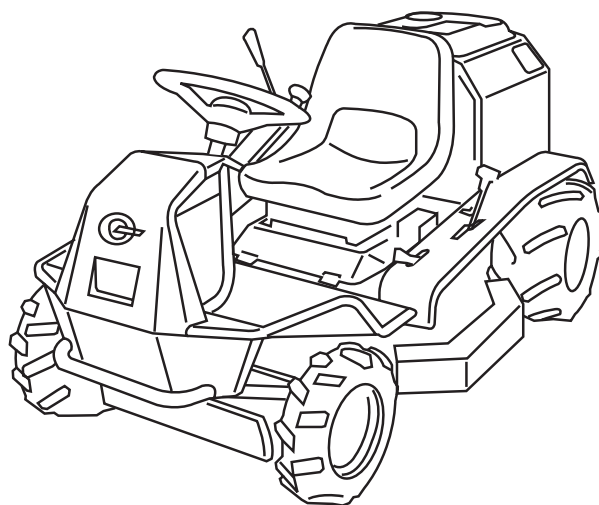


Ride on Mower

CM1801/CM1305

OPERATOR'S MANUAL



⚠ WARNING

Read and understand this manual completely before attempting to operate, maintain, and inspect this machine.

Keep this manual with care so that it may be consulted in operating, maintaining, or inspecting this machine.

5309 5201 000

CHIKUSUI CANYCOM, INC.

90-1 Fukumasu, Yoshii-machi,
Ukiha-shi, Fukuoka, Japan 839-1396
Tel. (0943)75-2195 Fax.(0943)75-4396

NOTICE TO THE USER

Thank you for purchasing our product.

Please read and understand the comments of this manual for proper operation before using this machine.

WARNING

The user must know that this machine can be potentially dangerous. Always follow the instructions in this manual when operating, maintaining, or inspecting the machine.

WARNING

This machine is a work vehicle for mowing. Do not use it for other purposes. Driving this machine on a public road (or its equivalent) may be illegal. CHIKUSUI CANYCOM, INC. does not bear responsibility for accidents or violations of local regulations.

WARNING

Do not remodel the machine. Do not remove the safety cover when operating, or they may cause serious accidents.

CONTENTS

1.	INTRODUCTION	1
1.1	PURPOSE OF THIS MANUAL	1
1.2	CONTENTS	1
1.3	SAFETY INSTRUCTION IN THIS MANUAL	2
1.4	WARNING LABELS ATTACHED TO THIS MACHINE	3
2.	WARRANTY AND AFTER-SALES SERVICE	4
3.	RULES FOR SAFE OPERATION AND WORK	5
4.	NAME AND FUNCTION OF COMPONENTS	9
5.	SPECIFICATIONS	11
5.1	SPECIFICATIONS FOR THIS MACHINE	11
5.2	DETAILS ABOUT TOOL BAG	12
6.	OPERATION	13
6.1	PREPARATIONS FOR OPERATION	13
6.1.1	Fuel Handling	13
6.1.2	Inspection & Refilling Engine Oil	14
6.1.3	Inspection & Refilling HST Oil	14
6.2	STARTING	15
6.3	OPERATION PROCEDURE	19
6.4	STOPPING PROCEDURE	20

6.5	HOW TO PARK	21
6.6	HOW TO TRANSPORT THE MACHINE IN CASE OF EMERGENCY	21
6.7	HOW TO AVOID REAR WHEEL SLIPPAGE	22
6.8	ADJUSTMENT OF STEERING WHEEL HEIGHT	22
6.9	HOW TO OPERATE BLADE	23

7. MAINTENANCE 25

7.1	REGULAR INSPECTION CHART	25
7.2	OIL/GREASE/LUBRICANT/FLUID LIST	28
7.3	CONSUMABLES (SERVICE PARTS) LIST	29
7.4	LUBRICATION	30
7.4.1	Engine Oil	30
7.4.2	Transmission Oil	31
7.4.3	HST Oil	32
7.5	LUBRICATION AND GREASING	33
7.5.1	Lubrication	33
7.5.2	Greasing	34
7.6	POURING BATTERY FLUID	35
7.6.1	Battery Fluid	35
7.7	CLEANING	37
7.7.1	Air Cleaner Element	37
7.7.2	Spark Plug	38
7.7.3	Fuel Cock (Fuel Filter)	39
7.7.4	Blower Housing and Cooling Fan	40
7.8	ADJUSTMENT	41
7.8.1	V Belt for Driving	41
7.8.2	Blade Rotary V Belt	41
7.8.3	Rotary Stopper	41
7.8.4	Brake Pedal	42
7.8.5	HST Lever	42
7.8.6	Tire Pressure	42

7.9	REPLACEMENT	43
7.9.1	Oil filter (CM1801)	43
7.9.2	Fuel Pipe, Engine Oil Drain Pipe, and HST Oil Tank Connection Hose	43
7.9.3	HST Oil filter (CM1801)	43
7.9.4	Blade	43
7.10	AFTER-USE MAINTENANCE	44

8. STORAGE (LONG-TERM) 45

8.1	VEHICLE BODY	45
8.2	BATTERY	46
8.3	ENGINE	46
8.3.1	Fuel Cock	46
8.3.2	Cleaning Air Cleaner Element	47
8.3.3	Replacing Engine Oil	47

9. TROUBLESHOOTING 48

9.1	TROUBLESHOOTING CHART	48
-----	-----------------------------	----

10. TRANSPORTATION OF/WITH THIS VEHICLE 53

<Guarantee certificate>

Attached to the end of this manual.

* Receive the guarantee certificate together with a receipt after you have received instructions for handling of this machine.

<Appendix>

"Instruction manual for engine" (Included in the tool bag)

* Be sure to read it together with this manual.

1. INTRODUCTION

1.1 PURPOSE OF THIS MANUAL

The purpose of this manual is to provide the user with appropriate information in detail about how to operate, maintain, and inspect this machine.

This manual has been prepared for people who use this machine for the first time.

1.2 CONTENTS

This manual gives information by dividing it into the following chapters.

1. INTRODUCTION

This chapter explains the purpose and contents of this manual and warning terms used in this manual. It also includes the description of warning labels attached to this machine.

2. WARRANTY AND AFTER-SALES SERVICE

This chapter describes the warranty and after-sales service for this machine.

3. RULES FOR SAFE OPERATION AND WORK

This chapter describes the general safety rules which the user must observe when operating and working.

4. NAME AND FUNCTION OF COMPONENTS

This chapter explains the names and functions of the component parts.

5. SPECIFICATIONS

This chapter describes the specifications of this machine. It also describes the details about the tool bag.

6. OPERATION

This chapter explains the preparations before operation, operating procedure, and how to use the control devices.

7. MAINTENANCE

This chapter gives information about maintenance such as regular inspection, supplying oil, grease, lubricant, and fluids, cleaning, adjustments, and after-use maintenance.

8. STORAGE (LONG-TERM)

This chapter gives information about the storage (long-term storage) of this machine.

9. TROUBLESHOOTING

This chapter describes the troubleshooting on this machine.

10. TRANSPORTATION OF/WITH THIS VEHICLE

This chapter explains the procedures and precautions for transporting this machine.

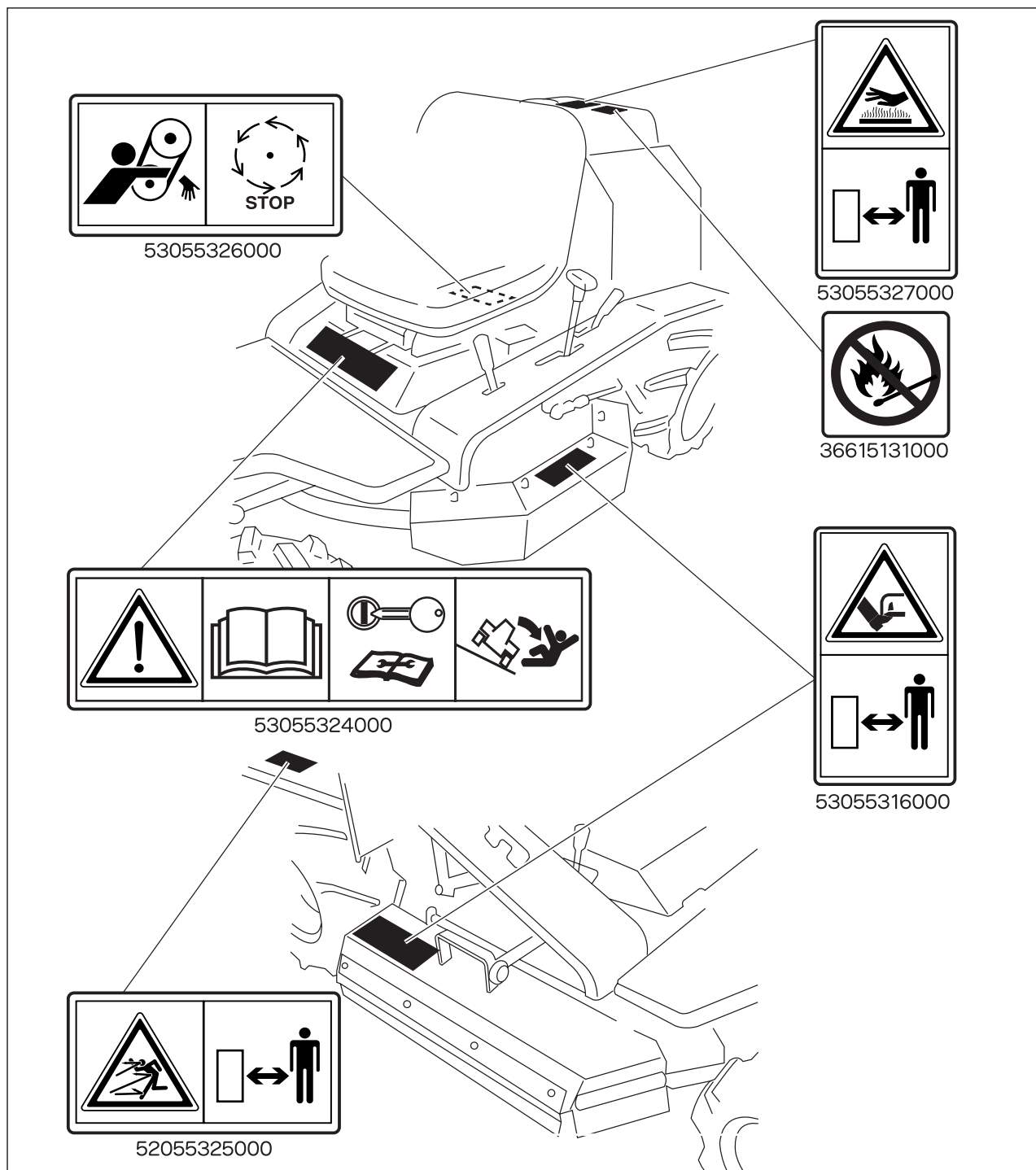
1.3 SAFETY INSTRUCTION IN THIS MANUAL

In this manual, safety information is classified into the following four categories according to the degree of hazard (seriousness of possible accidents). Read and understand the contents below and always observe the safety instructions in this manual.

Category	Meaning
 DANGER	Indicates an extremely hazardous situation which will result in death or serious injury if the user does not follow appropriate instructions.
 WARNING	Indicates a potentially hazardous situation which could result in death or serious injury if the user does not follow appropriate instructions.
 CAUTION	Indicates a potentially hazardous situation which could result in injury to the user or damage to the machine if the user does not follow appropriate instructions.
NOTE	Used to emphasize information which needs particular attention.

1.4 WARNING LABELS ATTACHED TO THIS MACHINE

The warning labels shown below are attached to this machine. When warning labels have come off or become difficult to see, order new ones from a dealer by the part numbers shown below labels and attach them.



2 WARRANTY AND AFTER-SALES SERVICE

2. WARRANTY AND AFTER-SALES SERVICE

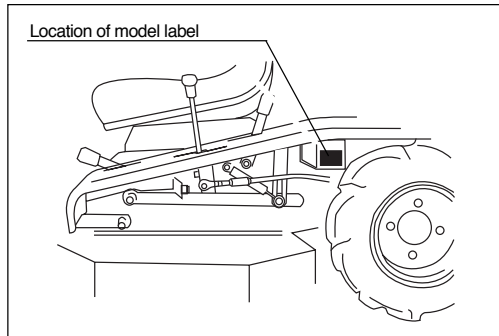
CONCERNING WARRANTY

Our company guarantees this product based on the contents of the written warranty. For more information, refer to the written warranty attached to the end of this manual.

CONCERNING AFTER-SALES SERVICE

Please feel free to consult with the store of purchase or with our company's sales department in regard to service orders or in case trouble or questions arise during the course of using the unit. At such times, please be prepared to report the product model and product's serial number shown in the model label, as well as the names of the manufacturer and model of the engine installed. (For the names of the manufacturer and model of the engine installed, refer to Chapter 5 "SPECIFICATIONS" in this manual.  Page 11)

<Location of model label>



<Model label>

CM1801



← Product model

← Serial number

CM1305



← Product model

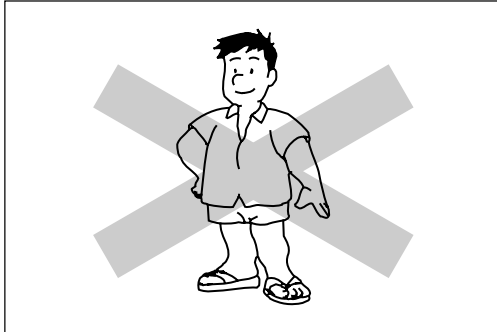
← Serial number

CONCERNING THE TERM (PERIOD) OF SUPPLY OF REPAIR PARTS

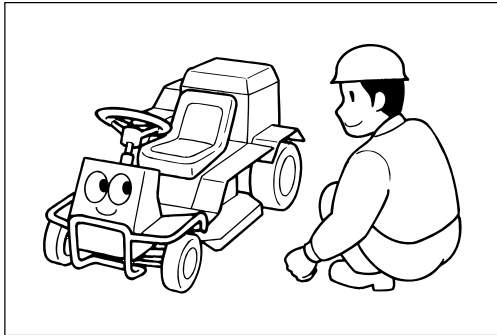
The term (period) of supply of repair parts for this product shall be seven years after manufacturing is discontinued.

3. RULES FOR SAFE OPERATION AND WORK

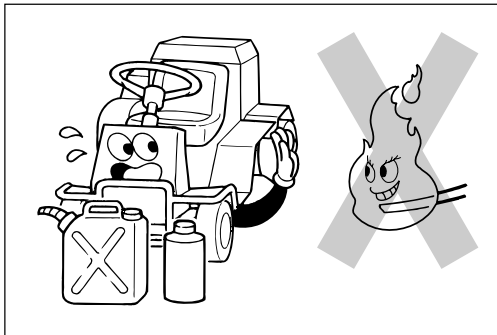
This chapter shows the general safety precautions to be observed during driving or operation. Try to carry out driving or operation safely by being sure to follow the safety instructions in other chapters as well.

**SAFETY PRECAUTIONS BEFORE OPERATION****PROTECTIVE CLOTHING**

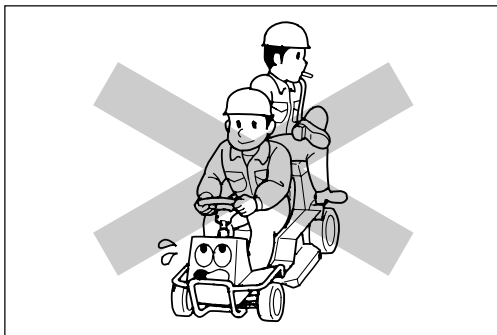
Make it a rule to wear clothes suitable for driving and operation. Do not be lightly dressed or do not wear sandals, etc. in carrying out driving and operation.

**PRE-WORK CHECK**

Carry out the daily pre-check before starting the machine. Repair or replace defective parts before use.

**FUEL HANDLING**

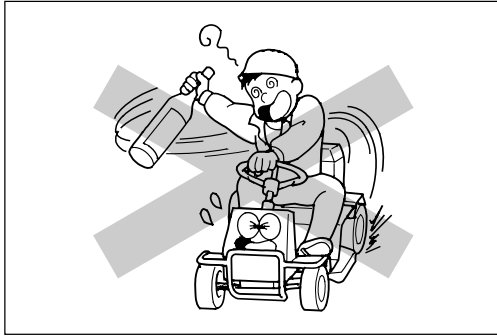
When handling fuel or grease, never bring fire (cigarette fire, etc.) to it. Also, be very careful of fire when charging the battery or servicing the engine.

