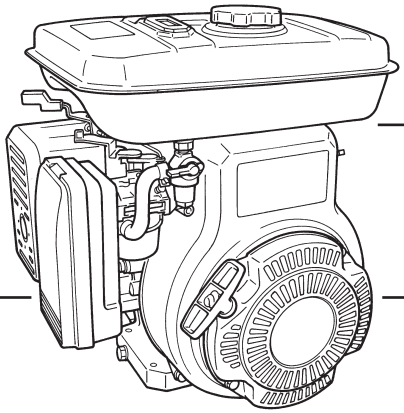
SUBARU

EH12-2D/12-2B
EH17-2D/17-2B

INSTRUCTIONS FOR USE



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Robin Engines

NOTICE

FEDERAL EMISSION COMPONENT DEFECT WARRANTY and CALIFORNIA EMISSION CONTROL WARRANTY are applicable to only those engines/generators complied with EPA (Environmental Protection Agency) and CARB (California Air Resources Board) emission regulations in the U.S.A.

NOTICE

To the engines/generators exported to and used in the countries other than the U.S.A., warranty service shall be performed by the distributor in each country in accordance with the standard Robin engine/generator warranty policy as applicable.

FEDERAL EMISSIONS COMPONENT DEFECT WARRANTY

EMISSIONS COMPONENT DEFECT WARRANTY COVERAGE – This emission warranty is applicable in all States, except the state of California.

Fuji Heavy Industries Ltd. and Robin America Inc., Wood Dale Illinois, (herein "ROBIN AMERICA") warrant(s) to the initial retail purchaser and each subsequent owner, that this Nonroad engine (herein "engine") has been designed, built, and equipped to conform at the time of initial sale to all applicable regulations of the U.S. Environmental Protection Agency (EPA), and that the engine is free of defects in materials and workmanship which would cause this engine to fail to conform with EPA regulations during its warranty period.

For the components listed under PARTS COVERED, the service dealer authorized by ROBIN AMERICA will, at no cost to you, make the necessary diagnosis, repair, or replacement necessary to ensure that the engine complies with applicable U.S. EPA regulations.

EMISSION COMPONENT DEFECT WARRANTY PERIOD

The warranty period for this engine begins on the date of sale to the initial purchaser and continues for a period of two years.

PARTS COVERED

Listed below are the parts covered by the Emission Components Defect Warranty. Some of the parts listed below may require scheduled maintenance and are warranted up to the first scheduled replacement point for that part.

(1) Fuel Metering System
- (i) Carburetor and internal parts (and/or pressure regulator or fuel injection system).
- (ii) Air/fuel ratio feedback and control system, if applicable.
- (iii) Cold start enrichment system, if applicable.
- (iv) Regulator assy (gaseous fuel, if applicable)

(2) Air Induction System
- (i) Intake manifold, if applicable
- (ii) Air filter.

(3) Ignition System
- (i) Spark plugs.
- (ii) Magneto or electronic ignition system.
- (iii) Spark advance/retard system, if applicable.

(4) Exhaust manifold, if applicable

(5) Miscellaneous Items Used in Above Systems
- (i) Electronic controls, if applicable
- (ii) Hoses, belts, connectors, and assemblies.
- (iii) Filter lock assy (gaseous fuel, if applicable)

OBTAINING WARRANTY SERVICE

To obtain warranty service, take your engine to the nearest authorized Robin America service dealer. Bring your sales receipts indicating date of purchase for this engine. The service dealer authorized by ROBIN AMERICA will perform the necessary repairs or adjustments within a reasonable amount of time and furnish you with a copy of the repair order. All parts and accessories replaced under this warranty become the property of ROBIN AMERICA.

WHAT IS NOT COVERED

*Conditions resulting from tampering, misuse, improper adjustment (unless they were made by the service dealer authorized by ROBIN AMERICA during a warranty repair), alteration, accident, failure to use the recommended fuel and oil, or not performing required maintenance services.

*The replacement parts used for required maintenance services.

*Consequential damages such as loss of time, inconvenience, loss of use of the engine or equipment, etc.

*Diagnosis and inspection charges that do not result in warranty-eligible service being performed.

*Any non-authorized replacement part, or malfunction of authorized parts due to use of non-authorized parts.

OWNER'S WARRANTY RESPONSIBILITIES

As the engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. ROBIN AMERICA recommends that you retain all receipts covering maintenance on your engine, but ROBIN AMERICA cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the engine owner, you should however be aware that ROBIN AMERICA may deny warranty coverage if your engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your engine to the nearest service dealer authorized by ROBIN AMERICA when a problem exists.

If you have any questions regarding your warranty rights and responsibilities, you should contact the Robin America customer service department at 1-630-350-8200 for the information.

THINGS YOU SHOULD KNOW ABOUT THE EMISSION CONTROL SYSTEM WARRANTY MAINTENANCE AND REPAIRS

You are responsible for the proper maintenance of the engine. You should keep all receipts and maintenance records covering the performance of regular maintenance in the event questions arise. These receipts and maintenance records should be transferred to each subsequent owner of the engine. ROBIN AMERICA reserves the right to deny warranty coverage if the engine has not been properly maintained. Warranty claims will not be denied, however, solely because of the lack of required maintenance or failure to keep maintenance records.

MAINTENANCE, REPLACEMENT OR REPAIR OF EMISSION CONTROL DEVICES AND SYSTEMS MAY BE PERFORMED BY ANY REPAIR ESTABLISHMENT OR INDIVIDUAL; HOWEVER, WARRANTY REPAIRS MUST BE PERFORMED BY A SERVICE DEALER AUTHORIZED BY ROBIN AMERICA. THE USE OF PARTS THAT ARE NOT EQUIVALENT IN PERFORMANCE AND DURABILITY TO AUTHORIZED PARTS MAY IMPAIR THE EFFECTIVENESS OF THE EMISSION CONTROL SYSTEM AND MAY HAVE A BEARING ON THE OUTCOME OF A WARRANTY CLAIM.

If other than the parts authorized by ROBIN AMERICA are used for maintenance replacements or for the repair of components affecting emission control, you should assure yourself that such parts are warranted by their manufacturer to be equivalent to the parts authorized by ROBIN AMERICA in their performance and durability.

HOW TO MAKE A CLAIM

All repair qualifying under this limited warranty must be performed by a service dealer authorized by ROBIN AMERICA. In the event that any emission-related part is found to be defective during the warranty period, you shall notify Robin America customer service department at 1-630-350-8200 and you will be advised of the appropriate warranty service dealer or service providers where the warranty repair can be performed.

