

# MARUZEN

HYDRAULIC RIG MOUNTED

EARTH AUGER DRILL

MODEL AG-2000

OPERATING MANUAL



CAUTION

FOR THE SAFETY PURPOSE, PLEASE READ THIS MANUAL THOROUGHLY BEFORE ATTEMPTING TO USE THIS BREAKER. ANY FALES OPERATING PROCEDURES WILL CAUSE DAMAGES OF THE MACHINE. ALWAYS KEEP THIS MANUAL TO AN EASILY ACCESSABLE PLACE.



MARUZEN KOGYO CO., LTD.

# FOREWORD

This manual is an important part of your equipment. It provides rules and guidelines which will help you use this machine safely and effectively. You **MUST** familiarize yourself with the functions and operations by reading the manual thoroughly before you begin using this machine. For your safety, it is especially important that you read and observe all precautions in this manual and labels on the machine. The precautions **MUST** be followed strictly at all times when performing operation and maintenance. \* Fail to follow the guidelines and safety alerts in the manuals and on the machine, or use this machine in alternative ways from the manuals may result in system failure or serious personal injury.

Keep this manual with the equipment or in an easily accessible place in all times for future reference. Make sure all personnel involved in working on this machine can consult it periodically. In case this manual should be lost or damaged, immediately contact us or your dealer to purchase a new copy.

We recommend you always use Maruzen genuine components and parts. Replacing components and parts from other sources may cause damages to this machine and endanger operators.

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## SAFETY INFORMATION

To enable you to use this machine safely, safety precautions and labels are given in this manual and affixed to the machine to give explanations of situations involving potential hazards and of the methods of avoiding such situations.

## SAFETY ALERT CLASSIFICATIONS

The following safety alert symbols are used to inform you that there is a potential hazardous situation that may lead to personal injury or damage.

In this manual and on machines labels, the following safety alert symbol are used to express the potential level of hazard.



**DANGER**

Indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.



**WARNING**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



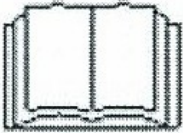

**CAUTION**



Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



**\*\* Safety alert symbols are to emphasize all operation which, if not strictly followed, could result in a life-threatening situation, bodily injury or damage to equipment.**

## SAFETY ALERTS



**DO NOT OPERATE THE MACHINE UNLESS THE FOLLOWING SAFETY INSTRUCTIONS HAVE BEEN THOROUGHLY READ AND UNDERSTOOD!**


	 <b>WARNING</b>
	<b>Read and understand operating manual before operating.</b>

	 <b>WARNING</b>
	<b>Be Cautious About High Pressure Hydraulic Oil</b> There is a risk of sudden breakage of hydraulic hoses which causes the oil inside belch out. <ol style="list-style-type: none"><li>1. Relieve the pressure inside before disconnecting hoses.</li><li>2. <b>DO NOT</b> inspect oil leakage with your bare hands. Because oil leakage is very often not noticeable, <b>ALWAYS</b> use cardboard or wood pieces to assist your inspection</li></ol>

	 <b>WARNING</b>
	<b>Be Cautious About High Heat</b> <ol style="list-style-type: none"><li>1. Following by rapid raise of the oil temperature, the temperature of the machine goes up while and after the operation. <b>DO NOT</b> touch the machine with your bare hands.</li><li>2. The temperature of tools will also raise while or after the operating. <b>BE SURE</b> that you always wear protective equipments while handling tools.</li></ol>

\* Failure to observe this precaution can result getting burned.

