

EY15-^{DK}_{BK}
EY18-3^{DK}_{BK}
EY20-DK
EY25-2^{DK}_{BK}
EY27-2^{DK}_{BK}
EY35-^{DK}_{BK}
EY40-^{DK}_{BK}
EY44-2^{DK}_{BK}

Model

INSTRUCTIONS for USE

Fujiheavy's

Robin Kerosene Engines

2ZZ9020006

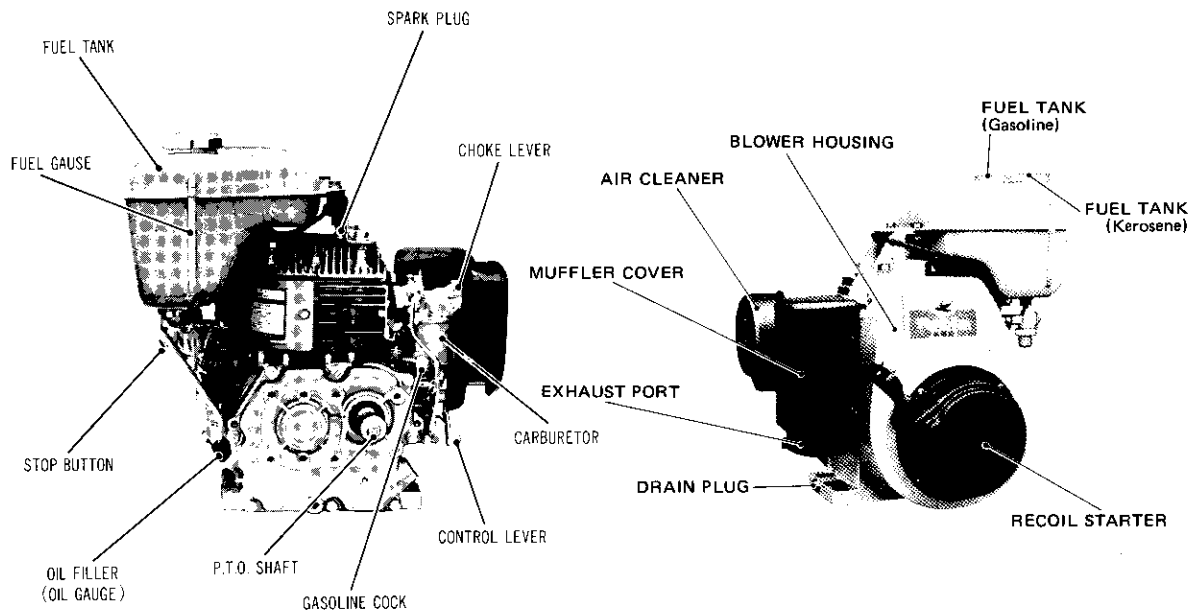
SPECIFICATIONS

MODEL	EY15		EY18-3		EY20		EY25-2		
	DK	BK	DK	BK	DK		DK	BK	
Type	Air-Cooled, 4-Cycle, Single-Cylinder, Horizontal P.T.O. Shaft								
Piston displacement (cu.in)	143cc (8.73)		182cc (11.14)		183cc (11.16)		252cc (15.40)		
Output	Maximum HP/rpm	3.3/4000	3.3/2000	4.3/4000	4.3/2000	4.3/4000		6.0/4000	6.0/2000
	Continuous I-P/rpm	2.2/3600	2.2/1800	3.1/3600	3.1/1800	3.1/3600		4.5/3600	4.5/1800
Direction of rotation	Counter-clockwise as viewed from P.T.O shaft side								
Lubricant	Engine oil SAE #20 or #30 (10W-30 in cold season)								
Fuel	Kerosene (Automobile Gasoline for start)								
Fuel Tank Capacity (US gal.)	approx. Kerosene 3 liters (.8) gasoline 0.3 liter(.08)			approx. Kerosene 3.6 liters(.95) gasoline 0.35 liter(.092)			approx. Kerosene 5.5 liters(1.5) gasoline 0.4 liter (.1)		
Spark plug	NGK BP-4HS								
Reduction ratio	-	1/2	-	1/2	-	1/2	-	1/2	
Starting method	Rope (Optional: Recoil Starter)		Recoil Starter		Rope (Optional: Recoil Starter)		Recoil Starter		
Lighting capacity	6~8V, 15W (Optional)		6~8V, 15W, 12V, 15W (Optional)				6~8V, 15W (Optional)		
Dry weight (lbs.)	15.5kg (34)		18.5kg (41)	19kg (42)	17.0kg (37.4)		25kg (55)		
Length, Width, Height (mm) (inch)	303x430x387mm (11.9x16.9x15.2)		304x422x438mm (11.9x16.6x17.2)		319x424x420mm (12.6x16.7x16.5)		354x456x442mm (13.9x19.0x17.4)		
Tools	1 set of Standard Tools								

