measured 0.5 °C
0.6	Temperature measured 0.6 °C
0.7	Temperature measured 0.7 °C
0.8	Temperature measured 0.8 °C
0.9	Temperature measured 0.9 °C
1.0	Temperature measured 1.0 °C
1.1	Temperature measured 1.1 °C
1.2	Temperature measured 1.2 °C
1.3	Temperature measured 1.3 °C
1.4	Temperature measured 1.4 °C
1.5	Temperature measured 1.5 °C
1.6	Temperature measured 1.6 °C
1.7	Temperature measured 1.7 °C
1.8	Temperature measured 1.8 °C
1.9	Temperature measured 1.9 °C
2.0	Temperature measured 2.0 °C
2.1	Temperature measured 2.1 °C
2.2	Temperature measured 2.2 °C
2.3	Temperature measured 2.3 °C
2.4	Temperature measured 2.4 °C
2.5	Temperature measured 2.5 °C
2.6	Temperature measured 2.6 °C
2.7	Temperature measured 2.7 °C
2.8	Temperature measured 2.8 °C
2.9	Temperature measured 2.9 °C
3.0	Temperature measured 3.0 °C
3.1	Temperature measured 3.1 °C
3.2	Temperature measured 3.2 °C
3.3	Temperature measured 3.3 °C
3.4	Temperature measured 3.4 °C
3.5	Temperature measured 3.5 °C
3.6	Temperature measured 3.6 °C
3.7	Temperature measured 3.7 °C
3.8	Temperature measured 3.8 °C
3.9	Temperature measured 3.9 °C
4.0	Temperature measured 4.0 °C
4.1	Temperature measured 4.1 °C
4.2	Temperature measured 4.2 °C
4.3	Temperature measured 4.3 °C
4.4	Temperature measured 4.4 °C
4.5	Temperature measured 4.5 °C
4.6	Temperature measured 4.6 °C
4.7	Temperature measured 4.7 °C
4.8	Temperature measured 4.8 °C
4.9	Temperature measured 4.9 °C
5.0	Temperature measured 5.0 °C
5.1	Temperature measured 5.1 °C
5.2	Temperature measured 5.2 °C
5.3	Temperature measured 5.3 °C
5.4	Temperature measured 5.4 °C
5.5	Temperature measured 5.5 °C
5.6	Temperature measured 5.6 °C
5.7	Temperature measured 5.7 °C
5.8	Temperature measured 5.8 °C
5.9	Temperature measured 5.9 °C
6.0	Temperature measured 6.0 °C
6.1	Temperature measured 6.1 °C
6.2	Temperature measured 6.2 °C
6.3	Temperature measured 6.3 °C
6.4	Temperature measured 6.4 °C
6.5	Temperature measured 6.5 °C
6.6	Temperature measured 6.6 °C
6.7	Temperature measured 6.7 °C
6.8	Temperature measured 6.8 °C
6.9	Temperature measured 6.9 °C
7.0	Temperature measured 7.0 °C
7.1	Temperature measured 7.1 °C
7.2	Temperature measured 7.2 °C
7.3	Temperature measured 7.3 °C
7.4	Temperature measured 7.4 °C
7.5	Temperature measured 7.5 °C
7.6	Temperature measured 7.6 °C
7.7	Temperature measured 7.7 °C
7.8	Temperature measured 7.8 °C
7.9	Temperature measured 7.9 °C
8.0	Temperature measured 8.0 °C
8.1	Temperature measured 8.1 °C
8.2	Temperature measured 8.2 °C
8.3	Temperature measured 8.3 °C
8.4	Temperature measured 8.4 °C
8.5	Temperature measured 8.5 °C
8.6	Temperature measured 8.6 °C
8.7	Temperature measured 8.7 °C
8.8	Temperature measured 8.8 °C
8.9	Temperature measured 8.9 °C
9.0	Temperature measured 9.0 °C
9.1	Temperature measured 9.1 °C
9.2	Temperature measured 9.2 °C
9.3	Temperature measured 9.3 °C
9.4	Temperature measured 9.4 °C
9.5	Temperature measured 9.5 °C
9.6	Temperature measured 9.6 °C
9.7	Temperature measured 9.7 °C
9.8	Temperature measured 9.8 °C
9.9	Temperature measured 9.9 °C
10.0	Temperature measured 10.0 °C