	<p style="text-align: center;"> <b>WARNING</b></p> <p><b>Before operating the equipment, be sure to wear personal protective equipments such as follows:</b></p> <ol style="list-style-type: none"><li>1. <b>Helmet</b></li><li>2. <b>Protective goggles</b></li><li>3. <b>Protective boots</b></li><li>4. <b>Safety gloves</b></li><li>5. <b>Hearing Protection</b></li><li>6. <b>Mask</b></li></ol> <p>* Failure to observe this precaution can result serious personally injuries.</p>
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 <b>WARNING</b>	<p><b>Do not operate the equipment if you are or if your</b></p> <ol style="list-style-type: none"><li>1. <b>taking medication, feeling drowsy, feeling unwell or feeling tired.</b></li><li>2. <b>under the influence of drugs or alcohol.</b></li><li>3. <b>hands, feet, lower back or other parts of your body hurt or being injured.</b></li></ol> <p><b>* Failure to observe this precaution can result serious injury or even death.</b></p>
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**CAUTION**

**When lending someone the equipment**

Make sure the safety instructions have been thoroughly read and fully understood by the person who is going to use the equipment.

**WARNING**

**Never operate the AUGER DRILL when bystanders are in the work**

1. Do not operate the auger drill if any people are within the area where flying debris or movement of the breaker may injure them.
2. For preventing flying debris, make sure protection fences are being set up.

Failure to observe this precaution can result personal injury.

## INTRODUCTION

1. This hydraulic auger drill is designed to be used for drilling earth (soil).
2. **DO NOT** operate this auger drill under the following situations:
  - (1) Drench part of the earth auger body or whole body into water or seawater.
  - (2) Attach this auger drill to an unsuitable mini-excavator.
  - (3) Operating with oil temperature below 10°C or over 100°C.
  - (4) Use the equipment for purposes other than stated in this manual.
  - (5) Use parts other than Maruzen genuine ones.



## **SPECIFICATIONS & DESCRIPTIONS**

Model	AG-2000
Dimensions (mm)	W $\phi$ 254 x L $\phi$ 641
Weight (kg)	82kg
Operating Pressure	225kgf/cm <sup>2</sup> (22.0MPa)
Max Intake Pressure	290kgf/cm <sup>2</sup> (28.4MPa)
Rated Torque	160kgf. m (1570N.m)
Max Torque	210kgf.m(2060N.m)
Max Allowable Oil Flow	65 l/ min.
Auger R.P.M.	50/30 l, 65/40 l, 80/50 l, 105/65 l
Hose Connection	1/2" coupler
Auger Dia. (mm)	$\phi$ 150, 200, 250, 300, 350, 400, 450, 500, 600mm
Extension (mm)	$\phi$ 150 – 450mm
Auger Joint	50mm hex x 70mm l
Drilling Speed	15-30 sec./ m
Drilling Capacity	$\phi$ 150-250mm: 12-17m $\phi$ 300-350mm: 8-12m $\phi$ 400-450mm: 6-10m $\phi$ 500-600mm: 1m

## OPERATION

1. Hydraulic Connection (See Fig.1 )
  - 1) Before operating, read and follow all the instructions in operating and maintenance manual of the excavator to which AG-2000 may be attached.
  - 2) Disconnect the hoses from the bucket cylinder and attach the couplers to each disconnected connections. For excavator use, connect the hoses to the hoses from auger driving unit with couplers. Auger start/ stop are done by the bucket operating lever. Check and confirm if the relief valve pressure is within the specified range of 290kgf/cm<sup>2</sup>.
2. Installation of AG-2000 to the excavator
  - 1) Stop the engine of excavator and detach the bucket from the excavator.
  - 2) Attach AG-2000 to the end of bucket link by the pin.
  - 3) Connect the hoses of AG-2000 with the bucket cylinder hoses.
  - 4) Start engine and check if normal and reverse operation and stop can be done by the lever for bucket operation lever.

### Cautions ! :

Be sure not to put your hand between the arm of excavator and AG2000 body.

Read and follow the instructions of the operation manual of the excavator .

Always check the specifications of the excavator and attach AG-2000 to the suitable excavator.