- Optional: Lower noise muffler, Lighting coil

EY27-2		EY35		EY40		EY44-2	
DK	BK	DK	BK	DK	BK	DK, DKS	BK, BKS
Air-Cooled, 4-Cycle, Single-Cylinder, Horizontal P.T.O. shaft							
266 (16.23)		334 (20.38)		388 (23.68)		433 (26.)	
6.5/4000	6.5/2000	7.5/3600	7.5/1800	8.5/3600	8.5/1800	8.5/3600	8.5/1800
5.0/3600	5.0/1800	5.6/3600	5.6/1800	7.0/3600	7.0/1800	7.0/3600	7.0/1800
Counter-clockwise as viewed from P.T.O. shaft side							
Engine oil SAE #20 or #30 (10W-30 in cold season)							
Kerosene (Automobile Gasoline for start)							
approx. Kerosene 5.5 liters(1.5) gasoline 0.4 liters(.1)		approx. Kerosene 7 liters (.1.85) gasoline 0.5 liter (.13)				approx. Kerosene 6.5 liters(1.69) gasoline 0.8 liters(0.2)	
NGK B-4H		NGK BP-4HS				NGK B-4H	
-	1/2	-	1/2	-	1/2	-	1/2
Recoil Starter						Recoil Starter DKS, BKS: Electric Starter	
6~8V, 15W (Optional)		12~16V, 15W, 12~16V, 40W, (Optional)				12V-15W (Optional)	
25kg (55)		34g (75)	35kg (77)	33kg (73)	34kg (75)	DK,BK: 42kg(93) DKS,BKS: 47kg(103)	
354x456x442mm (13.9x19.0x17.4)		397x489x513mm (15.6x19.3x20.2)		397x501x513mm (15.6x19.7x20.2)		436x500x516mm (17.1x19.6x20.3)	
1 set of Standard Tools							

●OPTIONAL:
Lighting Coil
EY-14 , EY18-3, EY25-2
EY27-2



IMPORTANT

OPERATING NEW ENGINE

The proper break-in of a new engine will greatly increase its life and result in trouble-free operation.

The factory test given is not sufficient to establish the polished surfaces of bearings and all sliding members which are so necessary for reliable performance and long engine life. There is no quick way to force the establishment of these good surfaces, and these can only be obtained by running a new engine carefully and under reduced speeds and loads for a short period of time. If at all possible, operate engine at light loads for a period totaling about eight hours before maximum load is applied.

SAFETY PRECAUTIONS

1. *Be careful with the operating place and its ventilation.*
 - * Avoid operating the engine in a closed room, tunnel, or another badly ventilated place, since its exhaust contains poisonous carbon monoxide which, if breathed, affects people's lives. If the engine is employed in such a place due to unavoidable circumstances, discharge

the exhaust outside the room by a suitable means.

- * Be careful with the circulation of cooling air, if the engine is operated in a small room or bonnet.
- * Mount engine at an even and stable place.

NOTE: Avoid operating engine at a steep gradient, otherwise seizure may result due to a failure of appropriate lubrication.

2. *Be careful with the following remarks when transporting the engine.*
 - * Clamp fuel tank cap securely, and close fuel strainer cock tightly during transportation or shipment.
 - * Drain gasoline from fuel tank before transporting engine over a long distance or along a rough road. Gasoline leak, if any, is not only wasteful but dangerous.
3. *Stop engine without fail before replenishing fuel.*
 - * Never replenish gasoline while the engine is running or remains hot, otherwise spilled or evaporated fuel is liable to cause combustion or ignition due to engine sparks or muffler.
 - * Wipe off spilled fuel, if any, before starting engine.

