AIR-COOLED
DIESEL ENGINE

OPERATION MANUAL

EPA CERTIFIED ENGINE
FA SERIES

HLDE1FA2012-A

FA SERIES DIESEL ENGINES

Thank you for purchasing our product.

This Operation Manual tells you how to operate and service your new FA engine. Please read it before using the FA engine to insure proper handling and operation. Follow the instructions carefully to keep your engine in the best running condition. If you have any question concerning this manual,or any suggestions,please contact your nearest dealer.

This Operation Manual deals with the main points for operation of the FA engine.

In order to insure safe working conditions,be sure to read the precaution statements for safe operation of the FA engine.

Pay special attention to statements preceded by the following words.

STOP WARNING:

Indicate a strong possibility of severe personal injury or loss of life if instructions are not followed.

⚠ CAUTION:

Indicates a possibility of personal injury or equipment damage if instructions are not followed.

Note:
Gives helpful information.

If a problem should arise,or if you have any questions about the engine,consult an authorized dealer.

STOP WARNING:

The FA engine is designed to give safe and dependable service provided that it is operated according to instructions.
Read and understand the Operation Manual before operating the FA engine.
Failure to do so could result in personal injury or equipment damage.

TIPS ON SAFETY

WARNING:

1.PREVENTING FIRES

Never add fuel to the fuel tank while the engine is running.
Wipe away all fuel spills with a clean cloth.Keep gasoline,kerosene,matches and other explosives and inflammables away from the engine,because the temperature around the exhaust muffler is very high during operation.

- To prevent fire hazards and to provide adequate ventilation,keep the engine at least 3 ft(1m) away from buildings and other equipment during operation.
- Operate the engine on a level surface as flat as possible. The allowable inclination of the engine for continuous use is 20 degrees. There may be fuel spillage if the engine is tilted exceeding the limit.
- Do not put the engine or the engine mounted machinery indoors while the engine is still hot.

2.PREVENTING EXHAUST GAS INHALATION

- Exhaust gas contains poisonous carbon monoxide.
- Never use the engine in poorly ventilated locations,such as indoors and inside tunnels. If indoor operation is unavoidable,provide proper ventilation so that people and cattle will not be affected.

3.PREVENTING BURNS

- Never touch the muffler,muffler cover or engine body while the engine is running or hot.

4.OTHER SAFETY TIPS

- Know how to stop the engine quickly and understand how to operate all of the controls. Never permit anyone to operate the engine without proper instruction.
- Always wear a helmet and safety shoes(non-skid soles)and proper clothes.
- Do not operate under influence of alcohol.
- Keep children and pets away from the engine when it is in operation.
- Keep away from rotating parts while the engine is running.
- When the engine is coupled with a machine,be sure to provide suitable covers for the belt,coupling and other dangerous parts.
- A spark arrester is provided as an optional part for this engine.It is illegal in some areas to operate the engine without a spark arrester.Check local laws and regulations before operating the engine.
- Work according to the rules and regulations of the work area.
- Use the correct tools and equipment.

5.WHEN CHARGING THE BATTERY

- Battery electrolyte contains sulphuric acid.Protect your eyes,skin and clothing.In case of contact,flush thoroughly with water and get prompt medical attention,especially if your eyes are affected.
- Batteries generate hydrogen gas,which can be highly explosive,do not smoke or allow flames or sparks near a battery,especially during charging.
- Charge the battery in a fully ventilated place.
- Be sure to confirm battery polarity.

CONTENTS

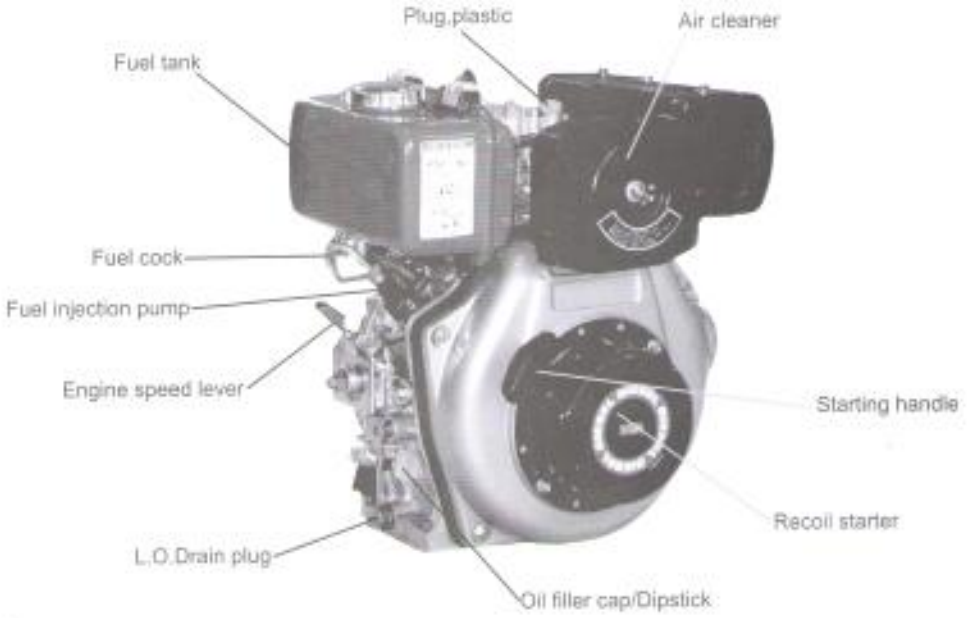
1.Specifications and name of parts

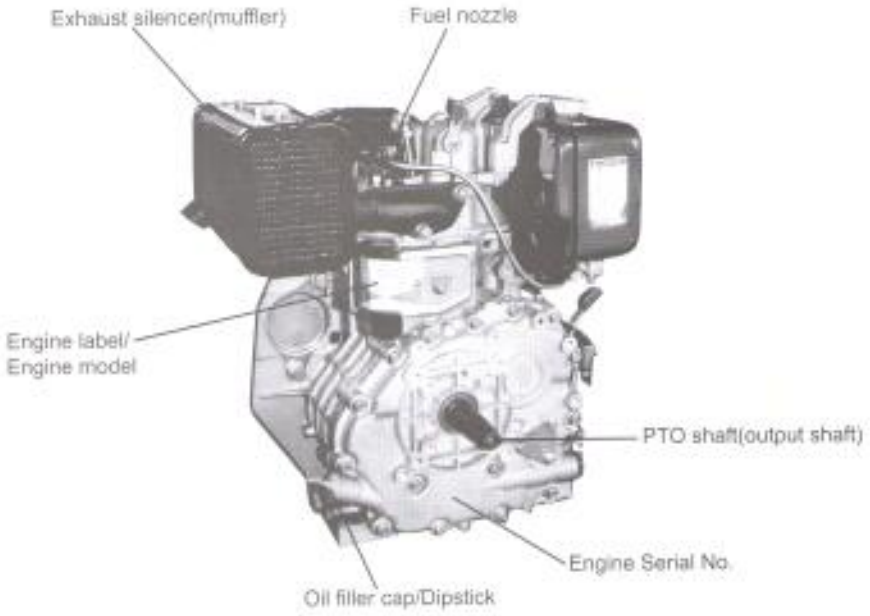
1-1.Specifications

Model		170FA	170FA-E	178FA 178FA-E	178FS 178FS-E	186FA 186FA-E	186FS 186FS-E
Type		Air-cooled, 4-cycle,direct injection Diesel Engine					
No.of cylinders		1					
BoreXStroke	mm	70X57		78X64	78X62	86X72	86X70
Displacement	cc	219		306	296	418	406
Continuous rated output	kW/rpm (hp/rpm)	2.5/3000 2.8/3600 (3.4/3000)(3.8/3600)		【1500】 【1800】 3.68/3000 4.0/3600 (5.0/3000) (5.44/3600)		【1500】 【1800】 5.66/3000 6.3/3600 (7.7/3000) (8.6/3600)	
Max.output	kW/rpm (hp/rpm)	2.8/3000 3.1/3600 (3.8/3000) (4.2/3600)		【1500】 【1800】 4.0/3000 4.4/3600 (5.44/3000) (6.0/3600)		【1500】 【1800】 6.3/3000 6.9/3600 (8.6/3000) (9.4/3600)	
Revolution direction		Counterclockwise(Viewed from output shaft)					
Cooling system		Forced air by flywheel fan					
Lubricating system		Forced lubrication and Splash lubrication					
Starting system		Recoil or Recoil/Electric					
Fuel tank capacity (ℓ)		2.4		3.3		5.4	
Lube oil capacity	Full (ℓ)	0.80		1.10		1.65	
	Effective (ℓ)	0.55		0.65		1.0	

Note: The output shaft of FS model is the camshaft. (【 】:camshaft rpm)

1-2.Name of parts





2.Installation

2-1.Installation

1)Use an engine mount which is strong enough to prevent misalignment and play during engine operation.Fasten the engine base firmly to the engine mount with adjustable shims.

2)Ensure accurate centering for coupling with the output shaft.

3)Check that the pulley's shaft hole(fitting hole)and the key groove fit the output shaft precisely.

WARING:

Too much play in the output shaft coupling may cause an accident.Be sure to tighten the output shaft bolts firmly.

4)For belt driving,select a pulley which is a suitable size for the engine and which matches the revolution speed and pulley size of the driven machinery.The proper pulley size for the engine can be obtained by the following formula:

$$\text{Engine's pulley dia} = \frac{\text{Driven machinery pulley dia} \times \text{Driven machinery revolution speed}}{\text{Engine's service speed}}$$

CAUTION: Use of an unsuitable pulley overloads the engine,and this shortes the engine life.

5)Belt tension

Ensure proper belt tension.

CAUTION:Too much tightness overloads the engine at starting and stretcher the belt,making it prone to damage.The output shaft may also be broken,and other accidents could occur.Too much looseness causes belt slippage during high output and high speed operation.

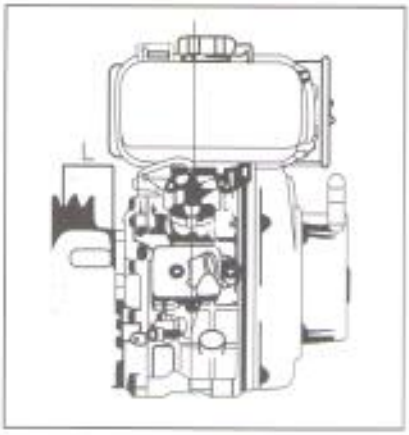
2-2.Allowable overhang

The v-pulley's belt grooves should be as close as possible to the engine side,though in accordance with the matching for the driven machinery.The overhang distance should be within the range listed below.

NOTE: (1)The overhang distance "L" is the distance between the PTO shaft shoulder and the center of the pulley groove at the farthest outside position.

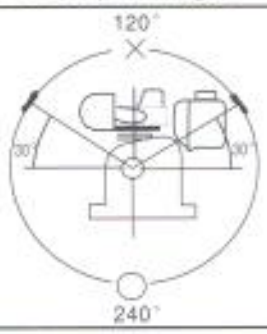
(2)The allowable overhang distance varies according to the type and number of V-belts(determined by the driving load of the driven machinery),and the V-belt tension.For details,consult your nearest dealer.

		170FA	178FA	186FA
Belt	Type	A	B	B
	No.of belt	2	2	3
L		within 80mm	within 95mm	within 70mm



2.Installation

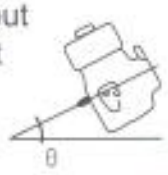
2-3.Belt-pull angle



(1)Crankshaft PTO:
The belt-pull angle should be within 240 degrees,as illustrated.

(2)Camshaft PTO(S type):
Belt-pull can be made in all directions(360 degrees).

2-4.Inclination angle

Allowable inclination(for continuous use)	Output shaft 			
	$\theta \leqslant 20^{\circ}$			

Keep the engine inclination within the specified range.
NOTE: Place the engine on the level when refilling with engine oil.

2-5.Electrical wiring

●For the wiring of electrical equipment contact your nearest dealer.

Recommended batteries (20hrs.rating)	170FA-E	178FA-E	186FA-E
	18AH~24AH	24AH~36AH	36AH~45AH

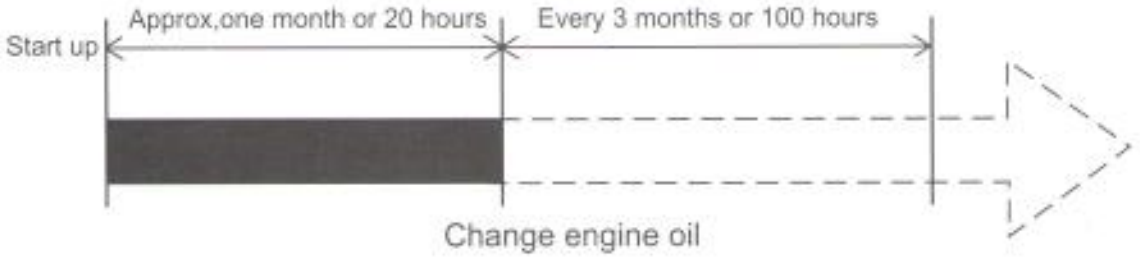
3.Handling your engine

While your engine is still new,applications of heavy loads may shorten the life of the engine.Follow the breaking-in procedures during the first 20 hours.

●Avoid overloads
Avoid applying any heavy load during the breaking-in period.

●Change engine oil regularly
Change the engine oil after 20 hours of initial operation or at the end of the first month,and every 3 months or 100 hours thereafter.

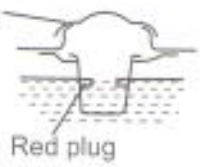
NOTE: Be sure to drain the oil while the engine is warm. When cold,it may be difficult to drain the oil completely.



