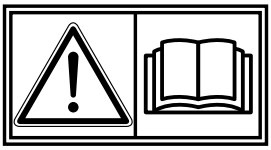
SUBARU

Industrial Power Products

# EX16/17/21



取 扱 説 明 書 JP

*INSTRUCTIONS FOR USE* Original EN

*INSTRUCTIONS FOR USE (USA only)* US

*MANUEL D'UTILISATION* FR

*BEDIENUNGSANLEITUNG* DE

*GEBRUIKSAANWIJZING* NL

*MANUAL DE INSTRUCCIONES* ES

*MANUALE D'USO E MANUTENZIONE* IT

*MANUAL DE INSTRUÇÕES* PT

*ΟΔΗΓΙΕΣ ΧΡΗΣΕΩΣ ΚΑΙ ΣΥΝΤΗΡΗΣΕΩΣ ΚΙΝΗΤΗΡΩΝ* GR

*INSTRUKTIONSBOK* NO

*BRUKSANVISNING* SE

*KÄYTTÖ-JA HUOLTO-OHJEET* FI

*BRUGSANVISNING* DK

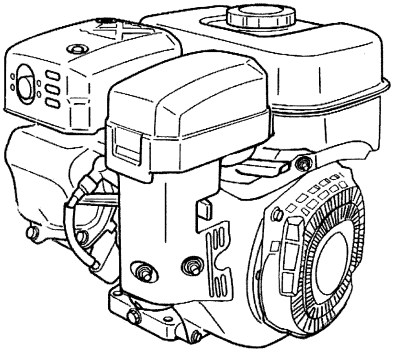
*РУКОВОДСТВО ПО ЭКСПЛУАТАЦИИ* RU

*INSTRUKCJA OBSŁUGI DO SILNIKÓW* PL

使 用 说 明 书 CN

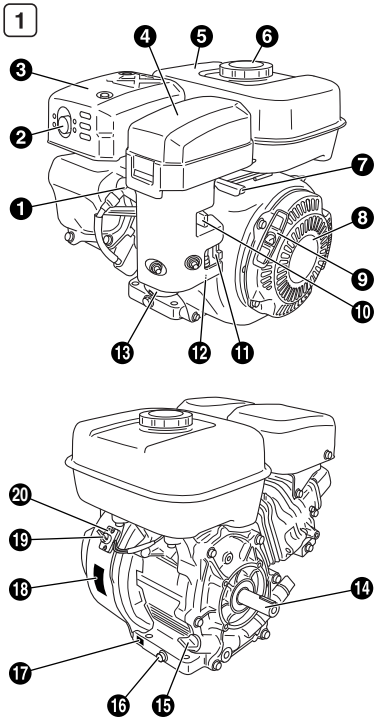
*사용 설명서* KR

إرشادات الإستعمال AR



20A9994301

# OHC Gasoline Engines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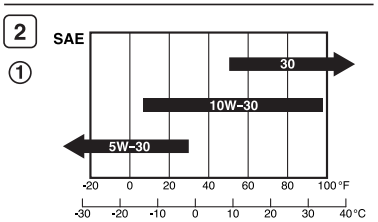
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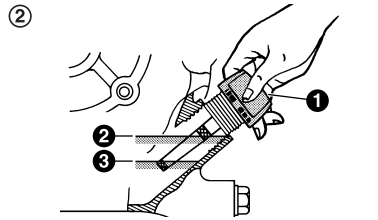
SAE
30
10W-30
5W-30
-20 0 20 40 60 80 100°F
-30 -20 -10 0 10 20 30 40°C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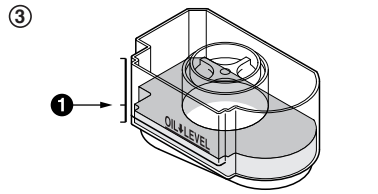
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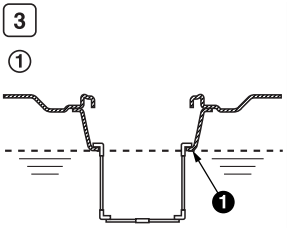
OIL LEVEL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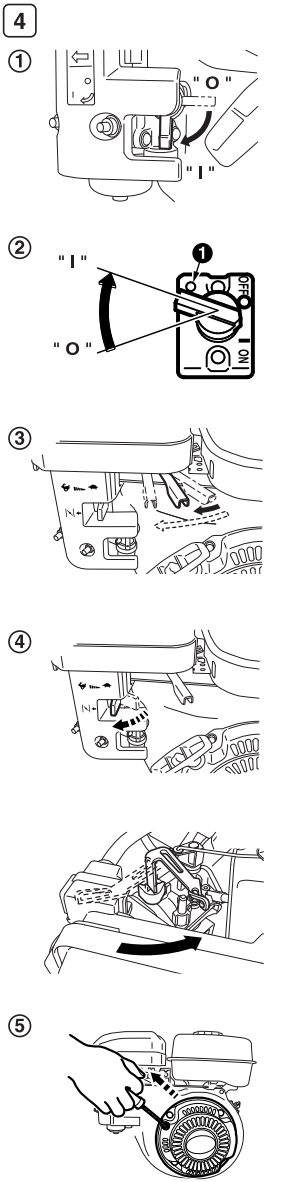
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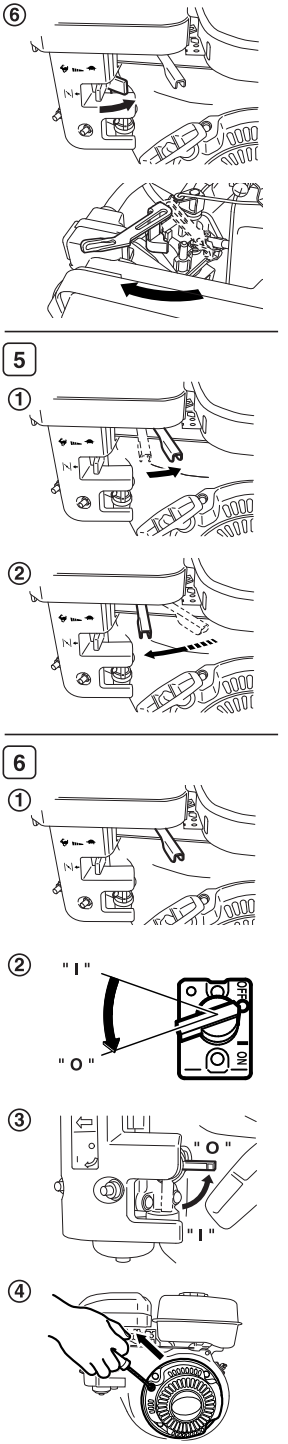
③
④
⑤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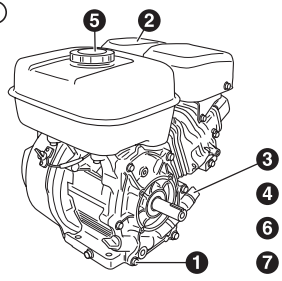