FOREWORD

Thank you very much for purchasing a **ROBIN ENGINE**.

Your **ROBIN ENGINE** can supply the power to operate various sorts of machines and equipment.
Please take a moment to familiarize yourself with the proper operation and maintenance procedures in order to maximize the safe and efficient use of this product.
Due to constant efforts to improve our products, certain procedures and specifications are subjected to change without notice.
When ordering spare parts, always give us the MODEL, SPECIFICATION and SERIAL NUMBER of your engine.
Please fill in the following blanks after checking the specification number on your engine.

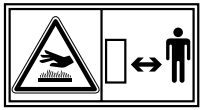
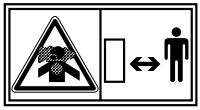
SPEC. NO. E H

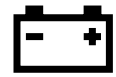
For your nearest ROBIN distributor (and/or dealer), you are able to check at our ROBIN website of the following URL;

http://www.fhi.co.jp/robin/distri/text2/f_dist_e.htm

CONTENTS

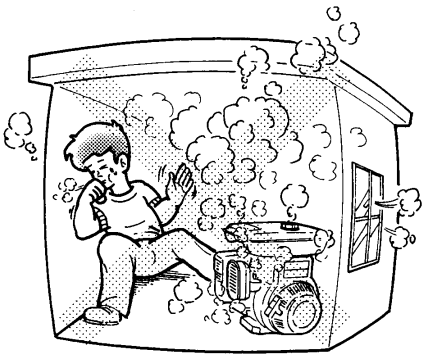
SYMBOLS

	*Read the owner's manual.*
	*Stay clear of the hot surface.*
	*Exhaust gas is poisonous.* *Do not operate in an unventilated area.*
	*Stop the engine before refueling.*
	*Fire, open flame and smoking prohibited.*

	On (Run)		*Plus ;* *positive polarity*
	*Off (Stop)*		*Battery*
	*Engine oil*		*Engine start* *(Electric start)*
	*Add oil*		

1. SAFETY PRECAUTIONS

Please make sure you review each precaution carefully.



EXHAUST PRECAUTIONS

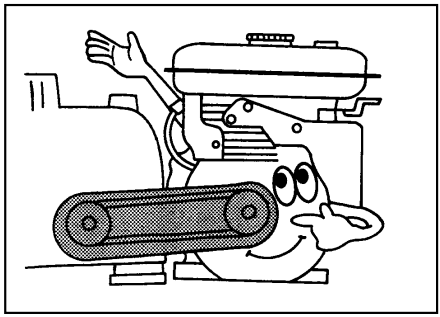
- Never inhale exhaust gasses. They contain carbon monoxide, a colorless, odorless and extremely dangerous gas which can cause unconsciousness or death.
- Never operate the engine indoors or in a poorly ventilated area, such as tunnel, cave, etc.
- Exercise extreme care when operating the engine near people or animals.
- Keep the exhaust pipe free of foreign objects.

REFUELING PRECAUTIONS

- Be sure to stop the engine prior to refueling.
- Do not overfill the fuel tank.
- If fuel is spilt, wipe it away carefully and wait until the fuel has dried before starting the engine.
- After refueling, make sure that the fuel cap is secured to prevent spillage.

FIRE PREVENTION

- Do not operate the engine while smoking or near an open flame.
- Do not use around dry brush, twigs, cloth rags, or other flammable materials.
- Keep the engine at least 3 feet (1 meter) away from buildings or other structures.
- Keep the engine away from flammables and other hazardous materials (trash, rags, lubricants, explosives).



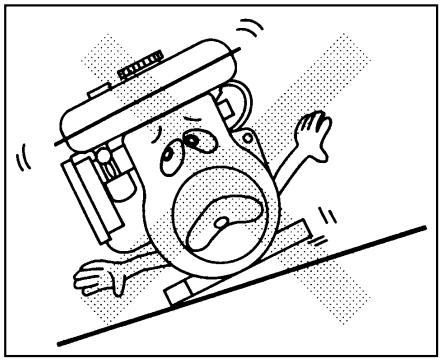
PROTECTIVE COVER

- **Place the protective covers over the rotating parts.**
  If rotating parts such as the drive shaft, pulley, belt, etc. are left exposed, they are potentially hazardous.
  To prevent injury, equip them with protective covers or shrouds.

- **Be careful of hot parts**.
  The muffler and other engine parts become very hot while the engine is running or just after it has stopped. Operate the engine in a safe area and keep children away from the running engine.

- Never make adjustments on the machinery while it is connected to the engine, without first removing the ignition cable from the spark plug. Turning the crankshaft by hand during adjusting or cleaning might start the engine, and machinery with it, causing serious injury to the operator.

- Never run the engine with governor disconnected, or operate at speeds in excess of 3600 rpm load.



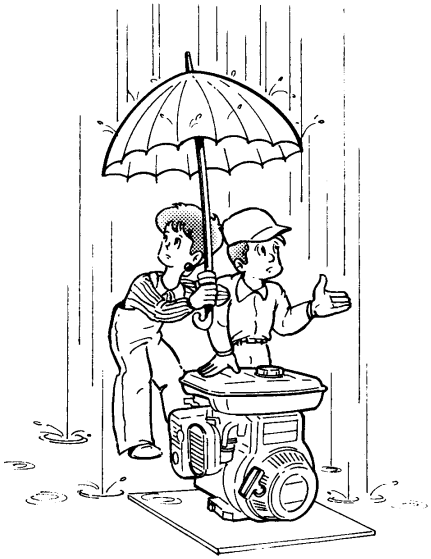
SURROUNDINGS

- Operate the engine on a stable, level surface free of small rocks, loose gravel, etc.

- **Operate the engine on a level surface.**
  If the engine is tilted, fuel spillage may result.

NOTE

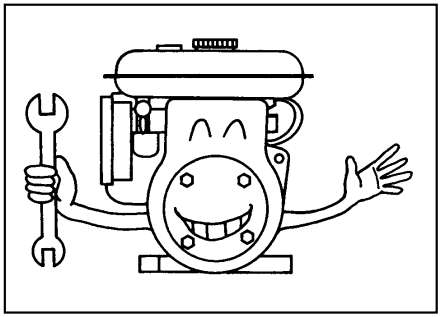
Operating the engine at a steep incline may cause seizure due to improper lubrication even with a maximum oil level.