4.Preparations for starting

	170FA	178FA	186FA
Fuel tank capacity (effective) ℓ	1.9	2.7	4.7

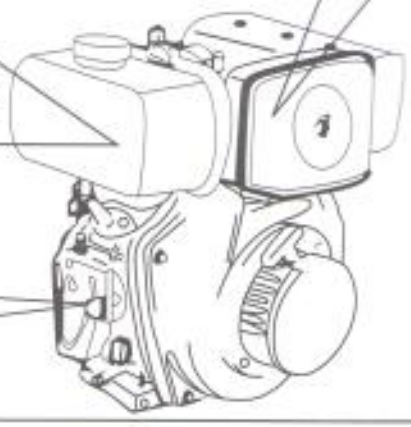
Fuel tank
Use diesel fuel.Take care not to enter dust and water into the fuel and the fuel tank.



Overfilling is dangerous. Do not fill the tank beyond the top of the red plug inside the fuel tank filter.

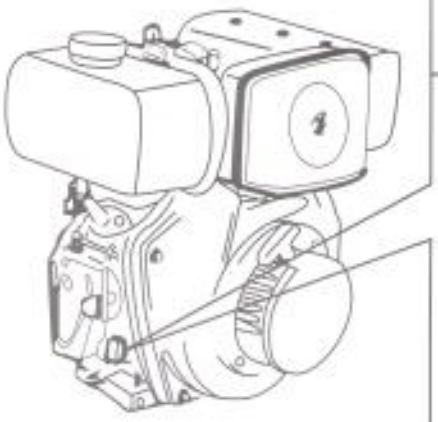
Diesel fuel specification	Location
No.2-D,No.1-D,ASTM D975-94	USA
EN590:96	European Union
ISO 8217DMX	International
BS 2869-A1 or A2	United Kingdom
GB252	China
KSM-2610	Korea
JIS K2204 Grade No.2	Japan

Air cleaner element
Do not wash the air cleaner element because this is a wet type element. When the engine output tends to drop or the exhaust colour changes adversely, replace the element.Do not perforate the element and never run the engine without it.



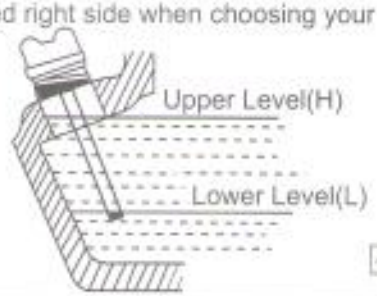
Engine Speed Lever

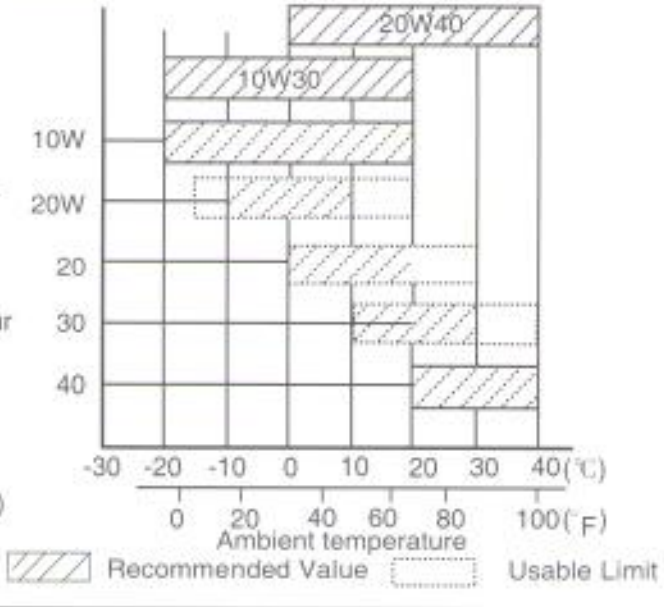
Lube Oil Filler Port
Fill the Oil up to the mouth of the filler port with the engine placed on the level.When checking the Oil,simply dip the dipstick into the Oil pan.Do not screw in the dipstick.



	170FA	178FA	186FA
Lube Oil capacity ℓ (us qts.)	0.80 (0.85)	1.10 (1.16)	1.65 (1.74)

Engine Oil
We recommends A.P.I engine service classification of CC or CD.Always use Oil with the right viscosity for the ambient temperature in which your engine is being operated.Use the chart mentioned right side when choosing your engine Oil.

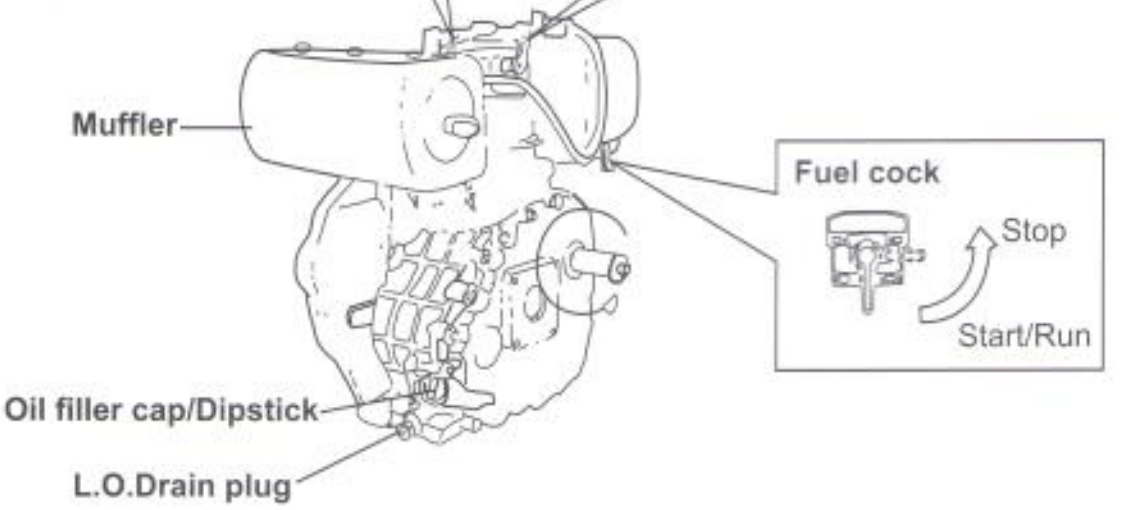


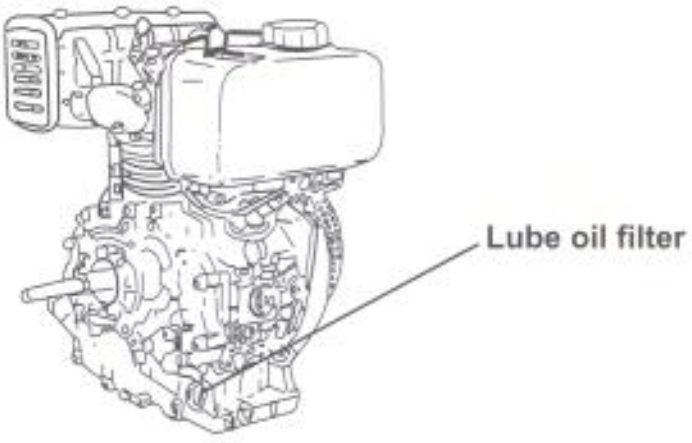


4.Preparations for starting

Plastic Plug(170FA-178FA)
In cold weather,when the engine is hard to start,remove the plastic plug and add 2cc of engine oil,put the plug back in place.
NOTE:Always keep the palstic plug in place.If it is removed,the engine will suck in dust band be damaged.

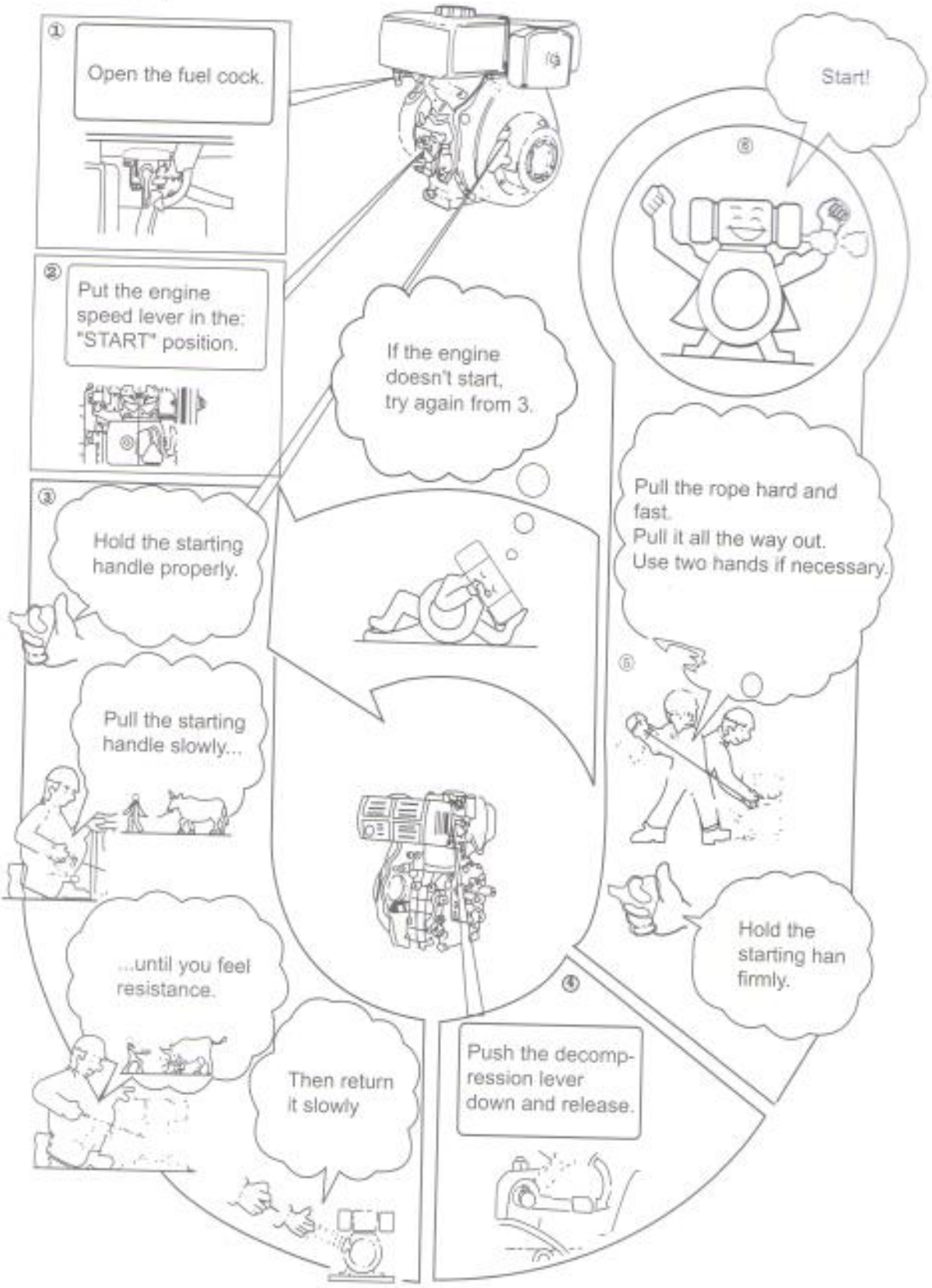
Decompression Lever
Do not use decompression lever to stop the engine.