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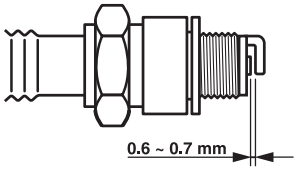


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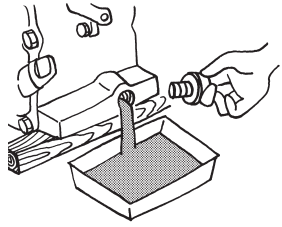

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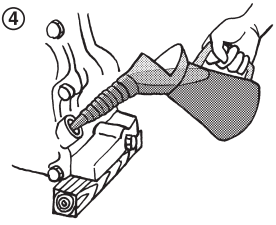

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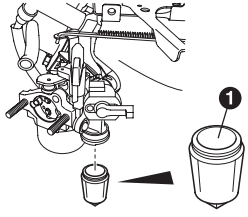


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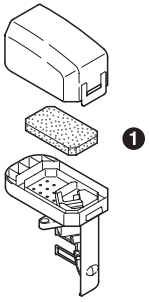


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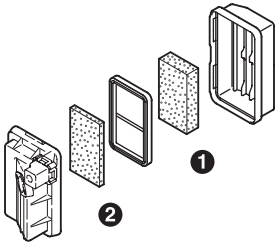


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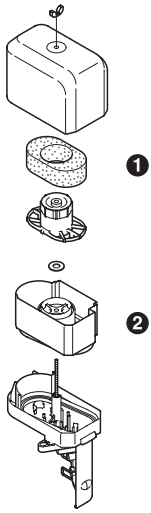


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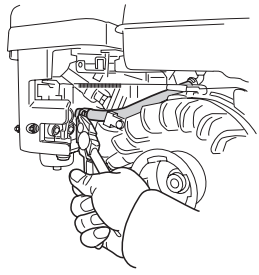

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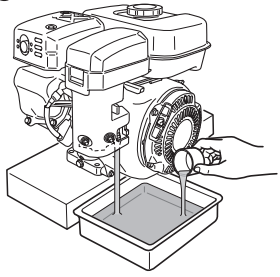
①



# 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.

Keep this owner's manual at hand, so that you can refer to it at any time.

Due to constant efforts to improve our products, certain procedures and specifications are subject to change without notice.

When ordering spare parts, always give us the MODEL, PRODUCTION NUMBER and SERIAL NUMBER of your engine.

Please fill in the following blanks after checking the production number on your engine. (Location of label is different depending on the engine specification.)