- * Be careful not to spill the fuel.
4. *Keep inflammables away from the vicinity of the exhaust port.*
 - * Be careful with gasoline, match, straw and other inflammables, since the exhaust port is subjected to a high temperature.
 5. *Observe the following checks before operating engine.*
 - * Fuel leak from fuel pipe, etc.
 - * Bolts and nuts for looseness.
 - * Components for damaged or broken parts.

PREPARATION for OPERATION

1. LUBRICATION

a) RECOMMENDED LUBRICATING OIL

TEMPERATURE	GRADE of OIL
20°C (68°F) to 40°C (104°F)	SAE 30
-10°C (14°F) to 20°C (68°F)	SAE 20
at any season regardless of the temperature (oil consumption may increase slightly)	SAE 10W-30

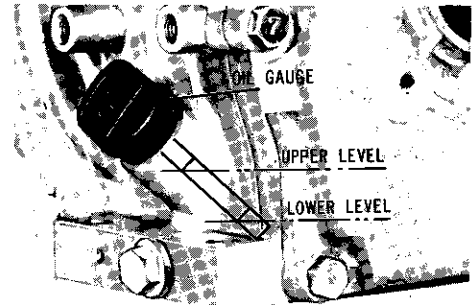
Use a high quality lubricating oil classified "SC" or higher grade.

b) FILLING

Fill crankcase through oil filler with oil while keeping the engine horizontally, until oil reaches the upper level mark on the oil gauge without screwing the cap.

Oil capacity:

Model	EY15-DK, BK	600cc (0.16 US gal.)
	EY18-3DK, 3BK	700cc (0.18 US gal.)
	EY20-DK,	600cc (0.16 US gal.)
	EY25-2DK, 2BK	800cc (0.21 US gal.)
	EY27-2DK, 2BK	800cc (0.21 US gal.)
	EY35-DK, BK	1200cc (0.3 US gal.)
	EY40-DK, BK	1200cc (0.3 US gal.)
	EY44-2DK, 2BK	1200cc (0.3 US gal.)



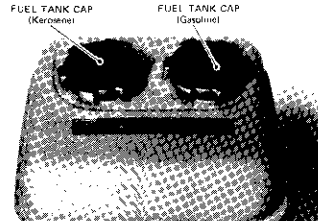
2. FUEL

- * Fill the kerosene tank with kerosene, and the gasoline tank with gasoline, respectively.

CAUTION: PARTICULARLY BE CAREFUL NOT TO TAKE GASOLINE FOR KEROSENE OR VICE VERSA.

- * Close fuel cocks (kerosene & gasoline) before replenishing fuel.
- * Use fuel strainer provided at the fuel tanks opening without fail whenever pour in fuel.
- * Wipe off fuel, if spilled, before starting engine. Spilled fuel, if any, could cause a fire.

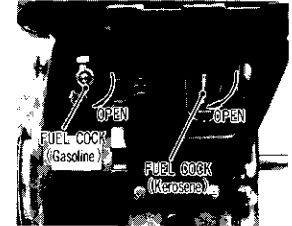
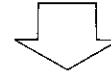
CAUTION: DO NOT REPLENISH FUEL TO TANK WHILE ENGINE IS RUNNING OR HOT.



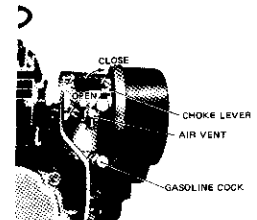
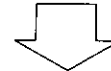
OPERATING THE ENGINE

● STARTING PROCEDURES

1. Open FUEL COCKS of gasoline and kerosene.



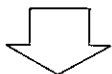
2. Pull GAOSLINE COCK of the carburetor until the fuel overflows from the air vent of the carburetor,



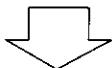
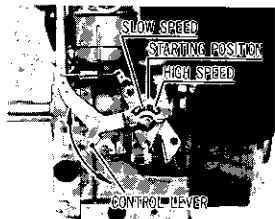
3. Close CHOKE LEVER.

Adjust choke valve opening according to the engine and/or ambient conditions.