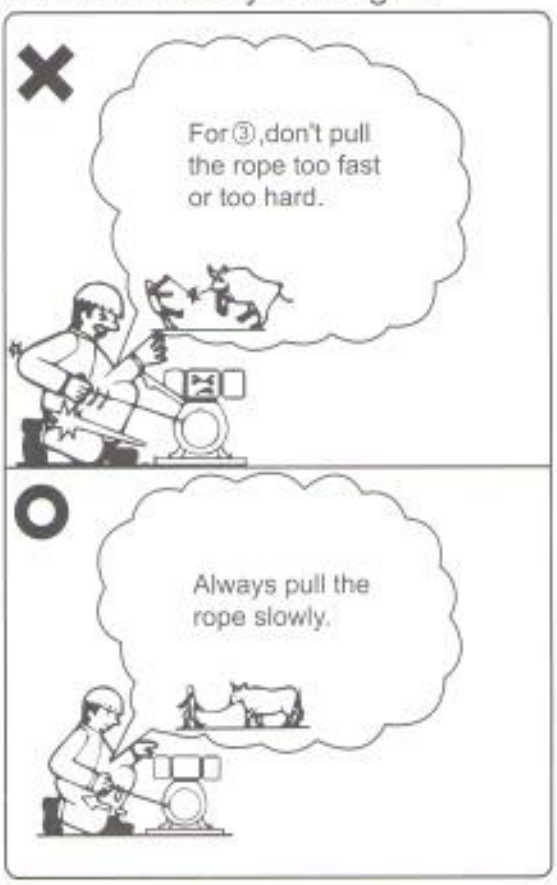


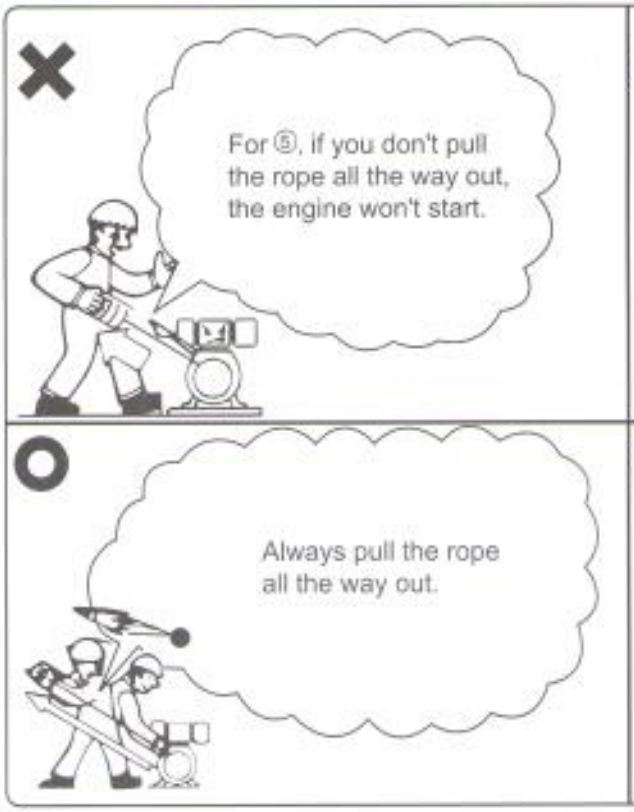
5.How to start your engine

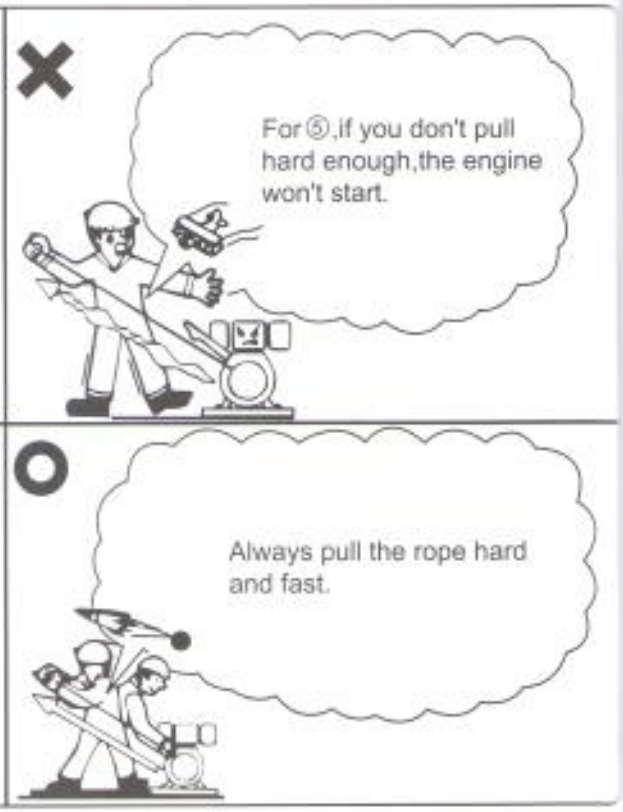
5-1.Recoil Starting



5.How to start your engine

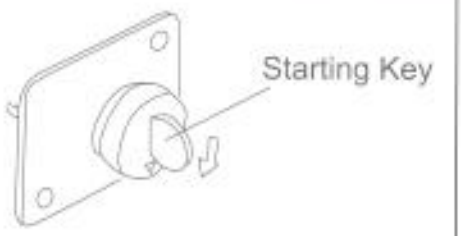






5.How to start your engine

5-2.Electric Starting



(1)Starting

The preparations for electric starting are the same as for manual(recoil)starting.

①Open the fuel cock.
②Set the engine speed lever at "START" position.
③Turn the starting key clockwise to "START".
④Remove your hand from the key as soon as the engine starts.
⑤If the starting motor doesn't start after 10 seconds,wait a while(for about 15 seconds) before attempting to start again.

⚠ CAUTION:
If the starting motor is turned for too long,the battery will go flat and the motor will seize up.Always leave the starting key turned on,in the "ON" position,while the engine is running.

(2)Battery

Check the level of the fluid in the battery once a month.When the level has dropped to the lower mark,replenish with distilled water up to the upper mark.

⚠ CAUTION:
- **If the battery fluid is low,the engine may not start because too little electricity is reaching the starter motor.Always keep the fluid level within the upper and lower limits.**
- **If too much battery fluid is supplied,the fluid may spill and corrode the surrounding parts.**

5-3.Starting aid

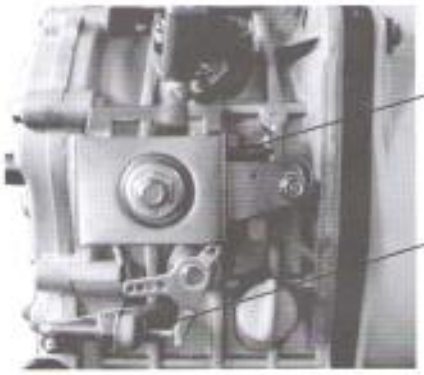
In cold weather,when your engine is hard to start,remove the plastic plug of the rocker arm cover and add 2cc of engine oil before starting.

STOP WARNING:
Never use gasoline,paint thinner or any other volatile liquid as a fuel starting aid put through the air cleaner.Explosions may occur.

⚠ CAUTION:
Keep the plastic plug in the cover except when adding oil.If the plug is not in place,rain and dirt or other contaminants may enter the engine and cause accelerated wear of internal parts.This can cause serious problems.

6. Operating your engine

6-1.Operating your engine



(1) Warm up the engine without load for about 3 minutes.
(2)Turn the engine speed lever to the desired speed position and fasten the thumb nut.

⚠ CAUTION:

- **Be sure to use the engine speed lever to control the engine speed.**
- **Do not loosen or readjust either the revolution speed limiting bolt or fuel injection limiting bolt.Performance may be affected.**

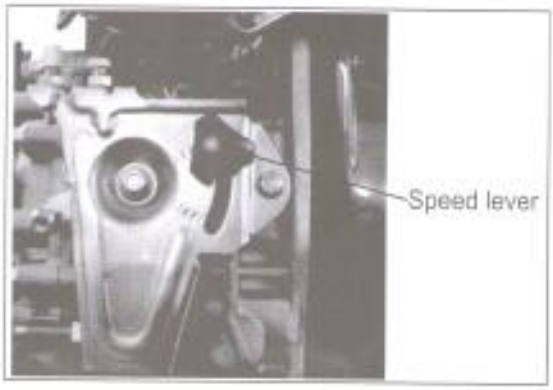
6-2.Checks during operation

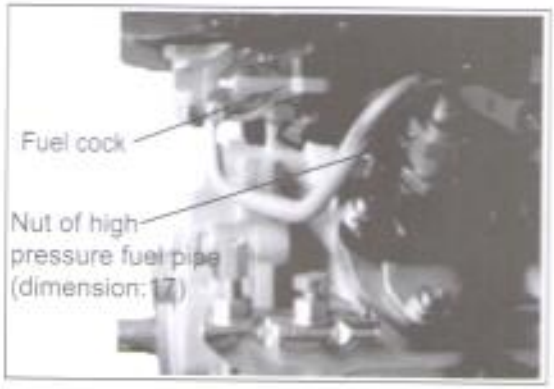
(1) Any abnormal sound or vibration?
(2) Is the engine misfiring or running rough?
(3) What about the color of the exhaust gas?(Is it black or too white?)
If you notice any of the above,stop the engine and consult your nearest dealer.

STOP WARNING:

If the engine has been running,the muffler will be very hot. Be careful not to touch the muffler.
Never refill the fuel while the engine is running.

7.Stopping your engine





(1) Before stopping the engine,move the engine speed lever to low speed,and run the engine for about 3 minutes with no load.
(2) Return the engine speed lever to the "STOP" position.
(3) In electric-start models,return the starter key to the "OFF" position.
(4) Set the fuel cock lever to "S" (closed) position.
(5) Slowly pull out the recoil handle until pressure is felt (that is,to the point in the compression stroke where the intake and exhaust valves ar closed), and leave the handle in this position.This prevents rust from forming while the engine is not in use.

⚠ CAUTION:

- **When stopping the engine,reduce the load slowly.Don't stop the engine suddenly since this may cause the temperature to rise abnormally.**
- **Do not stop the engine with the decompression lever.**

STOP WARNING:

If the engine keeps on running even after the speed lever is placed at "STOP" position,stop the engine either by closing the fuel cock("S" position) or by loosening the nut of the high pressure fuel pipe on the pump side.

8.Periodic checks and maintenance

Periodic checks and maintenance are very important for keeping the engine in good condition and durable.The chart below indicates which checks to make and when to make them.

Operation hours / Item	Daily	First month or 20 Hrs	Every 3 months or 100 Hrs	Every 6 months or 300 Hrs	Every 1 year or 1000 Hrs
Check and tighten bolts and nuts	○				
Check and resupply lube oil	○				
Replace lube oil		○ 1 st time	○ 2nd time and thereafter		
Clean and replace lube oil filter			○	○ Replace if necessary	
Check lube oil leakage	○				
Replace air cleaner element		Service more frequently when used in dusty areas		○	
Drain the fuel tank	Monthly				
Clean and replace fuel filter			○ Clean	○ Replace	
Check fuel injection nozzle				●	
Check fuel injection pump				●	
Check fuel piping				○ Replace if necessary	
Adjust intake/exhaust valves head clearance		○ 1 st time		○	
Check and lap intake/exhaust valves seat					●
Check battery liquid	Monthly				
Oil bath type air cleaner: Oil level check and cleaning of element	○ Oil level check	○ Clean Monthly or 50 Hrs			

Note: The mark(●) indicates that special tools and skills are required.

8. Periodic checks and maintenance

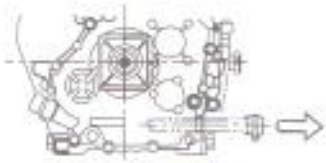
Cleaning and replacement of fuel filter

The fuel filter has to be cleaned regularly to insure maximum engine output.Remove the filter from the fuel tank and clean.

Clean	Every 3 months or 100 hours
Replace	Every 6 months or 300 hours

Replacement of lube oil filter

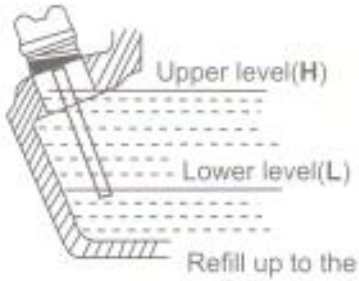
Clean	Every 3 months or 100 hours
Replace	Every 1,000 hours or during engine disassembly



Replacement of lube oil

Lube oil replacement	Operation hours
1 st time	First month or after 20 hours
2nd time and thereafter	Every 3 months or 100 hours

	170FA	178FA	186FA
Lube oil capacity (ℓ)	0.80	1.10	1.65



Refill up to the top of the filler port with the engine on the level.

Changing the air cleaner element

Do not wash the air cleaner element with detergent because this is a wet type element.

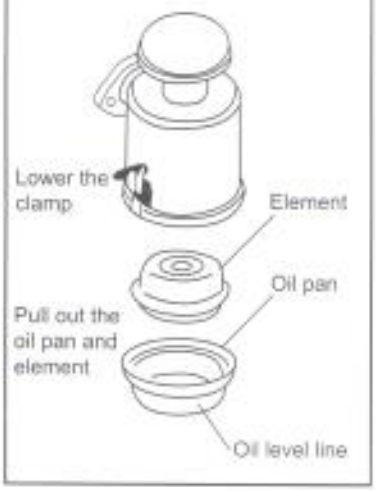
⚠ CAUTION:
Never run the engine without the element or with a defective element.

Note:

- A clogged element hinders the flow of air to the combustion chamber.This reduces engine output,Increases lube oil and fuel oil consumption and makes starting difficult.
- Make sure you clean your element regularly.

Change	Every 6 months or 300 hours

Cleaning of the air cleaner element (Oil bath type air cleaner)



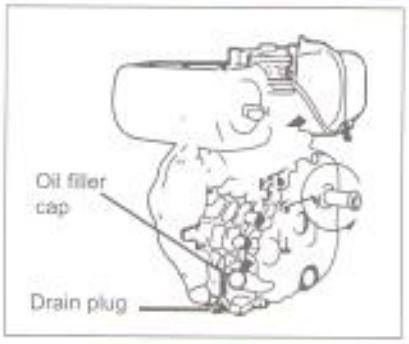
Wash the dirty element with diesel fuel.After dipping it in the oil and squeezing out the oil from the element, remount it.Fill new engine oil to the oil level of the oil pan.

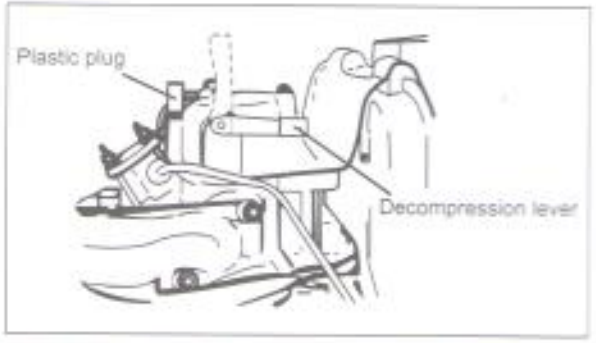
STOP WARNING:
Never use gasoline or low flash point solvents.

Oil level check	Daily
Cleaning of element	Every 1 month or 50 Hrs

178FS

9.Long term storage





If store your engine for long periods,make the following preparations.

(1) Operate the engine for about 3 minutes and then stop.

(2) Stop the engine. Drain the engine lube oil while the engine is still warm and fill with new oil.

(3) Remove the plastic plug on the rocker arm cover and add about 2cc of lube oil. Put the pulg back in place.