**NEVER CARRY PASSENGERS**

The seating capacity of this machine is only one for the operator. It is extremely dangerous to drive this machine with a fellow passenger or passengers on it, because movements of the center of gravity, etc. occur. Never allow a person or persons other than the operator to ride on the machine.

3

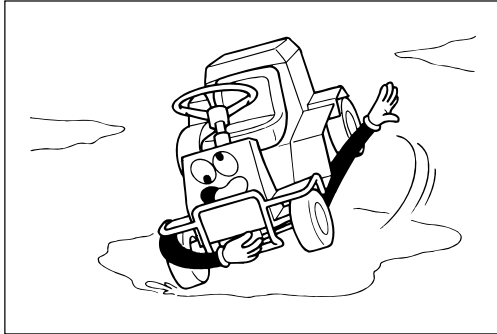
RULES FOR SAFE OPERATION AND WORK



PROHIBIT RECKLESS DRIVING

Do not drive when drinking alcoholic drinks or when your physical conditions are bad.

Also, do not let unauthorized young people drive the machine.

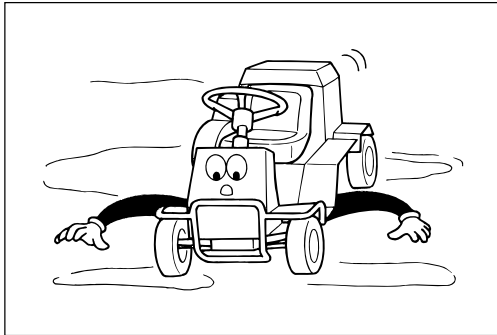


PRECAUTIONS WHEN DRIVING THE MOWER



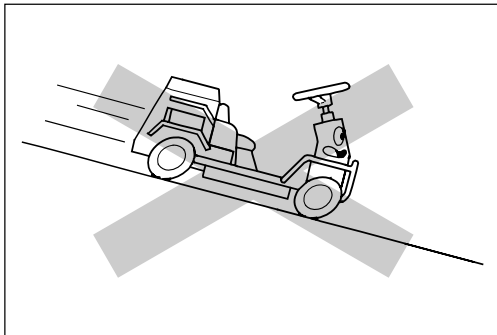
PROHIBIT QUICK STARTING, ACCELERATING, TURNING AND BRAKING

Avoid quick starting, sudden accelerating, sharp turns and braking. Always drive safely. Before driving ensure the area around the machine is safe. On soft and wet ground never try sudden or sharp turning or stops, as this may cause the machine to slip or turnover.



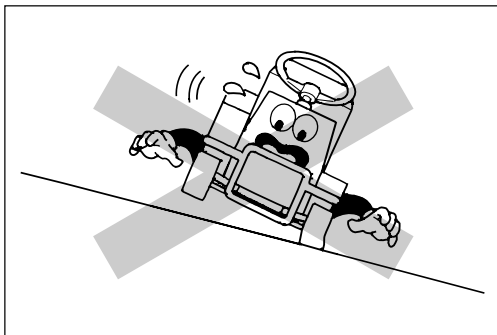
OBSERVE SAFE SPEED

Drive at safe speeds on a slope in accordance with the conditions.



ENGINE BRAKE ON DOWN HILL

When driving down a slope, stop once before going down and set the aux. speed change lever to the "Low" position. Use engine brake.

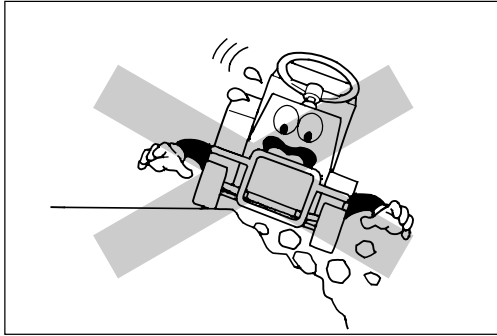


DO NOT DRIVE ACROSS SLOPES

On slopes go straight up or down within the limits of machine gradeability. Driving across slopes is dangerous.

RULES FOR SAFE OPERATION AND WORK

3



PRECAUTIONS OF CRUMBLING GROUND

Beware of driving trenches and banks. There is a danger of the ground crumbling due to the machine weight. If travelling on soft ground, drive slowly and safely.

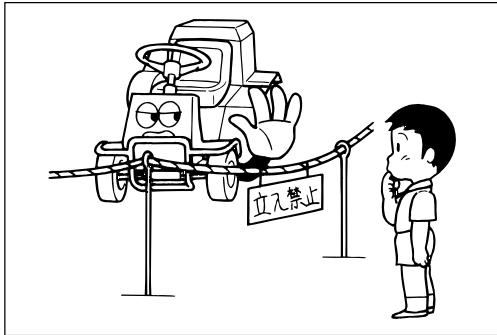


SAFETY PRECAUTIONS WHEN OPERATING



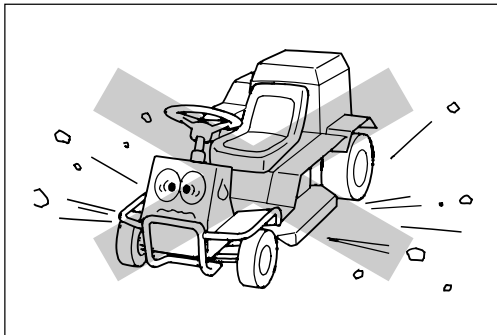
DO NOT OPERATE IN DANGEROUS PLACES

Remove all obstacles. Do not operate on steep slopes or soft and rough ground and avoid dangerous places.



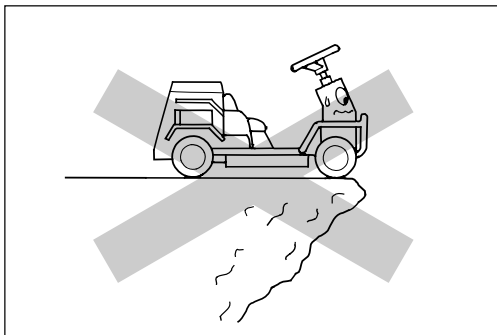
SECURE AREA (NO ADMITTANCE) DURING OPERATION

Post notice boards before that operating that job site is under operation. If necessary, apply guard ropes to enclose and restrict access so that people (especially children) may not enter the work area and safety may be ensured.



BEWARE OF FLYING OBJECTS

During operation make sure that stones and small objects are not discharged to nearby persons, animals, crops, cars or other objects.



PRECAUTIONS WHEN PARKING

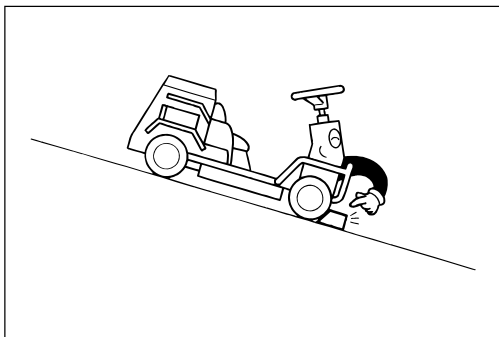


DO NOT PARK IN DANGEROUS PLACES

Park the machine on stable, flat ground. Avoid parking in dangerous places.

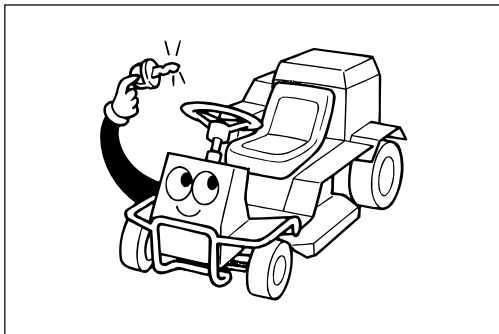
3

RULES FOR SAFE OPERATION AND WORK



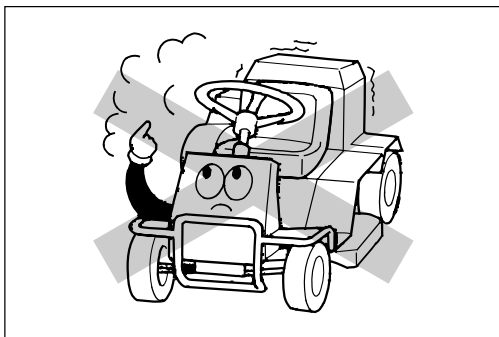
ALWAYS APPLY BRAKES ON SLOPES

Avoid parking on slopes. If parking on a slope is unavoidable, apply brakes and wheel blocks.



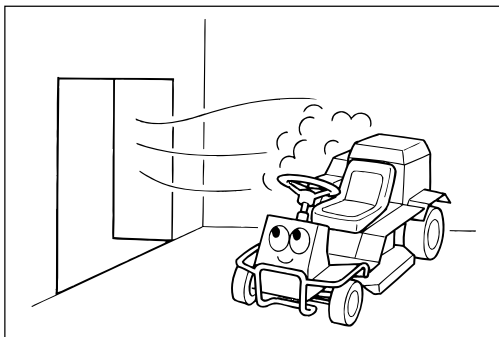
SAFETY CONFIRMATION WHEN PARKING

When parking always apply brake and stop engine.
Always remove key.



DO NOT SERVICE WHEN THE ENGINE IS RUNNING

Do not service the mower while the engine is running.
Always do service work after stopping engine.

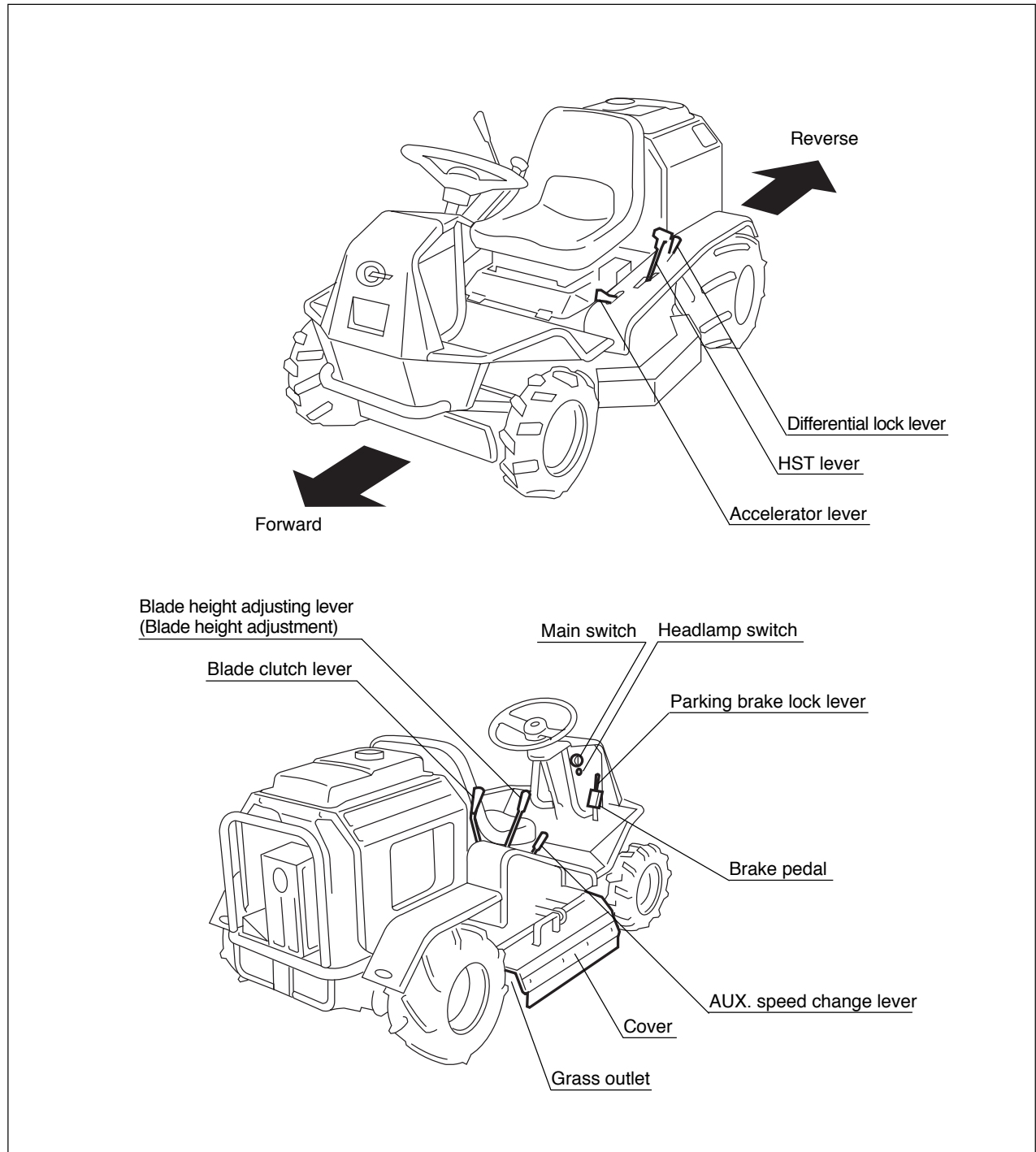


PRECAUTIONS FOR VENTILATION

When operating the engine indoors make sure that there is enough ventilation to prevent poisoning due to exhaust gas.

4. NAME AND FUNCTION OF COMPONENTS

NAMES OF COMPONENTS



4 NAME AND FUNCTION OF COMPONENTS

FUNCTIONS OF COMPONENTS

- Main switch Start the engine or stall the engine with this switch by means of remote control.
 ※ When the machine is not used remove and keep the key.
- Accelerator lever Increases and decreases engine speed.
- Choke lever When the lever is pulled, the choke valve closes, and when it is returned, the choke valve opens. Pull the lever when starting the engine and return it after the engine is started.
 (In the case of CM1305, the choke lever is connected with the accelerator lever.)
- HST lever The HST lever changes the discharge of the hydraulic pump in the HST and changes the advancing direction and travelling speed in a stepless way.
 When pushing the lever forward from neutral position the machine starts to move forward. Pulling the lever in reverse makes machine drive backward. Speed increases as lever is depressed in either direction.
- AUX. speed change lever Use this lever when shifting speed to high/low levels.
 Speed shift can be used while driving.
- Brake pedal Use to stop the machine.
 When depressing brake pedal HST lever returns to neutral and stops the machine.
- Differential lock lever Use this lever when slipping one side of the rear wheels.
 When lever is pushed to "ON", the differential lock is engaged.
 When lever is "OFF", the differential lock is released (normal driving position).
 ※ During normal driving always put the lever to "OFF" position.
- Light switch Headlamp is turned on when switch is pulled.
- Parking brake lock lever After stopping the machine, pull the lock lever downward to lock brake pedal.
- Blade height adjusting lever Adjusts the height of blade (5 steps)
- Blade clutch lever Turns on and off the power of blade.
 When putting this lever to "OFF" position, the cutter brake pulley is engaged and the brake is applied.
- Grass outlet Secure area around machine before opening. Opening outlet allows cut grass to be easily removed. Open outlet when changing cutter blade.
 ※ Outlet should be closed during normal use to prevent stones and other objects from being thrown from machine.

5. SPECIFICATIONS

5.1 SPECIFICATIONS FOR THIS MACHINE

NOTE

Use this product properly after understanding the specifications for this product.

MODEL			CM1305	CM1801
MACHINE WEIGHT		kg	255	260
APPLICABLE JOB AREA		m²/h	4500 ~ 9000	
MACHINE DIMENSIONS	OVERALL LENGTH	mm	1840	1870
	OVERALL WIDTH	mm	995	
	OVERALL HEIGHT	mm	885	
	WHEEL BASE	mm	1200	
	TREAD	mm	Front 800, Rear 735	
	MINIMUM FREEBOARD	mm	105	
ENGINE	MODEL		GH400V/GM400PV	FH531V
	TYPE		Air-cooled 4-cycle gasoline	Air-cooled 4-cycle gasoline V twin
	CYLINDER (BORE X STROKE)	mm	84 × 70	68 × 68
	TOTAL DISPLACEMENT	cm³ (cc)	389 (389)	494 (494)
	MAXIMUM OUTPUT	kW/min ⁻¹ (PS/rpm)	9.56/4000 (13.0/4000)	13.3/3600 (18.0/3600)
	STARTING SYSTEM		Self-starting system	
	FUEL USED		Gasoline	
	FUEL TANK CAPACITY	ℓ	11	
	LUBRICATING OIL CAPACITY	ℓ	1.4	1.5
	BATTERY TYPE	V/AH	28A19R	38B19R
	BATTERY CAPACITY		12/21	12/28
	IGNITION SYSTEM		Electronic ignition	
	IGNITION PLUG NO.		BP4HS-10	RCJ8Y

MODEL					CM1305	CM1801
TRAVELLING PERFORMANCE	TRAVELLING SPEED	NUM- BER OF STAGES	F (FORWARD)		HST (Variable speed)	
			R (REVERSE)		HST (Variable speed)	
		HIGH SPEED		km/h	0 ~ 10.7	
		LOW SPEED		km/h	0 ~ 5.9	
		STABILITY INCLINATION ANGLE	LEFT		degree	45
	RIGHT		degree	45		
	MINIMUM TURN RADIUS			m	1.9	
	GRADEABILITY			degree	15	
	AMOUNT OF TRANSMISSION OIL				ℓ	1.2
POWER TRANSMIS- SION DEVICE	MAIN SPEED CHANGE TYPE				HST	
	STEERING DEVICE				Rack and pinion type round steering wheel	
	B R A K E T Y P E				Internal expanding type brake	
	T I R E				Front AGR3.50-7, Rear 16 × 7.00-8	
CUTTER BLADE	CUTTER BLADE WIDTH			mm	900	
	CUTTER BLADE HEIGHT			mm	0 to 75 (5 steps)	
	CUTTER BLADE TYPE				Knife to be used both as a free one and a fixed one, and stay with steps	

*We reserve the right to change the specifications without prior notice.

