

MARUZEN

HYDRAULIC HANDHELD POST DRIVER

MODEL KH193

OPERATING MANUAL

ORIGINAL INSTRUCTIONS



FOR THE PURPOSE OF SAFETY, PLEASE READ THIS MANUAL THOROUGHLY BEFORE ATTEMPTING TO USE THIS ROCK DRILL. ANY INCORRECT OPERATING PROCEDURES WILL CAUSE DAMAGE TO THE MACHINE. ALWAYS KEEP THIS MANUAL IN AN EASILY ACCESSIBLE PLACE.



MARUZEN KOGYO CO., LTD.

(Revised July 12, 2022)

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 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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CONTENTS

SAFETY INFORMATION	4
SAFETY ALERT CLASSIFICATIONS	4
SAFETY ALERTS	5
SPECIFICATIONS & DESCRIPTIONS.....	10
PRECAUTION LABELS AND POSITIONS.....	11
INSPECTIONS BEFORE EACH OPERATION	12
OPERATION	13
GUIDELINES	15
INSPECTION.....	17
TROUBLE SHOOTING.....	18
TEXPLODED VIEW	18
PARTS LIST	19


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.

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











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

 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!

	Read and understand all of the instructions and safety information in this manual before operating.
	Wear eye protection.
	Wear ear protection.
	Wear a dust mask.
	Wear a helmet.
	Wear protective gloves.
	Wear foot protection boots.
	Do not touch oil with your bare hands.
	The rock drill body will be hot during and after use. Do not touch it with your bare hands.
	Contains high pressure gas.



WARNING

Before operating the tool, be sure to wear personal protective equipment such as follows:

1. Helmet
2. Protective goggles
3. Protective boots
4. Safety gloves
5. Ear protection
6. Dust mask

* Failure to observe this precaution could result serious personally injuries.



WARNING

Do not operate the equipment if you are or if your

1. taking medication, feeling drowsy, feeling unwell or feeling tired.
2. under the influence of drugs or alcohol.
3. hands, feet, lower back or other parts of your body hurt or being injured.


* Failure to observe this precaution can result serious injury or even death.



 **WARNING**



Do not touch with your bare hands.

1. Following by rapid raise of the oil temperature, the temperature of the machine goes up while and after the operation. **DO NOT** touch the machine with your bare hands.
 2. The temperature of tools will also raise while or after the operating. **BE SURE** that you always wear protective tool while using tools.
- * Failure to observe this warning could result getting burned.

 **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.

- * Failure to observe this precaution can result serious personal injuries or damage the machines.

	<p style="text-align: center;"> WARNING</p> <p>Pay special attention to high-pressure gas.</p> <p>There is a risk of sudden breakage of hydraulic hoses which causes the oil inside to blow out.</p> <ol style="list-style-type: none">1. Depressurize the machine before disconnecting any hoses.2. Do not check for oil leaks with your bare hands since high-pressure oil is invisible and can cause serious injury. ALWAYS use cardboard or wood pieces to assist your inspection
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INTRODUCTION