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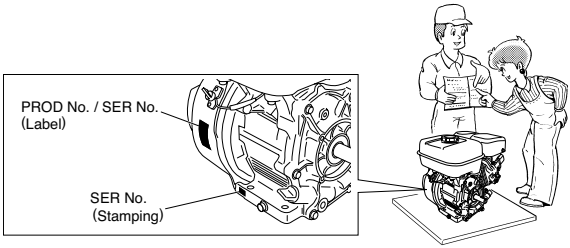
| PROD No. | SER No. |
|---|---|
| | |




## NOTICE

The engines which have emission label are allowed to be exported to USA. The emission label placed on the engine indicates that the engine is complied with EPA (Environmental Protection Agency) and CARB (California Air Resources Board) emission regulations in USA. Exporting any engine to USA which does not have the emission label is a violation of EPA/CARB emission law subject to civil penalty.

## CONTENTS



**NOTE** **Please refer to the illustrations on the back page of the front cover or back cover for Fig. 1 to 8 indicated in the sentence.**

# 1. SAFETY PRECAUTIONS

Please make sure you review each precaution carefully.
Pay special attention to statement preceded by the following words.

**⚠ WARNING** **"WARNING" indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.**

**⚠ CAUTION** **"CAUTION" indicates a possibility of personal injury or equipment damage if instructions are not followed.**

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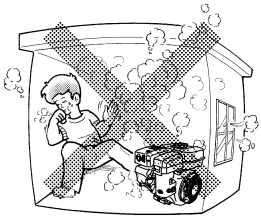
## ⚠ WARNING : EXHAUST PRECAUTIONS



- 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.

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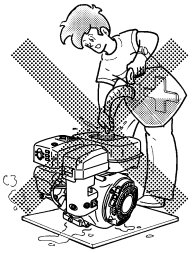
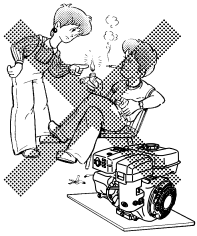
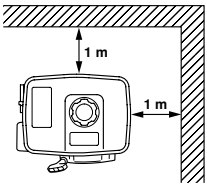
## ⚠ WARNING : REFUELING PRECAUTIONS





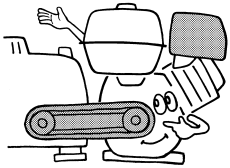
- **Gasoline is extremely flammable and its vapors can explode if ignited.**
- Do not refuel indoors or in a poorly ventilated area.
- Be sure to stop the engine prior to refueling.
- Do not remove fuel tank cap nor fill fuel tank while engine is hot or running.
  Allow engine to cool at least 2 minutes before 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.

## ⚠ WARNING : 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 cooling air intake (recoil starter area) and muffler side of the engine at least 1 meter (3 feet) away from buildings, obstructions and other burnable objects.
- Keep the engine away from flammables and other hazardous materials (trash, rags, lubricants, explosives).

## ⚠ WARNING : OTHER SAFETY PRECAUTIONS

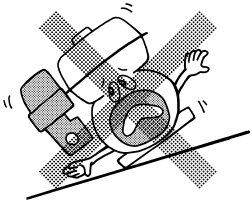


- **Place the protective covers over the rotating parts.**
  If rotating parts such as the drive shaft, pulley, belt, etc. are left exposed, they are potentially hazardous. To prevent injury, equip them with protective covers or shrouds.
- **Be careful of hot parts.**
  The muffler and other engine parts 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.

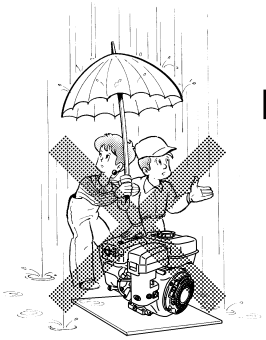
■ Do not touch the spark plug and ignition cable when starting and operating the engine.

■ 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 cause serious injury to the operator.

■ Operate the engine on a stable, 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.



■ Do not transport the engine with fuel in tank or with fuel strainer valve open.

■ 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).

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## ⚠ CAUTION : PRE-OPERATION CHECKS

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

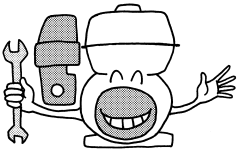
■ Check bolts and nuts for looseness. A loose bolt or nut may cause serious engine trouble.

■ Check the engine oil and refill if necessary.

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

■ Keep cylinder fins and recoil starter free of dirt, grass and other debris.

■ 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.



