

MARUZEN

HYDRAULIC GRASS MOWER MODEL GC600

OPERATING MANUAL AND PARTS LIST



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.

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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.



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



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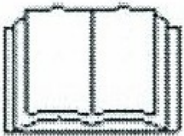




Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

**** 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!

	 WARNING
	Read and understand operating manual before operating.



WARNING

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

1. Helmet
2. Protective goggles
3. Protective boots
4. Safety gloves
5. Hearing Protection
6. Mask

* Failure to observe this precaution can 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

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.



DANGER

Never operate the mower when bystanders are in the work area

1. Do not operate the mower if any people are within the 50m work area where flying debris or movement of the mower 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.



CAUTION

Notice on Operation

1. **DO NOT** press the edge of the teeth of blade on the ground.
2. **DO NOT** press the machine to cutting object without rotating the blade.
* **Failure to observe this precaution can result the damage of blade and may cause the personal injuries by flying broken debris of blade.**



WARNING

Be Careful for Blade of Mower

When the working signal button is out, don't approach the cutting blade as the cutting blade is ready to rotate.

For maintenance, always check the blade after stopping the engine.

*** Failure to observe this precaution can result the personal injuries.**



WARNING

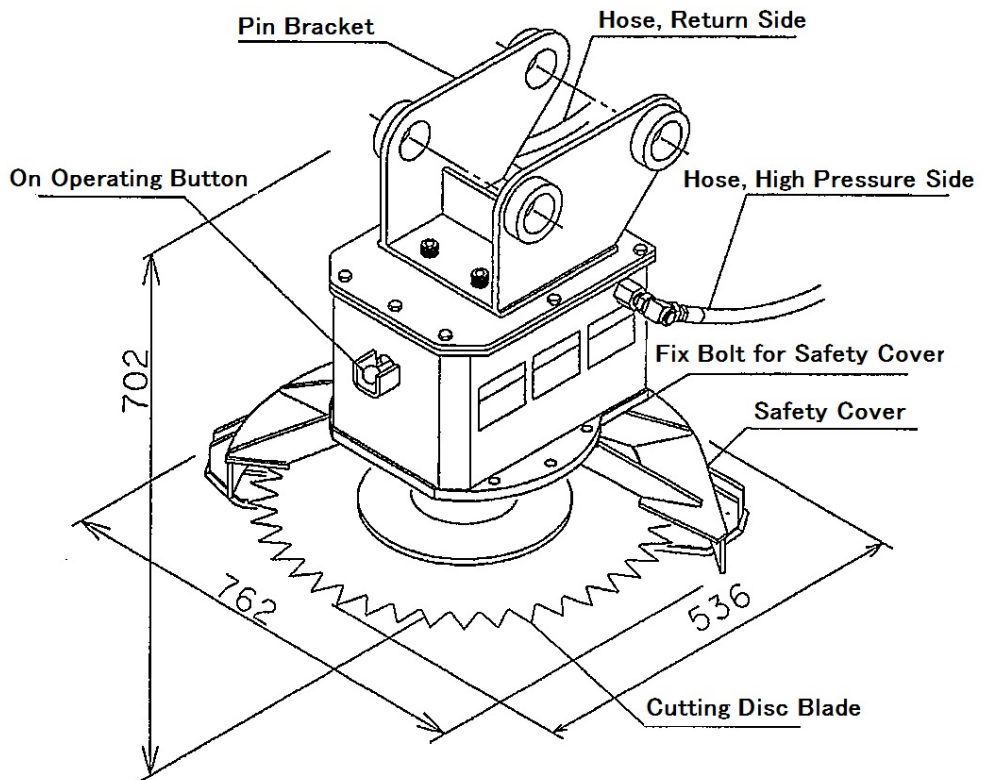
Be Sure to Attach Safety Cover

1. **DO NOT** operate machine without safety cover.

*** Failure to observe this precaution can result the personal injuries.**

2. SPECIFICATIONS

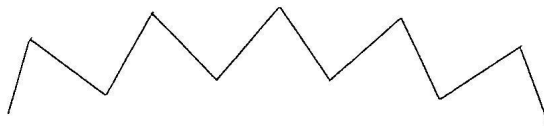
Model	GC-600
Dimensions	LxWxH(mm) 762x536x702
Weight	97kg (without pin bracket)
Hydraulic Motor	Geared Motor
Flow Range	25~60L/min (flow divider)
Relief Set Pressure	17.2 MPa
Allowable Back Pressure	Max 2.0 MPa
Blade Size	OD610mm x Thickness2.2mm x Teeth40 (std)
Blade R.P.M.	3600 r.p.m.
Torque	Max 12.7N/m
Blade Speed	120m/s
Connection	G 1/2
Safety Cover Rotation Angle	$\pm 45^{\circ}$