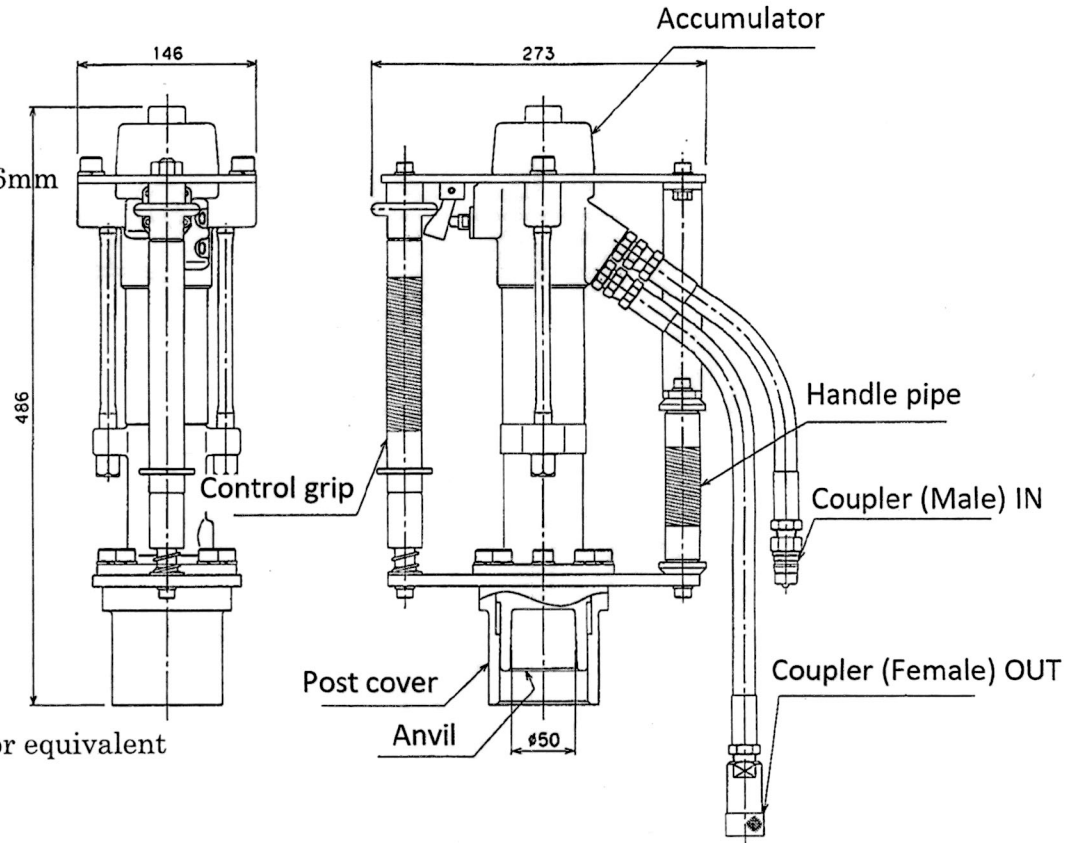
1. This hydraulic post driver is designed to be used for driving
 - (1) anchors and piles.
 - (2) pipes into soil ground.

2. **DO NOT** operate this post driver on the following situations:
 - (1) Drench part of the body or whole body into water, seawater, or muddy water.
 - (2) Drive more than 3 minutes in the situation when pile or pipe does not go in.
 - (3) Use for purpose other than stated in this manual.
 - (4) Use with power source which oil flow and pressure exceeds from its specification.
 - (5) Operating with air temperature below -10°C or over 40°C.

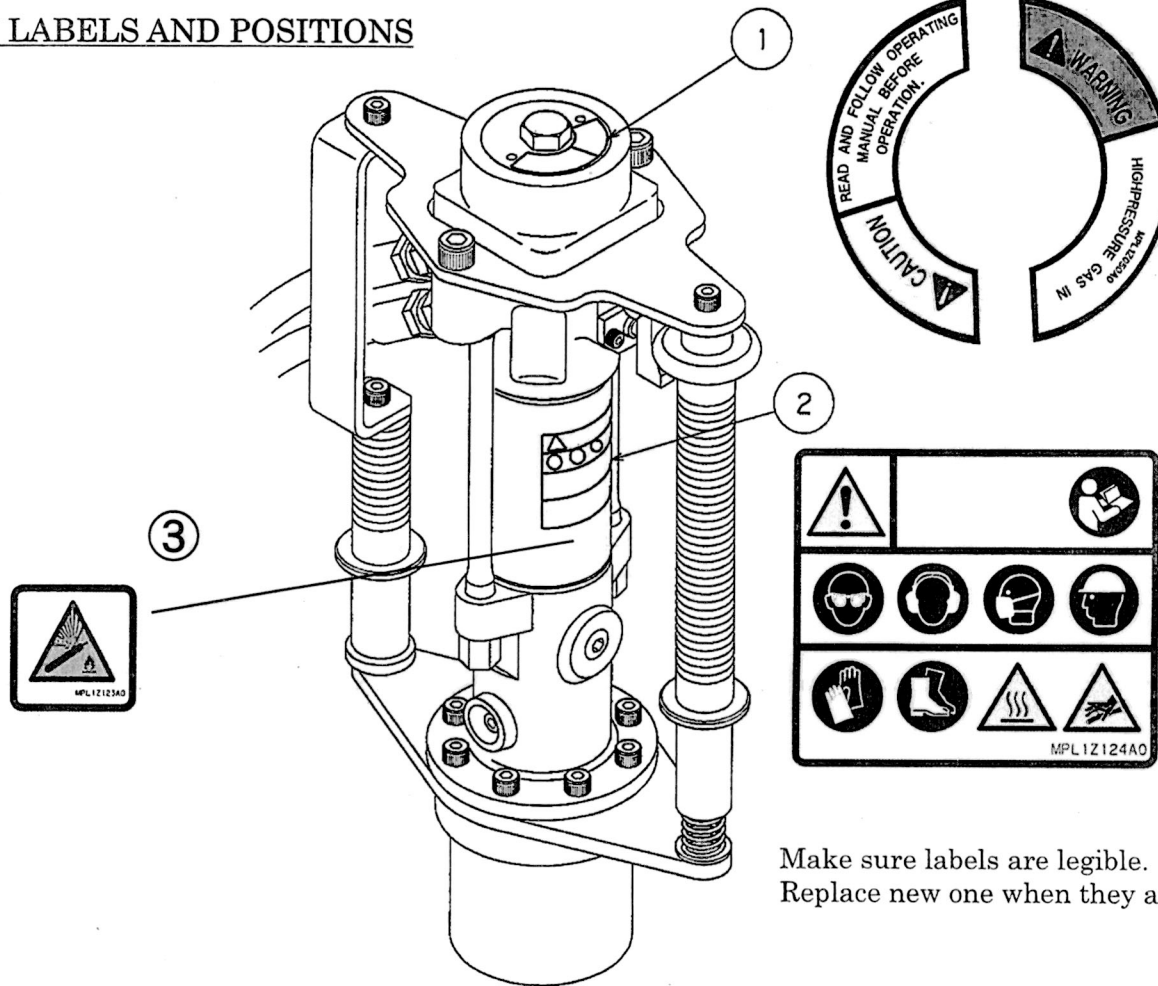
- (6) Operating with oil temperature below 10°C or over 90°C.
 - (7) Use connecting with extension hoses which exceed 3/8in x 10 meter.
 - (8) Attach to other construction machinery.
3. Contact us if you intend to use this post driver for other purposes.