(4) Recoil starting

Push the decompression lever down(non-compression position) and hold it while you pull the recoil starter 2 or 3 times.(Don't start the engine.)

Electric starting

Turn the engine for 2~3 seconds with the decomp.Lever set at the non-compression position,and the starter key at the "START" position.(Don't start the engine.)

(5) Pull the decompression lever up. Pull the recoil starter slowly.Stop when it feels tight.This closes the intake and exhaust valves(in compression position) and helps prevent rust from forming.

(6) Wipe the oil and dirt from the engine and store in a dry place.

NOTE: This plug is not provided to the engines supplied for some tropical areas.With these engines,delete(3) and (4) procedures.

10.Troubleshooting

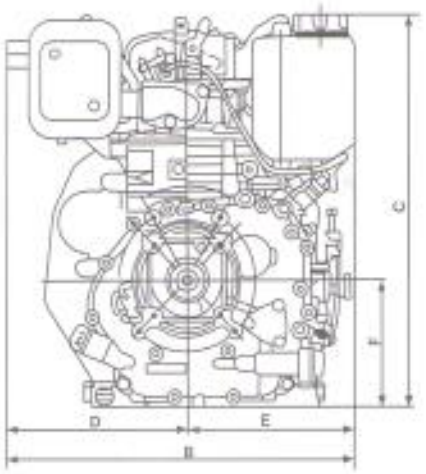
When the engine will not start:

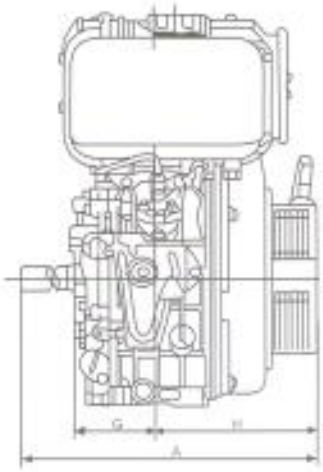
(1) Is there enough fuel?
(2) Is the fuel cock at the "O"(OPEN) position?
(3) Is diesel fuel reaching the fuel injection pump or nozzle?
(4) Is the speed control lever in the"START" position?
(5) Is the lube oil level correct?
(6) Is the fuel injection nozzle working properly?
(7) Is the recoil starter pulled sufficiently quickly and firmly?
(8) Is the spark arrester clogged by carbon?
(9) Is the battery discharging?

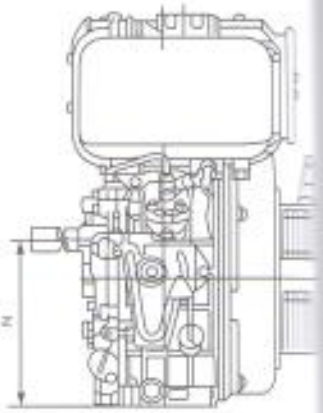
WARNING:

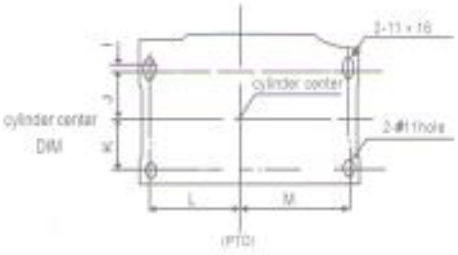
Keep away from the injection nozzle when performing the injection spray test.
NOTE:Always pull the recoil starter quickly and firmly.
(See the section,"How to start your engine".

11.Overall dimensions and installation:





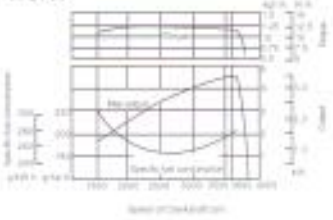




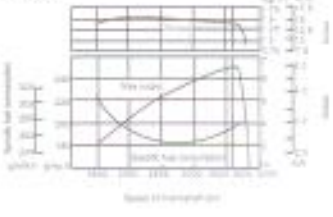
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
170FA	324	**392**	416	218	192	130	86	185	5	**36.5**	**38.5**	**95**	**115**	186
178FA	358	421	450	218	203	145	96	199	5	41.5	43.5	**104**	**144**	172
186FA	392	470	494	247	223	155	105	224	5	43.5	51.5	**117**	**155**	172

12.Performance curves:

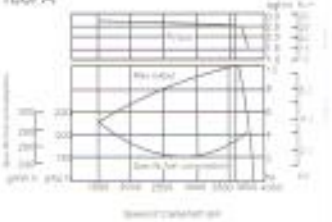
170FA



178FA



186FA



Performance measured after 30 hours running-in, with air cleaner and exhaust silencer.

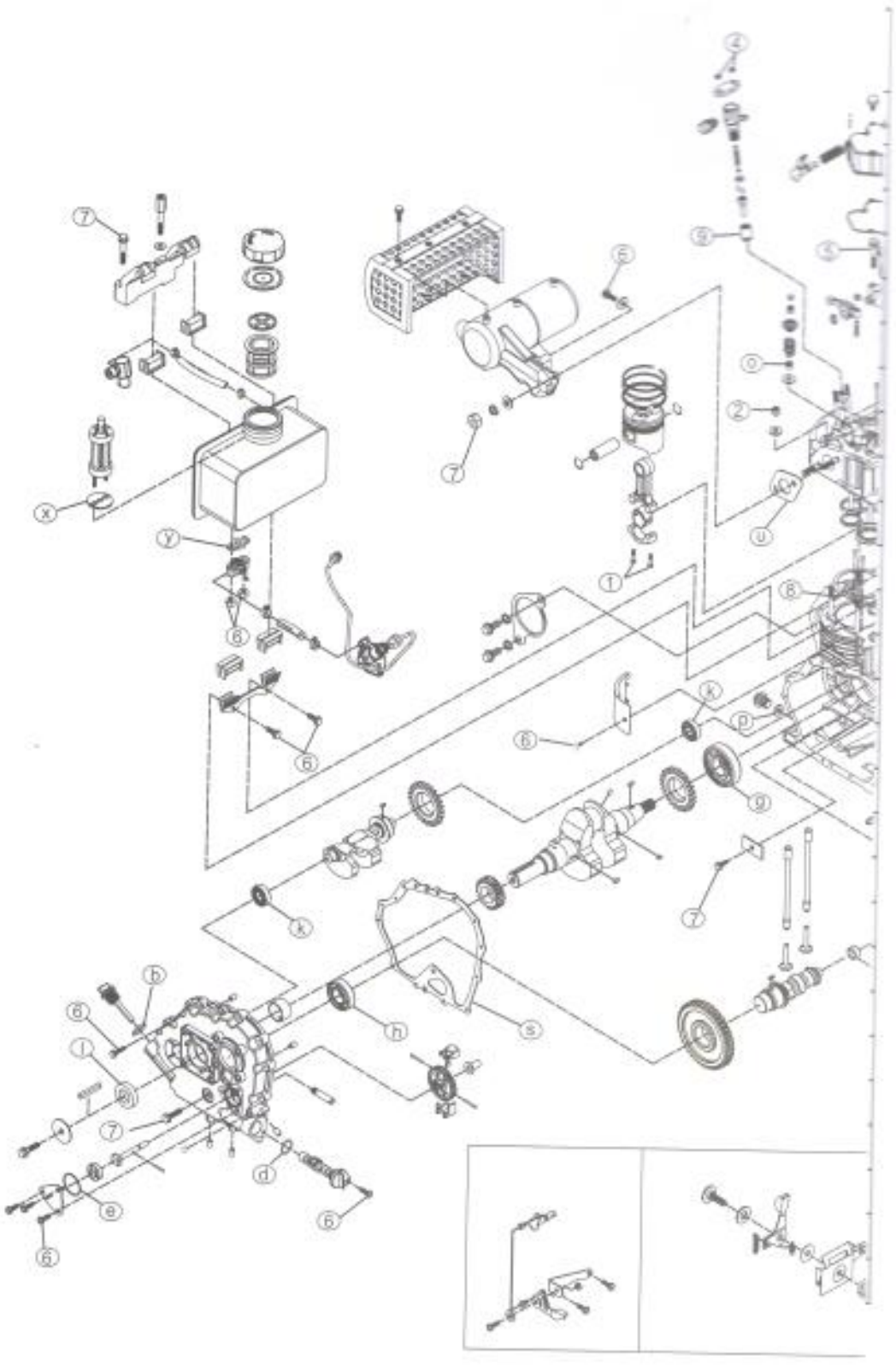
Atmospheric conditions: **ISO 3046/1**

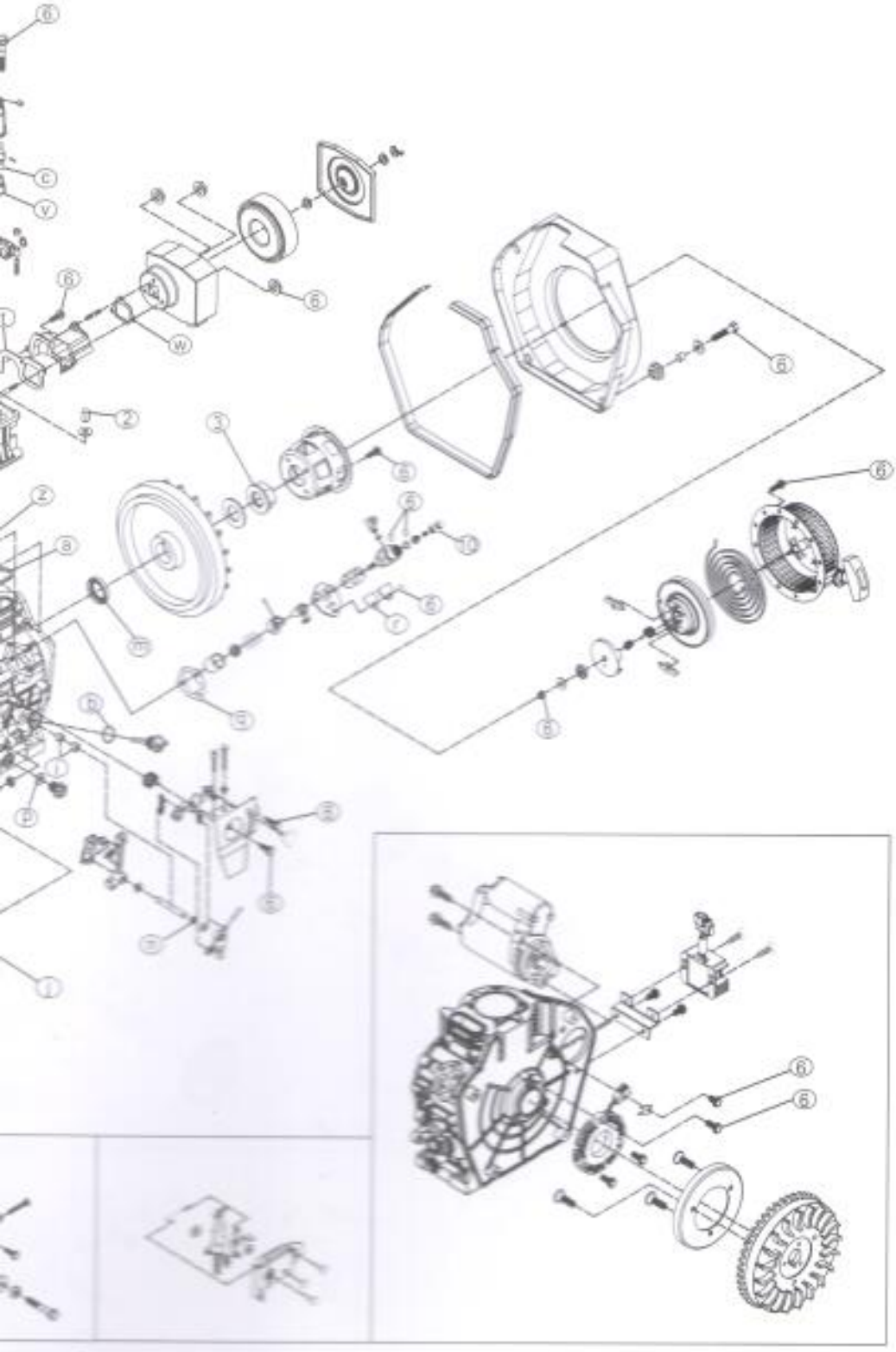
Barometric pressure: 100kPa[750mmHg]

Temperature: 25℃[298K]