- **Be careful of fuel spillage when transporting the engine.**
  Tighten the fuel tank cap securely and close the fuel strainer cock before transport.

- **Do not move the engine while in operation when it has been removed from the equipment.**

- Keep the unit dry (do not operate it in rainy conditions).



PRE-OPERATION CHECKS

- Carefully check fuel hoses and joints for looseness and fuel leakage.
  Leaked fuel creates a potentially dangerous situation.

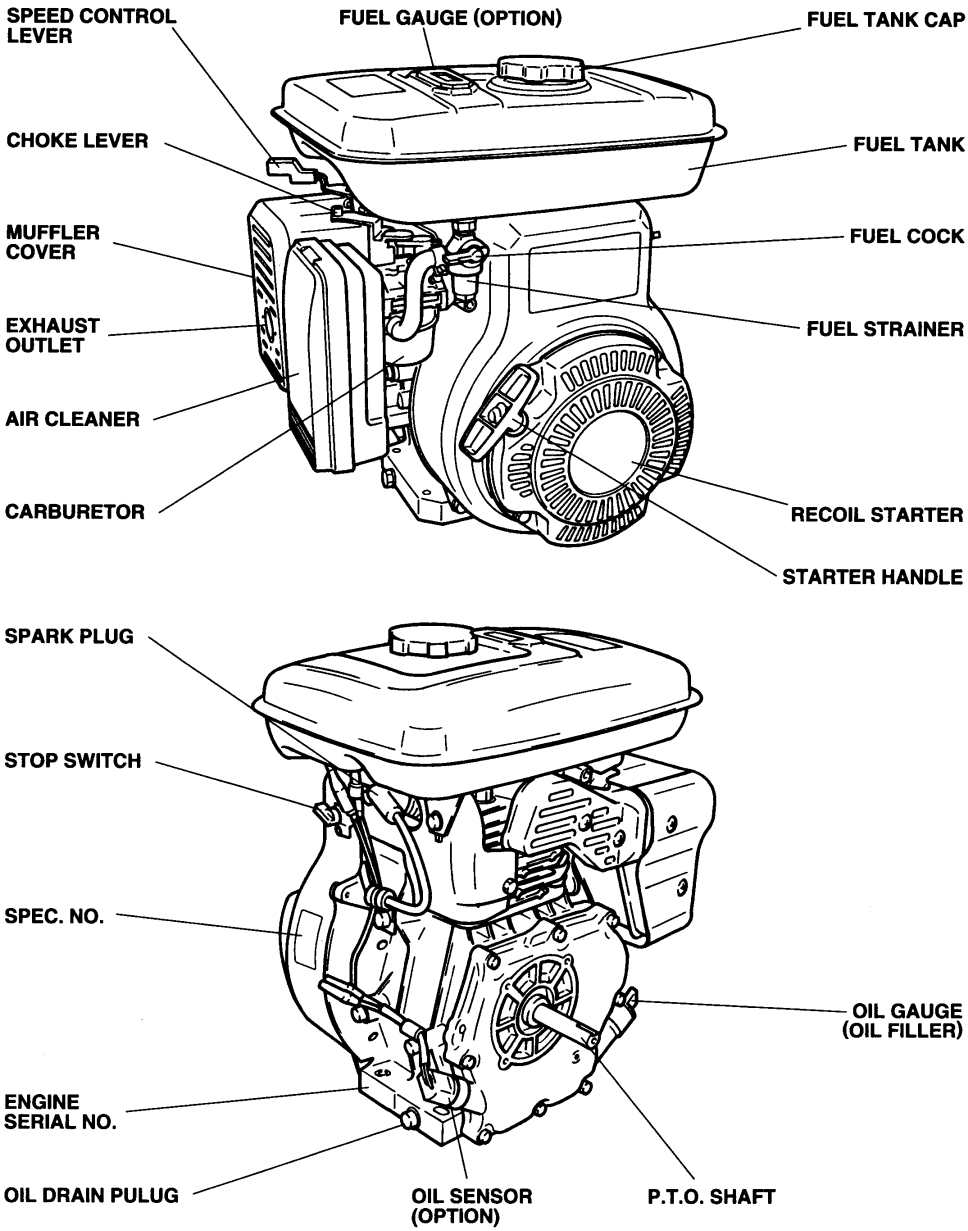
- Check bolts and nuts for looseness.
  A loose bolt or nut may cause serious engine trouble.

- Check the engine oil and refill if necessary.

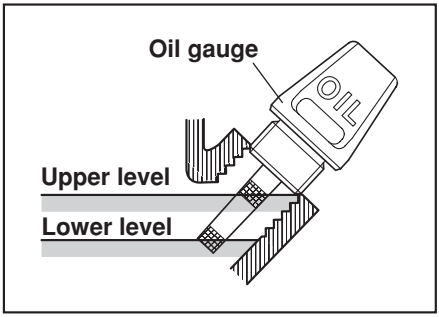
- Check the fuel level and refill if necessary.
  Take care not to overfill the tank.

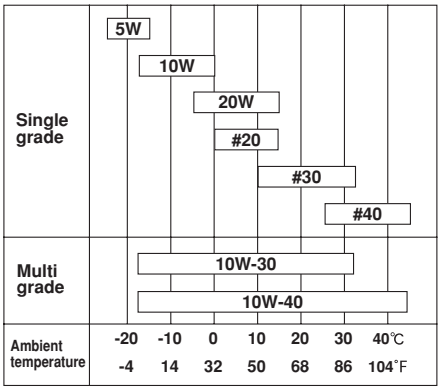
- Wear snug fitting working clothes when operating the engine.
  Loose aprons, towels, belt, etc., may be caught in the engine or drive train, causing a dangerous situation.

2. COMPONENTS



3. PRE-OPERATION CHECKS





CHECK ENGINE OIL

Before checking or refilling engine oil, be sure the engine is located on a stable, level surface and stopped.

- Do not thread the gauge into oil filler to check oil level.
- If the oil level is below the lower level line on the dipstick, refill with the proper oil (see table) to the upper level.

Oil capacity (Upper level) :	(L)
EH12-2	0.6
EH17-2	0.65

- Change oil if it is contaminated. (See page 16 Maintenance Schedule.)
- Use 4-stroke automotive detergent oil of API service class SE or higher grade (SG, SH or SJ is recommended).
- If multi-grade oil is employed, oil consumption tends to increase when the ambient temperature is high.