SPECIFICATIONS & DESCRIPTIONS

Overall Weight	20kg
Overall Dimensions	486mm X 273mm X 146mm
Working Pressure	8 ~ 11MPa
Max. Pressure	21.4 MPa
Flow Range	20.5 L/min
Blow per Minute	1920 bpm
Coupling	3/8" Couplers
Allowable Back Pressure	2.5 MPa
Max. Hose Length	3/8" x 10m
Hydraulic Oil	ISO VG32, ISO VG46 or equivalent



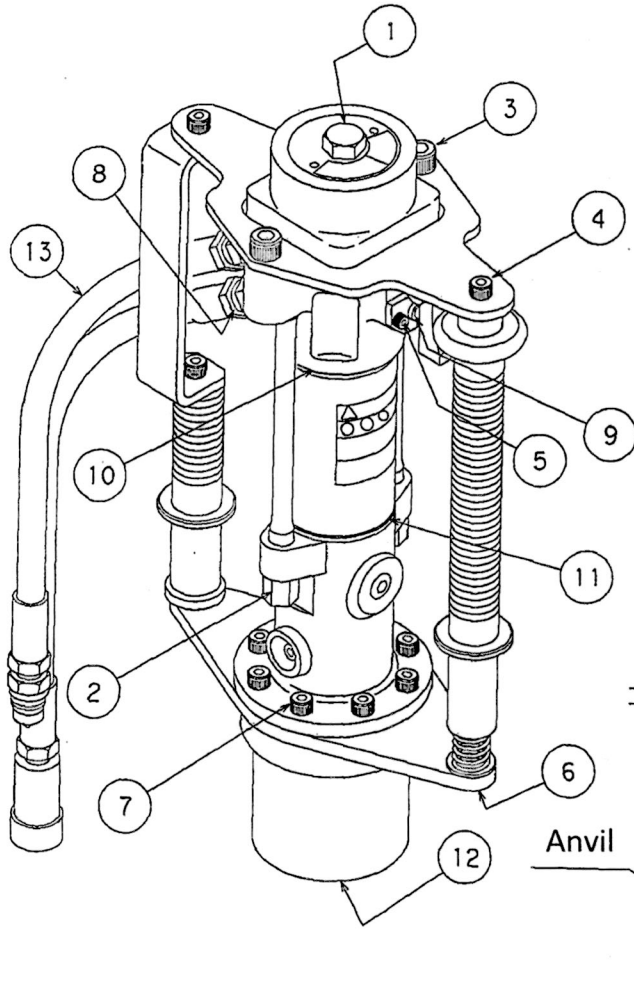
PRECAUTION LABELS AND POSITIONS



Make sure labels are legible.
Replace new one when they are illegible.