Humidity: 30%

13. 170FA Diesel Engine Assembly

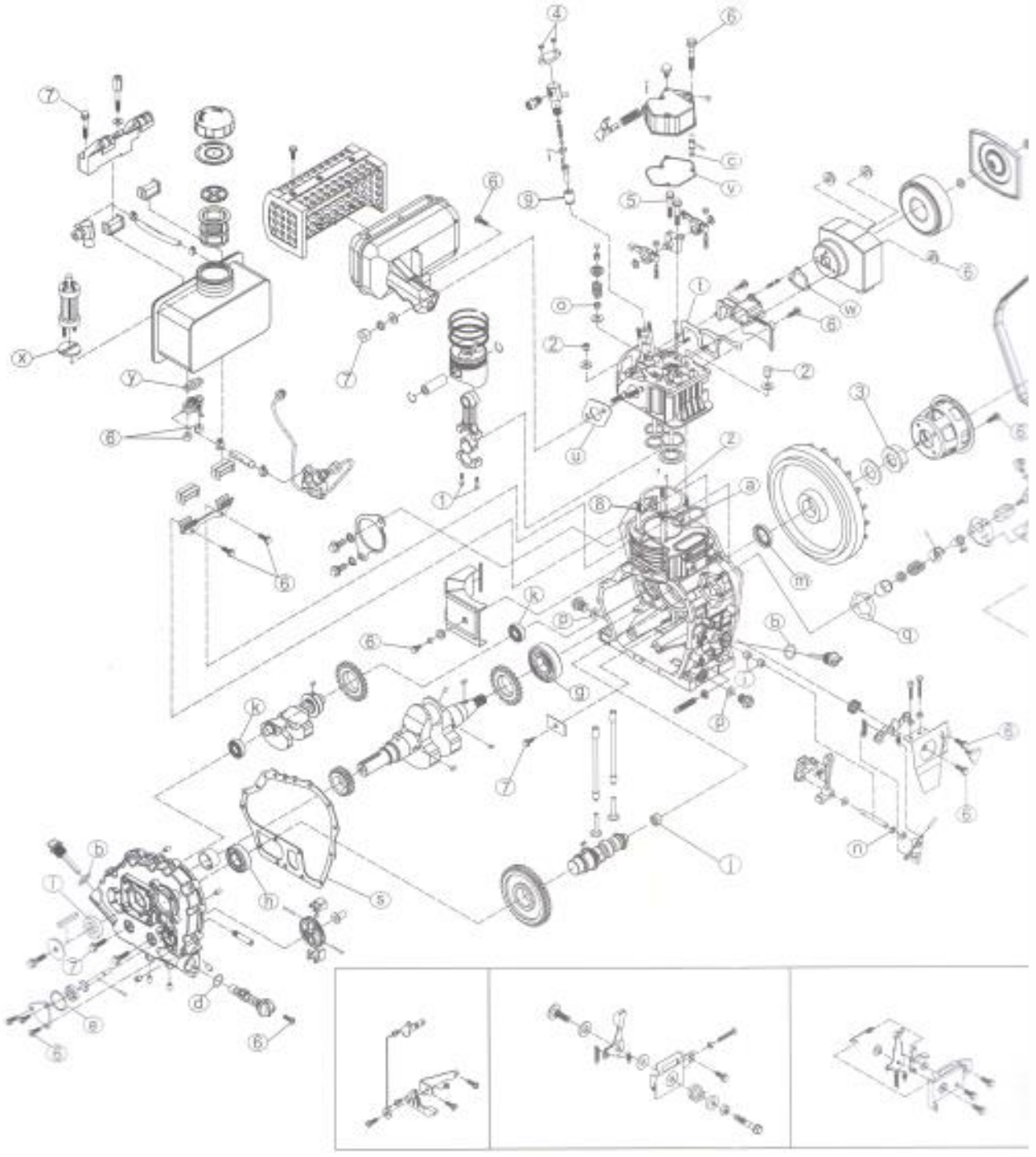


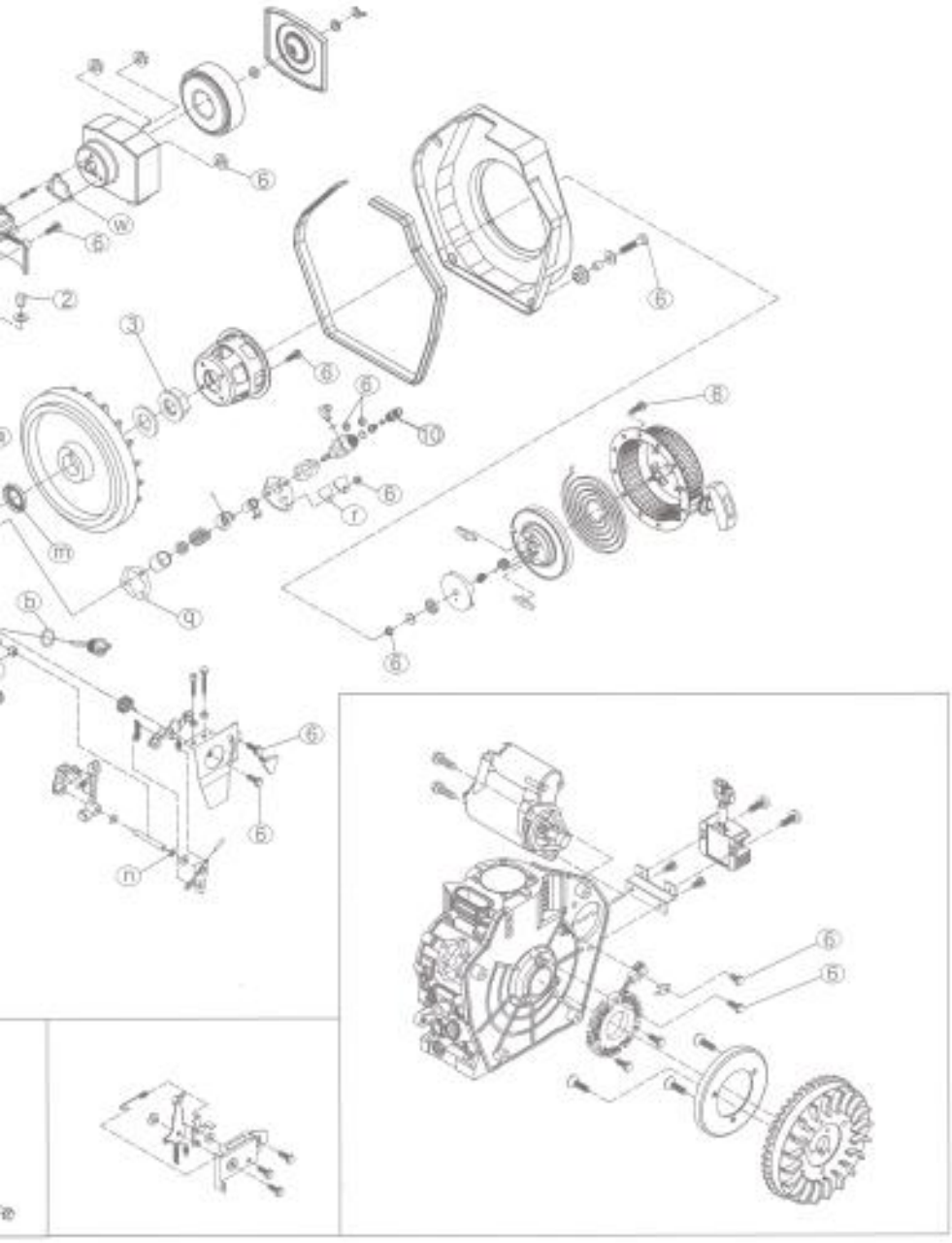


(1) Cylinde

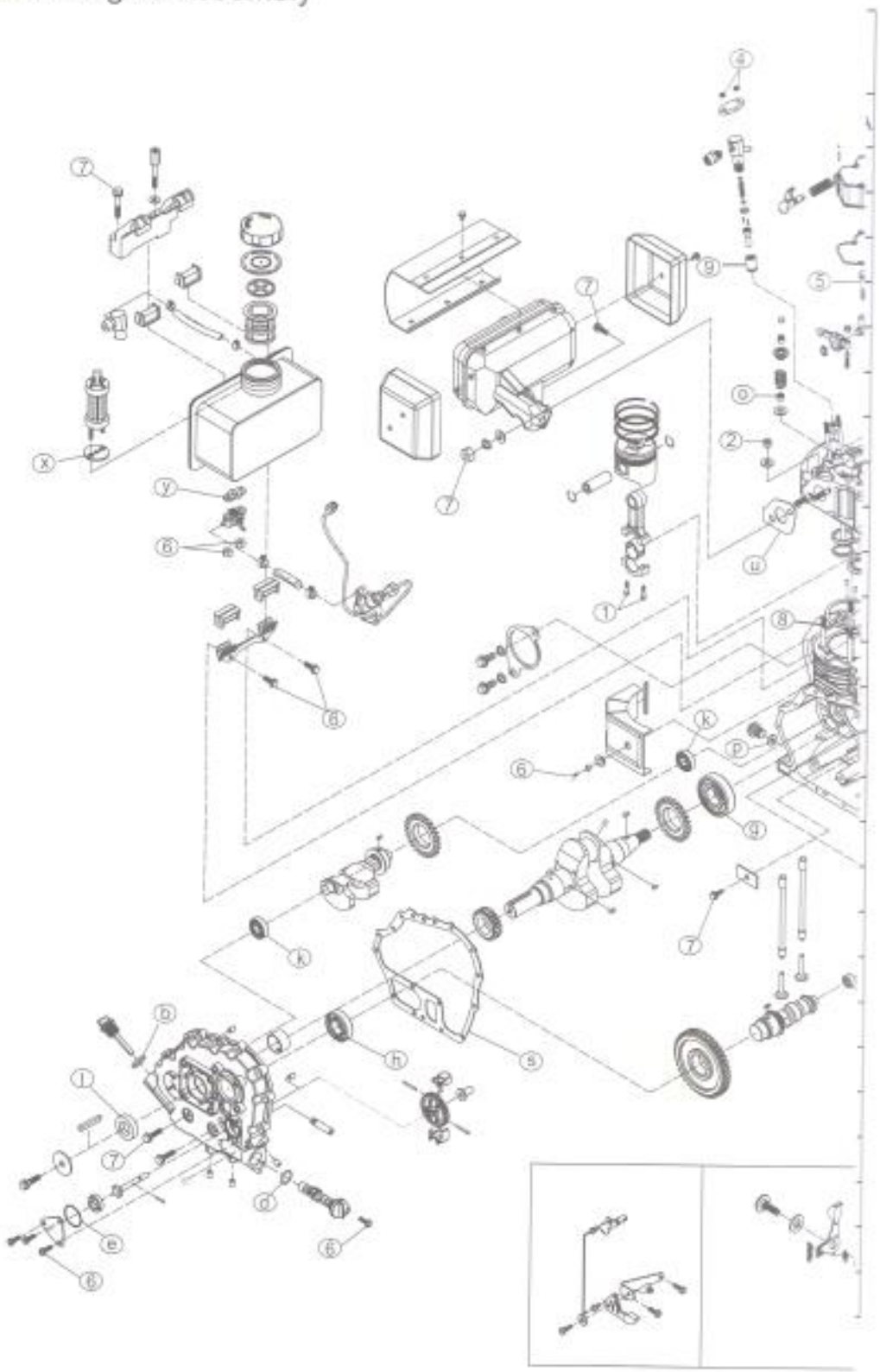
NO	
	170
1	98
2	
3	
4	
5	170F-0
6	
7	
8	
9	170FA-I
10	170F-0
11	
12	
13	2
14	170F-0
15	
16	170F-0
17	170F-0
18	170F-0
19	170FA-I
20	170F-0
21	170F-0
22	170F-0
23	5789-06
24	
25	
26	