CHECK FUEL

⚠ CAUTION

Do not refuel while smoking, near an open flame or other potential hazards.

NOTE

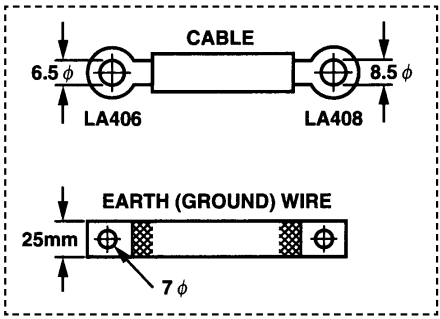
THIS ENGINE IS CERTIFIED TO OPERATE ON AUTOMOTIVE UNLEADED GASOLINE.

- Stop the engine and open the cap.
- Use automotive unleaded gasoline only.
- Close the fuel cock before filling the fuel tank.
- When filling the fuel tank, always use the fuel filter.
- Wipe off any spilled fuel before starting the engine.

4. ELECTRIC STARTER MODELS

PARTS TO BE PREPARED

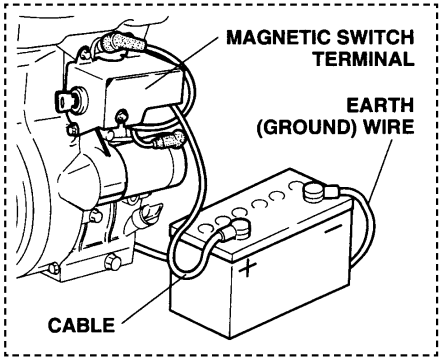
- Use a battery rated 12V-24AH or larger.
- Use a proper cable and ground wire to connect battery.



BATTERY

CABLE LENGTH	CABLE DIA.	WIRE GAUGE		
		AWG (BS) BWG	SAE	JIS
Less than 1.5 m	7.3 mm	1	6	AV15
1.5 m to 2.5 m	8.5 mm	0	4	AV20
2.5 m to 4 m	10.8 mm	3/0	2	AV30

For GROUND WIRE, use a flat braided wire of 0.03 sq. in. or larger sectional area. (SAE GAUGE #4)



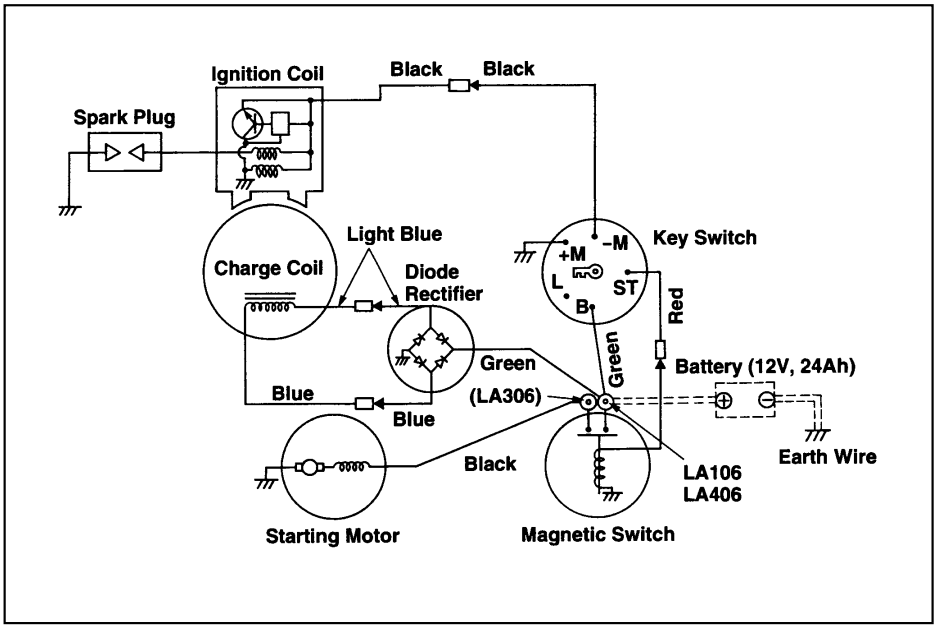
WIRING

1. **Connect positive terminal on magnetic switch and positive terminal of the battery with battery cable.**
2. **Ground negative terminal of the battery to the body of engine or machine with ground wire.**
3. **When installing the key switch on the machine, install with its drain hole at the bottom.**

NOTE

Tighten bolts and nuts on terminals securely so they will not be loosened by vibration.

WIRING DIAGRAM



SWITCH CABLE

If a remote key switch is used, select wires of proper gauge to connect it and magnetic switch of the engine.

CABLE LENGTH	CABLE DIA.	WIRE GAUGE		
		AWG(BS)	BWG	JIS
Less than 1.5 m	1.5 mm	14	16	AV1.25
1.5 to 3 m	1.9 mm	12	14	AV2
3 to 5 m	2.4 mm	10	13	AV3

5. OPERATING YOUR ENGINE

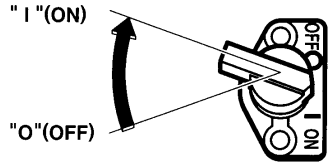
NOTE

Following operating method is for the STD type speed control lever. As to the fixed type speed control lever (exp. Generator spec.), do not move it otherwise the generator component such as voltage regulator may be damaged.

STARTING

STOP SWITCH

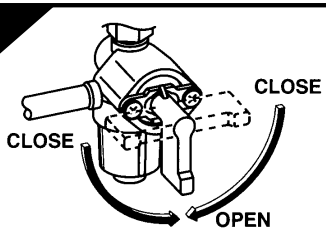
1



Turn the STOP SWITCH clockwise to the position " I "(ON).

FUEL COCK

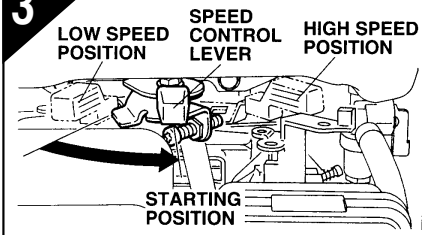
2



Open the fuel cock.

SPEED CONTROL LEVER

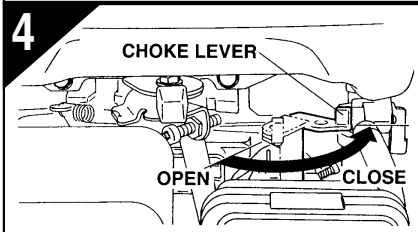
3



Set the speed control lever 1/3 to 1/2 of the way towards the high speed position.