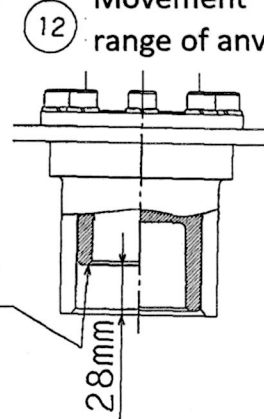
INSPECTIONS BEFORE EACH OPERATION

Make sure the following inspection items are done each time before using. (Refer the drawing on the right)



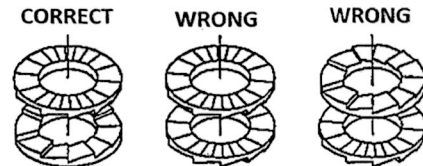
Inspection Items	Countermeasures
1. Loose cap ①	Retighten
2. Loose nut ②	Retighten
3. Loose bolt ③④⑤⑥⑦	Retighten
4. Loose hose fitting ⑧	Retighten
5. Oil Leakage ⑨⑩⑪⑫	Repair
6. Injuries on Hoses ⑬	Replace
8. Movement range of anvil ⑫	Clean

Movement range of anvil



How to set NO.64 Washer correctly

When using NO.64 Washer again, check carefully if
 -thread is not crushed
 -there are no crack
 and set in correct way.



OPERATION

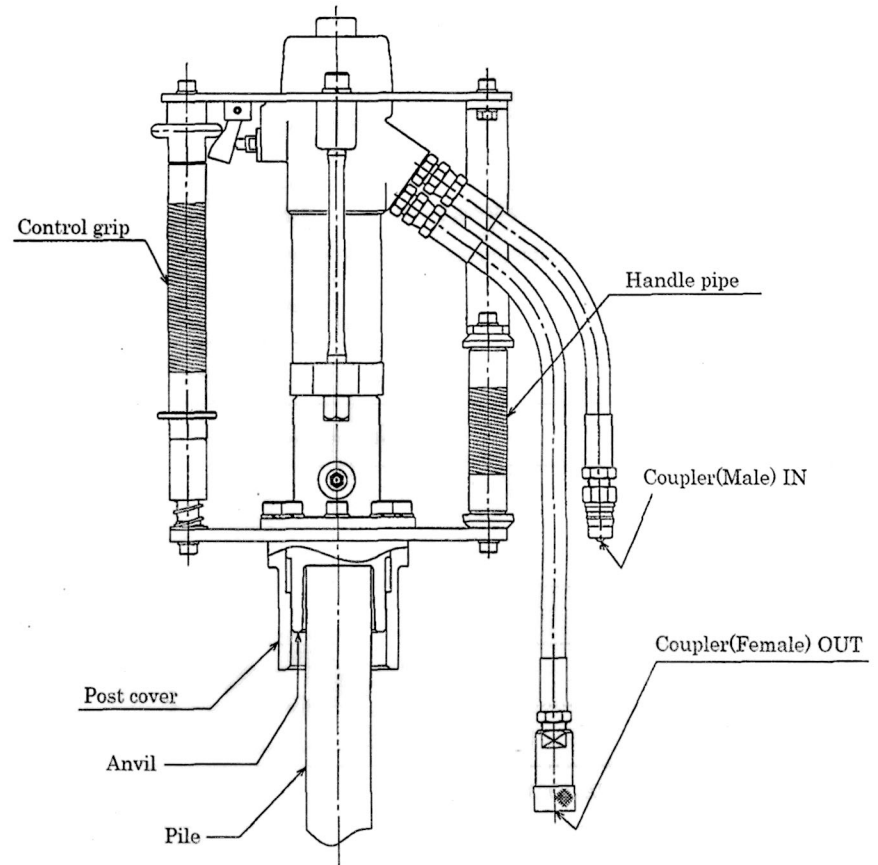
Make sure this post driver is being connected to a suitable power source before operating.

Preparation

1. Make sure coupler is clean.
(No dust, mud or other foreign material attach to them)
Connect the post driver with hydraulic power source with extension hoses
2. Attaching $\varnothing 4\text{mm}$ (or more) lifting wires on top plate to lift the post driver.
3. Set pile or pole which you intend to drive vertically to the ground. Set the pile guide on the top of the pile or pole which you intend to drive.
4. Start the power unit or other power source.