5.2 DETAILS ABOUT TOOL BAG

No.	Part name	Quantity	Remarks
1	Operator's manual (This document)	1	
2	Instruction manual for engine	1	
3	Engine tools	1 set	For engine servicing

6. OPERATION

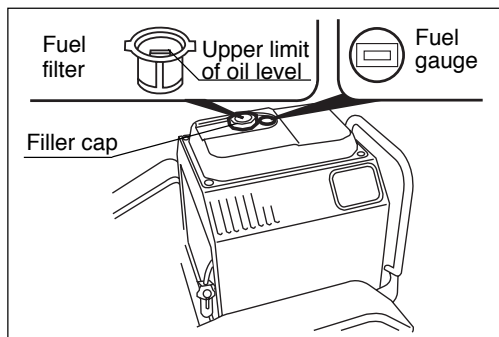
- Before reading this chapter, be sure to read "RULES FOR SAFE OPERATION AND WORK" in Chapter 3 (☞ pages 5 to 8).
- Concerning the operation and control, be sure to follow the instructions given in this chapter. If you do not have a complete understanding of the operating and control system or safety devices, never operate the machine based on your own judgment.

6.1 PREPARATIONS FOR OPERATION

6.1.1 Fuel Handling

⚠ DANGER

- Petrol (gasoline) fuel is flammable. Never refuel or service the fuel system while smoking or when near open flames or sparks.
- Never refuel the machine when the engine is running.
- After stopping engine, the engine becomes hotter. Therefore fuel must be handled with great care when refueling. Do not spill fuel out of filler cap.



1. Check the fuel gauge visually. If fuel is not reserved enough, open the filler cap and pour fuel.

Fuel to be used : ☞ page 28

Fuel tank capacity : ☞ page 28

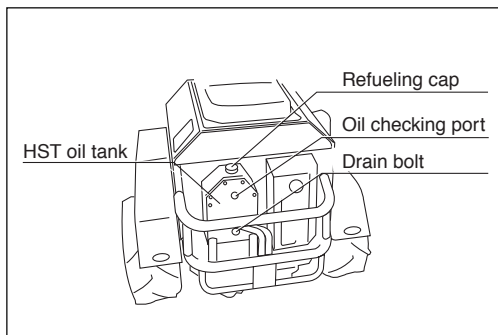
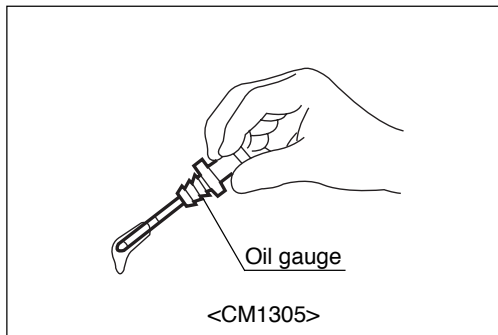
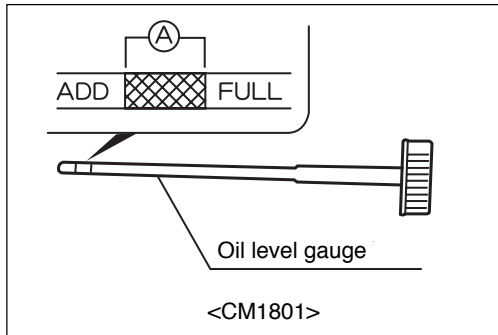
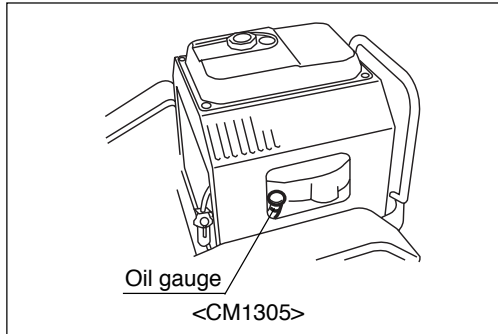
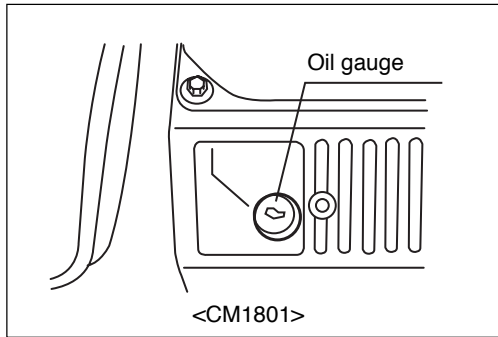
NOTE

- When fuel gauge needle approaches empty "E", refuel as soon as possible.
- When using the unit on slopes, refuel less than the upper fuel limit for the fuel filter in the lubrication port.

2. Close the filler cap firmly after refueling

6

OPERATION



6.1.2 Inspection & Refilling Engine Oil

1. Draw out the oil gauge. Clean the gauge with clean cloth. Reinsert to measure oil level.

2. Check the amount of engine oil. If it is not in the range A, supply engine oil from the refueling port.

Fuel to be used : page 28

Amount of engine oil :

In the case of CM 1801 :

Within the range A with the oil gauge tightened

In the case of CM1305 :

Between the upper and lower limits of the oil gauge

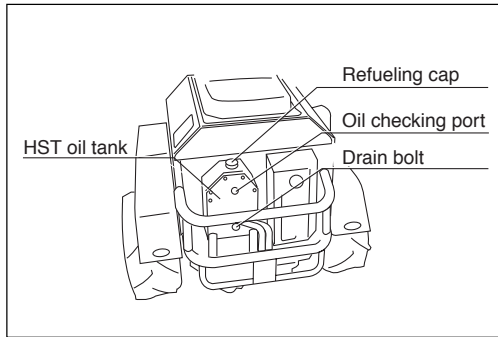
(Do not exceed the upper limit.)

NOTE

After checking and refueling are completed, completely tighten the oil gauge with reliability.

6.1.3 Inspection of the amount of HST oil and replenishment

1. Remove the screw for the oil checking port of the HST oil tank and check if oil comes out of the oil checking port. (Check if oil has reached the oil checking port.)



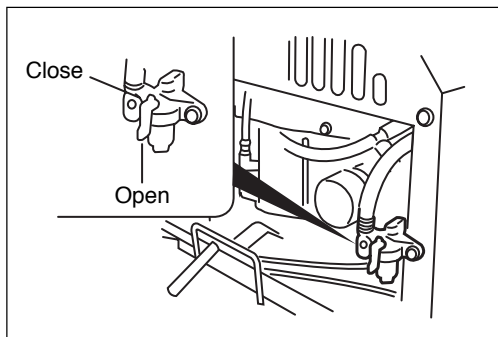
- When the amount of oil is insufficient, open the refueling cap of the oil tank and supply HST oil.

Oil to be used: page 28
Amount of HST oil: 4.1 lit.

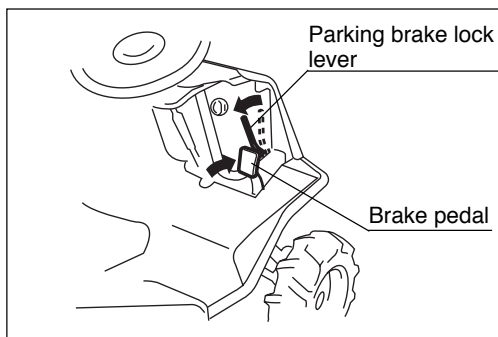
6.2 STARTING

DANGER

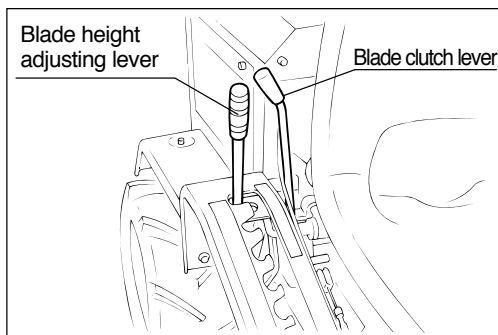
When starting engine make sure that there is enough ventilation to prevent poisoning from the exhaust gas.



- Open the fuel cock.



- Brake pedal should be locked.
(If not locked, depress the brake pedal and apply the parking brake lock lever.)



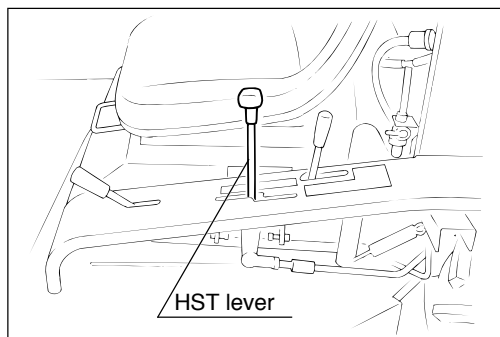
- Blade clutch lever should be in "OFF" position.
- Blade height adjusting lever should be in "TRAVEL" position.

NOTE

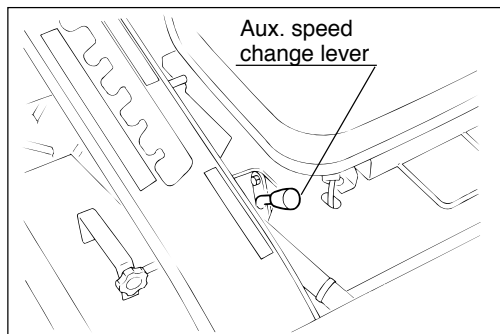
When the clutch of blade clutch lever is in "ON" position, a safety switch is engaged and engine will not start.

6

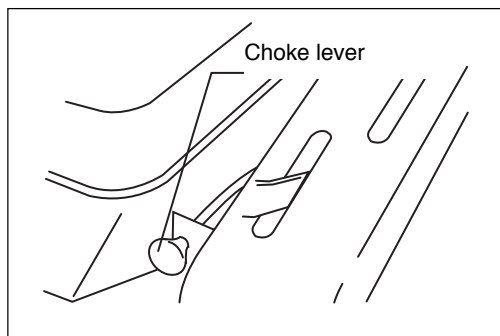
OPERATION



5. HST lever should be in "Neutral" position.

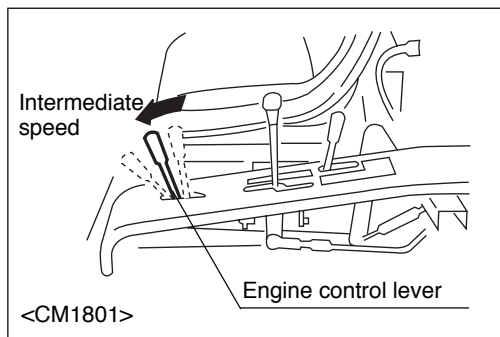


6. Aux. speed change lever should be in "Neutral" position.

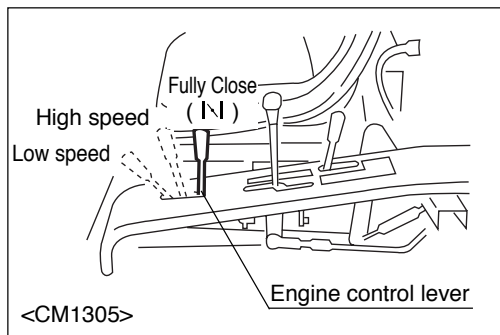


In the case of CM 1801

7. Pull the choke lever and set it at the "Fully Close (N)" position.



8. Adjust the accelerator lever in the neutral position between "High speed" and "Low speed."



In the case of CM 1305

7. Move the accelerator lever to the "High speed" position.

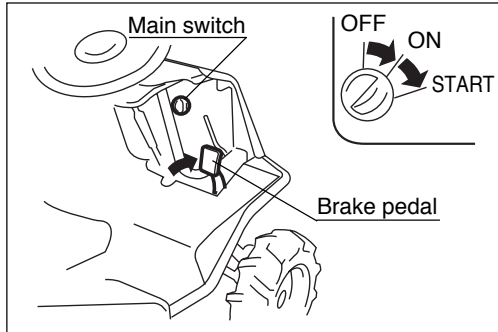
NOTE

Even when the engine is warm, be sure to set the accelerator lever at the "High speed" position when starting the engine.

9. Release the parking brake lock lever and depress the brake pedal fully.

NOTE

When the brake pedal is not fully depressed, a safety switch is engaged and engine will not start.



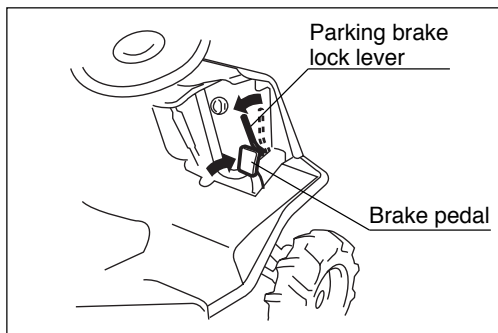
10. Remove main switch cap and put the engine key into main switch.
11. Turn the key to the "START" position.
12. When the engine starts, release the key and it will spring back to "ON" position.

NOTE

- Do not run the start motor for a long time for its long life. If the engine fails to start after 15-second try, wait about 1 minute for another try.
- When the engine fails to start, set the key switch at "OFF" and then restart the engine. Quick restarting may damage the starter gear.
- When the operator does not sit on the seat, a safety switch is engaged and engine will not start.

CAUTION

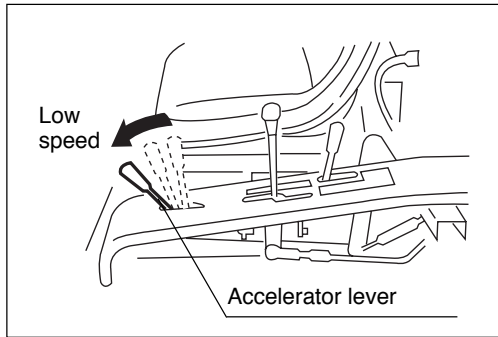
During engine operation, never turn the key to "START" position. Otherwise, the starter may be damaged.



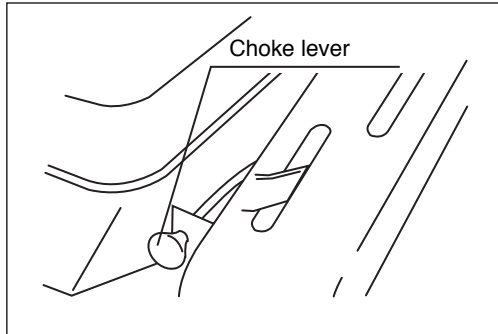
13. Engage parking brake lock lever and push the brake pedal into the full depressed position.