CHOKE LEVER

4

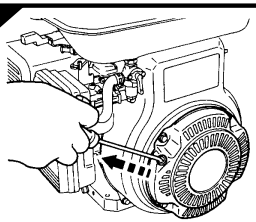


Close the choke lever.

- If the engine is cold or the ambient temperature is low, close the choke lever fully.
- If the engine is warm or the ambient temperature is high, open the choke lever half-way, or keep it fully open.

RECOIL STARTER

5

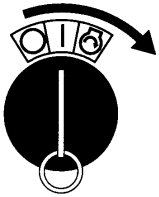


- Pull the starter handle slowly until resistance is felt.
  This is the "compression" point.
  Return the handle to its original position and pull swiftly.
- Do not pull out the rope all the way.
- After starting the engine, allow the starter handle to return to its original position while still holding the handle.

RUNNING

KEY SWITCH (OPTIONAL)

5



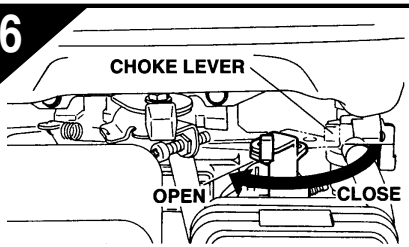
Insert the key into the key slot and set it at the" I " (ON) position.

Turning it to the right (START position) starts the engine.

- Do not operate the electric starter continuously for more than 5 seconds, even if the engine does not start.
- If the engine failed to start, set the key to the" I " (ON) position and wait for about 10 seconds before retrying.
- Never turn the key switch to the START position while engine is running.

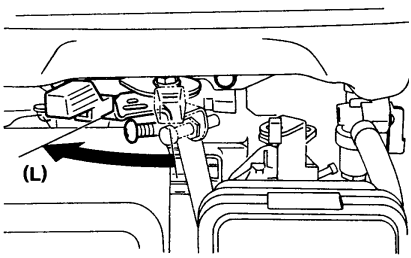
CHOKE LEVER

6

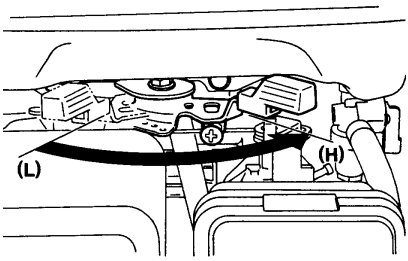


- After starting the engine, gradually open choke by turning the choke lever and finally keep it fully opened.
- Do not fully open the choke lever immediately when the engine is cold or the ambient temperature is low, because the engine may stop.

SPEED CONTROL LEVER



After the engine starts, set the speed control lever at the low speed position (L) and warm it up without load for a few minutes.



Gradually move the speed control lever toward the high speed position (H) and set it at the required engine speed.

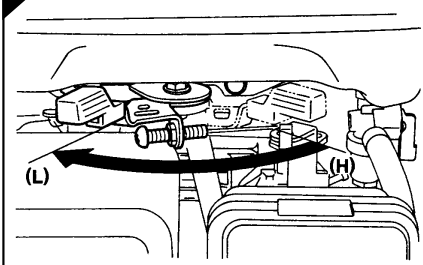
NOTE :

Whenever high speed operation is not required, slow the engine down (idle) by moving the speed control lever to save fuel and extend engine life.

STOPPING

SPEED CONTROL LEVER

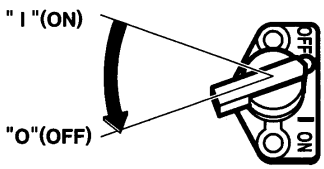
1



Set the speed control lever at the low speed position and allow the engine to run at low speed for 2 or 3 minutes before stopping.

STOP SWITCH

2



Turn the STOP SWITCH counter-clockwise to the position "O" (OFF).

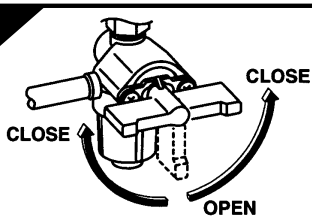
KEY SWITCH (OPTIONAL)

2

Set the key switch to "O" (STOP) position.

FUEL COCK

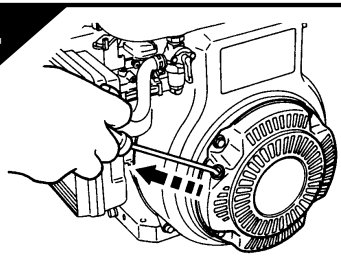
3



Close the fuel cock.

RECOIL STARTER

4



Pull the starter handle slowly and return the handle to its original position when resistance is felt.

NOTE :

The above operation is necessary to prevent outside moist air from intruding into the combustion chamber.

STOPPING ENGINE WITH THE FUEL COCK

Close the fuel cock and wait for a while until the engine stops.

Avoid to let the fuel remain in the carburetor over long periods, or the passages of the carburetor may become clogged with impurities, and malfunctions may result.

If your engine has an electric starter, set the key switch to the "O"(STOP) position after stopping the engine.

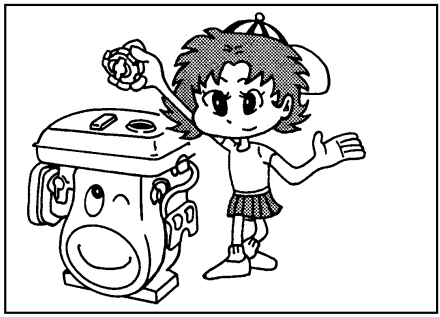
6. EASY TROUBLESHOOTING

WHEN ENGINE WILL NOT START:

- Perform the following checks before you take the engine to your Robin dealer.
- If you still have trouble after completing the checks, take the engine to your nearest Robin dealer.

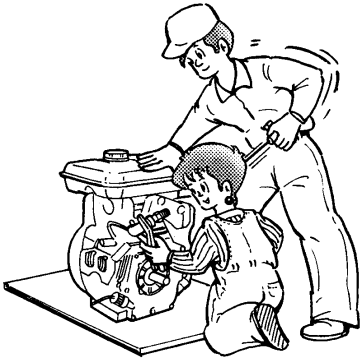
Is there enough compression?

1. Pull the starter handle slowly and check if resistance is felt.
2. If little force is required to pull the starter handle, check if the spark plug is tightened firmly.
3. If the spark plug is loose, tighten it.