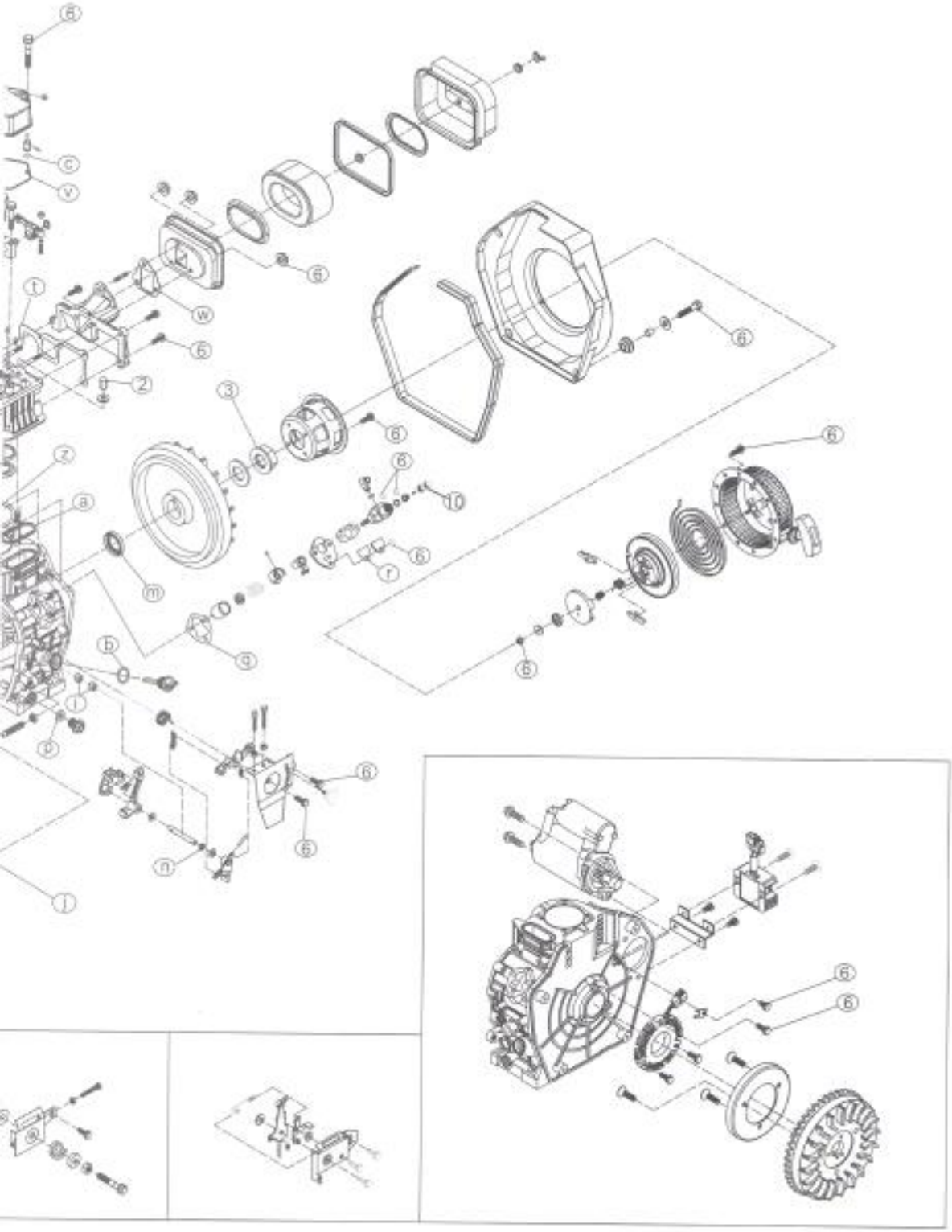
14. 178FA Diesel Engine Assembly





15. 186FA Diesel Engine Assembly

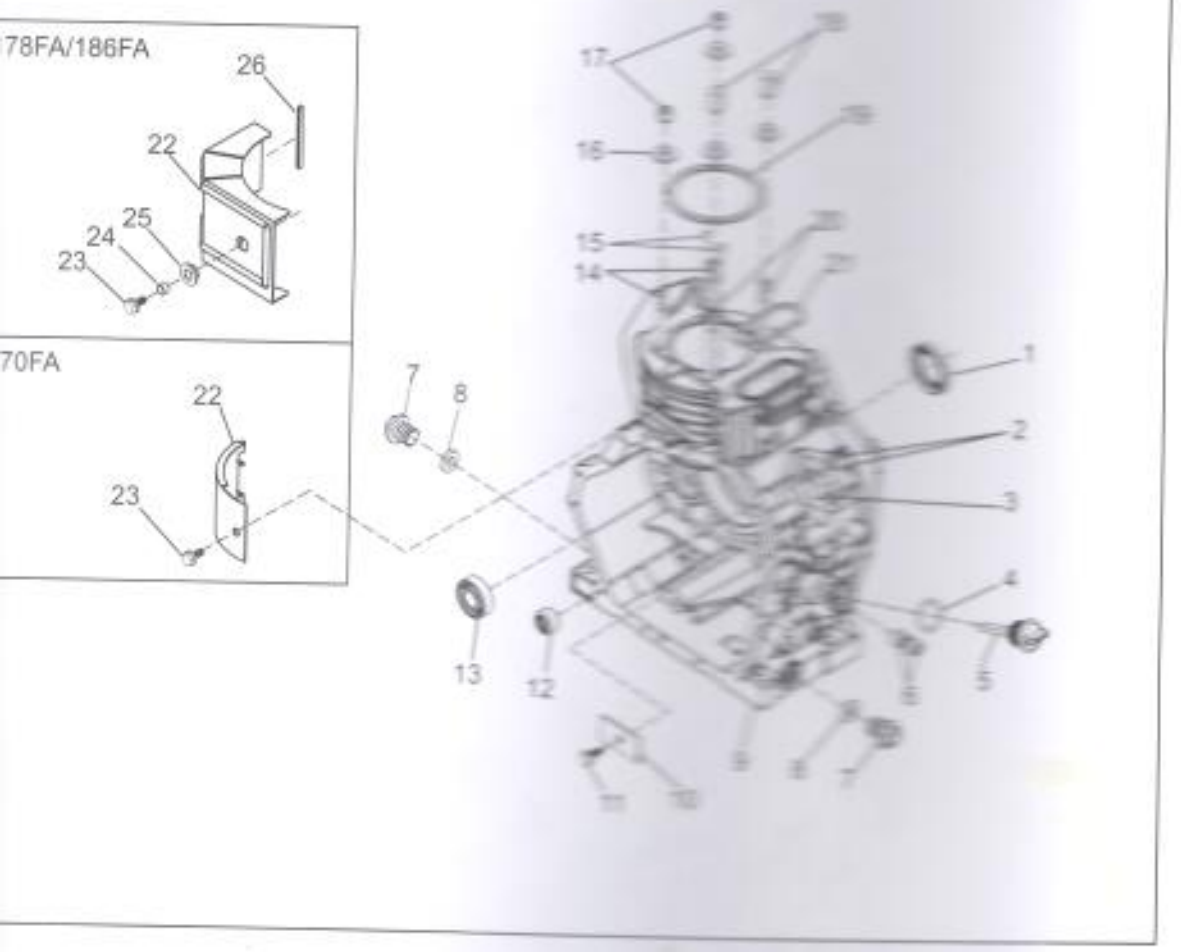




List of Diesel Engine parts:

Cylinder Block Assembly<1>

70FA/178FA/186FA



(1) Cylinder B

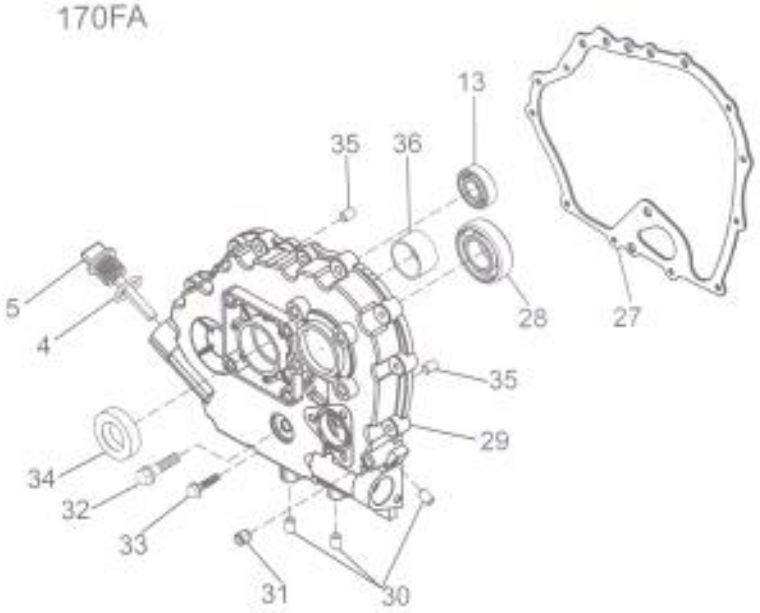
NO	F
	170FA
1	9877.
2	
3	
4	
5	170F-0100
6	
7	
8	
9	170FA-0100
10	170F-0100
11	
12	
13	276-
14	170F-0100
15	
16	170F-0100
17	170F-0100
18	170F-0100
19	170FA-0101
20	170F-0100
21	170F-0100
22	170F-0120
23	5789-060124
24	
25	
26	

(1) Cylinder Block Assembly<1>

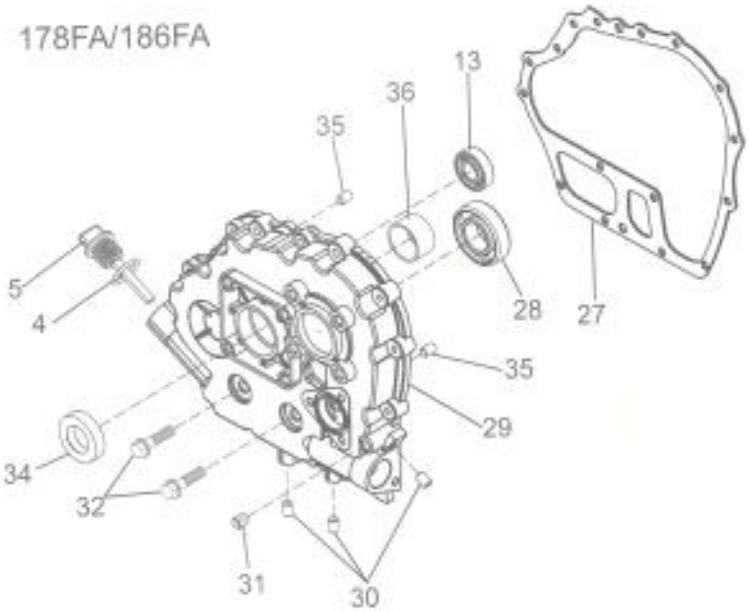
NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	9877.1-304508		9877.1-355008	Oil Seal 30X45X8		Seal 35X50X8	1		
2	170F-01011			Stud M6X24			2		
3	170F-01012			Stud M6X18			1		
4	3452.1-190265			O-Ring 19X2.65			2		
5	170F-01002	178F-01002		Lube Oil Filler Cap,Dipstick			2		
6	290-HKH0810			Needle Bearing 081410			2		
7	170F-01017			Drain Plug M16X1.5			2		
8	170F-01100			Oil Plug Seal Assy			2		
9	170FA-01001	178FA-01001	186FA-01001	Cylinder Block			1		
10	170F-01009	178F-01009	170F-01009	Retainer			1		
11	5789-08014A2			Bolt M8X14			1		
12	290-HK1512			Needle Bearing 152112			1		
13	276-6202P6		276-6203P6	Ball Bearing 6202P6		6203P6	2		
14	170F-01003	178F-01003	186F-01003	Cylinder Head Stud (short)			2		
15	119.1-04008			Pin 4X8			2		
16	170F-01005	178F-01005	186F-01005	Flat Washer			4		
17	170F-01004	178F-01004	186F-01004	Cylinder Head Nut (short)			2		
18	170F-01007	178F-01007	186F-01007	Cylinder Head Nut (long)			2		
19	170FA-01013	178FA-01013	186FA-01013	Cylinder Head Gasket			1		
20	170F-01006	178F-01006	186F-01006	Cylinder Head Stud (long)			2		
21	170F-01008	178F-01008	186F-01008	Rectangle Ring			1		
22	170F-01204	178F-01204	186F-01204	Air Cover			1		
23	5789-06012A2	5789-06016A2		Bolt M6X12	Bolt M6X16		1		
24		178F-01202			Collar			1	
25		178F-01201			Cushion,Rubber			1	
26		178F-01203			Seal,Rubber			1	

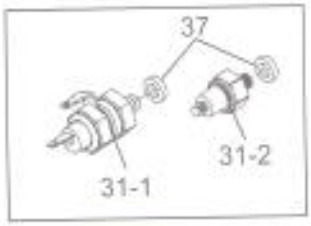
(1) Cylinder Block Assembly<2>

170FA

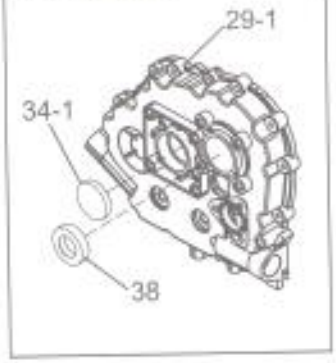


178FA/186FA





178FS/186FS

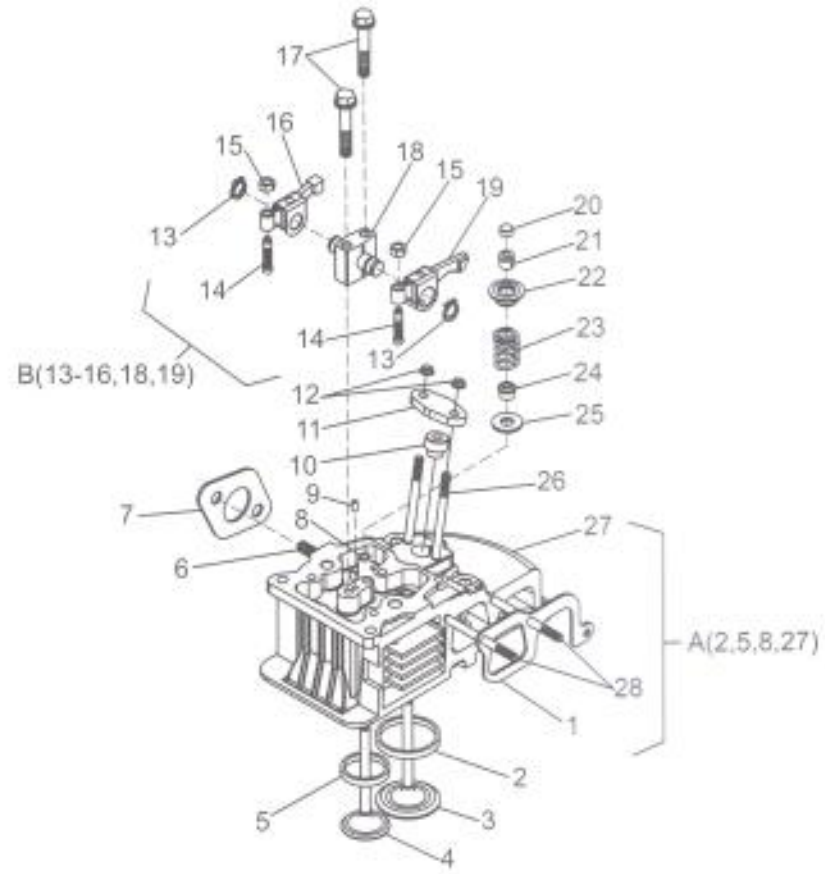


(1) Cylinder Block Assembly<2>

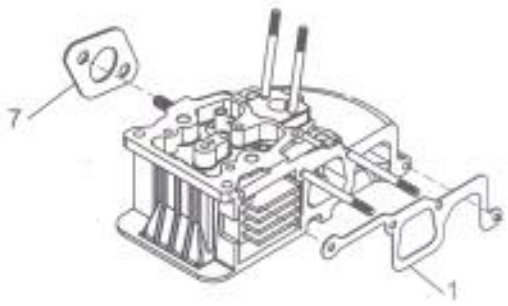
NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
27	170F-01015	178F-01015	186F-01015	Crank Case Gasket			1		
28	276-6205P5	276-6206P5	276-6207P5	Ball Bearing 6205P5	6206P5	6207P5	1		
29	170F-01016	178F-01016	186F-01016	Crank Case Cover			1		
30	170F-01021			Plug 8X10,Aluminium			3		
31	170F-01018			Plug NPT 1/8"			1		
31-1	170F-01300B			Oil Pressure Sensors			1		
31-2	170F-01300A			Oil Pressure Sensors			1		
32	5789-08033A2			Bolt M8X33.5			1	15	16
33	5789-06025A2			Bolt M6X25			14		
34	9877.1-254210	9877.1-304510	9877.1-355010	Oil Seal 25X42X10	Seal 30X45X10	Seal 35X50X10	1		
35	119.1-08012			Pin 8X12			2		
36	170F-01014	178F-01014	186F-01014	Main Bearing			1		
37	170F-01310			Washer,Rubber			1		
178FS/186FS									
1-1		9877.1-304508S	9877.1-355008S		Seal 30X45X8(S)	Seal 35X50X8(S)		1	
29-1		178FS-01016	186FS-01016		Crank Case Cover			1	
34-1		178FS-01022	186FS-01022		Plug 45	Plug 50		1	
38		9877.1-304510	9877.1-355010		Seal 30X45X10	Seal 35X50X10		1	