6

OPERATION



14. Put the accelerator lever in the "Low speed" position.



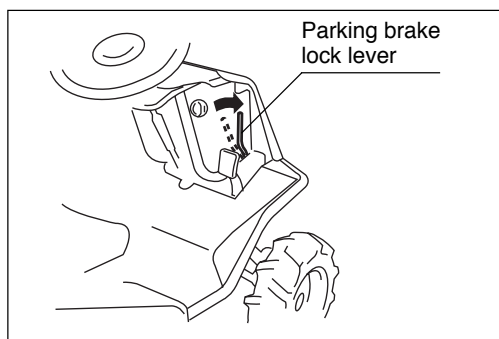
15. Return the choke lever to the "Fully Open" position. (CM 1801)

16. Carry out warming-up without applying a load for three to five minutes.

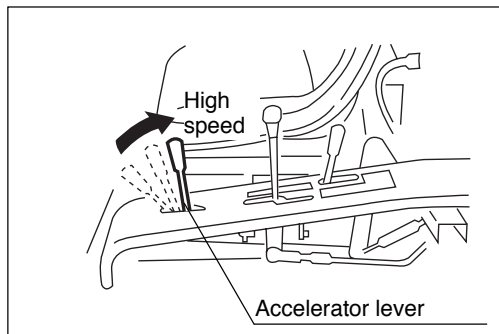
NOTE

- Lack of warming-up engine may cause seizure of engine.
- During the first 40 to 50 hours of new machine use, do not use with excessive load and avoid severe operations.
- In some areas where temperature is very low, oil viscosity increases and normal operation may not be possible. Continue warming-up engine as indicated in the following chart :

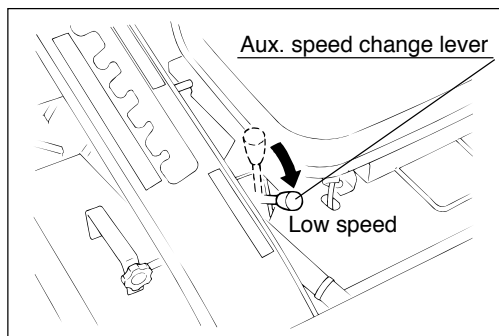
Air temperature	Recommended warming-up time
Over 0°C	about 10 minutes
0°C to -10°C	10 to 20 minutes
-10°C to -20°C	20 to 30 minutes
Under -20°C	more than 30 minutes

**6.3 OPERATION PROCEDURE**

1. Check the area around the machine for safety.
2. Release the parking brake lock lever.
3. Put the accelerator lever to "High speed" position to increase the engine speed.

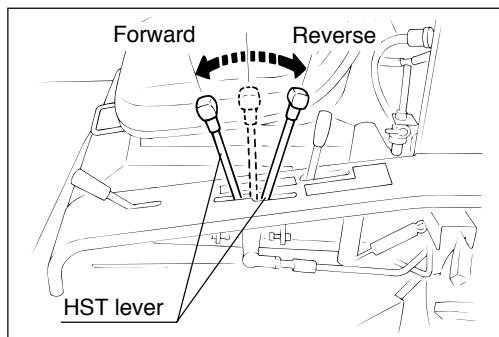


4. Put the aux. speed change lever to "Low speed" position.

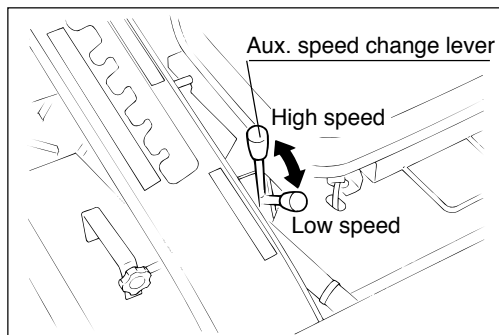


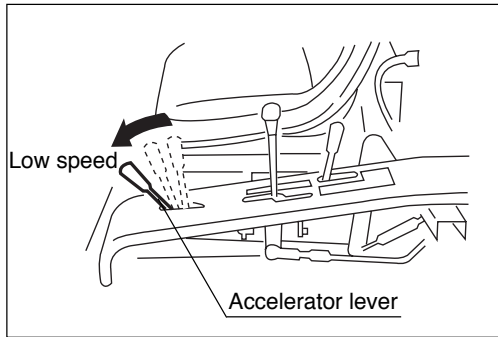
5. To accelerate, move the HST lever slowly.

Moving forward : Push the lever to the front.
Moving backward : Push the lever to the rear.

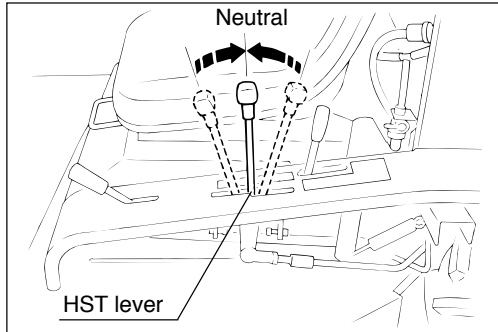
**(WHEN CHANGING SPEEDS)**

6. When conditions require speed changes, put the aux. speed change lever to "High" or "Low" position.
(Speed shift is available when travelling)



6.4 STOPPING PROCEDURE

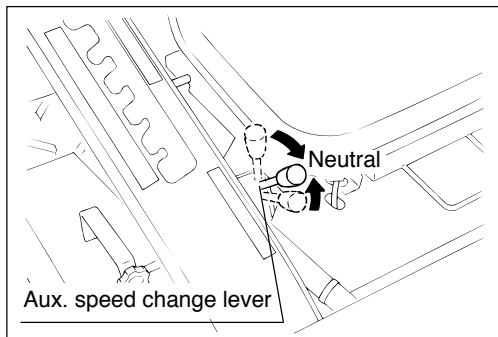
1. Put the accelerator lever to "Low speed" position to decrease engine revolution speed.



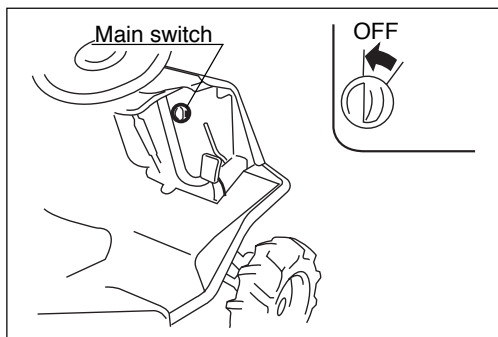
2. Return the HST lever to "Neutral" position and stop the machine.

NOTE

In case of emergency depress the brake pedal. The HST lever automatically returns to "Neutral" position and stops the machine.



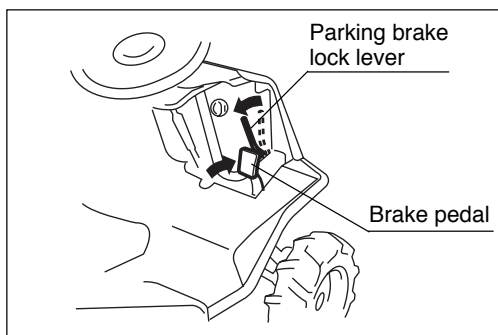
3. Return the aux. speed change lever to "Neutral" position from High or Low position.



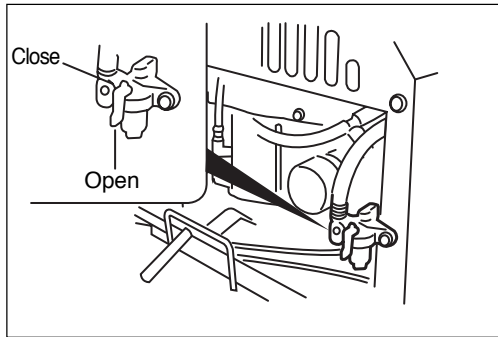
4. Turn the starter switch to the "OFF" position.
5. Remove the key.

NOTE

Never leave the key in the "ON" position with the engine. This may cause discharging of the battery, because a current from the battery continues to flow to each circuit.



6. Depress the brake pedal fully and apply the parking brake lock lever to lock the brake pedal.

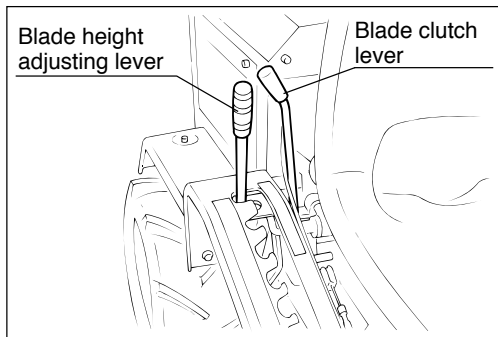


7. Close the fuel cock.

6.5 HOW TO PARK

⚠ WARNING

Even when blade brake is in "OFF" position, the blade may still be turning due to inertia. Do not get off until the blade is completely stopped, and always confirm that blade has stopped turning before dismounting machine.

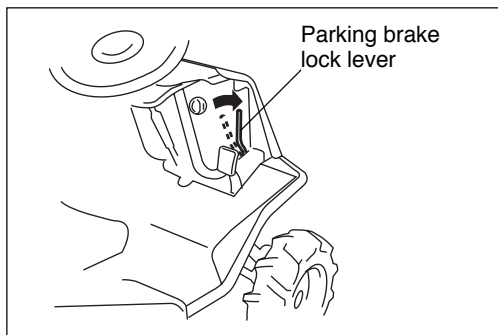


1. Stop the machine under the procedures shown in item 6.4 STOPPING PROCEDURE.
2. Turn off engine and remove key.
3. Move the clutch of the blade clutch lever to the "OFF" position.
4. Move the blade height adjusting lever to the "Transport" position.

6.6 HOW TO TRANSPORT THE MACHINE IN CASE OF EMERGENCY

NOTE

If the base unit does not operate with normal control due to engine failure, etc., do not force the machine to move. Transport the machine with the following procedures.



1. Move HST lever and aux. speed change lever to "Neutral" position.
2. Move blade height adjusting lever into "Transport" position.
3. Release the parking brake lock lever and then move base machine.

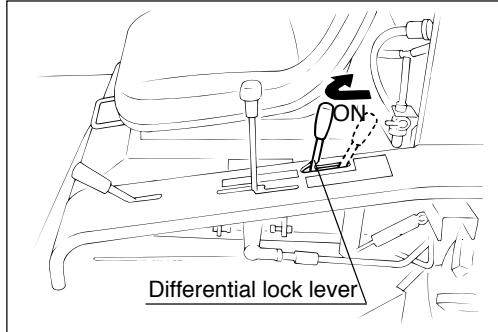
6

OPERATION

6.7 HOW TO AVOID REAR WHEEL SLIPPAGE

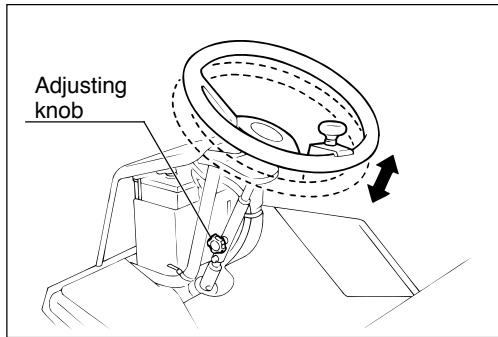
NOTE

Rear wheels slippage on steep slopes or soft ground can be avoided by using differential lock lever. During normal driving operation always keep the differential lock lever in the "OFF" position.

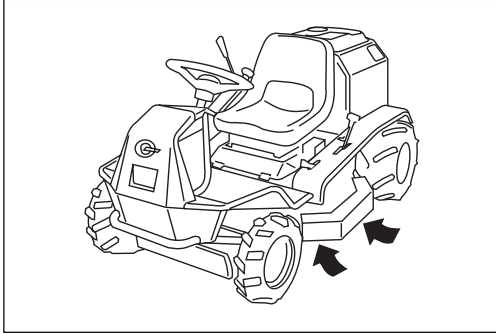


1. Move differential lock lever into "ON" position.
2. Move aux. speed change lever to "SLOW" speed side and start to drive slowly.
3. After leaving steep slopes or soft ground areas, return differential lock lever to "OFF" position.

6.8 ADJUSTMENT OF STEERING WHEEL HEIGHT



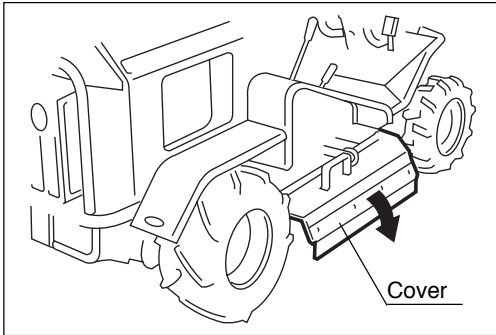
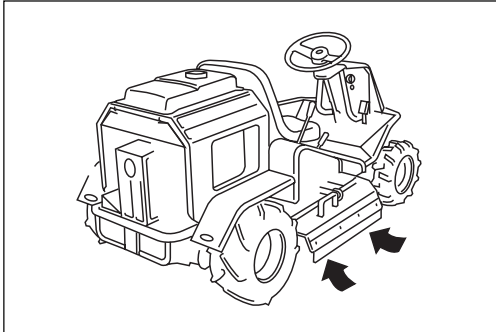
1. Release the adjusting knob and adjust the height of steering handle by moving up or down.
2. Tighten the knob after adjusting height.

6.9 HOW TO OPERATE BLADE**⚠ DANGER**

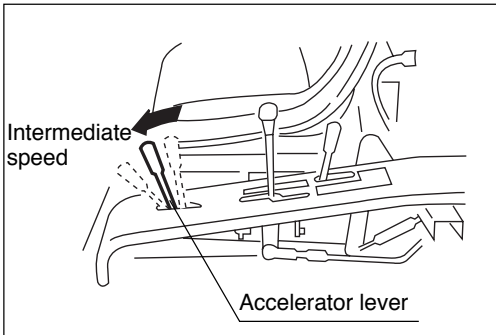
Never put legs beneath cutter blade covers. The cutter blade rotates close to each cover during operation.

NOTE

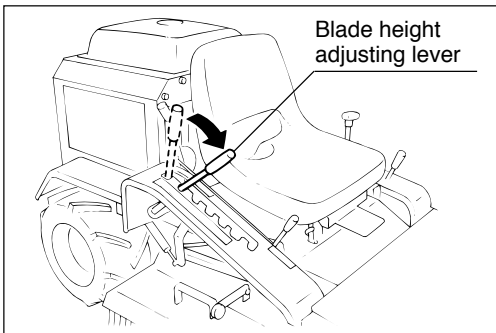
- When using machine for the first time, select flat ground and operate slowly so that each cutting paths overlaps.
- When cutting around obstacles, always position trees, posts, and other obstacles on the left side of the machine. (Make leftward turning.)
- Before carrying out work, be sure to read "SAFETY PRECAUTIONS WHEN OPERATING" in Chapter 3 "RULES FOR SAFE OPERATION AND WORK". (👉 Page 7)



1. Confirm that the grass outlet cover is closed.



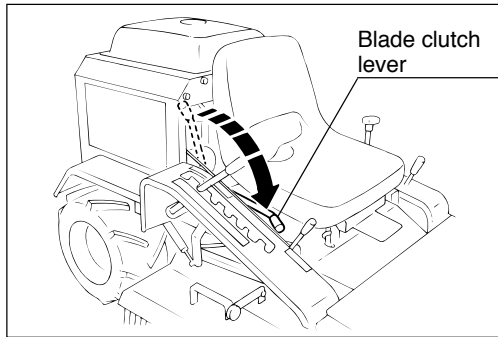
2. Stop the machine and move the accelerator lever to a position between "High speed" and "Low speed".



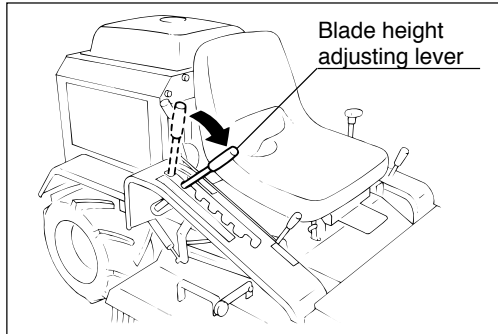
3. Move blade height adjusting lever to the position "5".

6

OPERATION

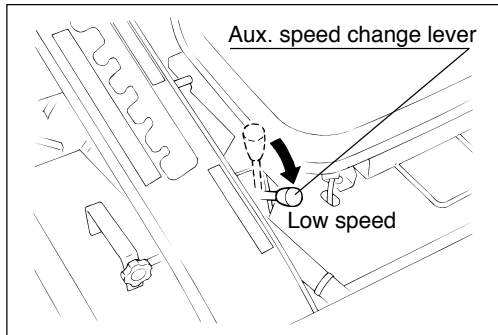


4. Push blade clutch lever down slowly and push clutch into "ON" position.

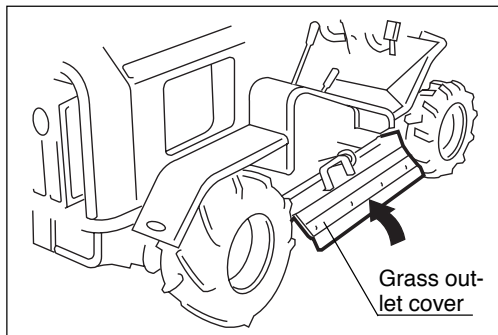


5. In accordance with your requirement adjust the height of the cutter blade by controlling the blade height adjusting lever.