3. Connecting of Auger Tools
  - 1) Check if mud or others stick to the joint of the driving unit and auger.
  - 2) Put each bolt hole of the driving unit and auger joint together and insert the hex joint of auger into the hex socket joint of driving unit ( See Fig.2)
  - 3) Insert the hex socket bolt (M10 x 110) into the bolt of hole and fasten it with the nylon nut (M10) ( See Fig.3)
4. Operation
  - 1) Attach the drill point to the ground to be drilled and start drilling by rotating the auger ( See Fig.3)
  - 2) If the joint of driving unit reach the ground and further drilling is necessary, detach the hex socket bolt and lift the driving unit. ( See Fig.4)  
Attach the extension to the drill in the ground first and joint the extension with the driving unit fastening each hex socket bolt with nylon nut. ( See Fig.5)

Fig. 2

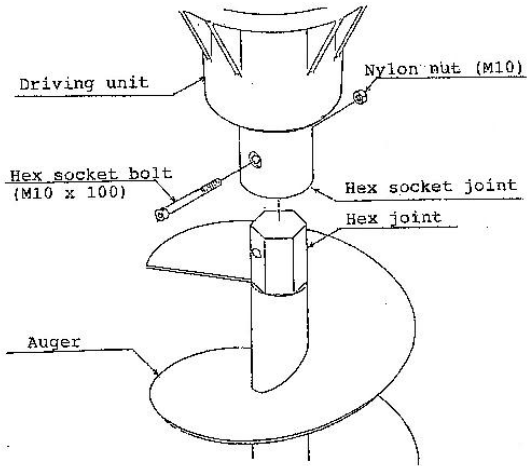


Fig. 1

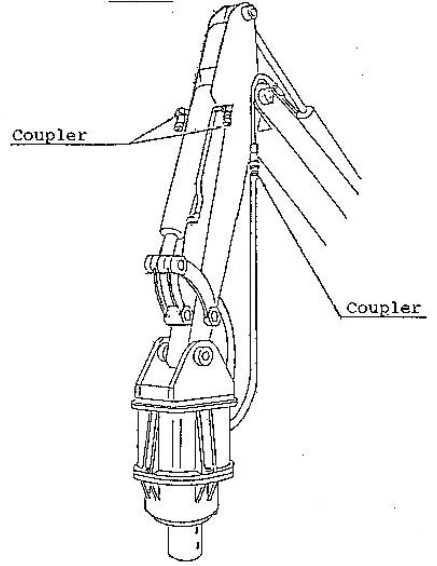


Fig. 3

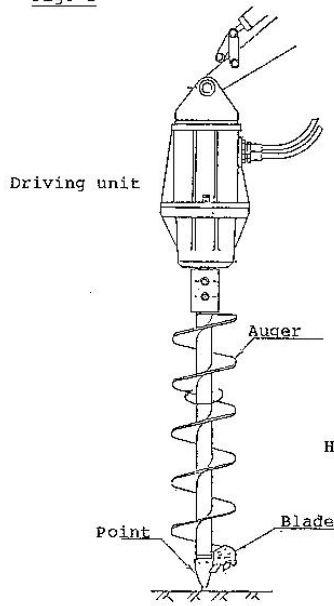


Fig. 4

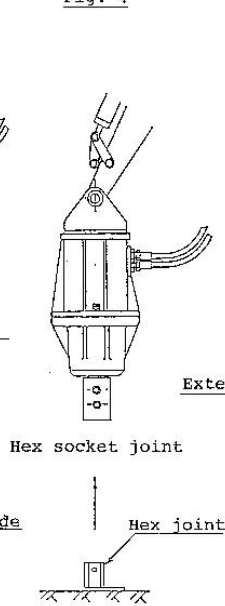
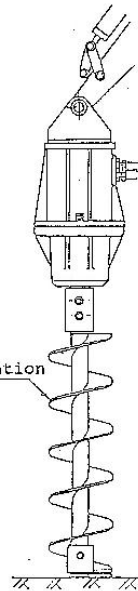
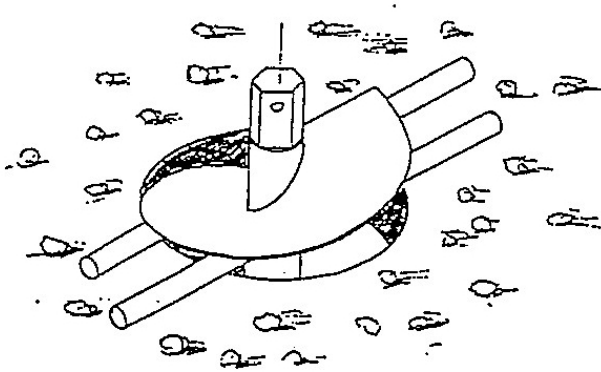