## SYMBOLS

| | | | |
|---|---|---|---|
|  | *Read manual.* |  | *Shutt off fuel valve when the engine is not in use.* |
|  | *Stay clear of the hot surface.* |  | *Check for leakage from hose and fittings.* |
|  | *Exhaust gas is poisonous. Do not operate in an unventilated room or enclosed area.* |  | *Fire, open flame and smoking prohibited.* |
|  | *Stop the engine before refueling.* |  | *HOT, avoid touching the hot area.* |

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| *USA and CANADA only* | | | | | |
|---|---|---|---|---|---|
|  | *Read INSTRUCTIONS FOR USE before use.* |  | *The engine emits toxic gas can kill you in minutes. Do not run in an enclosed area.* |  | *Hot surface can burn you. Stay away if engine has been running.* |
|  | *Gasoline is extremely flammable and its vapors can explode.*<br>*• Stop the engine before refueling.*<br>*• Check for leakage from hoses and fittings.*<br>*• Shut off fuel valve when the engine is not in use.* | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
|  | *On (Run)* |  | *Engine start (Electric start)* |  | *Fuel (gasoline)* |  | *Primer* |
|  | *Off (Stop)* |  | *Engine stop* |  | *Fuel (diesel)* |  | *Push primer* |
|  | *Engine oil* |  | *Cold engine* |  | *Fuel shut-off* |  | *Do not push primer* |
|  | *Add oil* |  | *Warm engine* |  | *Fuel system failure / malfunction* | 2X | *Two times* |
|  | *Battery* |  | *Electrical preheat (Low tem-perature start aid)* |  | *Choke* | | |
|  | *Fast* |  | *Run position* |  | *Plus ; positive polarity* | | |
|  | *Slow* |  | *Stop position* |  | *Minus ; negative polarity* | | |

## 2. COMPONENTS

**(See Fig. 1)**

**NOTE** **Please refer to the illustrations on the back page of the front cover or back cover for Fig. 1 to 8 indicated in the sentence.**

❶ SPARK PLUG
❷ EXHAUST OUTLET
❸ MUFFLER COVER
❹ AIR CLEANER
❺ FUEL TANK
❻ FUEL TANK CAP (FUEL FILLER)
❼ SPEED CONTROL LEVER
❽ RECOIL STARTER
❾ STARTER HANDLE
❿ CHOKE LEVER
⓫ FUEL VALVE
⓬ FUEL CUP
⓭ CARBURETOR
⓮ P.T.O. SHAFT
⓯ OIL GAUGE (OIL FILLER)
⓰ OIL DRAIN PLUG
⓱ ENGINE SERIAL NO. (STAMPING)
⓲ ENGINE NAME LABEL (SPEC. No.)
⓳ STOP SWITCH
⓴ OIL SENSOR UNIT

# 3. PRE-OPERATION CHECKS

**NOTE**
Engine shipped from our factory is without oil.
Before starting engine, fill with oil. Do not over-fill.

## 1. CHECK ENGINE OIL (See Fig. 2)

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

- Do not screw the oil gauge into the oil filler neck to check oil level. If the oil level is low, refill to the upper level with the following recommended oil.
- Use 4-stroke automotive detergent oil of API service class SE or higher grade.
- Select the viscosity based on the air temperature at the time of operation as shown in the table. (See Fig.2-①)

| Oil capacity (Upper level) : | (L) |
|---|---|
| EX16/17/21 . . . . . | 0.6 |

### Explanation of Fig.2-②

❶ Oil Gauge
❷ Upper Level
❸ Lower Level

- For the engine with Oil Bath type air cleaner, fill the engine oil upto the specified level of the oil bath (oil pan). (See Fig.2-③-❶)

| Oil Capacity in the Oil Bath (oil pan) : |
|---|
| EX16/17/21 . . . . . About 55 mL |

## 2. CHECK FUEL (See Fig. 3)

**⚠ WARNING**

**Do not refuel while smoking, near an open flame or other such potential fire hazards. Otherwise fire accident may occur.**

- Stop the engine and open the cap.
- Use unleaded automotive gasoline only.
  - Unleaded regular/premium or reformulated gasoline containing no more than 10% Ethanol (E10), or 15% MTBE may also be used.
  - Never use gasoline containing ethanol exceeding 10%, or MTBE exceeding 15% because engine or fuel system damage could result.
  - Never use stale or contaminated gasoline.
  - Use of these non-recommended fuels may result in reduced performance and/or denial of warranty.

| Fuel tank capacity : | (L) |
|---|---|
| EX16/17/21 . . . . . | 3.2 |

- Close the fuel valve before filling the fuel tank.

### Explanation of Fig.3-①

❶ Maximum Fuel level

- Do not fill above the top of the fuel filter screen (marked ❶), or the fuel may overflow when it heats up later and expands.
- When filling the fuel tank, always use the fuel filter screen.
- Reattach the fuel cap by turning clockwise until reaching the physical stop (about one quarter turn). Do not attempt to turn past the physical stop or the fuel cap may be damaged.
- Wipe off any spilled fuel before starting the engine.