Blade height adjusting lever position	Blade height
Transportation	for transportation
5	75 mm
4	60 mm
3	45 mm
2	30 mm
1	15 mm



6. Move accelerator lever into High position to increase engine speed.
7. Move aux. speed change lever into Low speed mode and start driving with lower speed. (Adjust speed in accordance with operating conditions.)
8. When the work load is large (i.e. the amount of weeds is large), carry out work by decreasing the speed or cut grass twice.



9. If grass outflow is not smooth, slightly open the right side of the grass outlet cover.

⚠ CAUTION

Beware of stones or other objects which may come of cutter blade area when opening the grass outlet cover. Therefore, ensure the safety completely.

⚠ CAUTION

Carry out the mowing operation in the forward direction. Do not perform the operation in the backward direction, because it makes grass discharge poor and causes stones or other objects to scatter.

7. MAINTENANCE

7.1 REGULAR INSPECTION CHART

Proper inspection/maintenance will prevent accidents and breakdowns. To maintain the machine's normal function and ensure daily safe operation, carry out the regular inspection according to the chart below.

The regular inspection consists of the yearly, monthly and daily pre-operation checks.

NOTE

The chart below includes inspections which require technical knowledge or specified tools and measuring instruments. As to difficult inspections for the user, consult the dealer or one of our service centers.

Item			Content		Timing			Remarks
					Pre-op	Monthly	Yearly	
Engine	Body	Starting	Check if engine starts smoothly and makes abnormal noise.	Smooth start. No abnormal noise.	○	○	○	
		Eng.speed	Check if engine speed is proper at idling and unloaded max. speed. Check for smooth operation.	Proper engine speed. Smooth and continuous engine operation.		○	○	Request dealer for inspection.
			Accelerate engine and check for axle lever drag, engine stall, and knocking.	No drag, engine stall, or knocking.	○	○	○	
		Exhaust	After warming up engine, run engine from idling to high speed and check exhaust gas color and noise.	Normal exhaust gas color/noise.	○	○	○	
			Check for gas leak from muffler, exhaust pipe, etc.	No gas leak.		○	○	
		Air cleaner	Check case for crack and deformation, looseness at lid or connecting pipe.	No crack or deformation in case. No looseness at lid and pipe.		○	○	
			Check element for dirt and damage.	No severe dirt. No damage.		○	○	Cleaning/Replacement: 👉 Page 37
		Tightening	Check cylinder head and manifold retaining bolts/nuts for looseness. *This check is not necessary if no gas or water leak is found at these areas.	No looseness.			○	
		Valve clearance	Check valve clearance. *This check is not necessary if no valve-derived abnormal noise is heard and the engine operates smoothly.	Proper clearance.			○	Request dealer for inspection.

Item			Content	Timing			Remarks	
				Pre-op	Monthly	Yearly		
Engine	Body	Compressing pressure	Check compression pressure. *This check is dispensable if no abnormality is found in engine operation and exhaust condition at idling and acceleration.	Proper pressure.			○	Request dealer for inspection.
		Engine mount	Check engine base for crack and deformation.	No crack or deformation.	○	○	○	
			Check bolts and nuts for looseness or missing parts.	No looseness or missing parts.	○	○	○	
	Lubricating system	Check oil amount and contamination.	Proper amount. No severe dirt.	○	○	○	Inspection/Replacement: Pages 30 and 31	
		Check head cover, oil pan, and pipes for oil leak.	No severe oil leak.	○	○	○		
	Fuel system	Check fuel tank, injection pump, hose, and pipes for fuel leak.	No fuel leak.	○	○	○		
		Check fuel hose for damage and deterioration.	No damage or deterioration.	○	○	○		
		Check fuel filter element for dirt and clogging.	No severe dirt. No clogging.		○	○	Cleaning: Page 39	
	Electrical	Spark plug	Check electrode for wear and carbon deposit.	No wear or carbon deposit.			○	Inspection/Cleaning: Pages 38 and 39
		Battery	Check electrolyte amount.	Proper amount.		○	○	Inspection/Refilling: Page 35
			Check terminal for looseness and corrosion.	No looseness or severe corrosion.		○	○	
		Wiring harness	Check connection for looseness.	No looseness.		○	○	
			Check wiring harness for damage.	No damage.		○	○	
Power train	V belt	Check appearance for crack, damage, and dirt.	No crack, damage, or grease deposit.		○	○	Inspection: Page 41	
		Check belt tension.	Proper tension.		○	○		
	Transmission	Drive vehicle forward or rearward position, and check operating condition and check for abnormal noise and overheat.	Normal operation. No abnormal noise or overheat.	○	○	○		
		Check oil amount in case.	Proper amount.		○	○	Inspection/Replacement: Pages 31 and 32	
		Check oil for contamination.	No severe contamination.		○	○	Inspection/Replacement: Pages 31 and 32	
		Check case for oil leak.	No oil leak.		○	○		
Speed adjustment	Speed change lever	Check if the lever fits into each speed position and moves smoothly when driving.	Proper fitness to each position and proper movement of the lever.	○	○	○		
		Check connection for looseness or rattle.	No looseness or rattle.	○	○	○		
	HST lever	Check the movement of HST lever when driving.	Proper and smooth movement.	○	○	○		
		Check connection for looseness or rattle.	No looseness or rattle.	○	○	○		

MAINTENANCE

7

Item		Content		Timing			Remarks
				Pre-op	Monthly	Yearly	
Driving system	Steering wheel	• Drive vehicle and turn steering wheel right and left for firm steering operation.	Proper steering.	○	○	○	
	Tire, wheel	• Check tire pressure and groove depth.	Within criterion.	○	○	○	Inspection:  Page 42
		• Check tire/wheel for crack, damage, and partial wear.	No crack, damage, or partial wear.	○	○	○	
		• Check tire groove for foreign objects such as metal fragments and gravel.	No foreign object.	○	○	○	
		• Check wheel bolt/hub nut for looseness or missing parts.	No looseness or missing parts.	○	○	○	
		• Check wheel bearing for looseness, abnormal noise and overheat.	No looseness, abnormal noise or overheating.		○	○	
Brake	Brake	• Drive vehicle and operate brake pedal and parking brake. Check the operation.	Proper brake effect.		○	○	
		• Check brake pedal free play.	Proper amount.		○	○	Adjustment:  Page 42
	Rod, link, and wires	• Check rod/link/wires for damage and looseness at connection.	No damage or looseness.	○	○	○	
		• Repeatedly operate brake and check connection for looseness and missing split pins.	No looseness at connection or missing split pins.	○	○	○	
Body	Body, cover	• Check body and cover for crack, deformation, and loose/missing bolt/nut.	No crack, deformation, or loose/missing bolt/nut.		○	○	
Lamp system	Headlamp	• Operate light switch and check headlamp operation.	Normal operation.	○	○	○	
		• Check lamp for lens damage or water intrusion.	No damage or water intrusion.		○	○	

7.2 OIL/GREASE/LUBRICANT/FLUID LIST

Item	Timing	Recommendation	Amount	Reference page
Fuel	As necessary.	Gasoline	11.0 ℓ	☞ Page 13
Engine oil	Add : Check daily and add as necessary. Replace : 1st : 8 operating hours 2nd or later : every 50 operating hours (Every week)	API class : SD or higher, or SAE class: 10W-30	1.4 ℓ ^{*1)}	☞ Page 30
Transmission oil	Replace : 1st : 50 operating hours 2nd or later : every 500 operating hours	Gear oil API class GL4 or 5 SAE class #80	1.2 ℓ	☞ Page 31
HST oil		(SAE class 20W-50 engine oil MOBIL SHC629)	4.1 ℓ	☞ Page 32
Each area to be lubricated	Every six months. * No need for lubrication for the first 6 months after purchase	Gear oil API class GL4 or 5 SAE class #80	—	☞ Page 34
Each area to be greased	Every six months. * No need for greasing for the first 6 months after purchase	Chassis grease	—	☞ Page 33
Battery fluid	Check every month and add as necessary.	Distilled water	—	☞ Page 35

*1) 1.5 lit. at the time of oil filter replacement (CM1801)

7.3 CONSUMABLES (SERVICE PARTS) LIST

Item			Part No.	Replacement timing	Quantity	Reference page
Air cleaner	Form element (CM1801)		11013-7001	Check every 50 operating hours (every week) and replace if malfunctioning.	1	☞ Pages 37 and 38
	Paper element (CM1801)		11013-7002			
	Element (CM1305)		53040001300			
Fuel cock			53060329000	Check every 200 operating hours (every month) and replace if malfunctionin .	1	☞ Page 39
V-belt	Running	CM1801	08521300033	Replace if malfunctioning.	1	Request dealer for replacement.
		CM1305	08521300036			
	Rotary	CM1801	08521500069			
		CM1305	08521500066			
Brake lining			73014007000	Replace if malfunctioning.	1 set (The entire set is replaced.	Request dealer for replacement.
Battery	CM1801		37053901000	Replace if malfunctioning.	1	☞ Page 36
	CM1305		34070501000			
Tire	Front (R)		53042201000	Replace if malfunctioning.	2 for the front	Request dealer for replacement.
	Front (L)		53042206000		2 for the rear	
	Rear (R)		53042301000			
	Rear (L)		53042302000			
Fuel pipe	From the front of tank to joint	CM1801	53060332000	Every three years or when a malfunction is found.	2	☞ Page 43
		CM1305	53060333000			
	From the rear of tank to joint	CM1801	53060331000			
		CM1305	53080323000			
	From joint to cock (CM1801)		53060333000			
	From cock to filter (CM1801)		53050325100			
	From joint to cock (CM1305)		53050331000			
	From cock to filter (CM1305)		53080325000			
Wire	Throttle wire	CM1801	53090105000	Replace if malfunctioning.	1	—
		CM1305	53040209000			
	Choke wire (CM1801)		53090106000	Replace if malfunctioning.	1	—
	Blade clutch wire		53062431000	Replace if malfunctioning.	1	—
	Brake wire		36103014000	Replace if malfunctioning.	1	—
	Differential lock wire		36083229000	Replace if malfunctioning.	1	—
	Blade brake wire		53064311000	Replace if malfunctioning.	1	—
Rotaries	Stay		53044205000	Replace if malfunctioning.	1	☞ Page 43
	Blade		53044202000	Replace if malfunctioning.	2	☞ Page 43
	Cup square neck bolt		53044203000	Replace if malfunctioning.	2	☞ Page 43
	Collar		53044204000	Replace if malfunctioning.	2	☞ Page 43
	Cap		53044204100	Replace if malfunctioning.	2	☞ Page 43
	SW		A3600101202	Replace if malfunctioning.	2	☞ Page 43
	Castle nut		A3110101203	Replace if malfunctioning.	2	☞ Page 43
	Split pin		05200132025	Replace if malfunctioning.	2	☞ Page 43
	Brake lever		53064301000	Replace if malfunctioning.	1	☞ Page 43
Parts, other than the above, which seem to require replacement as a result of inspection				Consult the dealer (or one of our service centers).		—

7.4 LUBRICATION

NOTE

- Insufficient or improper lubrication not only causes the machine to fail to achieve smooth turning but also causes it to break down, shortening the life of the machine. Therefore, fill the machine with the right amount of designated good quality oil on a regular basis.
- Always shut off the engine before inspection or servicing.

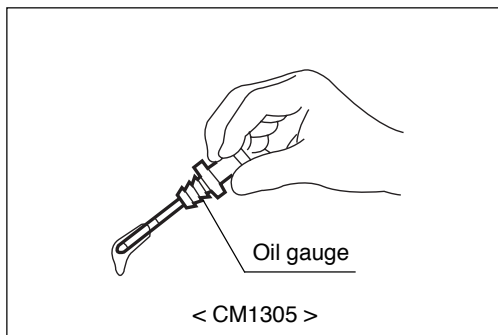
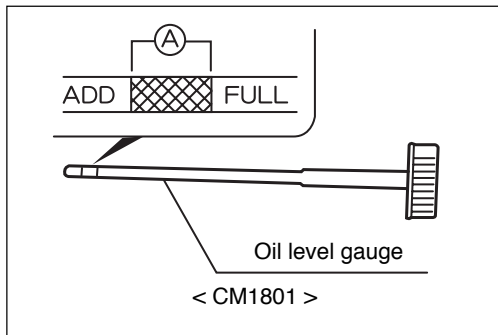
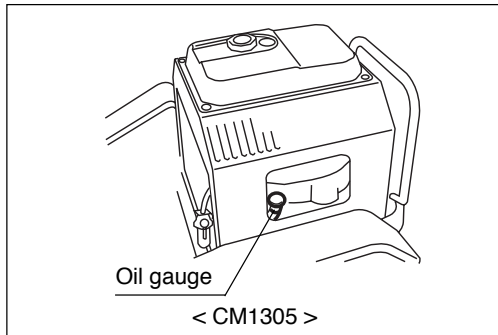
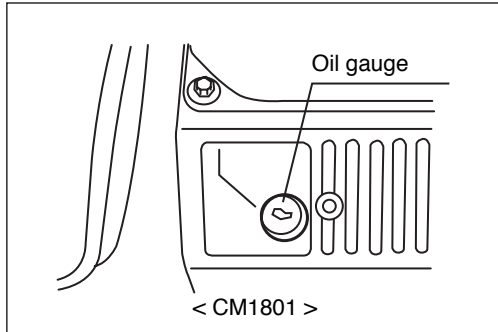
7.4.1 Engine Oil

Inspection/Refilling

1. Park machine on a horizontal surface.
2. Remove oil gauge.

NOTE

Inspect engine oil quantity either before starting engine or more than 5 minutes after stopping engine. Immediately after stopping engine, oil still remains in engine parts and correct oil quantity inspection is impossible.



3. Check the amount of engine oil visually. If it is not in the range A, supply engine oil.
4. Visually check the engine oil for dirt. When the engine oil is very dirty, replace it.

Fuel to be used : ➞ page 28

Amount of engine oil :

In the case of CM1801

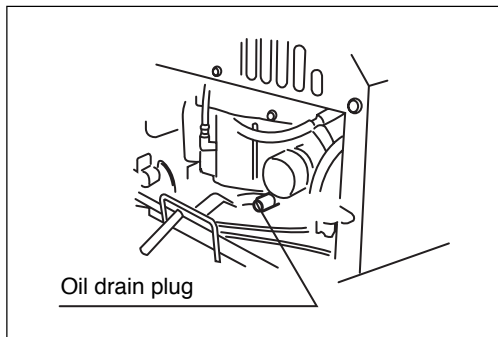
Within the range A with the oil gauge tightened

In the case of CM1305 :

Between the upper and lower limits of the oil gauge

(Do not exceed the upper limit.)

5. Reinsert oil gauge.



Replacement

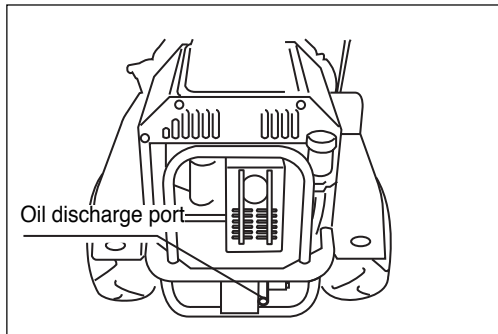
1. Prepare a suitable container to collect drained oil.
2. Remove oil drain plug and drain oil from crankcase.

CAUTION

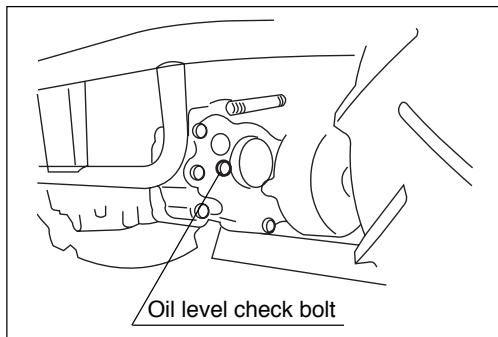
Hot oil can cause burns.

NOTE

Properly dispose of drained oil.



3. Replace oil drain plug.
4. Remove oil gauge and pour the designated oil from the lubrication port.



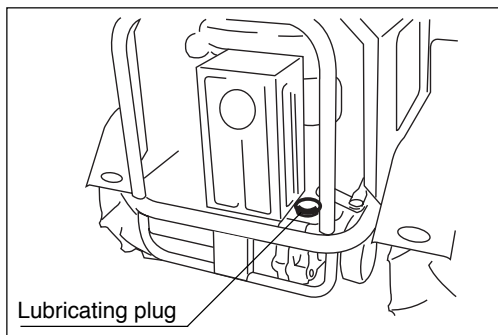
7.4.2 Transmission Oil

Inspection

1. Park machine on horizontal surface.
2. Remove the oil level check bolt and check if oil comes out from the bolthole. (Check if oil has reached the check bolthole.)