Operation

5. Hold on handle grip and control grip with both hands. To start operating, pressure down the post driver and control grip.
6. Release control grip when intend to stop the machine.



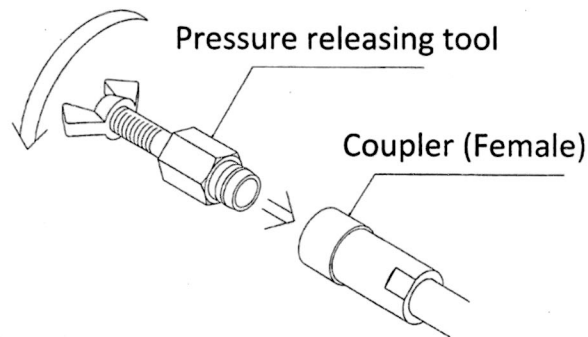
After the operation

7. Stop the power unit or power source.
8. Remove the extension hoses.
9. For preventing dust, dirt entering the extension hoses, attach both sides of the couplers on extension hose to each other.
10. Clean and wide out dirt and dust on post driver.

* For more information regarding to operation and precautions, please refer to the next page.

◆When the coupler cannot be connected

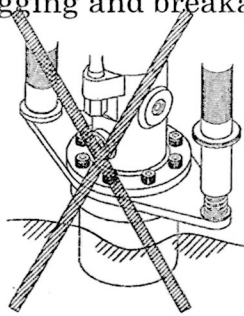
If the coupler cannot be connected, there may be pressure remaining inside the hose (residual pressure). Use a pressure relief tool (option tool) to release the pressure.



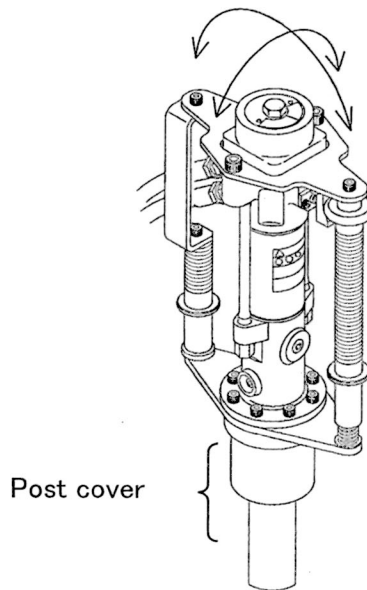
GUIDELINES

1. Use appropriate hydraulic power source which is suitable the specification range of this post driver.
2. Be careful of the following when operating the post driver.
 - (1) Piles fall down and cause injury.
 - (2) Be careful not being trip over by extension hoses.
 - (3) Be careful of your footing. Clear work area of objects which might cause operators to trip and fall.
 - (4) Preventing the sudden falling of post driver, make sure the post driver is lifted (with wires) while operating.
 - (5) Make sure the post driver is placed horizontally while not being used. Fail to place the post driver horizontally after operating can cause injury by sudden falling of the post driver.
 - (6) Be careful not to injure your back while lifting the post driver.
3. After disconnect hydraulic power unit and the post driver, connect both side of the couplers on extension hoses together.
4. If operation does not stop even after releasing control grip, STOP the hydraulic power source IMMEDIATELY.
It is necessary to inspect and repair the tool.
5. In case of sudden hydraulic hose breakage and hydraulic oil belch out, STOP the power source IMMEDIATELY.
6. When connecting and disconnecting couplers, a small amount of oil spills out. Wipe it off and try and be careful not to contaminate the surrounding area with oil.
Also, check the amount of hydraulic oil when starting the power unit. Refill when it is insufficient.
7. Make sure to STOP the power source when connecting and disconnecting the post driver and the power source with hoses.
8. When connecting and disconnecting couplers, make sure dirt, dust and other foreign substance does not enter or attach to couplers and hoses.
9. In cold place or seasons and if the oil temperature is below 10°C, warm up the power unit or power source before start operating.

10. Do not use with the tip of the tool in the soil or water.
It may cause mud clogging and breakage.



11. If the pile or pipe does not go in, stop the operation and check for obstacles. If you continue to work, the pile or pipe might get deformed and get stuck in the tool, or it may cause breakage. If the tool cannot be pulled out from the pile or pipe, shake the tool back and forth to pull it out. Do not hit the post cover part with such as a hammer. It may cause damage and it is dangerous.