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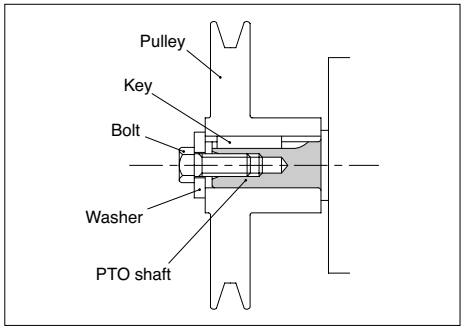
# 4. BELT PULLEY INSTALLATION ONTO KEYWAY-TYPE CRANKSHAFT

When installing the belt pulley and/or clutch onto keyway-type crankshaft (PTO shaft), proper and correct arrangements are needed. The following illustration shows the correct installation of the applicable component parts.



■ **Metric keyway-type crankshaft**

Washer; Use the washer (material; SS41P) with the thickness described below;

| | EX16/17/21 |
|---|---|
| Washer Thickness mm | 4.5 or over |
| ROBIN genuine part | 020-00801-40, Washer |
| Thickness; mm | 4.5 |
| OD; mm | 28 |
| ID; mm | 8.5 |
| Material; | SS41P |

Bolt; Select the proper bolt and tighten it to the specified tightening torque, as mentioned below;

| | EX16/17/21 |
|---|---|
| Effective thread length mm | 16 to 22 |
| Strength | "8T" or higher |
| Tightening Torque N•m(kgf•cm) | 20 - 22 (204 - 224) |
| ROBIN genuine parts (Screw length; mm) | 011-00802-50, Flange Bolt 25 |

■ **SAE (inch) keyway-type crankshaft**

Washer; Use the washer (material; SS41P) with the thickness described below;

| | EX16/17/21 |
|---|---|
| Washer Thickness in. (mm) | 0.177 (4.5) or over |
| ROBIN genuine part | 020-00801-40, Washer |
| Thickness; mm | 4.5 |
| OD; mm | 28 |
| ID; mm | 8.5 |
| Material; | SS41P |

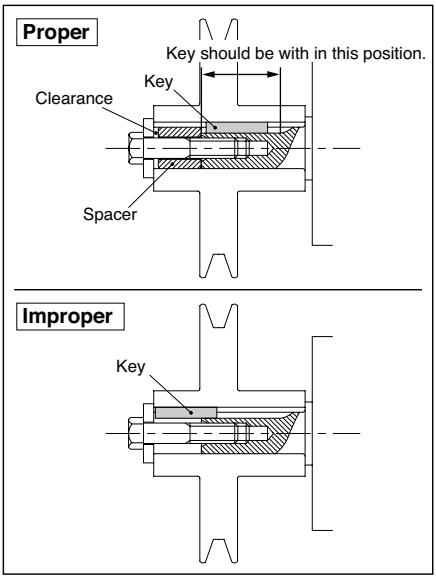
Bolt; Select the proper bolt and tighten it to the specified tightening torque, as mentioned below;

| | EX16/17/21 |
|---|---|
| Thread dimensions | 5/16 – 24UNF2B |
| Effective thread length in. (mm) | 0.63 to 0.87 (16 to 22) |
| Strength | "8T" or higher |
| Tightening Torque N•m(kgf•cm)(ft•lb.) | 20 - 22 (204 - 224) (14.8 - 16.2) |

(No ROBIN genuine part is available.)

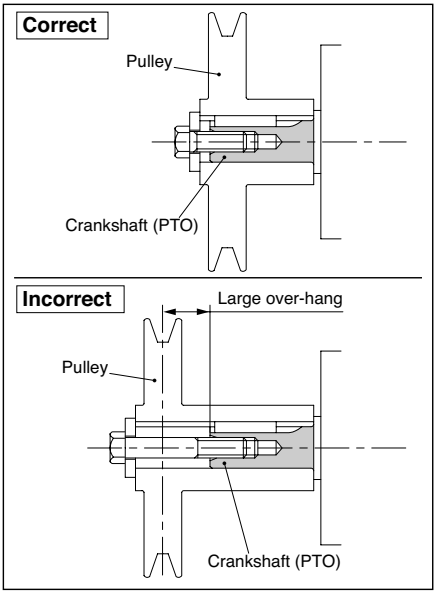
**Key Location**

When using the belt pulley with the extended boss on both side as shown in the illustration, put the spacer so that the key stays in the keyway portion of the crankshaft.




**Belt Pulley Installation**

Install the belt pulley in the no over-hang condition as shown in the illustration.

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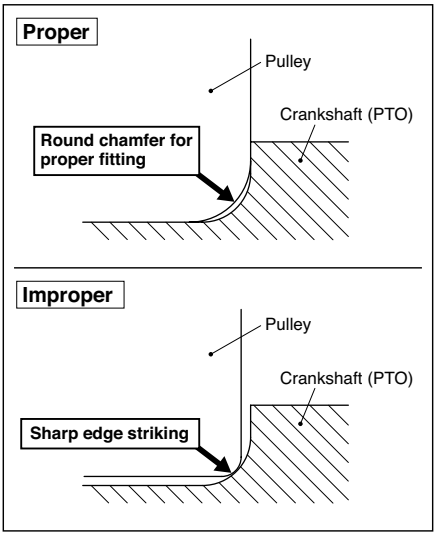
**Pulley fitting onto PTO shoulder**

For proper pulley fitting onto PTO shoulder, make round chamfer at pulley corner.