## Contents of figures

### Part 2 Machine Operation

Fig. 1-1 Machine control system	1-3
Fig. 1-2 Major constituent components of machine	1-4
Fig. 1-3 Sample machining diagram	1-5
Fig. 1- 4 Machine coordinate axes	1-5
Fig. 2- 1 Operation Panel	2-1
Fig. 2-2 Indicator lamps on the screen	2-5
Fig. 2-3 Auxiliary operation panel	2-6
Fig. 2-4 External data input/output panel	2-8
Fig. 3- 1 Pre-start Inspection	3-1
Fig. 3- 2 Emergency stop button	3-2
Fig. 3- 3 Turning on the power procedure	3-4
Fig. 3-4 Inspection items after the power is on.	3-5
Fig. 3-5 Home point return procedure	3-8
Fig. 3-6 Home point return speed (when home point return is executed for the first time after the power has been turned on).	3-9
Fig. 4-1 Manual operation selector mode keys	4-1
Fig. 4-2 Operation of SPINDLE REVERSE button.	4-2
Fig. 4-3 Rotation directions of spindle	4-2
Fig. 4-4 Operation of SPINDLE START button	4-3
Fig. 4-5 Turning the turret by operating the TOOL SELECT button	4-4
Fig. 4-6 Axial movement (X, Z)	4-6
Fig. 4-7 Axial movement (X, Z)	4-8
Fig. 4-8 Tail stock	4-9
Fig. 4-9 Tail spindle switch	4-10
Fig. 4-10 Tail spindle thrust adjustment	4-10
Fig. 4-11 Menu selector key	4-11
Fig. 5-1 Adjusting the coolant discharge port.	5-1
Fig. 5-2 Sample single foot switch operation	5-3
Fig. 5-3 Sample double foot switch operation	5-3
Fig. 5-4 Tail spindle thrust adjustment	5-4
Fig. 5-5 Gripping the work by its outside diameter (1/4)	5-5
Fig. 5- 6 Gripping the work by its outside diameter (2/4)	5-5
Fig. 5-7 Gripping the work by its outside diameter (3/4)	5-6
Fig. 5- 8 Gripping the work by its outside diameter (4/4)	5-6
Fig. 5-9 Gripping the work by its inside diameter (1/4)	5-6
Fig. 5-10 Gripping the work by its inside diameter (2/4)	5-7
Fig. 5-11 Gripping the work by its inside diameter (3/4)	5-7
Fig. 5-12 Gripping the work by its inside diameter (4/4)	5-7

Fig. 5-13 How to extend the tool eye	5-8
Fig. 5-14 Case where tool nose is brought near sensor (X-axis direction).	5-8
Fig. 5-15 Screen with offset no. entry	5-8
Fig. 5-16 Case where tool nose is brought into contact with sensor	5-9
Fig. 5-17 Case where tool nose is brought into contact with sensor (Z-axis direction).	5-10
Fig. 5-18 Sample of tool offset entry	5-10

## Part 3 Machine Maintenance

Fig. 1-1 Door pocket cover	1-3
Fig. 2-1 Adjustment of chuck open/close check sensor	2-2
Fig. 2-2 Replacing the hydraulic chuck (Sample: KITAGAWA B-208)	2-3
Fig. 2-3 Test piece	2-4
Fig. 2-4 Inspection of headstock accuracy	2-4
Fig. 2-5 Cleaning the chuck cylinder	2-5
Fig. 2-6 Replacing the collet chuck (O-CHS-476)	2-7
Fig. 2-7 Test piece (for collet chuck)	2-8
Fig. 2-8 Inspection of headstock accuracy (for collet chuck)	2-8
Fig. 2-9 Structure of the tool rest	2-9
Fig. 2-10 Structure of the tail stock	2-10
Fig. 2-11 Removing the center	2-11
Fig. 2-12 Hydraulic unit	2-13
Fig. 2-13 Cleaning the tank and strainer	2-14
Fig. 2-14 Adjusting the pressure	2-15
Fig. 2-15 Lubrication unit	2-16
Fig. 2-16 Replacing the suction filter	2-17
Fig. 2-17 Chip pan	2-18
Fig. 2-18 Replacing the air filter element	2-20
Fig. 2-19 Placement inside electric control cabinet	2-21
Fig. 2-20 Replacement of the machine fluorescent light	2-22
Fig. 2-21 Setting the reference position for turret indexing (1/2)	2-23
Fig. 2-22 Setting the reference position for turret indexing (2/2)	2-23

## Part 4 Appendix

Fig. 1-1 Shape of spindle nose	1-3
Fig. 1-2 Spindle output graph (standard)	1-4
Fig. 1-3 Chuck and tool eye interference diagram	1-24
Fig. 1-4 Dimensions of tool eye and chuck and distances between them	1-25
Fig. 2-1 Moving the machine	2-4
Fig. 2-2 Maintenance area	2-5
Fig. 2-3 Relocating the machine	2-5

## **Contents of tables**

### **Part 2 Machine Operation**

Table 2-1 Description of operational controls (Switch, key and button)	2-2
Table 2-2 Description of operational controls (Switch, key and button)	2-6
Table 3-1 Inspections for commencement of operation (before the power is on)	3-2
Table 3-2 Outline of the warmup operation	3-10

### **Part 4 Appendix**

Table 1-1 Main specifications	1-1
Table 1-2 Chuck length	1-24