INSPECTION

1. Anti –rust treatment of piston

Water may get inside the front cap during use.

If it is leaved as it is, rust can happen on piston and damage piston and cause oil leakage.

After use, remove Plug (26) on the figure and spray rust prevention spray through the inspection hole.

After spraying, install the plug and tighten it.

2. For long term storage, take following measures.

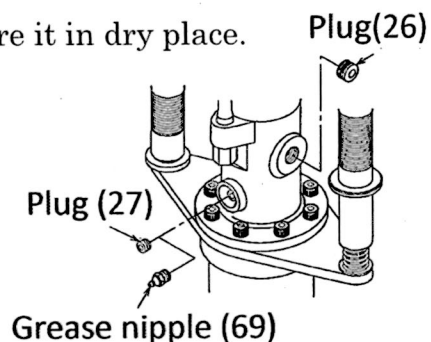
(1) Apply anti-rust spray to anvil from post cover.

(2) Remove Plug (26) of inspection hole and take rust prevention measures for the piston.

(3) Replace the plug (27) with the grease nipple (69), and feed grease 3 to 5 times with a grease pump.

(4) Wipe and clean the entire tool with a cloth moistened with oil.

(5) Place a cover to the tool and store it in dry place.



3. Periodical inspection

Ask your Maruzen nearest dealers for the following maintenance.

Inspection Items	Operating Hours
Accumulator Nitrogen gas charge	Every 250 hours or 1 Year
Change accumulator diaphragm	Every 500 hours or 2 years
Change O ring in valve body	Every 500 hours or 2 years
Change U cup packing	Every 500 hours or 2 years
Change all O rings	Every 3 years
Grease on front cap	Every 50 hours or 6 months

* The pressure of nitrogen gas charging in accumulator is 3.9MPa.