Sharp edge of pulley corner strikes PTO shoulder. In this improper condition, bolt will be loosened, and PTO damaged finally.




# 5. OPERATING YOUR ENGINE (See Fig. 4)

## 1. STARTING

(1) Open the fuel valve. (See Fig.4-①)

(2) Turn the STOP SWITCH to the position " I " (ON). (See Fig.4-②)

(3) Set the speed control lever 1/3 of the way towards the high speed position. (See Fig.4-③)

(4) Close the choke lever. (See Fig.4-④)

- 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.

(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. (See Fig.4-⑤)

(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. (See Fig.4-⑥)

## 2. RUNNING

(1) 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. (See Fig.5-①)

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(2) Gradually move the speed control lever toward the high speed position (H) and set it at the required engine speed. (See Fig.5-②)

- 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.

## 3. STOPPING

(1) Set the speed control lever at the low speed position and allow the engine to run at low speed for 1 or 2 minutes before stopping. (See Fig.6-①)

(2) Turn the STOP SWITCH counterclock-wise to the position " ○ " (OFF). (See Fig.6-②)

(3) Close the fuel valve. (See Fig.6-③)

(4) Pull the starter handle slowly and return the handle to its original position when resistance is felt. This operation is necessary to prevent outside moist air from intruding into the combustion chamber. (See Fig.6-④)

**※ STOPPING ENGINE WITH THE FUEL VALVE**

Close the fuel valve 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.

# 6. MAINTENANCE

## (See Fig. 7)

### 1. DAILY INSPECTION (See Fig.7-①)

Before running the engine, check the following service items.

❶ Loose or broken bolts and nuts

❷ Clean air cleaner element

❸ Enough clean engine oil

❹ Leakage of gasoline and engine oil

❺ Enough gasoline

❻ Safe surroundings

❼ Excessive vibration, noise

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### 2. PERIODIC INSPECTION

Periodic maintenance is vital to the safe and efficient operation of your engine.

Check the table below for periodic maintenance intervals. 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.

### 3. INSPECTING THE SPARK PLUG (See Fig.7-②)

(1) Clean off carbon deposits on the spark plug electrode using a plug cleaner or wire brush.

(2) Check electrode gap. The gap should be 0.6 mm to 0.7 mm (0.02 inch.-0.03 inch.). Adjust the gap, if necessary, by carefully bending the side electrode.

**Recommended Spark Plug :**
E6RC (TORCH) or BR-6HS (NGK)

### 4. ENGINE OIL CHANGE (See Fig. 7-③,④)

**Initial oil change : After 20 hours of operation**
**Thereafter : Every 100 hours of operation**

(1) When changing oil, stop the engine and loosen the drain plug. Drain the used oil while the engine is warm. Warm oil drains quickly and completely.

**⚠ CAUTION**

To prevent injury, pay attention to the hot oil.

(2) Re-install the drain plug before refilling oil.

| Oil capacity (Upper level) : | (L) |
|---|---|
| EX16/17/21 . . . . . | 0.6 |

(3) Refer to page 5 for the recommended oil.

■ 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.

| Maintenance items | Every 8 hours (Daily) | Every 50 hours (Weekly) | Every 200 hours (Monthly) | Every 300 hours | Every 500 hours | Every 1000 hours |
|---|---|---|---|---|---|---|
| CLEAN ENGINE AND CHECK BOLTS AND NUTS | ● (Daily) | | | | | |
| CHECK FOR LEAKAGE FROM HOSES AND FITTING | ● (Daily) | | | | | |
| CHECK AND REFILL ENGINE OIL | ● (Refill daily up to upper level.) | | | | | |
| CHANGE ENGINE OIL | ● (Initial 20 hours) | ● (Every 100 hours.) | | | | |
| CLEAN SPARK PLUG | | ● (Every 100 hours.) | | | | |
| CLEAN AIR CLEANER | | ● | | | | |
| REPLACE AIR CLEANER ELEMENT | | | ● | | | |
| CLEAN FUEL CUP | | | ● | | | |
| CLEAN AND ADJUST SPARK PLUG AND ELECTRODES | | | ● | | | |
| CHECK AND ADJUST VALVE CLEARANCE | | | | ● | | |
| REMOVE CARBON FROM CYLINDER HEAD | | | | | ● | |
| CLEAN AND ADJUST CARBURETOR | | | | | ● | |
| REPLACE FUEL LINES | | | | | | ● (Every 2 years) |
| OVERHAUL ENGINE IF NECESSARY | | | | | | ● |

## 5. CLEANING FUEL CUP (See Fig. 7-⑤)

**⚠ WARNING Flame Prohibited**

(1) Inspect fuel cup for water and dirt. (See Fig.7-⑤-❶)

(2) To remove water and dirt, close the fuel valve and remove the fuel cup.