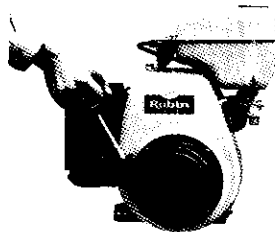
Fully open choke valve or open it halfway, for example, if the engine is warm or air temperature is high.



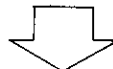
4. Set CONTROL LEVER to "S".
NOTE: Refer to the items of "COOLING CONTROL SHUTTER".



5. Pull RECOIL STARTER quickly and forcibly.



- a) Gradually pull handle until it becomes heavily (until it reaches the compression point). Continue pulling it slightly, and the handle will become loose. Return it to the original position, and pull rope forcibly.
- b) Avoid fully pulling out rope. Don't leave pulling handle, but reset it in positions as soon as possible.



- 6 CHOKE LEVER manipulation.
Don't turn choke lever to fully open the choke valve immediately after starting engine, but gradually open choke valve while monitoring the engine condition, otherwise the engine may stop sometimes.

NOTE: No fuel switching operation is needed since the fuel is automatically switched from gasoline to kerosene after the engine starts.

● RUNNING

1. After engine starts, WARM IT UP at slow speed without load for about 5 minutes.
2. Increase engine speed to the required value by moving CONTROL LEVER after warm-up.
3. Set COOLING CONTROL SHUTTER to "OPEN" position.

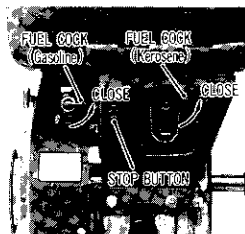
NOTE: Whenever high speed operation is not required, slow engine down (idle), by means of speed control lever. This practice will result in fuel economy and increased engine life.

● STOPPING

1. SLOW DOWN speed and allow the engine to run at idle speed for 2 or 3 minutes before stopping.
2. Depress STOP BUTTON and hold down until engine stops.

NOTE: Do not stop engine suddenly while running at high speed.

3. Close FUEL COCKS for gasoline and kerosene.



STARTING JUST AFTER STOPPING

* Within 4 to 5 minutes after stopping engine

1. Since the engine can be started with kerosene, it is not necessary to switch the fuel to gasoline.
2. Open choke lever by half, and then, gradually open it fully after the engine starts operating.
3. If the engine does not start even when pulling the starting rope (or recoil starter) once or twice, try pulling the gasoline cock of the carburetor for 3 to 5 seconds before pulling the rope again.

* When the engine remains hot

Start the engine after pulling the gasoline cock of the carburetor for 3 to 5 seconds.

How to use COOLING CONTROL SHUTTER

This device is effective for the following cases:

- * Switching the fuel from gasoline to kerosene when starting the engine at low temperature.
- * Minimizing the contamination of ignition plug.
- * Attenuation of lubricating oil.

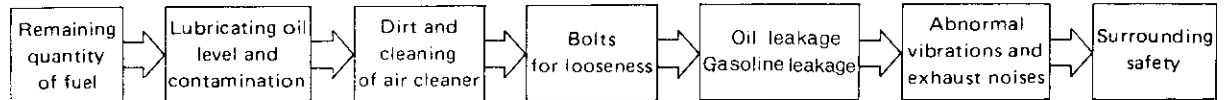


- When atmospheric temperature exceeds 10°C (50°F);
Keep cooling control shutter to OPEN at all times.
- When the engine is started or warmed up;
Set cooling control shutter to CLOSE.
- When the engine is operated with load (during work);
Set cooling control shutter to OPEN.

DAILY and ROUTINE CHECKS

* DAILY CHECK

Observe the following daily checks without fail before starting engine.



* ROUTINE CHECK

Perform maintenance and check according to the following check list (when the engine is employed under ordinary conditions) for the purpose of maintaining the engine under good operation conditions.

Items	Operating hours	every 8 hours (daily)	every 50 hours (weekly)	every 200 hours (monthly)	every 500 hours
Cleaning & Clamping check for Each Part		○			
Check and Supply of Lubricating Oil		○			
Replace of Oil		after 20 hours (new engine)	○ (every 40 hours)		
Cleaning of Spark Plug			○		
Cleaning of Air Cleaner			○		
Cleaning of Fuel Strainer				○	
Cleaning of Spark Plug Gap & Contact Breaker				○	
Removal of carbon from Cylinder Head					○
Cleaning of Carburetor					○
Check and Fitting of intake & Exhaust Valves					○
Overhaul					○

CAUTION: Replace rubber pipes for passage every two years. If and when fuel leakage is found, replace pipe at once.