(2) Cylinder Head Assembly

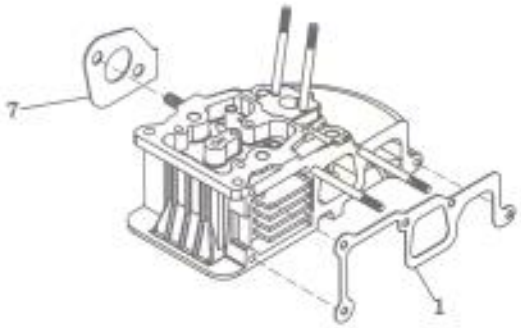
170FA



178FA



186FA

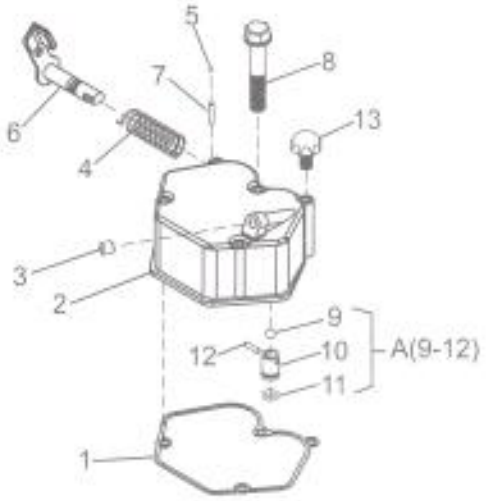


(2) Cylinder Head Assembly

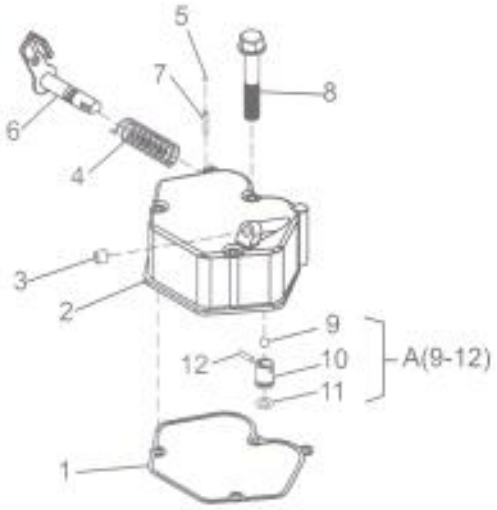
NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170F-02011	178F-02011	186F-02011	Air Intake Gasket			1		
A	170F-02200	178F-02200	186F-02200	Cylinder Head Assy			1		
2	170F-02203	178F-02203	186F-02203	Intake Valve Retainer			1		
3	170F-02004	178F-02004	186F-02004	Intake Valve			1		
4	170FA-02003	178F-02003	186F-02003	Exhaust Valve			1		
5	170F-02204	178F-02204	186F-02204	Exhaust Valve Retainer			1		
6	899-08020A2			Stud M8X20			2		
7	170F-02012		186F-02012	Muffler Gasket			1		
8	170F-02201	178F-02201	186F-02201	Valve Guide			2		
9	119.1-04008			Pin 4X8			1		
10	170FA-02009			Spacer			1		
11	170F-02008			Nozzle Retainer			1		
12	6177.1-06000A2			Nut M6			2		
B	170F-02100		186F-02100	Rocker Arm Assy			1		
13	894.1-12B		894.1-15B	Retaining Ring		Retaining Ring	2		
14	170F-02105		186F-02105	Adjusting Screw			2		
15	170F-02107		186F-02107	Nut M6			2		
16	170FA-02103		186FA-02103	Exhaust Valve Rocker Arm			1		
17	170FA-02106		186FA-02106	Bolt M6X45		Bolt M8X50	2		
18	170FA-02102		186FA-02102	Rocker Arm Support			1		
19	170FA-02104		186FA-02104	Intake Valve Rocker Arm			1		
20	170F-02013	178F-02013	186F-02013	Valve Adjusting Plate			2		
21	170F-02001	178F-02001	186F-02001	Valve Collet			4		
22	170F-02002	178F-02002	186F-02002	Valve Spring Retainer			2		
23	170F-02005	178F-02005	186F-02005	Valve Spring			2		
24	170F-02006	178F-02006	186F-02006	Valve Stem Seal			2		
25	170FA-02007	170F-02007	186F-02007	Valve Spring Washer			2		
26	900-06065A2	900-06055A2		Stud M6X65	Stud M6X55		2		
27	170FA-02202	178FA-02202	186FA-02202	Cylinder Head			1		
28	900-06060A2		900-06075A2	Stud M6X60		Stud M6X75	2		

(3) Cylinder Head Bonnet Assembly

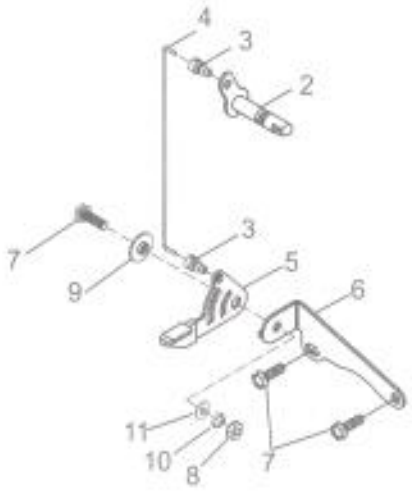
170FA/178FA



186FA



W-Model

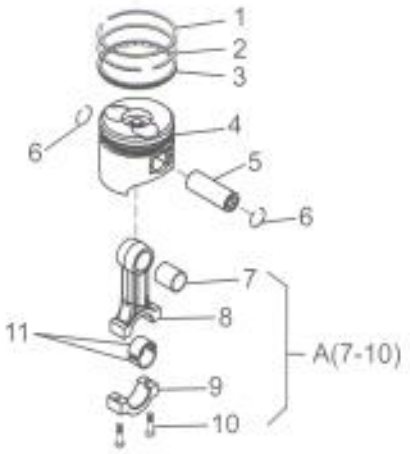


(3) Cylinder Head Bonnet Assembly

NO	PART NUMBER			DESCRIPTION			QTY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170FA-03003		186FA-03003	Bonnet Gasket			1		
2	170FA-03001		186FA-03001	Cylinder Head Bonnet			1		
3	170F-03006			Plug 8X8,Aluminium			1		
4	170F-03004a			Decompression Spring			1		
5	308-03175			Steel Ball 1/8"			1		
6	170F-03100a			Decompression Shaft Assy			1		
7	119.1-03016			Pin 3X16			1		
8	5789-06055A2		5789-06070A2	Bolt M6X55		Bolt M6X70	3		
A	170F-03200a			Breather Assy			1		
9	170F-03201a			Breather Ball			1		
10	170F-03202a			Breather Seat			1		
11	3452.1-093150			O-Ring 9.3X1.5			1		
12	170F-03203			Breather Pin			1		
13	170F-03002			Oil Screw Plug			1		
W-Model									
2	170F-03100W			Decompression Shaft Assy			1		
3	170F-03012W			Decompression Pulling-string Collar			2		
4	170F-03011W	178F-03011W	186F-03011W	Decompression Pulling String			1		
5	170F-03009W			Decompression Handle			1		
6	170F-03008W			Decompression Handle Support			1		
7	5789-06014A2			Bolt M6X14			3		
8	6170-06000A2			Nut M6			1		
9	170F-03013W			Decompression Handle Collar			1		
10	93-06A			Washer 6			1		
11	97.1-06A			Flat Washer 6			1		

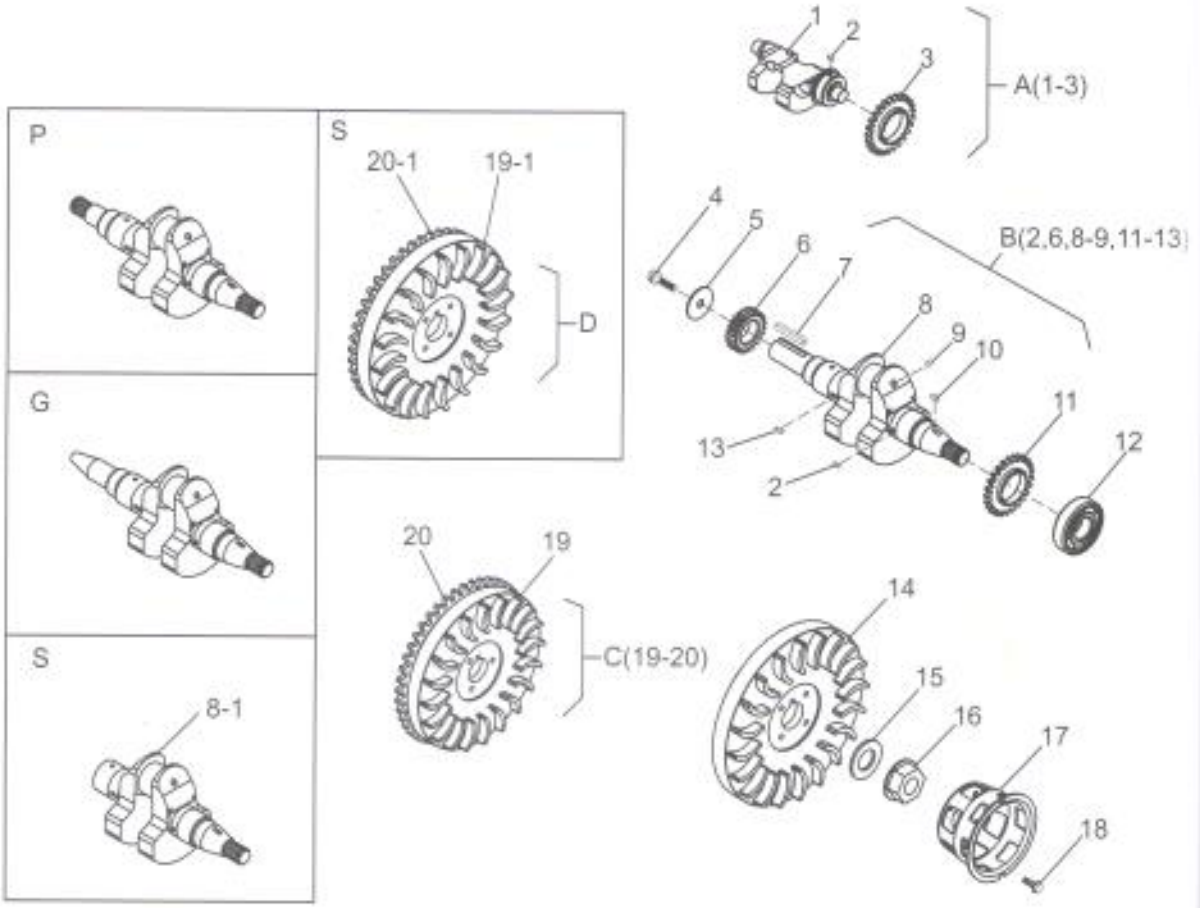
(4) Piston&Connecting Rod Assembly

170FA/178FA/186FA



(5) Crankshaft &Flywheel Assembly

170FA/178FA/186FA



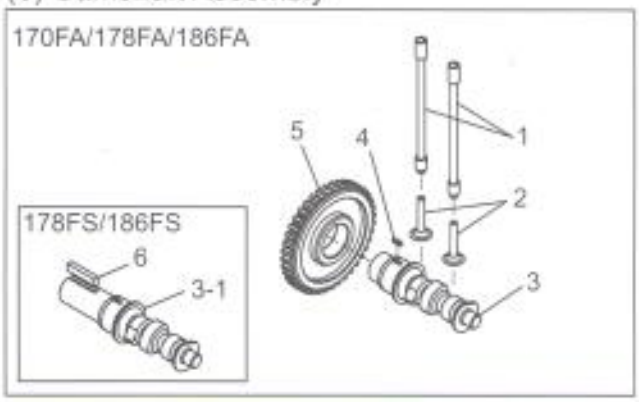
(4) Piston&Connecting Road Assembly

NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170F-04001	178F-04001	186F-04001	First Gas Ring			1		
2	170F-04002	178F-04002	186F-04002	Second Gas Ring			1		
3	170F-04100	178F-04100	186F-04100	Oil Ring Set			1		
4	170FA-04003	178FA-04003	186FA-04003	Piston			1		
5	170F-04004	178F-04004	186F-04004	Piston Pin			1		
6	893.1-19B	893.1-21B	893.1-23B	Circlip 19	Circlip 21	Circlip 23	2		
A	170F-04200	178F-04200	186F-04200	Connecting Rod Assy			1		
7	170F-04204	178F-04204	186F-04204	Connecting Rod Bushes			1		
8	170F-04201	178F-04201	186F-04201	Connecting Rod Body			1		
9	170F-04202	178F-04202	186F-04202	Connecting Rod Cover			1		
10	170F-04203	178F-04203	186F-04203	Connecting Rod Screw			2		
11	170F-04005	178F-04005	186F-04005	Connecting Rod Bearing			2		
178FS/186FS									
4-1		178FS-04003	186FS-04003	Piston			1		