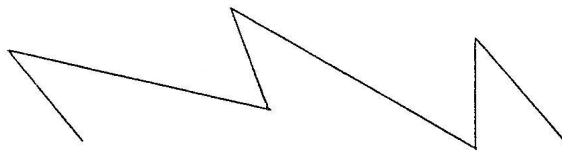
3. Features

- (1) As flow divider is built in this machine, rotation numbers of cutting blade is not affected by the change of oil flow of excavator and stable rotation of blade is obtainable.
- (2) Attachable to any mini-excavators which have hydraulic circuit with the flow range of 25-60L/min.
- (3) Original blades cut cleanly grasses and durable.
- (4) Break up the hard work by manual operated machine and workable efficiently.
- (5) Easy attachment of machine to excavator with 2 pins and 2 hoses.

Blade Types



1. Standard Blade OD 610mm x Thickness 2.2mm x Teeth 40



2. Blade for Soft Grass OD610mm x Thickness 2.2mm x Teeth 20



3. Blade for Hard Grass/Bamboo OD610mm x Thickness 2.2mm x Teeth 100

4. Usage

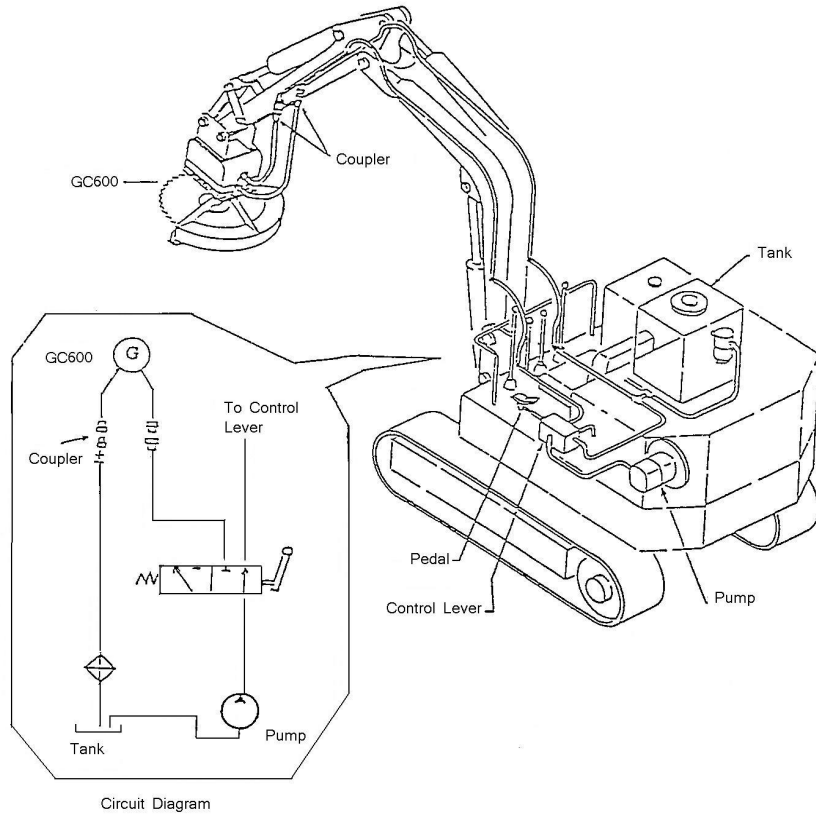
This machine is to use for cutting grasses and scrub brushes attaching to mini-excavator.

Don't use this machine under the following conditions.

- 1) Attaching to the power sources (construction machines) of which specifications are over the specifications of this machine (oil flow/pressure).
- 2) Work with the blades except genuine blades of this machine.
- 3) The works except the above usage.

5. Piping

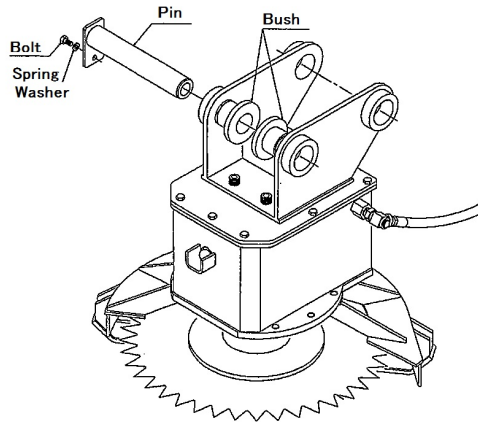
Piping is different according to the models and types of excavator. Refer the following basic piping for your attachment of machine and piping.