MAINTENANCE and ADJUSTMENT

1. Cleaning and adjusting Spark Plug

- a) If the plug is contaminated with carbon, remove it using the plug cleaner or wire brush.
- b) Adjust the electrode gap to 0.6~0.7mm (.020" to .027").

2. Changing Lubricating Oil

First time: Replace oil after 20 hours operation.

Second time thereafter: Replace oil once every 40 hours operation.

- a) Drain oil by unplugging the drain plug using a screwdriver while the engine is being warm. (Removal of the oil filler opening cap permits quick drainage.)
- b) Clamp drain plug securely, and put the lubricating oil until it reaches the upper level mark.
- c) For the lubricating oil brand, refer to the GRADE OF OIL CHART.

CAUTION: SUPPLY FRESH AND HIGH QUALITY LUBRICATING OIL IN THE SPECIFIED QUANTITY WITHOUT FAIL. IF CONTAMINATED OR DETERIORATED OIL SHOULD BE SUPPLIED IN SMALL QUANTITIES, THE SERVICE LIFE OF THE ENGINE WILL BE REMARKABLY SHORTENED.

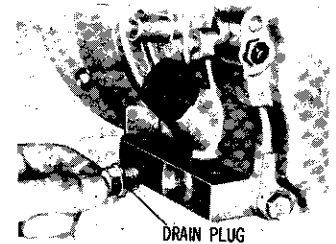
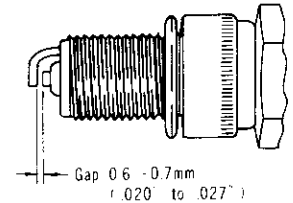
3. Cleaning Fuel Strainer

- a) Check if the strainer cup is free from water and dust deposit.
- b) If it is dirty, remove its cup, and remove dust and water.

Then, fully fasten it onto the main body without any fear of gasoline leak after washing it using gasoline.

4. Fuel Pipe

The fuel pipe may deteriorate and develop leaks after a prolonged service, these pipes must be replaced after one year's use.



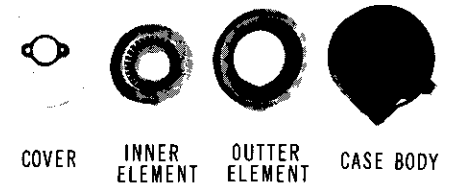
5. Cleaning Air Cleaner

The air cleaner is used for removing dust in the air so as to feed fresh air into the engine. If this cleaner element is seriously contaminated, the start-up failure, poor output, and malfunctions of the engine may result, and also the service life of the engine will be remarkably shortened.

Keep cleaner element always clean, according to the following procedures.

* Cyclone type air-cleaner

- a) Treat the outer urethane resin form in the same manner as specified above.
 - b) After washing the inner element using gasoline, dry it up in the shade.
 - c) Dip it into the mixed oil composed of Kerosene and lubricating oil at ratio of 2 ~ 4 : 1.
 - d) Mount it as before after sufficiently squeezing it.
6. Check each part for Loosen or Broken Bolts.
- a) Tighten loose bolts, if any.
 - b) Check each part for fuel or oil leak.
 - c) Replace broken or damaged parts, if any, with new ones.



PREPARATION for LONG STORAGE

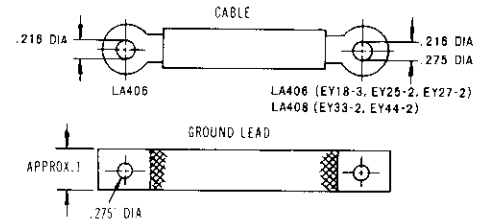
1. Drain fuel from the fuel tank and carburetor (by unscrewing the bolt at the bottom of the float chamber.)
2. Remove the lubricating oil with new oil.
3. Remove spark plug, and pour 5 ~ 10cc (1oz) of lubricating oil through the plug hole.
Perform idle operation several times by the starting pulley, and then, mount the spark plug.
4. Turn starting pulley until it becomes heavily (at the beginning of the compression stroke of the piston), otherwise the sticky valves may result.
5. Clean the outside of the engine with cloth wetted oil.
6. Select a dry, clean storing place, and put the cover for long storage.