Amount of oil : page 28

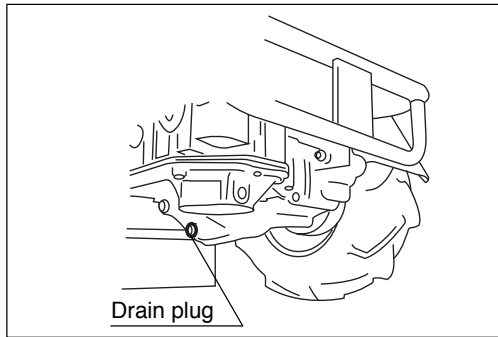
(Up to a point where oil reaches the oil level check bolthole)



To add oil

1. Remove lubricating plug.
2. Pour the designated oil from the lubrication port.

Oil to be used : page 28



Replacement

1. Prepare an appropriate container to collect oil.
2. Remove drain plug and drain oil into container.

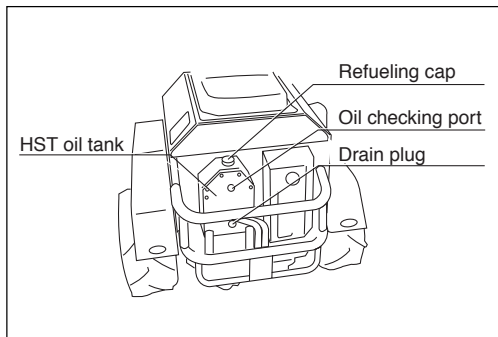
CAUTION

Hot oil can cause burns.

NOTE

Properly dispose of drained oil.

3. Replace drain plug.
4. Open the oil plug and pour the designated oil.



7.4.3 HST Oil

Inspection/Refilling

1. Park the machine in a horizontal place.
2. Check the amount of oil. When it is insufficient, supply oil (Page 14)

Oil to be used :  page 28

Amount of HST oil: 4.1 lit.

Replacement

1. Prepare a suitable container to collect drained oil.
2. Remove the drain plug and drain oil.

NOTE

Properly dispose of drained oil.

3. Replace the drain plug.
4. Open the refueling cap and put in a proper amount of designated oil.

7.5 LUBRICATION AND GREASING

NOTE

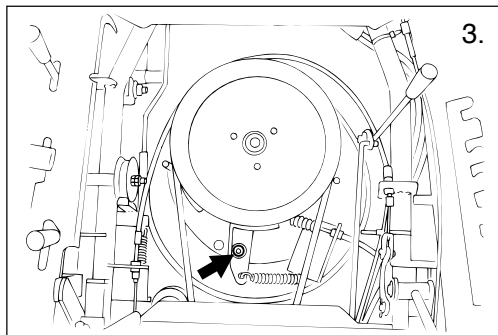
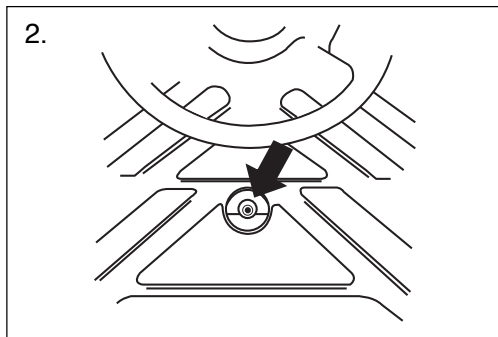
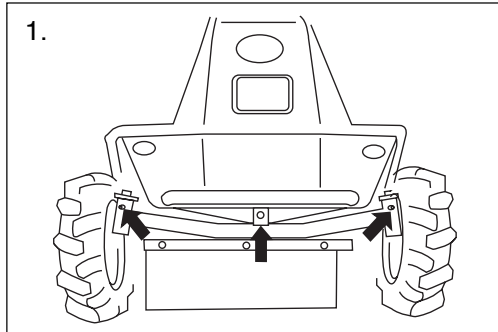
Insufficient or improper greasing can cause seizure or rust, making it difficult to achieve smooth turning and operation.

7.5.1 Lubrication

Lubricate the points as shown in the figure.

Oil to be used :  page 28

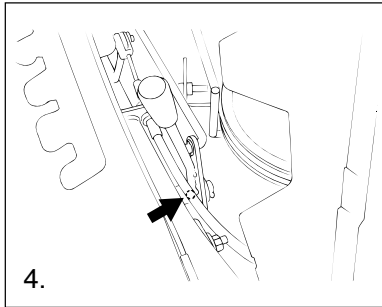
1. King pin. Pin for front axle shaft
2. Brake link section
3. Fulcrum of rotary stopper



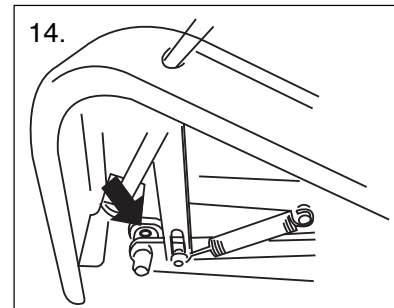
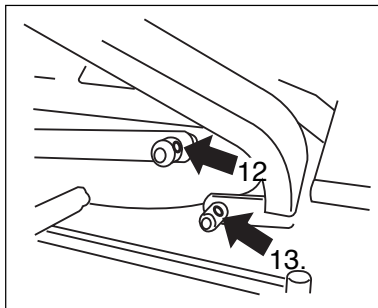
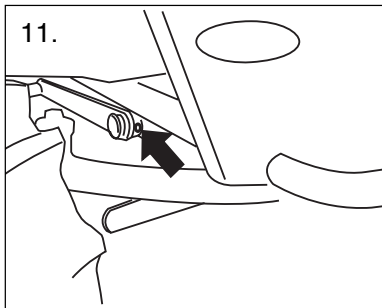
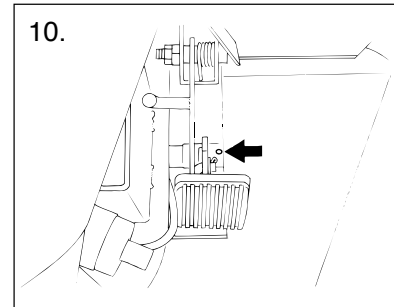
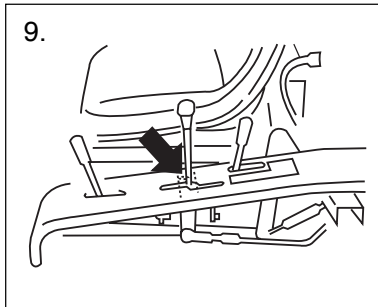
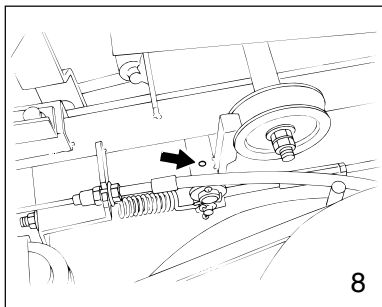
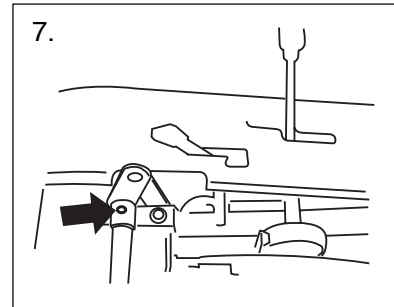
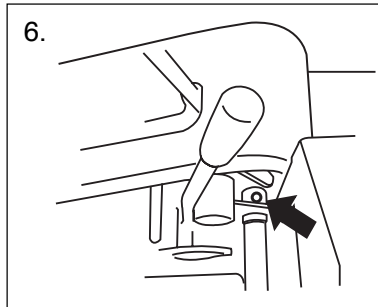
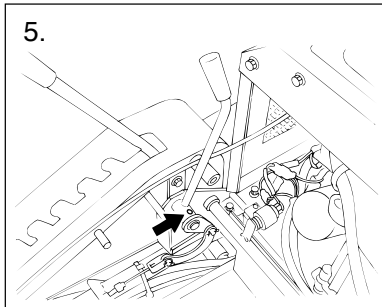
7.5.2 Greasing

Grease the points as shown in the figure.

Oil to be used :  page 28



- 4. Fulcrum of aux. speed change lever
- 5. Blade clutch lever fulcrum
- 6.&7. Fulcrum of cutter height adjusting lever link
- 8. Brake arm fulcrum
- 9. HST lever fulcrum
- 10. Brake pedal fulcrum
- 11.12.13.&14. Blade stay fulcrum
(11.12.13.&14. are also provided on the other side.)

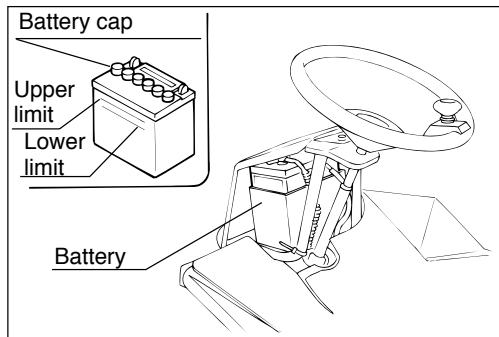


7.6 POURING BATTERY FLUID**7.6.1 Battery Fluid****⚠ DANGER**

The gas generated from the battery is flammable. Keep open flames away from battery. Open flames may cause battery explosion.

⚠ CAUTION

- Battery fluid sulfuric contains acid which may cause burns. Avoid fluid contact with skin or clothes, immediately remove affected clothes and clean the affected skin.
- Before checking or removing the battery, always stop engine and turn "OFF" the main switch.

**Inspection/Replenishment**

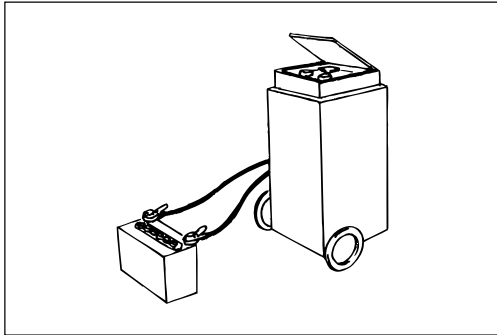
1. Park machine on horizontal surface.
2. Visually check the battery fluid quantity and add fluid if necessary by removing front cover and battery cap.
 Proper battery fluid level : Between (upper and lower) reference lines
 Battery fluid : Distilled water

Charging**⚠ CAUTION**

- Always remove the battery from the vehicle before charging. Charging the battery on vehicle may cause damage to electrical parts or wiring harnesses.
- Connect cables to correct terminals of the battery. Connecting to wrong terminal will immediately blow the fuse and render the battery not rechargeable.
- When disconnecting cables from the battery, disconnect plus terminal first. If you reverse the order, the battery may be shorted if a tool touches any conductive part of the battery.
- When reinstalling the removed battery, correctly connect the plus and minus cables and properly route and secure the cables with the tightening bolt so that they will not cause a short circuit with the other parts of the vehicle body.

NOTE

Quick charging is a method to partially recharge a battery in a short time with a large amount of current. This method should be used only in emergencies. After quick charging, always fully recharge the battery according to the proper procedure as soon as possible. Quick charging will extremely shorten battery life.



1. Remove the battery.
2. Connect a battery charger with the battery matching the polarities. (Follow the instructions in the battery charger operation manual.)

7.7 CLEANING**7.7.1 Air Cleaner Element****NOTE**

- Make sure to clean the air cleaner element on a regular basis (every 50 hour operation). A severely contaminated air cleaner element will badly affect engine startability, power and life.
- Since air cleaner is dry type, do not use oil. Also never use compressed air for cleaning and drying.
- Handle with care for not breaking cleaner or deform it.

Cleaning

In the case of CM1801:

1. Remove the hooks on both sides of the air cleaner cover and remove the cover.
2. Remove the wing bolt and remove the form element and paper element. Clean the form element in a tank containing a detergent and water. Then, dry the form element by applying compressed air to it or shaking it. After cleaning, allow clean engine oil to soak into the form element and squeeze excess oil. Then, wrap the form element in a clean cloth and dry it as much as possible by squeezing.
3. Install the form element and paper element. Then, install them on the main body with the wing bolt.

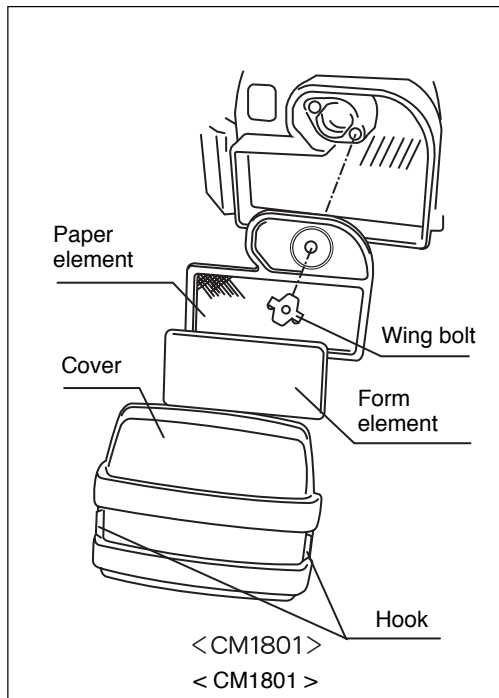
NOTE

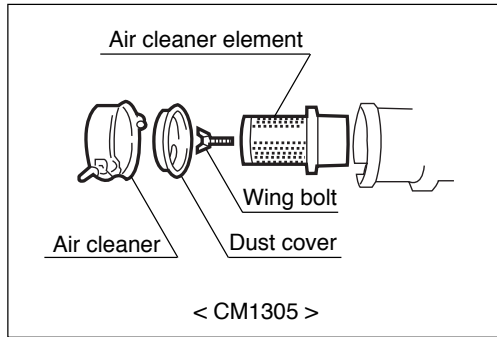
If the air cleaner is noticeably dirty or damaged, replace it.

4. Install the cover on the main body.

Replacing

Inspect air cleaner every 50 hours (every week) and replace if necessary.





In the case of CM1305:

1. Remove the air cleaner cover.
2. Remove the wing bolt.
3. Remove the dust cover and air cleaner element.
4. Remove dirt by allowing air (airpressure : 2.1 kg/cm² or less) to blow from the inside of the element or shaking the element slightly by hand.

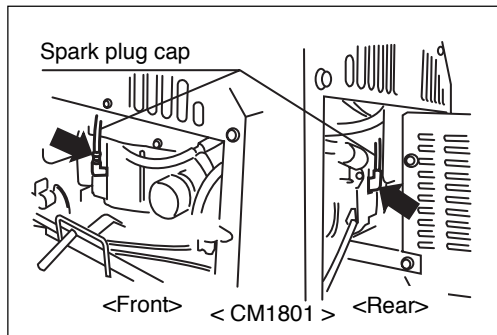
NOTE

Never allow the air cleaner to contain oil. When the air cleaner is very dirty or damaged, replace it.

5. Install the air cleaner element and dust cover.
6. Install the wing bolt.
7. Install the air cleaner cover.

Replacing

Inspect air cleaner every 50 hours (every week) and replace if necessary.



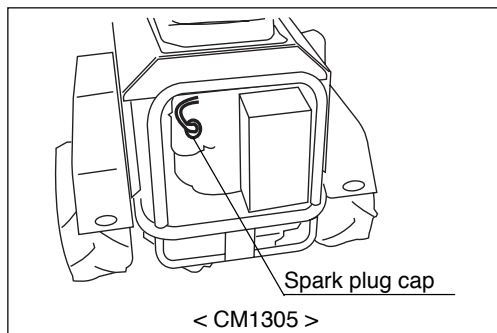
7.7.2 Spark Plug

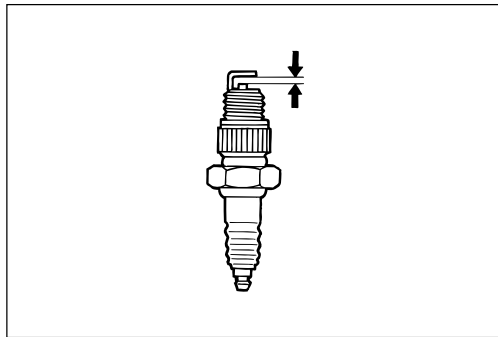
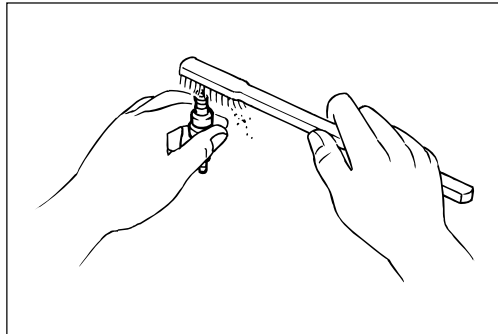
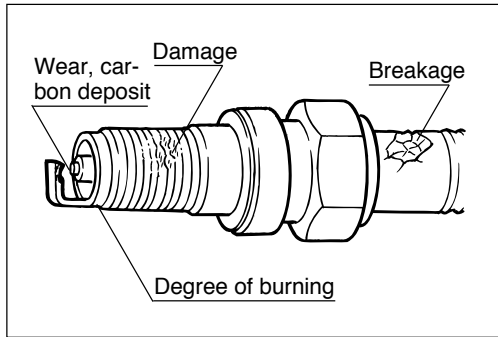
Inspection

1. Remove the spark plug cap.

NOTE

Do not pull on the cable when removing the spark plug cap. Always hold the cap body.