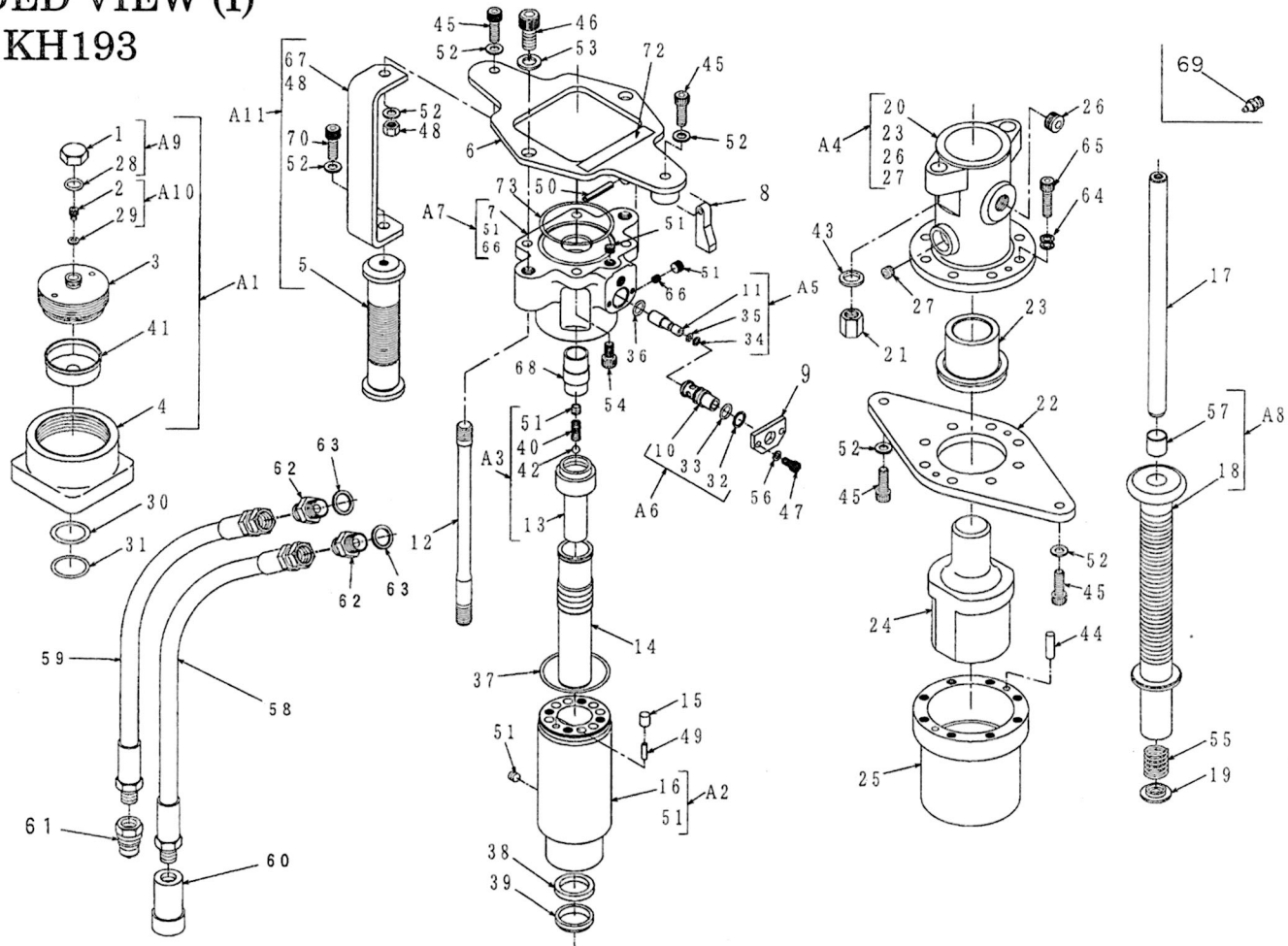
TROUBLE SHOOTING

Symptoms	Causes	Countermeasures
Grip the control lever but it does not start	1. Power unit or power source is OFF	Start the power unit or power source.
	2. The control lever on power unit is in "OFF" position.	Turn the control lever to "ON" position
	3. Hoses are not connected properly.	Connect all the hoses, extension hoses properly.
	4. Couplers are not connected properly.	Connect all the couplers and hose fittings properly.
	5. Pressure of relief valve was set too low.	* Adjust the pressure of relief valve to 11.7~20.6MPa
	6. Damage of control valve	* Replace a new control lever
	7. Malfunction of control valve	* Disassemble the post driver and remove dirt, foreigner substances between control valve and valve body.
	8. High pressure hose and low-pressure hose were attached to the wrong side.	Attach high pressure hose on the top of the main body.
	9. Draw bolt nuts are loosen	* Tighten draw bolt nuts firmly and evenly on both sides
Functioning but weak hammering or low hammering speed	1. Low rate of oil flow from power source	Turn the engine rotation rate up and increase the rate of oil flow (Adjust oil flow to the necessary rate) * Check the displacement of hydraulic pump
	2. Pressure of relief valve was set too low.	* Adjust pressure to the range of 11.7 ~ 20.6MPa)

Symptoms	Causes	Countermeasures
	3. Malfunction of control valve	* Remove and clean the joint of control lever and valve body
	4. Back pressure is too high	Use shorter and wider hose for hydraulic oil returned side (low pressure hose)
	5. Hydraulic oil is lesser than necessary amount.	Refill hydraulic oil.
	6. Damage of anvil	* Disassemble the post driver and replace a new anvil.
Normal hammering speed but weak hammering power	1. The gas pressure in accumulator is low	* Nitrogen gas charge * Charge pressure 4MPa
	2. Damage of accumulator diaphragm	* Replace new diaphragm *
Strong hammering and in high speed	1. High rate of oil flow	* Turn the engine rotation rate down to decrease the rate of oil flow (Adjust oil flow to the right range)
An abrupt stop during operation	1. Couplers were disconnected	* Check each connected parts and be certain all the couplers are connected firmly
	2. Damage of control valve	* Replace a control valve
Profuse Oil leakage from front end	1. Damage of U cup packing	* Replace U cup packing *
	2. Damage of U cup packing due to the scratch on piston.	* Replace U cup packing, remove the scratch on piston
High pressure hose shakes intensely	1. Damage of accumulator diaphragm	* Replace diaphragm