Is the spark plug wet with gasoline?

1. Choke (close choke lever) and pull the starter handle five or six times. Remove the plug and check if its electrode is wet. If the electrode is wet, fuel is well supplied to your engine.
2. When the electrode is dry, check where the fuel stops. (Check the fuel intake of the carburetor and fuel strainer intake.)
3. In case the engine does not start with well supplied fuel, try using fresh fuel.



Is there a strong spark across the electrode?

⚠ WARNING

- **Wipe out spilled fuel carefully before testing.**
  Place spark plug as far away from spark plug hole as possible.
- **Do not hold spark plug by hand while pulling recoil starter.**

1. Remove the spark plug and connect it to the plug cap.
   Pull the starter handle while grounding spark plug against engine body.
2. Try with a new spark plug if the spark is weak or there is no spark.
3. The ignition system is faulty if there is no spark with a new spark plug. Take your engine to your nearest Robin dealer.

NOTE

The engine with oil sensor will stop automatically when the oil level falls below the prescribed limit.

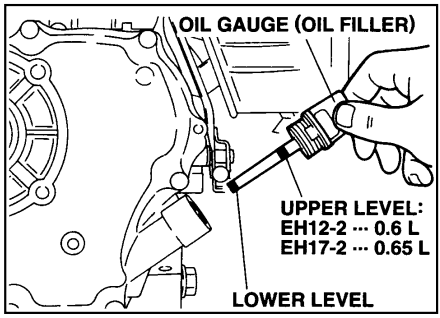
The engine can not be started unless the oil level is raised above the prescribed limit.

Is your battery well charged ?

If your battery for the electric starter is overly discharged, your engine will not start.

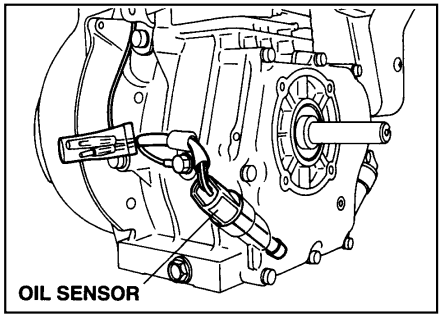
Consult your nearest dealer or service shop.

7.OIL SENSOR INSTRUCTIONS (OPTIONAL)



Is your oil sensor OK ?

The engine will stop automatically when the oil level falls below the safety limit. The engine cannot be started unless the level is raised above the prescribed limit.



RESTARTING

- Fill the crankcase with oil up to the proper level.
- As for restarting and operating the engine, refer to Section 5, "OPERATING YOUR ENGINE" on page 8.
- Check the wire connector from the engine.
  It must be connected securely to the wire from oil sensor.

NOTE

- Do not remove the oil sensor from the engine for checking oil level and refilling.
- When selecting the engine oil, refer to the chart on page 5.

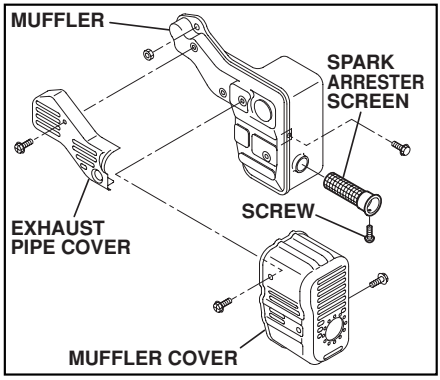
8. SPARK ARRESTER (OPTIONAL)

In a dry or wooded area, it is recommendable to use the product with a spark arrester. Some areas require the use of a spark arrester. Please check your local laws and regulations before operating your product.

The spark arrester must be cleaned regularly to keep it functioning as designed. A clogged spark arrester :

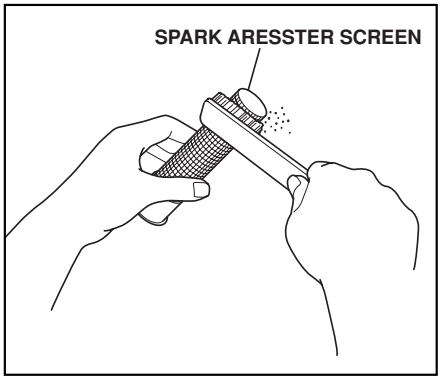
- Prevents the flow of exhaust gas
- Reduces engine output
- Increases fuel consumption
- Makes starting difficult

If the engine has been running, the muffler and the spark arrester will be very hot. Allow the muffler to cool before cleaning the spark arrester.



How to remove the spark arrester

1. Remove the flange bolts from the muffler cover and remove the muffler cover.
2. Remove the special screw from the spark arrester and remove the spark arrester from the muffler.



Clean the spark arrester screen

Use a brush to remove carbon deposits from the spark arrester screen.
Be careful to avoid damaging the screen.

The spark arrester must be free of breaks and holes. Replace the spark arrester if it is damaged.

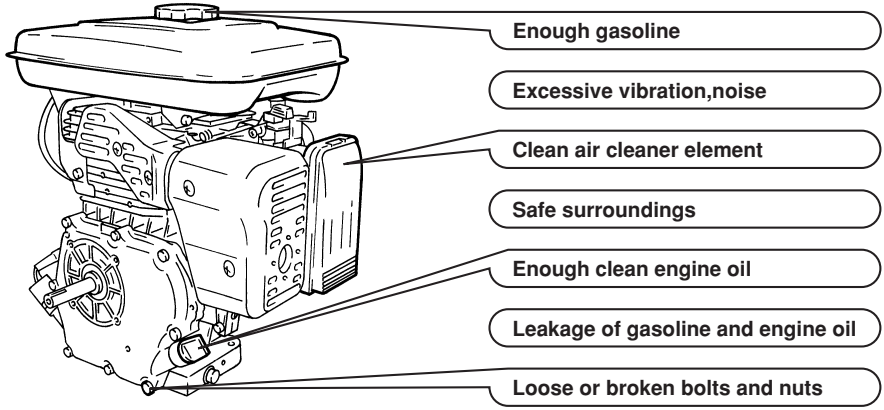
Install the spark arrester, and muffler protector in the reverse order of disassembly.

9. MAINTENANCE SCHEDULE

MAINTENANCE, REPLACEMENT, OR REPAIR OF THE EMISSION CONTROL DEVICES AND SYSTEMS MAY BE PERFORMED BY ANY NONROAD ENGINE REPAIR ESTABLISHMENT OR INDIVIDUAL.