Fig. 5



## 5. Operating Notices

- 1) Operate the excavator arm to keep the auger drilling down vertically.
- 2) Control the pressing-down power of excavator arm that the auger rotation may not stop during drilling.
- 3) If the auger drill stops against obstacles such as stones, lift the auger to return to normal rotation or reverse and lift the auger, then return to normal rotation.
- 4) Keep away from the auger, as stones and others can fly during drilling and are dangerous.
- 5) Never move and turn the excavator with the auger put in the ground.
- 6) When the excavator moves or is transported for long distance, take off the auger drill from the excavator.
- 7) When the auger reaches the aimed depth, pull it keeping in a vertical position. When the extension is detached, be sure to detach it with each one piece.
- 8) In case of deep drilling and pulling out the auger from the drilled hole, detach the extension preventing it with 2 pieces sticks from falling into the hole.

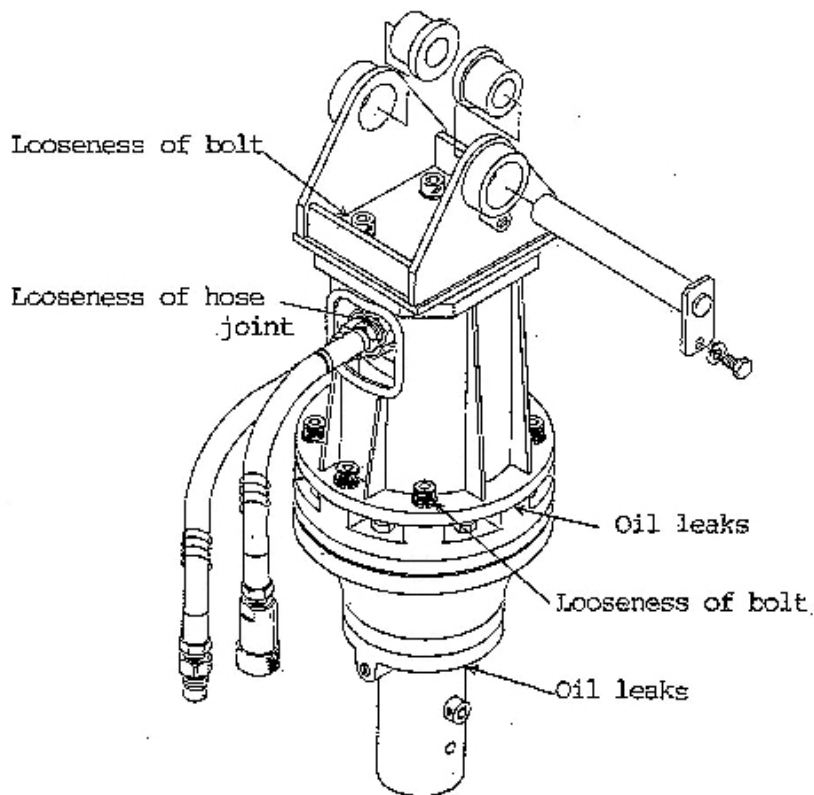


## Maintenance

### 1. Daily Checking ( Before operation )

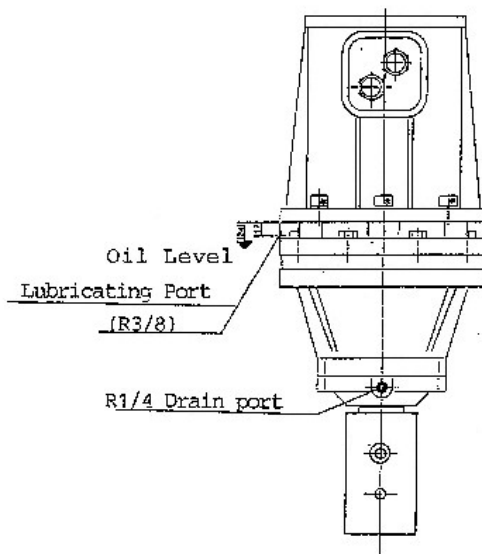
Before operating AG-2000, always check the followings and confirm if there are no troubles for operation.

Check points	Countermeasures
1. Bolt and nut of pin bracket	When loosened wipe out the grease oil on it and tighten it by the torque of 20kgfm.
2. Joint of hose	When loosened tighten it again
3. Bolt and nut of supporting bracket	When loosened tighten it again
4. Housing connection	When oil leaks from the connection, repair the housing



## 2. Periodical Checking

- 1) Replace the gear oil periodically after 50 hours at first and every 100 hours after that. Recommended oil: ISO VG220 or equivalent
- 2) Replacement procedure.
  1. Take off the taper plugs of oil drain ( PT1/4) and lubricating port ( PT3/8) and drain the oil of reduction gear completely standing AG-2000 as below Fig..