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

EXPLODED VIEW (I) MODEL KH193



PARTS LIST MODEL KH193

No.	Code	Descriptions	Q'ty	No.	Code	Descriptions	Q'ty
1	M2LTE115A	Cap	1	28	OS-22.4	O-Ring	1
2	1120 - 413 - A	Cap Bolt	1	29	WS - 06<<<<<<<<<<BH	Seal Washer	1
3	M2LTE109A	Lid (S)	1	30	OBP - 22	Back Up Ring	1
4	M2LTD103A	Shell	1	31	OP - 22	O Ring	1
5	MB26Y022A	Handle Pipe	1	32	OBP - 14	Back Up Ring	1
6	MB26Y005A	Top Plate	1	33	OP - 14	O Ring	1
7	MB26X012A	Valve Body	1	34	OBP - 5	Back Up Ring	1
8	MB08Z015A	Cam	1	35	OP - 5	O Ring	1
9	MB26Z010A	Plate	1	36	OP - 12.5 (1B)	O Ring	1
10	M2LTE108A	Valve Guide	1	37	OG - 60	O Ring	1
11	M1KTE111A	Valve Rod	1	38	IUIS - 30 - 40 - 6	U Cup Packing	1
12	MB26Z001B	Draw Bolt	2	39	DS - 30385	Dust Seal	1
13	M2LTE124A	Inner Tube(B)	1	40	M1HTE107A	Spring (P)	1
14	M2LTD125A	Piston (B)	1	41	MB02E006A	Diaphragm	1
15	MB26Z018A	Collar	1	42	QB - 5/16	Steel Ball	1
16	M2LTD104B	Cylinder	1	43	WF -14 -2L (JIS B1252)	Spring Washer	2
17	MB26Z004A	Handle Shaft	1	44	PFB - 6 x 24 (YAKIIRE)	Pin	2
18	MB26Z003A	Handle Grip	1	45	BH - 8 x 25	Bolt	4
19	MB26Z006A	Spring Stay	1	46	BH - 12 x 25	Bolt	2
20	MB26Y016C	Front Cap	1	47	BH - 5 x 12	Bolt	2
21	1120-423-C	Nut	2	48	N1-8	Nut	1
22	MB36Y003A	Flange	1	49	PR - 6 x 16	Pin	1
23	MB26Z014A	Chisel Bush	1	50	PR - 5 x 30	Pin	1
24	MB36Z001A	Anvil	1	51	BPH1 - PT 1/8	Plug	10
25	MB36Y002A	Post Cover	1	52	WF-8 (1L)	Washer	6
26	BPH1-PT3/8	Plug	1	53	WS - 12	Washer	2
27	BPH1-PT1/8	Plug	1	54	BH - 8 x 15	Bolt	4

No.	Code	Descriptions	Q'ty	No.	Code	Descriptions	Q'ty
55	SAWANE - 5549	Spring	1				
56	WS - 5	Washer	2				
57	DB - MB1615DU	DU Bush	1				
58	21091 · 6 - 50 -	Low Pressure Hose	1				
59	21091 · 6 - 35 -	High Pressure Hose	1				
60	-	Coupler Female	1				
61	-	Coupler Male	1				
62	N1011-06-HEX22	Adaptor	2				
63	WS-18<<<<<<<<<<BH	Seal washer	2				
64	NL8DP	Washer	8				
65	BH-8x30	Bolt	8				
66	M2LTE118A	M6 Orifice Plug(Φ 2.2)	1				
67	MB26Z023A	Stay	1				
68	M1XTE108A	Control Valve	1				
69	GN-01	Grease Nipple	1				
70	BH-8x20	Bolt	1				
71	-	-	-				
72	-	-	-				
73	OS-70	O-Ring	1				

KH193 ASSY PARTS LIST

No.	Code	Descriptions	Q'ty	
A1	M2LTZ501A	Accumulator Assy	1	1,2,3,4,28,29,41
A2	M2LTZ502A	Cylinder Assy	1	16,51(5)
A3	M2LTZ503A	Inner Tube Assy	1	13,40,42,51
A4	MB26Z026B	Front Cap Assy	1	20,23,26,27
A5	M1XTZ505A	Valve Rod Assy	1	11,34,35
A6	M2LTZ506A	Valve Guide Assy	1	10,32,33
A7	MB26Z029A	Valve Body Assy	1	7,51(6),66,73
A8	MB26Z030A	Handle Grip Assy	1	18,57
A9	M2LTZ508A	Cap Nut Assy	1	1,28
A10	MB24Z509A	Cap Bolt Assy	1	2,29
A11	MB26Z031A	Handle Pipe Assy	1	5,48,52(2),67,70
A12	M2LTZ511A	Seal Kit	1	28,29,30,31,32,33,34,35,36,37,38,39,63(2),73