2. Remove the spark plug using a plug wrench.
3. Check the plug for the following points and clean or replace it as necessary. (Specifications for spark plug : [Page 11](#))
 - Presence or absence of breakage of the insulator
 - Worn electrode
 - Carbon deposit
 - Damage to and breakage of gasket
 - Degree of burning of insulator in spark section

Cleaning

1. Clean the spark plug using a wire brush or plug cleaner.

2. Grind the electrode with sandpaper to adjust the gap as specified.

Standard clearance : 0.9 to 1.0 mm

3. Replace the spark plug.

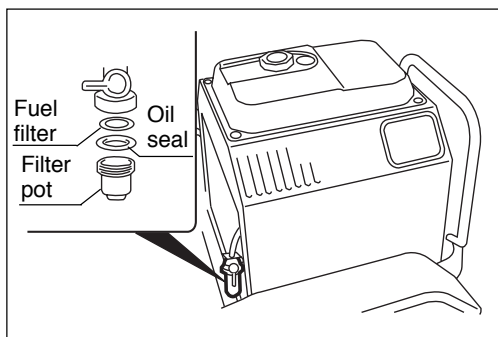
7.7.3 Fuel Cock (Fuel Filter)

NOTE

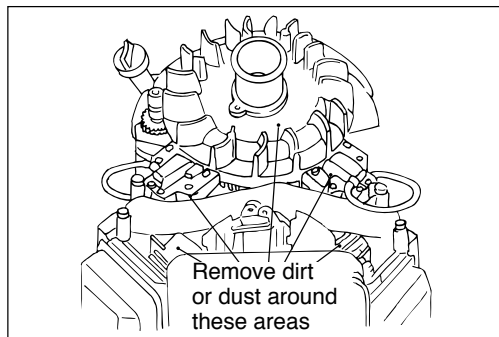
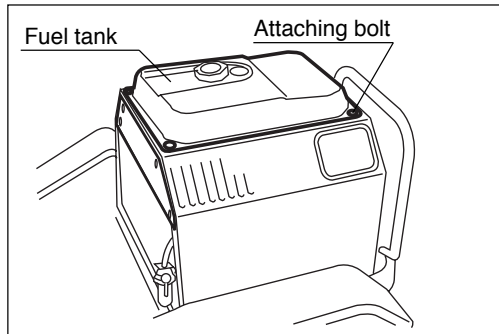
- Clean fuel filter every 100 hours of operation.
- Clean filter in a neat non-dusty place.

Cleaning

1. Check and confirm that fuel cock is closed.
2. Remove filter pot, oil seal and fuel filter.
3. Remove deposits (dust or water etc.) inside of filter pot.



4. Clean inside of filter pot, oil seal, fuel filter in clean kerosene.
5. Attach filter pot, oil seal and fuel filter.

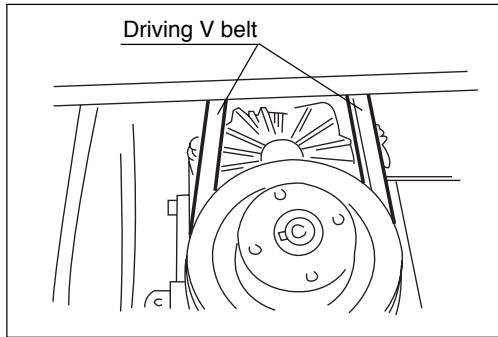


7.7.4 Blower Housing and Cooling Fan

CAUTION

Remove the blower housing after engine becomes cool.

1. Remove all the fuel completely from fuel tank.
2. Remove cover in front part of fuel tank.
3. Remove attaching bolts (4 pcs.) for fuel tank.
4. Move fuel tank to forward position and fix it.
5. Remove blower housing fixing bolts and detach the shroud.
6. Inspect cooling fins for dirt or dust. Clean with compressed air.



7.8 ADJUSTMENT

7.8.1 V Belt for Driving

Inspection

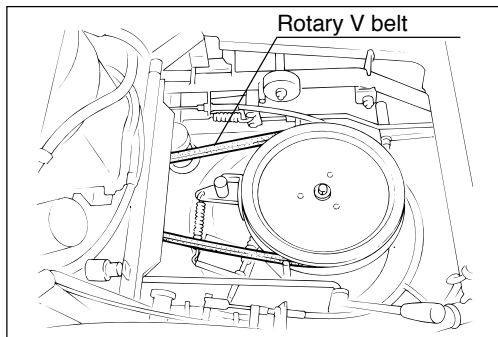
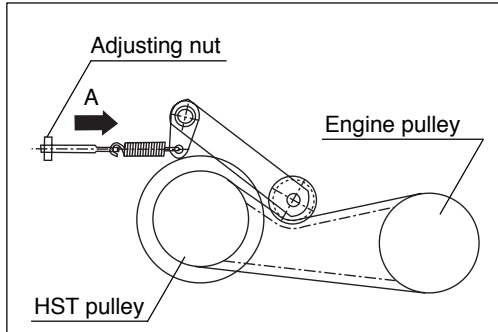
1. Visually check for damage on V belt. If any damage is found, replace the V belt.

Adjustment

NOTE

Adjust V belt only when V belt slips during driving. V belt should be always in tension during operation.

1. To adjust V belt, turn adjusting nut in direction A



7.8.2 Blade Rotary V Belt

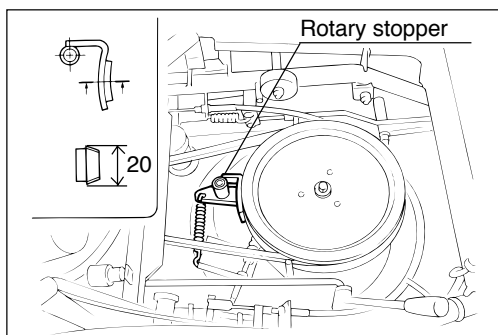
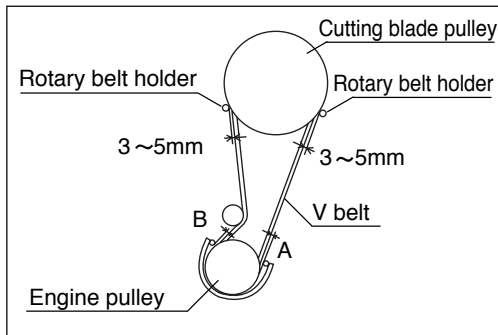
Inspection

1. Visually check for damage on V belt. If any damage is found, replace the V belt.

Adjustment

After replacing V belt, make adjustment as follows :

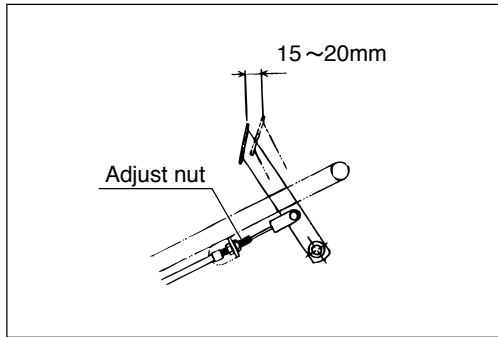
1. Set the engine side clearance at belt stopper A 2 to 4 mm and B 10 mm.
2. Set the clearance between rotary belt holder and V belt with 3 to 5 mm (when belt slips out of rotary, check the clearance on belt holder at rotary side).



7.8.3 Rotary Stopper

Inspection

1. Inspect and check whether blade stops within 4 seconds after putting blade clutch lever to OFF. If cutter does not stop within 4 seconds, check wearing of lining. If lining is 20 mm or less, ask the dealer to replace it.

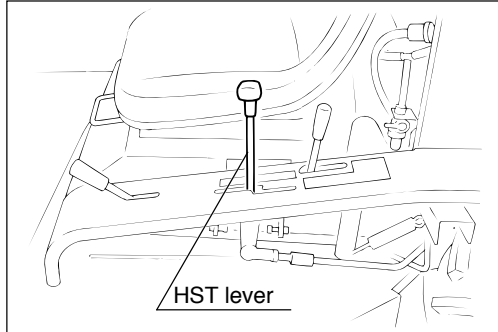


7.8.4 Brake Pedal

CAUTION

If brake pedal play increases, immediately make the following adjustment. Poor brake adjustment may cause accidents.

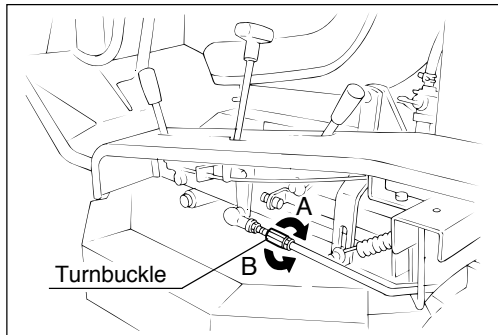
Adjust the brake pedal play with the wire adjust nut in such a way that when the brake pedal is depressed slightly, the play is 15 to 20 mm at the end.



7.8.5 HST Lever

NOTE

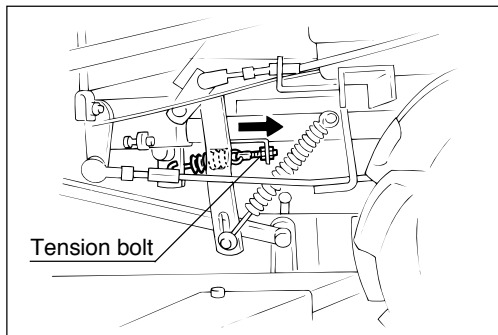
Adjustment is not needed unless the machine is overhauled. When "Neutral" position of HST lever is not correctly adjusted, the machine will slightly move forward or backward.



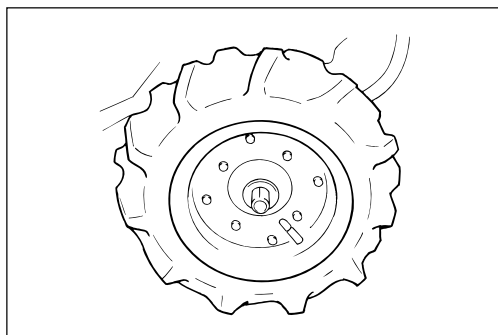
1. Move HST lever to "Neutral" position.
2. Adjust by turning the turnbuckle of HST lever.

If machine moves forward slightly :
Turn the turnbuckle in A direction.

If machine moves backward slightly :
Turn the turnbuckle in B direction.



When HST lever returns to "Neutral" while driving :
Remove seat, move tension bolt at the foot of HST lever in direction of arrow and adjust the lever movement.



7.8.6 Tire Pressure

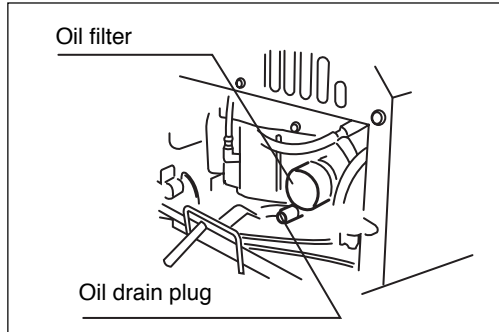
1. Check the air pressure of the front and rear tires. Adjust if required.

	Tire size	Air pressure (kg/cm ²)
Front wheel	3.50-7	1.2
Rear wheel	16 x 7.00-8.0	1.4

7.9 REPLACEMENT**7.9.1 Oil filter (CM1801)**

Replace oil filter every 100 hours of operation.

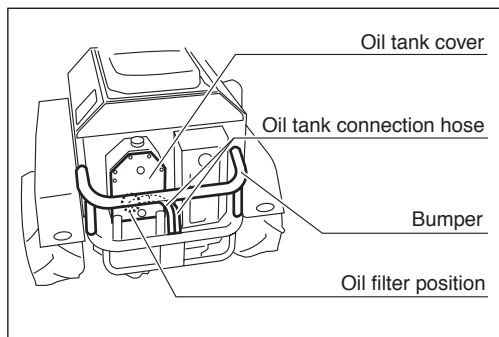
1. Before installing new filter wipe new oil on filter gasket.
2. Turn the filter by hand until it comes into contact with filter adapter gasket, then use tool to further tighten turning 1/2 to 3/4 turns.
3. Remove oil gauge and pour slowly new oil with appropriate grade and viscosity.
4. When checking oil level, insert the oil gauge completely before removing again and confirming the level.
5. Start engine and check for oil leakage.

**7.9.2 Fuel Pipe, Engine Oil Drain Pipe, and HST Oil Tank Connection Hose**

Rubber products, such as fuel pipe, deteriorate even if they are not used.

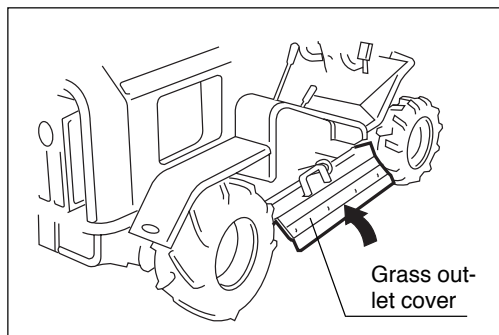
Replace them, together with the tightening handle, with new ones every three years.

(When they are damaged, replace them at once.)

**7.9.3 HST Oil filter (CM1801)**

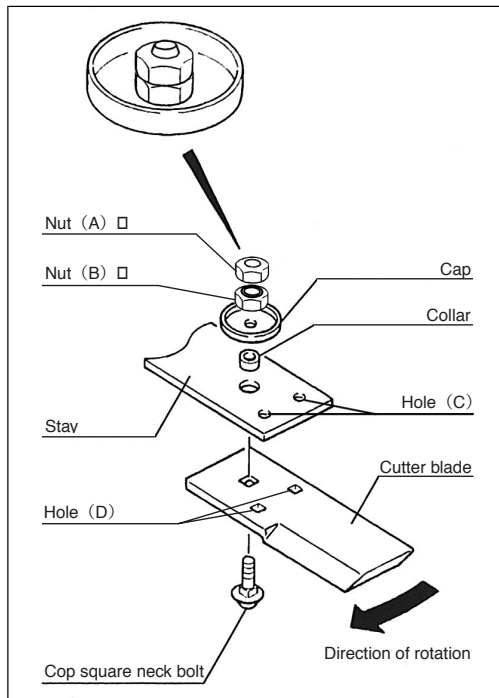
Replace the HST oil filter every 500 operating hours.

1. Remove the bumper.
2. Drain oil in the tank. (Page 32)
2. Take off the oil tank connection hose.
3. Take off the oil tank cover and replace the inside oil filter with a new oil filter.
4. Install the oil tank cover and oil tank connection hose.
5. Put in HST oil. (Page 32)
6. Install the bumper.

**7.9.4 Blade****CAUTION**

When handling cutter blade use thick gloves or wrap the blade with cloth and handle with care in order to prevent injuries.

1. Open the right hand side grass outlet cover.



2. Align the stay hole (C) with the cutter blade hole (D).

CAUTION

Because the cup square neck bolt wears out, be sure to check it for wear. When it is badly worn away, replace it.

3. Insert a high-strength rod-like thing (such as a screwdriver) into the hole (C or D) (one is acceptable) and lock the cutter blade.
4. Using a ring spanner or socket wrench, remove the upper nut (A) and the lower nut (B) in that order and take off the cutter blade.
5. Place a new cutter blade below the stay and let the cup square neck bolt pass through from below.
6. Let the cup square neck bolt pass through the collar and cap.
7. Align the stay hole (C) with the cutter blade hole (D).
8. Insert a high-strength rod-like thing (such as a screwdriver) into the hole (C or D) (one is acceptable) and lock the cutter blade.
9. Tighten the lower nut (B) with specified torque.
10. Tighten the upper nut (A) with specified torque.