DAILY INSPECTION

Before running the engine, check the following service items.



PERIODIC MAINTENANCE

Periodic maintenance is vital to safe and efficient operation of your engine.
Check the table below for periodic maintenance intervals.

IT IS ALSO NECESSARY FOR THE USER OF THIS ENGINE TO CONDUCT THE MAINTENANCE AND ADJUSTMENTS ON THE EMISSION-RELATED PARTS LISTED BELOW TO KEEP THE EMISSION CONTROL SYSTEM EFFECTIVE.

The emission control system consists of the following parts:

(1) Carburetor and internal parts
(2) Cold start enrichment system, if applicable
(3) Intake manifold, if applicable
(4) Air cleaner elements
(5) Spark plug
(6) Magneto or electronic ignition system
(7) Spark advance/retard system, if applicable
(8) Exhaust manifold, if applicable
(9) Hoses, belts, connectors, and assemblies

The maintenance schedule indicated in the following table is based on the normal engine operation.
Should the engine be operated in extremely dusty condition or in heavier loading condition, the maintenance intervals must be shortened depending on the contamination of oil, clogging of filter elements, wear of parts, and so on.

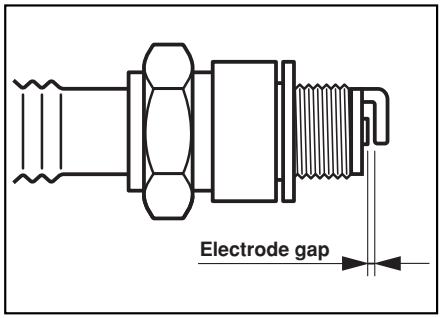
Periodic Maintenance Schedule table

MS2222

Maintenance Items	Every 8 hours (Daily)	Every 50 hours (Weekly)	Every 200 hours (Monthly)	Every 500 hours	Every 1000 hours
Clean engine and check bolts and nuts	● (Daily)				
Check and refill engine oil	● (Refill daily up to upper level)				
Change engine oil (*Note : 1)	● (Initial 20 hours)	● (Every 100 hours)			
Clean spark plug		●			
Clean air cleaner		●			
Clean spark arrester (Optional part)		● (Every 100 hours)			
Replace air cleaner element			●		
Clean fuel strainer			●		
Clean and adjust spark plug and electrodes			●		
Replace spark plug				●	
Remove carbon from cylinder head (*Note : 2)				●	
Check and adjust valve clearance (*Note : 2)				●	
Clean and adjust carburetor (*Note : 2)				●	
Replace fuel lines					● (Yearly)
Overhaul engine (*Note : 2)					●

*Note : 1. Initial oil change should be performed after first twenty (20) hours of operation. Thereafter change oil every hundred (100) hours.
Before changing oil, check for a suitable way to dispose of old oil.
Do not pour it down into sewage drains, onto garden soil or into open streams.
Your local zoning or environmental regulations will give you more detailed instructions on proper disposal.

*Note : 2. As to the procedures for these items, please refer to the Service Manual or consult your nearest service dealer.



INSPECTING THE SPARK PLUG

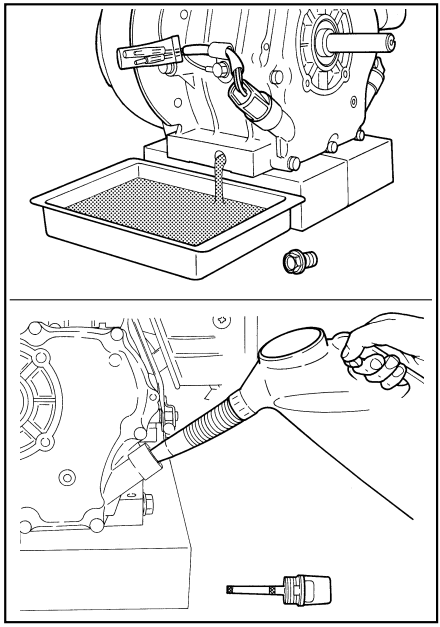
- Clean off carbon deposits on the spark plug electrode using a plug cleaner or wire brush.
- Check electrode gap. Adjust as follows.
- Use a proper spark plug :

ELECTRODE GAP

Model	Type	Electrode gap
EH12-2	NGK B6ES	0.03 in. (0.7 to 0.8 mm)
EH17-2	NGK B6HS	0.02 to 0.03 in. (0.6 to 0.7 mm)

ENGINE OIL CHANGE

- Initial oil change
  · · · · After 20 hours of operation
- Thereafter
  · · · · Every 100 hours of operation

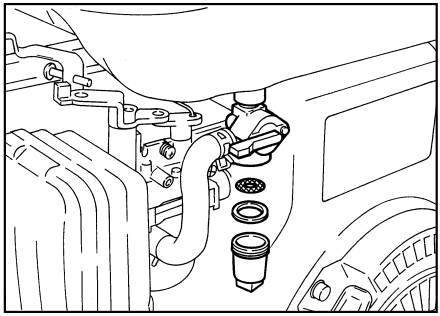


⚠ CAUTION

Make sure the Oil gauge is tightly secured to avoid spillage.

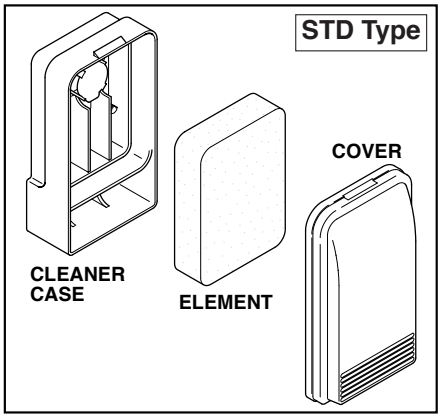
1. When changing oil, stop the engine and loosen the drain plug.
2. Re-install the drain plug before refilling oil.
3. Refer to the recommended oil table on page 5.
4. Always use the best grade and clean oil. Contaminated oil, poor quality oil and shortage of oil cause damage to engine or shorten the engine life.