6. Attachment

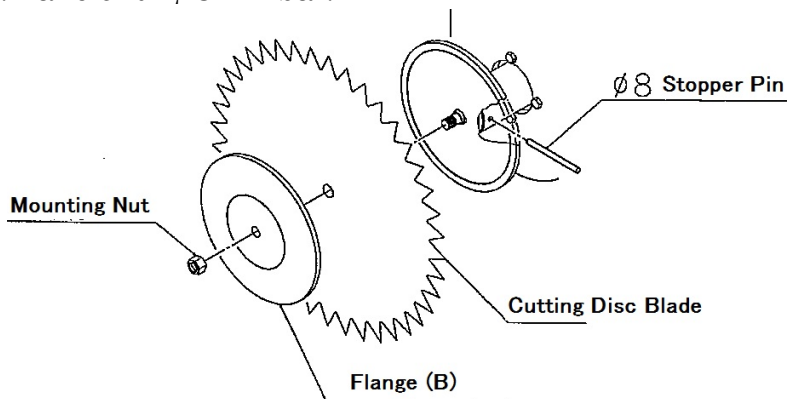
(1) Attaching Grass Mower to Excavator

1. Detach the bucket of excavator and set the arm ends inside of bracket of grass mower.
 2. Attach the grass mower to the bucket links of arm with 2 pins.
 3. Connect hoses of grass mower to the pipes of bucket circuit or PTO circuit if equipped.
- ** Connect the hoses of mower to be in position of upper hose to high pressure hose and lower hose to return hose.



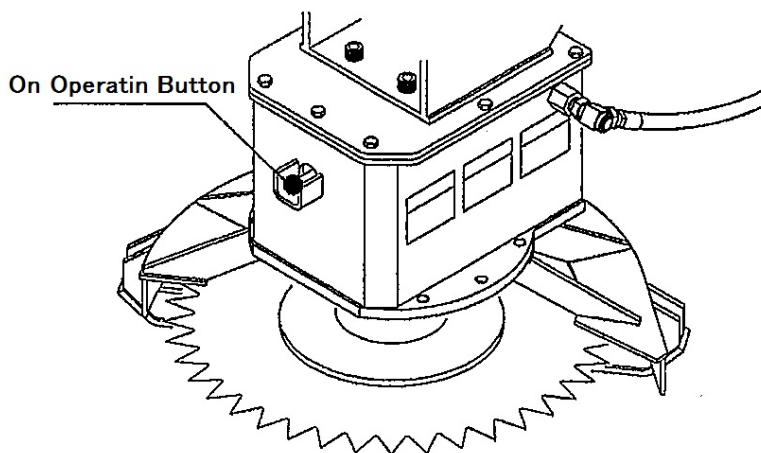
(2) Attachment of Blade

1. Insert $\phi 8$ mm bar or plus driver into the hole of bearing to stop the rotation of saw shaft.
2. Set saw blade between flange (A) and flange (B) and fix it with nut. * Tightening torque: 150-180N/m
3. Take out $\phi 8$ mm bar.



7. Operating Notices

- (1) When the rotation of mower decreased or stopped, release the mower from cutting object and re-start the work after spinning up the rotation in normal r.p.m.
- (2) When the grasses are got caught on saw blade and the rotation stopped, be sure to put the working signal button off position and stop engine. Then remove the entangled grasses from saw blade.
- (3) Never approach the saw blade when the working signal button is out, as the saw blade is ready to rotate.
- (4) The nut (counter clockwise thread) is always tighten with the tightening torque of 150-180N/m. Always replace the nut when used at 5 times of desorption.
- (5) Do the cutting work adjusting the turning speed of the boom not so fast. Fast turning of the boom makes the rotation speed lower and causes the working efficiency worse.
- (6) Be sure the rotation way is correct. Reverse rotation causes the damage of hydraulic motor.
- (7) Be careful not to fall down the cutting grass or scrub brushes to dangerous side.
- (8) Be careful not to put the blade cover on the arm of excavator. Deformed cover contacts the saw blade and may cause the personal injuries by broken debris of saw blade.



8. Daily Maintenance - - - - - Before Operation

Before operation, always check the followings and be sure there are no damages or troubles.

Ask your Maruzen dealer for the periodical inspections.

Inspection Items	Countermeasures
1. Looseness of bolts of pin bracket	When loosened, degrease the bolts and re-tighten with tightening torque of 196N/m applied lock tight No.1342
2. Looseness of hoses	When loosened, re-tighten
3. Looseness of bolts for blade cover	When loosened, re-tighten
4. Leakage of oil from inside of machine	Repair the machine in our service center.
5. Check the rotation without attaching the blade	When the rotation is not in center and swung, repair the machine in

- (1) Check the volume and dirt of hydraulic oil in the tank. The dirt of hydraulic oil may cause the damage of motor and flow divider of GC600. Replace the oil when it is dirty.
- (2) When stored GC600, dismount it from excavator and apply anti-corrosive oil. Hoses should be stored connected the couplers.
- (3) The nut (counter clockwise) for setting the blade should be replaced max after 5 times use. Don't use the nut over 5 times. Also, don't use the nut except genuine one. Failure to observe this can result the serious personal injuries.
- (4) Be sure the tightening torque of the nut of blade. Tightening torque : 150-180N/m.