Specified torque: M12 = 450 to 550 kgf · cm

NOTE

Always split the cotter pin vertically.

7.10 AFTER-USE MAINTENANCE

(Normal use)

- Remove all dirt, water and foreign objects from the body. Do not use water to wash the engine, the operation panel, or the filling plugs/caps. Water will damage parts and cause rust built up.
- Cover the vehicle with a water-proof sheet when placing it outdoors.

(In cold season)

- Remove all dirt, water and foreign objects from the body. Any remaining dirt will freeze and cause malfunctions. Place the vehicle on a concrete floor, dry firm ground or wooden blocks.
- Cover the vehicle with a water-proof sheet when placing it outdoors.

NOTE

If the vehicle freezes do not operate, do not force movement. Melt ice with (hot) water or wait until the vehicle is not frozen. Please take special note that our company will not take the responsibility for any failures caused by forced movements.

8. STORAGE (LONG TERM)

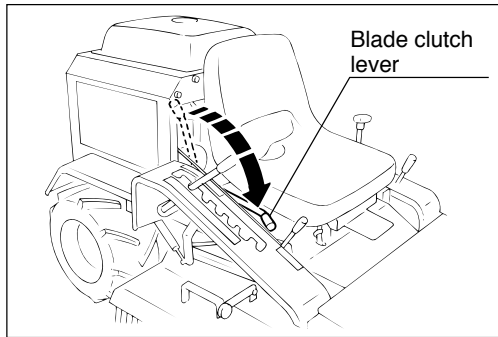
When storing the vehicle for a long time, appropriate maintenance is required for future use. After performing the after-use maintenance (☞ page 44), follow the instructions below.

⚠ DANGER

Do not store the vehicles, battery, or fuel near open flames or in a high temperature area. Doing so may cause accidental fires.

NOTE

Do not store the vehicle in a dusty or damp place. Be sure to put a cover (vinyl sheet, etc.) on the vehicle after the engine has become cool.

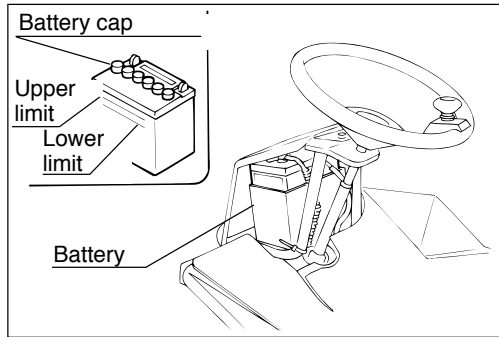


8.1 VEHICLE BODY

1. Inspect each area in accordance with the "REGULAR INSPECTION CHART" (☞ Page 25).
Carry out servicing if a defective condition is found.
2. Clean the external surface with a cloth moistened with oil.
Lubricate areas which are apt to get rusty.
3. Set the air pressure of the tires at a value slightly higher than the standard value.
4. Apply blocking in front of and behind the front wheels.
5. Move blade clutch lever to "ON" position.
6. Lubricate and grease areas to be lubricated and greased.
(☞ Pages 33 and 34)
7. Remove key from the main switch.

8

STORAGE (LONG TERM)



8.2 BATTERY

1. Remove the battery from the vehicle. (☞ Page 35)
(When storing with battery in machine, disconnect minus battery cable.)
2. Check the battery fluid level and add fluid as necessary.
3. Store the battery in a dry area with low temperature.

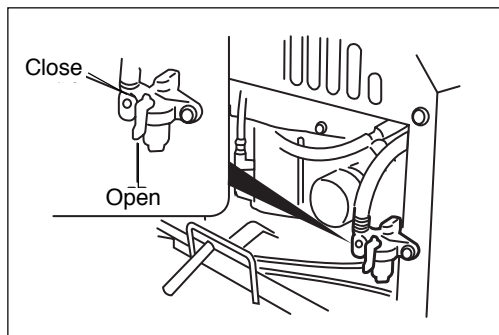
Notice:

Although the battery could be used without any recharges for approximately 6 months, it would be recommended to recharge before discharge for the battery's longer life.

8.3 ENGINE

NOTE

- Remove all fuel from the carburetor and fuel tank before storing the vehicle for a long time. Fuel in the carburetor will deteriorate if left unused for a long time, causing poor starting, or unstable operation of the engine. Do not use fuel which has been left unused for a long time.
- Refer to the engine operation manual for more details about long term storage of the engine.

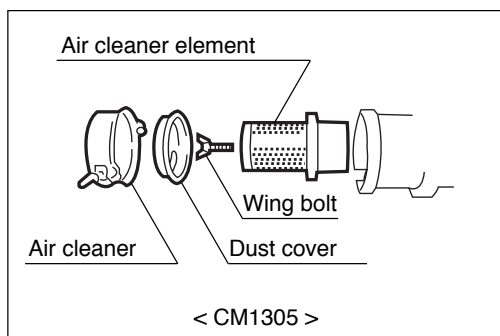
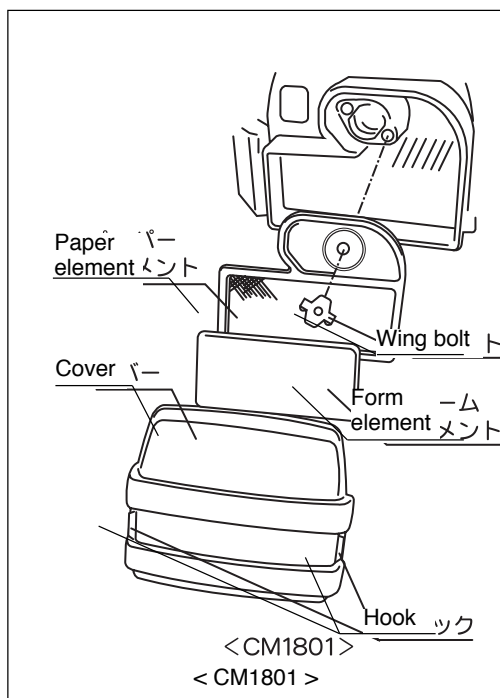


8.3.1 Fuel Cock

1. Turn the fuel cock to "CLOSE" to stop fuel supply.

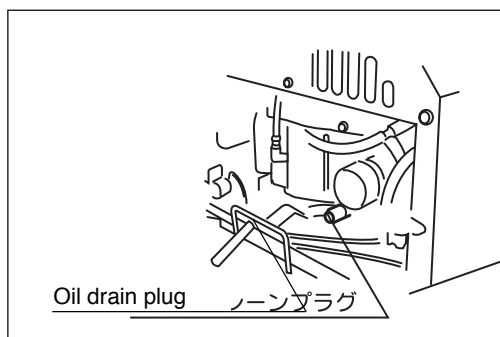
8.3.2 Cleaning Air Cleaner Element

1. Remove the air cleaner element and thoroughly clean it.
(☞ Pages 37 and 38)



8.3.3 Replacing Engine Oil

1. Drain all engine oil and refill engine with new engine oil.
(☞ Pages 30)



9

TROUBLESHOOTING

9. TROUBLESHOOTING

- If any malfunction or abnormal operation is found, immediately stop using the machine and make an appropriate repair referring to the troubleshooting chart shown below. If the malfunction is not listed in the chart or the suggested repair does not solve the problem, consult your dealer or one of our service centers.
- Some repair contents require specialized service knowledge. Request your dealer or one of our service centers for such repairs.

9.1 TROUBLESHOOTING CHART

Area	Malfunction	Possible cause	Corrective action
Engine	Engine does not start	• Blade clutch lever is not in the "OFF" position. (Safety device is actuated.) • Brake pedal is not depressed. (Safety device is working.) • Battery is over-discharged. • Battery cable is disconnected. • Fuse is blow. • Open circuit or contact failure of wiring	→ Put the lever to "OFF". (☞ Page 15) → Depress brake pedal. → Charge battery.(☞ Page 35) → Replace battery. (☞ Page 36) → Connect cable. → Replace. → Repair. (Consult dealer.)
	Hard to start (Difficult in starting)	• Lack of fuel • Air or water in fuel • Excessive intake of fuel • Engine oil insufficiency or poor quality (High oil viscosity) • Poor ignition due to dirt on spark plug or poor sparking • Insufficient capacity of battery (Poor electric starting) • Impurities in fuel circuit	→ Replenish. (☞ Page 13) → Check pipe and tightening band. Repair or replace. → Start after interval. → Replenish or replace. (☞ Page 30) → Clean or replace.(☞ Page 38) → Replenish battery fluid.(☞ Page 35) → Charge battery.(☞ Page 35) → Clean fuel cock.(☞ Page 39)

TROUBLESHOOTING

9

Area	Malfunction	Possible cause	Corrective action
Engine	Engine stalls soon	- Fuel cock is not opened - Insufficient fuel	Open fuel cock. (☞ Page 15) → Replenish. (☞ Page 13)
	Engine stops abruptly	- No fuel - Burn due to insufficient or deteriorated engine oil	→ Add. (☞ Page 13) → Check and add oil. (☞ Page 30)
	Improper idling (Irregular engine speed)	_____	→ Consult dealer.
	Poor power or acceleration	- V belt loosened - Improper accelerator adjustment - Clogging of air cleaner	→ Adjust. → Consult dealer. → Clean or replace. (☞ Pages 37 and 38)
	Abnormal noises or vibrations are made in or around the engine	- Looseness of engine mounting bolts - Others	→ Check and carry out additional tightening. → Consult dealer.
	Excessive engine oil	Engine oil leak	→ Check and repair.
	Engine overheating	- Insufficient engine oil - Blower housing and cooling fin clogging	→ Replenish. (☞ Page 30) → Clean. (☞ Page 40)
	Excessive fuel consumption	- Fuel leak from fuel system - Clogged air cleaner	→ Check and repair. (Consult dealer.) → Clean or replace. (☞ Pages 37 and 38)
	Excessive black smoke (Abnormal exhaust)	- Choke not opened completely - Poor compression - Clogged air cleaner - Excessive oil intake - Poor fuel	→ Put choke to FULL position. (☞ Page 18) → Check and repair. (Consult dealer.) → Clean or replace. (☞ Pages 37 and 38) → After checking adjust oil volume. (☞ Page 30) → Replace fuel.

Area	Malfunction	Possible cause	Corrective action
Engine	White smoke or blue smoke comes out. (Abnormal exhaust)	• An excessive amount of engine oil is put in. • Improper fuel • Worn cylinder or piston ring	→ After checking adjust oil volume. (☞ Page 30) → Replace fuel. → Check and repair. (Consult dealer.)
Power transmission system	Never move unit with HST lever forward or reverse.	• Insufficient HST oil • Parking brake is applied.	→ Replenish. (☞ Page 32) → Release parking brake lock lever. (☞ Page 19)
	The unit moves even when HST lever is in neutral position.	• Adjustment of neutral position of HST speed shift is not correct.	→ Adjust. (Consult dealer.)
Brake system	Not effective	• Worn out brake lining • Oil penetrates within brake drum. • Water penetrates inside of drum. • Worn out tire	→ Replace lining. (Ask dealer to do the job.) → Replace oil seal. (Ask dealer to do the job.) → Engine brake some times to dry water inside of drum. → Replace tire.
	Excessive play of brake pedal.	• Incorrect adjustment	→ Adjust. (☞ Page 42)
Steering system	Heavy steering	• Incorrect tire air pressure • Insufficient greasing for king pin • Malfunction inside of steering gear	→ Adjust. (☞ Page 42) → Lubricate. (☞ Page 33) → Repair. (Ask dealer to do the job.)
	Cannot drive straight.	• Incorrect tie-rod adjustment	→ Adjust.
Chassis	Abnormal vibration of the chassis	• Incorrect tire air pressure adjustment • Loose tire fixing bolt • Breakage of wheel bearing • Crack of tire	→ Adjust tire air pressure. (☞ Page 42) → Retighten. → Replace. (Ask dealer to do the job.) → Replace.
Lighting system	Head lamp failure	• Improper wiring • Bulb is disconnected. • Blow fuse	→ Connect properly. → Replace. → Replace.

Area	Mulfunction	Possible cause	Corrective action
Grass cutter devices	Mown grass not discharged well	• Wet grass • Grass too long • Mowing height too low • Low engine speed • High work speed	→ Perform the operation after grass becomes dry. → Mow twice with a higher mowing height. → Set the mower to a higher mowing height. (☞ Page 24) → Set the mower to the maximum motor speed. → Work more slowly.
	Some grass is left unmown.	• High work speed • Low engine speed • Grass too long • Wear and breakage of cutter • Accumulation of grass on the internal surface of the rotary cover	→ Work more slowly. → Set the mower to the maximum motor speed. (Check engine speed.) → Mow twice. → Replace the blade with a new one. (☞ Pages 43 and 44) → Clean the internal surface of the rotary cover.
	The mower cuts into the soil.	• Mowing height too low • High swing speed • Ground contours • Too many bumps and dips in the ground • Bent mowing blade	→ Set the mower to a higher mowing height. (☞ Page 24) → Reduce swing speed. → Change the moving pattern. (mowing direction, etc.) → Set the mower to a higher mowing height. (☞ Page 24) → Replace the blade with a new one. (☞ Pages 43 and 44)
	The belt slips	• Low belt tension • Rotary cover clogged with grass • Grass accumulated in the pulley • Worn belt	→ Adjust the belt tension. → Take out the jammed grass and clean the inside of rotary cover. → Clean the pulley. → Replace the belt with a new one.
	Extreme shaking	• Grass accumulated in the rotary cover and pulley • Damaged belt • Damaged pulley • Damaged blade	→ Clean the rotary cover and pulley. → Replace the belt with a new one. → Replace the pulley with a new one. → Replace the blade with a new one. (☞ Pages 43 and 44)

9

TROUBLESHOOTING

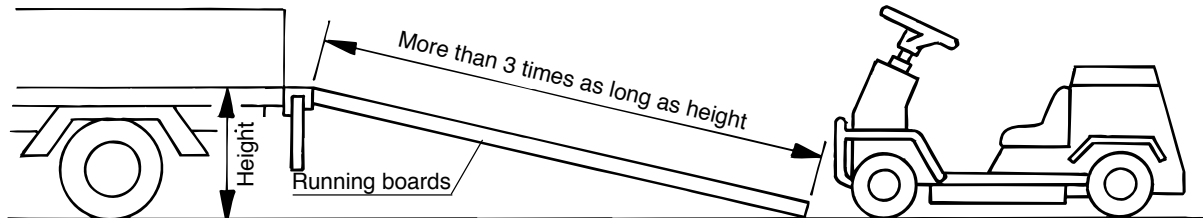
Area	Malfunction	Possible cause	Corrective action
Grass cutter devices	Cutter overloaded	• Poor balance of blade • Low engine speed • Operating speed too high • Grass accumulating or coiling around blade or around shaft	→ Replace the blade with a new one or balance the blade properly. ( Pages 43 and 44) → Increase engine speed to a maximum value. (Check engine speed.) → Slow down operating speed. → Clean up blade.

TRANSPORTATION OF/WITH THIS VEHICLE 10

10. TRANSPORTATION OF/WITH THIS VEHICLE

When loading and unloading the machine onto or from truck, follow the procedures below.

1. Prepare running boards with enough strength (durable to hold both machine and driver's weight), width (twice width of tire width), length (more than three times as long as the truck loading body height), and abrasive surface. Place the boards as shown below so that the boards firmly keep their positions even when the machine rides on them.



2. Securely hook the running boards to truck so that there is no difference in height between the boards and the truck's loading bed.

⚠ DANGER

- Do not allow any one to come near the machine, truck, and running board while loading or unloading the machine.
- Do not turn on the running boards. The machine may drop off the running boards.
- When moving up or down the running boards, drive the vehicle slowly at low speed.

⚠ CAUTION

When the machine is loading on the place between the truck and the running board, beware of the machine's center of gravity because it may move suddenly.

CHIKUSUI CANYCOM, INC.

■ Sales Headquarters	☎ 09437(5)2195	FAX (5)4396	■ Saitama Center	☎ 0495(77)4511	FAX (77)2949
■ Tokyo Headquarters	☎ 03(3552)6255	FAX (3552)6288	■ Osaka Center	☎ 0790(42)6031	FAX (42)6035
■ Foreign Trade Center	☎ 03(3552)6277	FAX (3552)6288	■ Hiroshima Center	☎ 0824(34)5996	FAX (34)5997
■ Tokyo Center	☎ 03(3552)6255	FAX (3552)6288	■ Fukuoka Center	☎ 0943(76)2583	FAX (75)5126
■ Sendai Center	☎ 022(281)1255	FAX (281)3141			

Memo of address and telephone number
(Name of dealer)

We prohibit unauthorized reprinting and reproduction of this document.