In case the KEY SWITCH must be located away from an engine itself, the wire size between KEY SWITCH and STARTING MOTOR should be specified as follows:

ENGINE with STARTING MOTOR

1. Items to be prepared by user.
 - a) Battery 12V, 18 amp-hrs
 - b) Cable and ground lead (See figure given below)

CABLE LENGTH	CABLE DIA.	SAE GAUGE
Below 1.5m (60in)	JIS AV 15 7.3mm dia.	6
1.5m to 2.5m (60in to 100in)	JIS AV20 8.5mm dia.	4
2.5m to 4m (100in to 180in)	JIS AV30 10.8mm dia.	2



FLAT BRAIDED WIRE OF .03 cu in or GREATER SECTIONAL AREA (SAE 4 GAUGE)

WIRE LENGTH	JIS STD	CONDUCTOR Diameter
Shorter than 1.5 meter	AV 1.25	1.5 milli-meter
1.5meter ~ 3meter	AV 2	1.9 milli-meter
3meter ~ 5meter	AV 3	2.4 milli-meter

2. Wiring

- a) Connect the cable between the (+) side of battery and the magnetic switch terminal. NEVER CONNECT THE CABLE TO THE STARTING MOTOR TERMINAL.
- b) Ground the (-) side of battery to an anchor bolt of the engine or the equipment main body using the ground lead.
- c) **When starting the engine BY THE STARTING ROPE WITH THE BATTERY DISCONNECTED, DISCONNECT the light blue (EY33-2) charging cable, and insulate the terminal.**

NOTE: Securely clamp all the terminal screw a so that they are not loosened by vibrations.

3. Starting Procedures

* Starter button type (EY44-2)

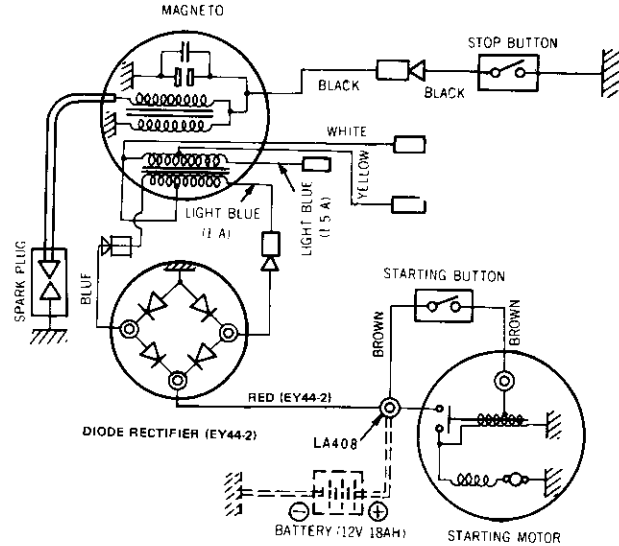
Depress the starter button, and the engine starts operating.

CAUTIONS.

1. *DON'T RUN STARTING MOTOR OVER 5 SECONDS, AS IT MAY OVERHEAT.*
2. *NEVER TURN THE KEY SWITCH TO THE STARTING POSITION or DON'T TOUCH THE STARTER BUTTON DURING OPERATION.*
3. *ALL THE OTHER START-UP PREPARATION AND OPERATION ARE THE SAME AS IN ORDINARY ENGINES.*

WIRING DIAGRAM (engine with starting motor)

- JIS CB female terminal
- ▶ JIS CA male terminal
- ⊙ JIS LA 406 (408) plate terminal
- * The dotted parts are not supplied with the engine.



EY33-2, EY44-2

ISSUE EMD-EU1002



WARNING:



The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.



FUJI HEAVY INDUSTRIES LTD.

INDUSTRIAL PRODUCTS DIV.

Subaru Bldg.

1-7-2, Nishi-Shinjuku, Shinjuku-ku, Tokyo 160, Japan

PHONE ; (Tokyo 03)3347-2420

FACSIMILE ; (Tokyo 03)3347-2418

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