9. TROUBLE SHOOTING

Symptoms	Causes	Countermeasures
(1) GC600 does not work at all	1. Less oil volume in the tank	1. Refill the hydraulic oil
	2. Couplers are not properly connected	2. * Check if there are couplers which are not properly connected
	3. Trouble of flow divider	3. * Repair in our service center or replace
	4. Trouble of hydraulic motor	4. Same as above 3
	5. Oil does not flow	5. Check the circuit
(2) Rotation does not rev up	1. Less oil flow	1. Adjust the flow in the range of 25-60L/min
	2. Low oil pressure of power source	2. Adjust the pressure to 13.7-17.2Mpa)
	3. Trouble of flow divider	3. * Repair in our service center or replace
	4. Trouble of hydraulic motor	4. * same as above 3
(3) Cutting performance is bad	1. The blade type is not suitable for the cutting object	1. Use suitable blade
	2. Too high speed of turning the arm	2. Keeping the rotation speed of blade, adjust to adequate turning speed of arm
Oil leakage from the hoses	1. Looseness of hoses	1. Retighten the hoses
	2. Damage of hoses	2. Replace the hoses

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

Parts List

No.	Part No.	Part Name	Q'ty	No.	Part No.	Part Name	Q'ty
1	MC06Y007A	Cover	1	35	B-12x45	Bolt	4
2	B-10x25	Bolt	8	36	BA 25xM8	Plastic Ball	1
3	WS-10	Spring Washer	8	37	OBP-10	Back Up Ring	1
4	N-1034-08	Adaptor	2	38	OP-10	O-Ring	1
5	17126*6--60--	Hose	1	39	MC01E016A	Cylinder	1
6	17121*8--59--	Hose	1	40	MC01E013A	Spring (B)	1
7	ICV-04 RC-05	Check Valve	1	41	MC01E015A	Piston	1
8	N-1006-08	Adaptor	1	42	OBP-26	Back Up Ring	1
9	MC06X006A	Box	1	43	OP-26	O-Ring	1
10	B-16x20	Bolt	3	44	MC01E017A	Rod Bracket	1
11	E203-08	Swivel Elbow	2	45	090-2-2	Hose Adaptor	2
12	* 17126*--60--6*.....	Hose	2	46	MC01E026A	Hose	1
13	MC06X005A	Safety Cover	1	47	B-6x16	Bolt	2
14	WS-16	Spring Washer	6	48	WS-6	Spring Washer	15
15	B-16x35 11T	Bolt	6	49	N1-6	Nut	4
16	M3CTE001A	Dia 300 Flange (A)	1	50	N-1034-06	Adaptor	2
17	MC01Y027A	Cutting Blade (20)	1	51	BH-6x60	Bolt	4
18	MC01Y028A	Cutting Blade (40)	1	52	MC01E006B	Manihold	15
19	MC01Y029A	Cutting Blade (100)	1	53	OP-11	O-Ring	4
20	M3CTE002A	Dia 300 Flange (B)	1	54	MC01E022A	Oil Tube	2
21	MC06Z014A	Nut (M20 Left Coating)	1	55	MC06Y001A	Valve	15
22	MA5RX104	Hydraulic Motor	1	56	17096*6--25--	Hose	2
23	MC01E019A	Caller	1	57	N-1071-06	Adaptor	2
24	MC06Y002A	Motor Flange	1	58	OP-14	O-Ring	2
25	BH-6x20	Bolt	1	59	BH-6x65	Bolt	3
26	CS-40	Stopper Ring	1	60	OP-18	O-Ring	2
27	6008LLU	Bearing	2	61	PFMC-04-22	Flow Divider	1
28	MC06Z008A	Sleeve	1	62	N-2040-08	Adaptor	1
29	MC06Y003A	Shaft	1	63	N-9034-08	Adaptor	1
30	KF-10x8x21 SR	Key	1	64	N-9009-08	Adaptor	1
31	MC06Y004A	Bearing Shell	1	65	N-1125-08	Adaptor	2
32	V-45A	V-Ring	1	66	BH-8x25	Bolt	4
33	MC06Z009A	Stopper Pin	1	67	BH-6x16	Bolt	4
34	WS-12	Spring Washer	4	68	N-1040-08	Adaptor	2

* Hose is quoted according to the main machine of customer