(3) After removing dirt and water, wash the fuel cup with kerosene or gasoline. Reinstall securely to prevent leakage.

## 6. CLEANING AIR CLEANER (See Fig.7-⑥ thru ⑨)

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.

**⚠ WARNING Flame Prohibited**

**A.** Urethane Foam Element Type (See Fig.7-⑥)

Remove the element and wash it in washing oil (kerosene). Then saturate it in engine oil and squeeze it firmly before installing.
(See Fig.7-⑥-❶)

**B.** Dual Element Type
(Urethane Foam and Paper elements) (See Fig.7-⑦)

■ For **EX16/17/21** urethane foam, remove it from the paper element and wash it in washing oil (kerosene). Then saturate it in engine oil and squeeze it firmly before installing. (See Fig.7-⑦-❶)

■ For the paper element, clean by blowing on it with compressed air from the inside or tapping on it gently to remove dirt. Change the paper element when doing this fails to remove the dirt. (See Fig.7-⑦-❷)

**C.** For Generator Type (See Fig.7-⑧)

■ Clean the first element via the method described in **A** above. Remove the second element from its casing and wash it thoroughly with detergent. Then dry it before installing. (See Fig.7-⑧-❶,❷)

**D.** Oil Bath Type (See Fig.7-⑨)

Clean the urethane foam (Fig. 7-⑨-❶) in the same way as described **A** Urethane Foam Element Type. Drain the dirty oil from the oil pan (Fig. 7-⑨-❷) and wash it in kerosene.
Then fill the new engine oil upto the specified oil level.

| **Oil Capacity in the Oil Bath (oil pan) :** |
|---|
| **EX16/17/21 . . . . . About 55 mL** |

**NOTE**
Instead of washing oil (kerosene), it is possible to wash the urethane foam element in a solution of mild detergent and warm water.
Then rinse the element thoroughly in clean water.
Allow the element to dry thoroughly. Soak the element in clean engine oil and squeeze out excess oil.

**NOTE**
Clean and replace air cleaner elements more often when operating in dusty environments. Replace the element in case that dirt or dust can not be removed and/or that the element is deformed or deteriorated.

## 7. FUEL HOSE REPLACEMENT (See Fig.7-⑩)

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

Replace the fuel hose every 2 years. If fuel leaks from fuel hose, replace the fuel hose immediately.

## 8. CHECKING BOLTS, NUTS AND SCREWS

■ Retighten loose bolts and nuts.

■ Check for fuel and oil leaks.

■ Replace damaged parts with new ones.

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# 7. PREPARATIONS FOR STORAGE

## 1. DISCHARGE FUEL (See Fig.8-①)

**⚠ WARNING** **Flame Prohibited**

If you do not use the engine more than 1 month, discharge fuel to prevent gum in the fuel system and carburetor parts.

- Remove the fuel cup, place it over a container and open the fuel valve to discharge fuel from the fuel tank.
- Remove the drain screw of the carburetor float chamber and discharge fuel.

## 2. ENGINE OIL

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- 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.

## 3. 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 well ventilated, low humidity area.

# 8. OIL SENSOR INSTRUCTIONS

(OPTIONAL)

## 1. FUNCTION OF OIL SENSOR

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. (See Fig.2-②)

## 2. RESTARTING

(1) Fill the crankcase with oil up to the proper level.

(2) As for restarting and operating the engine, refer to section **"5. OPERATING YOUR ENGINE"** on page 7 .

- Check the wire connector from the engine. It must be connected securely to the wire from oil sensor.
- When selecting the engine oil, refer to page 5 for the recommended oil.

# 9. SPARK ARRESTER (OPTIONAL)

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

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

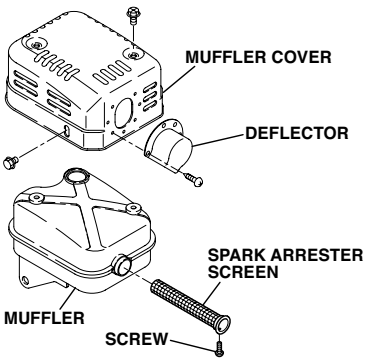
**⚠ CAUTION**

**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

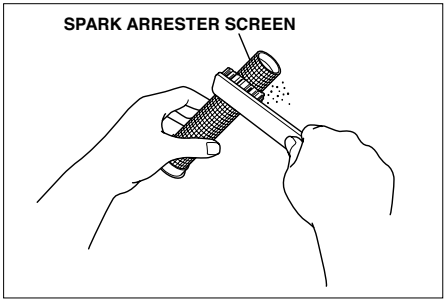
1. Remove the flange bolts from the muffler cover and remove the muffler cover.

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.

# 10. 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.

### 1. Is there a strong spark across the electrode ?

(1) Is the stop switch at position " **I** " (ON)?