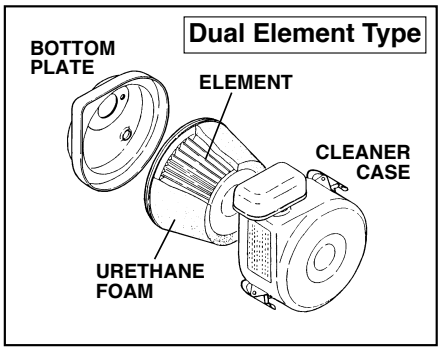
Oil capacity (Upper level) :	(L)
EH12-2	0.6
EH17-2	0.65



CLEANING FUEL STRAINER (NO SMOKING)

- Inspect fuel strainer for water and dirt.
- To remove water and dirt, close the fuel cock and remove the strainer cup.
- After removing dirt and water, wash the strainer cup with gasoline.
  Reinstall securely to prevent leakage.





CLEANING AIR CLEANER

A dirty air cleaner element will cause starting difficulty, power loss, engine malfunctions, and shorten engine life extremely.

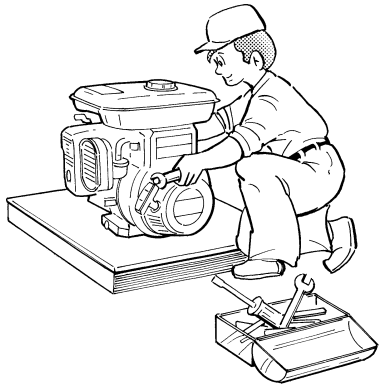
Always keep the air cleaner element clean.

1.STD Type
Remove the element and wash it in kerosene or diesel fuel. Then saturate it in a mixture of 3 parts kerosene or diesel fuel and 1 part engine oil.
Squeeze the element to remove the mixture and install it in the air cleaner.

2.Dual Element Type

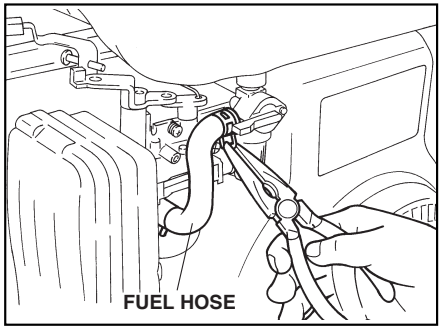
- Urethane Foam cleaning
  Clean the urethane foam in the same way as described above.
- Second Element
  Wash the element in kerosene or diesel fuel.
  Saturate it in a mixture of 3 parts kerosene or diesel fuel and 1part engine oil. Shake off excessive oil and reinstall.

Clean and replace air cleaner elements more often when operating in dusty environments.



CHECKING BOLTS, NUTS AND SCREWS

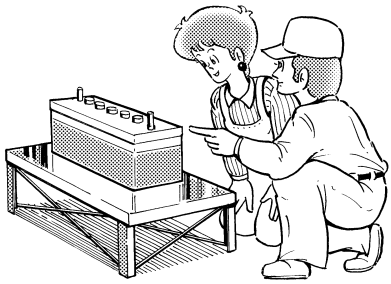
Retighten loose bolts and nuts.
Check for fuel and oil leaks.
Replace damaged parts with new ones.
Keep safety in your mind.



FUEL HOSE REPLACEMENT

⚠ WARNING
Take extreme caution when replacing fuel hose; gasoline is flammable.

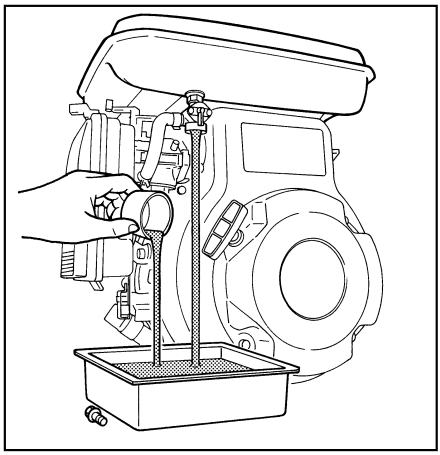
Replace the fuel hose every 1,000 hours or every year.
If fuel hose leak is found, replace the fuel hose immediately.



CHECK BATTERY

If the electrolyte fluid is below level line, refill with distilled water to the upper level line.

11. PREPARATIONS FOR STORAGE



DISCHARGE FUEL (NO SMOKING !)

- Remove the strainer cup, place the strainer over a container and open the strainer cock to discharge fuel from the fuel tank.
- Remove the carburetor float chamber bolt from the bottom and discharge fuel from the carburetor.

ENGINE OIL

- Change the engine oil with fresh oil.
- Remove the spark plug, pour about 5 cc of engine oil into the cylinder, slowly pull the starter handle of the recoil starter 2 or 3 times, and reinstall the spark plug.

CLEAN AND STORE

- Slowly pull the recoil starter handle until resistance is felt and leave it in that position.
- Clean the engine thoroughly with an oiled cloth, put the cover on, and store the engine indoors in a wellventilated, low humidity area.

12. SPECIFICATIONS

MODEL		EH12-2D	EH12-2B	EH17-2D	EH17-2B
Type		Air-cooled, 4-cycle single cylinder, overhead valve, gasoline engine			
Displacement	cm^3	121		172	
Continuous Output	kW/min^{-1}(HP/rpm)	1.8 / 3000 (2.5 / 3000)	1.8 / 1500 (2.5 / 1500)	2.6 / 3000 (3.5 / 3000)	2.6 / 1500 (3.5 / 1500)
		2.1 / 3600 (2.8 / 3600)	2.1 / 1800 (2.8 / 1800)	2.9 / 3600 (4.0 / 3600)	2.9 / 1800 (4.0 / 1800)
Maximum Output	kW/min^{-1}(HP/rpm)	2.9 / 4000 (4.0 / 4000)	2.9 / 2000 (4.0 / 2000)	4.4 / 4000 (6.0 / 4000)	4.4 / 2000 (6.0 / 2000)
Direction of Rotation		Counterclockwise, facing P.T.O. shaft			
Lubricant		API service class SE or higher grade (SG, SH or SJ is recommended), SAE #20, #30, #40 or multi-grade engine oil			
Fuel		Automotive unleaded gasoline			
Fuel Tank Capacity	L	3.6			
Spark plug		NGK B6ES		NGK B6HS	
Starting System		Recoil starter (Electric starter available as option)			
Dry Weight	kg	15.0	15.5	16.0	16.5
Dimensions	**Length** mm	297	299	299	301
	Width mm	330	330	330	330
	Height mm	366	366	380	380
Valve Clearance (Intake & Exhaust)		0.0039 ± 0.0012 in (0.1 ± 0.03 mm) Note : Adjust the valve clearance while the engine is cold.			

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