  2. Screw the taper plug ( PT1/4) to the drain with seal tape by 2.5kgfm torque.
  3. Lay down AG-2000 making the lubricating port to the top and pour 1.5 l lubricating oil into the gear case.
  4. Make AG-2000 stand and confirm oil does not flow out from the lubricating port.
  5. Screw the taper plug ( PT3/8) to the lubricating port with seal tape by 5kgfm torque.



### 3. Trouble Shooting

Symptom	Main Cause	Countermeasures
Stop in use	Coupler is disconnected. The damage of motor or reduction gear	Check the piping. Repair or replace.
Oil leakage from main body	The damage of motor. The damage of oil seal. Loosen of oil plugs.	Repair or replace. Replace. Refill the gear oil and tighten up plugs.
Oil leakage from hoses	Loosen of hoses. Damage of hoses.	Tighten up again. Replace.
Auger r.p.m. is too fast. Auger r.p.m. is too slow	Excessive oil flow. Short oil flow.	Adjust engine r.p.m. and reduce oil flow. Check oil flow.
Auger swing abnormally	Bend of auger. Bend of center shaft.	Repair or replace. Replace.

For items with \*, ask Maruzen dealers for service and maintenance.

**Parts list for AG-2000**

No.	Part No.	Part Name	Q'ty
	<b>Driving Unit</b>		
1	MH16D001A	Cover, bracket	1
2	MH16E002A	Joint	1
3	4-130-EAG-Y	Hydraulic motor w/ reduction gear	1
4	EAG-900-85070	Key	1
5	4043-1208	Connector w/SAE O-ring	2
6	28121 · 6□□□□SX	High pressure hose	2
7	32EA08CZ	1/2" coupler male	1
8	31EA08CZXXS	1/2" coupler female	1
9	WS-14	Spring washer	6
10	BH-14x35(P1.5)	Bolt, hex socket M14x35(P1.5)	6
11	BH-14x110	Bolt, hex socket M14x110	1
12	NN-14	Nylon nut M14	1
13	BH-10x110	Bolt, hex socket M10x110	1
14	NN-10	Nylon nut M10	1
	<b>Pin Bracket</b>		
63	BH-14x45	Bolt, hex socket M14x40	4
64	WS-14(1)	Spring washer M14	4
65	MH10D101B	Pin bracket M(Pin size $\phi$ 25-40)	1
66	MH10D301B	Pin bracket L(Pin size $\phi$ 45-50)	1
67		Pin	1
68		Bush	2
69	B-10x20-11T	Bolt, hex M10x20	1
70	WS-10-1L(JISB1252)	Spring washer M10	1