(2) Remove and inspect the spark plug.
If the electrode is fouled, clean or replace it with new one.

(3) Remove the spark plug and connect it to the plug cap. Pull the starter handle while grounding spark plug against engine body. Try with a new spark plug if the spark is weak or there is no spark.
The ignition system is faulty if there is no spark with a new spark plug.

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**⚠ 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.**

**NOTE**
The engine with oil sensor will stop automatically when the oil level falls below the prescribed limit.
Unless the oil level is raised above the prescribed limit, the engine will stop immediately after starting.

### 2. Is there enough compression?

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

### 3. Is the spark plug wet with gasoline?

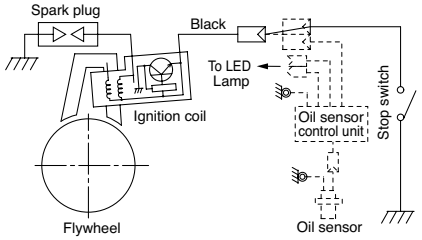
(1) Is the fuel valve opened?

(2) 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.

(3) When the electrode is dry, check where the fuel stops. (Check the fuel intake of the carburetor.)

(4) In case the engine does not start with well supplied fuel, try using fresh fuel.

## 11. WIRING DIAGRAM

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## 12. SPECIFICATIONS

| MODEL | | EX16D | EX17D | EX21D |
|---|---|---|---|---|
| Type | | Air-cooled, 4-cycle single cylinder, overhead camshaft, gasoline engine | | |
| Displacement | mL (cc) | 169 | | 211 |
| Continuous Output | kW/rpm (HP/rpm) | 2.2/3600 (3.0/3600) | 2.9/3600 (4.0/3600) | 3.7/3600 (5.0/3600) |
| Maximum Output | kW/rpm (HP/rpm) | 3.2/4000 (4.3/4000) | 4.2/4000 (5.7/4000) | 5.1/4000 (7.0/4000) |
| Direction of Rotation | | Counterclockwise, as Viewed from P.T.O. Shaft side | | |
| Lubricant | | Automotive detergent oil (API/ SE or higher grade, SAE/ 10W-30 etc.) | | |
| Oil Capacity | Liter | 0.6 | | |
| Fuel | | Automotive Gasoline (Unleaded) | | |
| Fuel Tank Capacity | Liter | 3.2 | | |
| Spark Plug | | TORCH E6RC (NGK BR-6HS) | | |
| Starting System | | Recoil starter | | |
| Dry Weight | kg | 15 | | 16 |
| Dimensions | (L x W x H) mm | 312 x 359 x 335 | | 320 x 370 x 335 |

- **Specifications are subject to change without notice**
- **Cold and damp weather conditions might cause your engine to trouble occasionally. Engine operation in the cold weather condition will be improved by means of optional "Cold Weather Kit". Please consult with your nearest ROBIN dealer or distributor.**

EN Original

SUBARU

Industrial Power Products

# EC-DECLARATION OF INCORPORATION IN ACCORDANCE WITH 2006/42/EC

**Directive:**

Machinery Directive on machinery safety,2006/42/EC

**Manufacturer**

FUJI HEAVY INDUSTRIES LTD.
1-7-2, Nishi-Shinjuku, Shinjuku-ku, Tokyo 160-8316 Japan

**Authorized Compiler In The Community:**

Robin Europe GmbH
Willicher Damm 135-137 D-41066 Mönchengladbach Germany
Hidefumi Sasaki

**Description and identification of the partly completed machinery:**

Generic denomination: Spark ignition engine or compression ignition engine
Function: Drive system

| Engine Models | Serial number start / last |
|---|---|
| EX13, EX27, EX30, EX35, EX40 | 1000001 / 9999999 |
| EX17, EX21 | 1000001 / 9999999 or T1000001 / T9999999 |
| SP170, SP210, EP16, EP17 | T1000001 / T9999999 |
| EH092, EH100 | F100001 / F999999 |
| ER12 | 1000001 / 9999999 |
| EH63D, EH64D, EH65D, EH72D | 1000001 / 9999999 |
| EH722D, EH722LD | 2000001 / 4999999 or 6000001 / 9999999 |
| EH122, EH172, EH252, EH300, EH340 | 1000001 / 9999999 |
| DY232, DY272, DY410, DY420 | 1000001 / 9999999 |
| EA190V | 1000001 / 9999999 |

**Declaration:**

The above designated engines are intended to installation in a machine as set out in the EC machines guideline.

Note:
Manufacturer of this machinery must submit the Technical Documentation, in response to a reasoned request by the national authorities, relevant information on the partly completed machinery.
This machinery part must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the appropriate machinery directive.

Done at: Saitama, JAPAN
Dated: 1 December 2011

Signed K. Shimada

Kazuto Shimada
General Manager, Quality Assurance

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