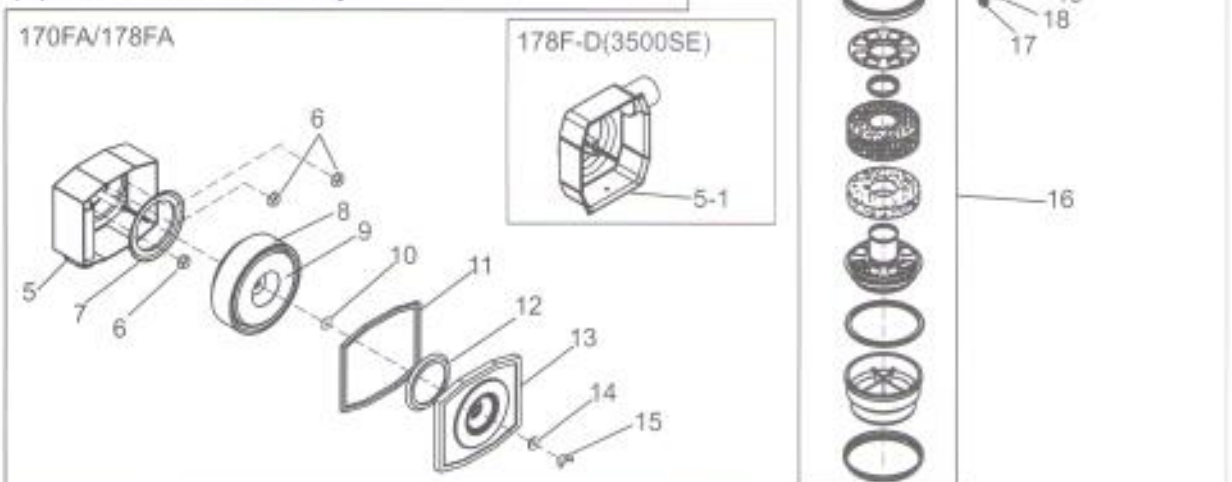
(5) Crankshaft &Flywheel Assembly

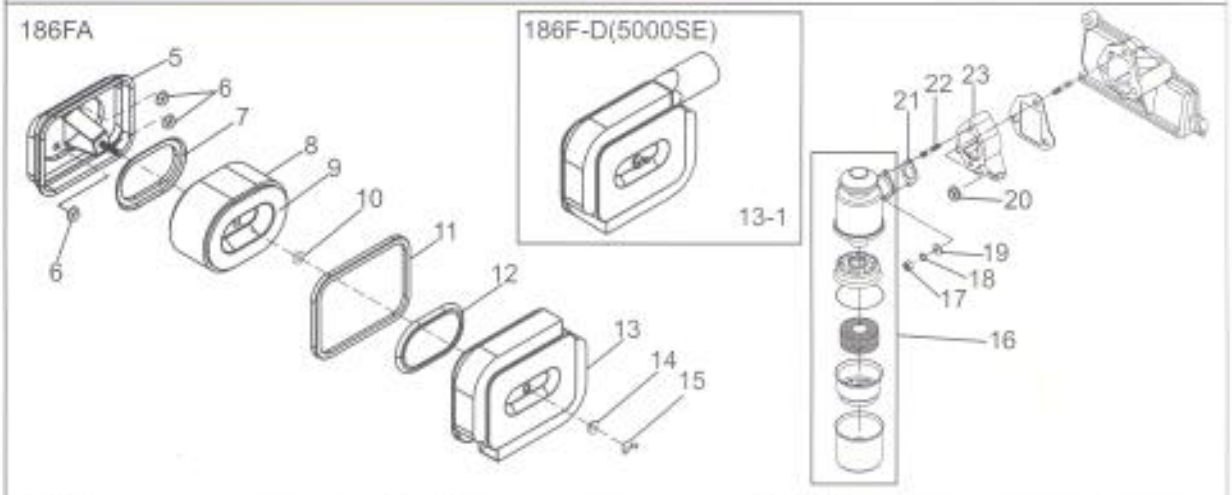
NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
A	170F-05300	178F-05300	186F-05300	Balancer Shaft Assy			1		
1	170F-05301	178F-05301	186F-05301	Balancer Shaft			1		
2	170F-05303			Key 5X7			2		
3	170F-05302	178F-05302	186F-05302	Balancer Gear			1		
4	170F-05006	178F-05006		Bolt			1		
5	170F-05005	178F-05005		Washer			1		
B	170F-05200	178F-05200	186F-05200	Crankshaft Assy			1		
6	170F-05203	178F-05203	186F-05203	Crankshaft Timing Gear			1		
7	1096-A05030	1096-A06050		Key 5X30	Key 6X50		1		
8	170FA-05201	178FA-05201	186FA-05201	Crankshaft			1		
9	308-06350			Steel Ball 1/4"			1		
10	1096-A05012		1096-A05014	Key 5X12		Key 5X14	1		
11	170F-05004	178F-05004	186F-05004	Balancer Drive Gear			1		
12	276-6306P5	276-6307P5	276-6308P5	Ball Bearing 6306P5	6307P5	6308P5	1		
13	1096-A05012			Key 5X12			1		
14	170F-05101	178F-05101	186F-05101	Flywheel			1		
15	170F-05003		186F-05003	Flywheel Nut Washer			1		
16	170F-05002		186F-05002	Flywheel Nut			1		
17	170F-05001	178F-05001	186F-05001	Starter Pulley			1		
18	5789-06012A2			Bolt M6X12			3		4
C	170FE-05100	178FE-05100	186FE-05100	Flywheel Assy (Electric)			1		
19	170FE-05101	178FE-05101	186FE-05101	Flywheel (Electric)			1		
20	170F-05102	178F-05102	186F-05102	Flywheel Gear (Electric)			1		
178FS/186FS									
8-1		178FS-05201	186FS-05201		Crankshaft			1	
D		178FSE-05100	186FSE-05100		Flywheel Assy (Electric)			1	
19-1		178FSE-05101	186FSE-05101		Flywheel(Electric)			1	
20-1		178FS-05102	186FS-05102		Flywheel Gear(Electric)			1	

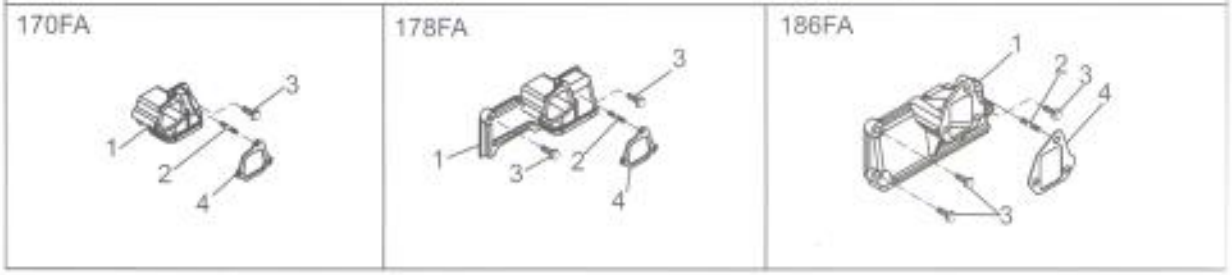
(6) Camshaft Assembly



(7) Air Cleaner Assembly







(6) Camshaft Assembly

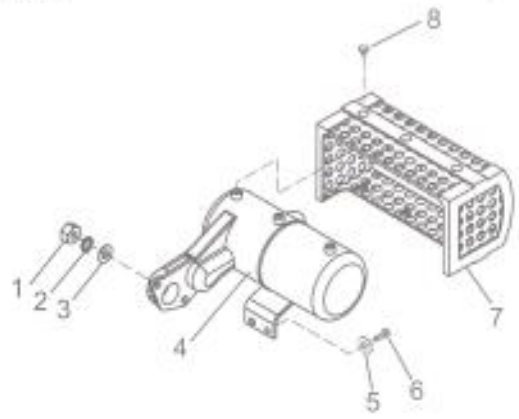
NO	PART NUMBER			DESCRIPTION			QTY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170F-06100	178F-06100	186F-06100	Valve Rod Assy			2		
2	170F-06003		186F-06003	Valve Tappet			2		
3	170FA-06001	178FA-06001	186FA-06001	Camshaft			1		
4	1096-A05014	1096-A04012	1096-A05014	Key 5X14	Key 4X12	Key 5X14	1		
5	170F-06002	178F-06002	186F-06002	Camshaft Timing Gear			1		
178FS/186FS									
6		1096-A08045			Key 8X45			1	
3-1		178FS-06001	186FS-06001		Camshaft			1	

(7) Air Cleaner Assembly

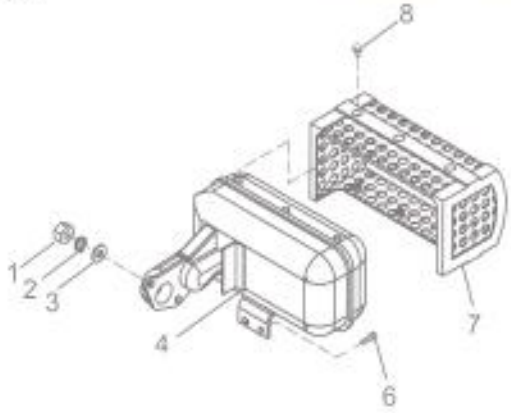
NO	PART NUMBER			DESCRIPTION			QTY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170F-07401	178F-07401	186F-07401	Intake Pipe			1		
2	170F-07402			Air Cleaner Stud			1		
3	5789-06022A2		5789-06025A2	Bolt M6X22		M6X25	1	2	3
4	170F-07001		186F-07001	Air Cleaner Gasket			1		
5	170F-07300		186F-07300	Air Cleaner Body Assy			1		
5-1		178F-07300D		Air Cleaner Body Assy				1	
6	6187.1-06000A2			Nut M6			3		
7	170F-07303		186F-07303	Shakeproof Seal Ring II			1		
8	170F-07108		186F-07108	Prefilter			1		
9	170F-07100		186F-07100	Air Cleaner Element Assy			1		
10	170F-07101		186F-07101	Vibration Proof Pad			1		
11	170F-07201		186F-07201	Seal Ring			1		
12	170F-07203		186F-07203	Shakeproof Seal Ring I			1		
13	170F-07200		186F-07200	Air Cleaner Cover Assy			1		
13-1			186F-07200D	Air Cleaner Cover Assy					1
14	170F-07210		186F-07210	Shakeproof Seal Ring Assy			1		
15	62-06000C		62-08000C	Fly Nut M6		Fly Nut M8	1		
16	178FS-07500		170FAIT-07500	Oil-bath Air Cleaner Assy		Oil-bath Air Cleaner Assy(long)	1		
17	6170-06000A2		6170-08000A2	Nut M6		Nut M8	3		2
18	93-06A		93-08A	Washer 6		Washer 8	3		2
19	97.1-06A		97.1-08A	Flat Washer 6		Flat Washer 8	3		2
20	6177.1-06000A2			Nut M6			3		
21	178FS-07501		186FS-07501A	Oil-bath Air Cleaner Gasket			1		
22	170F-01012		899-08020A2	Stud M6X18		Stud M8X20	3		2
23	178FS-07502		186FS-07502A	Oil-bath Air Cleaner Spacer Flange			1		

(8) Muffler Assembly

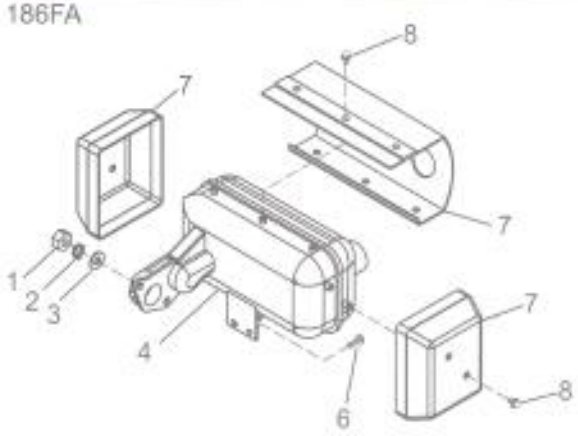
170FA



178FA

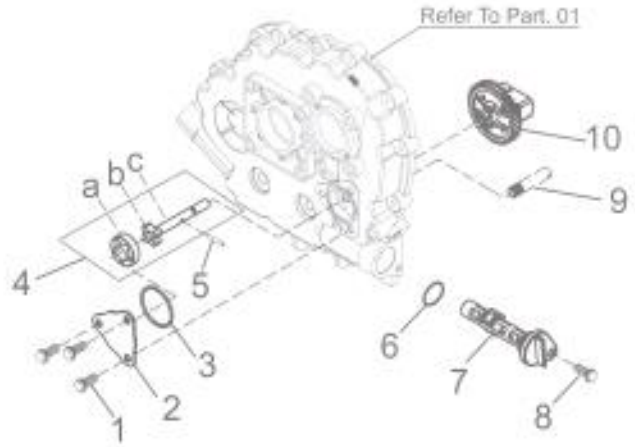


186FA



(9) Lube Oil System

170FA/178FA/186FA



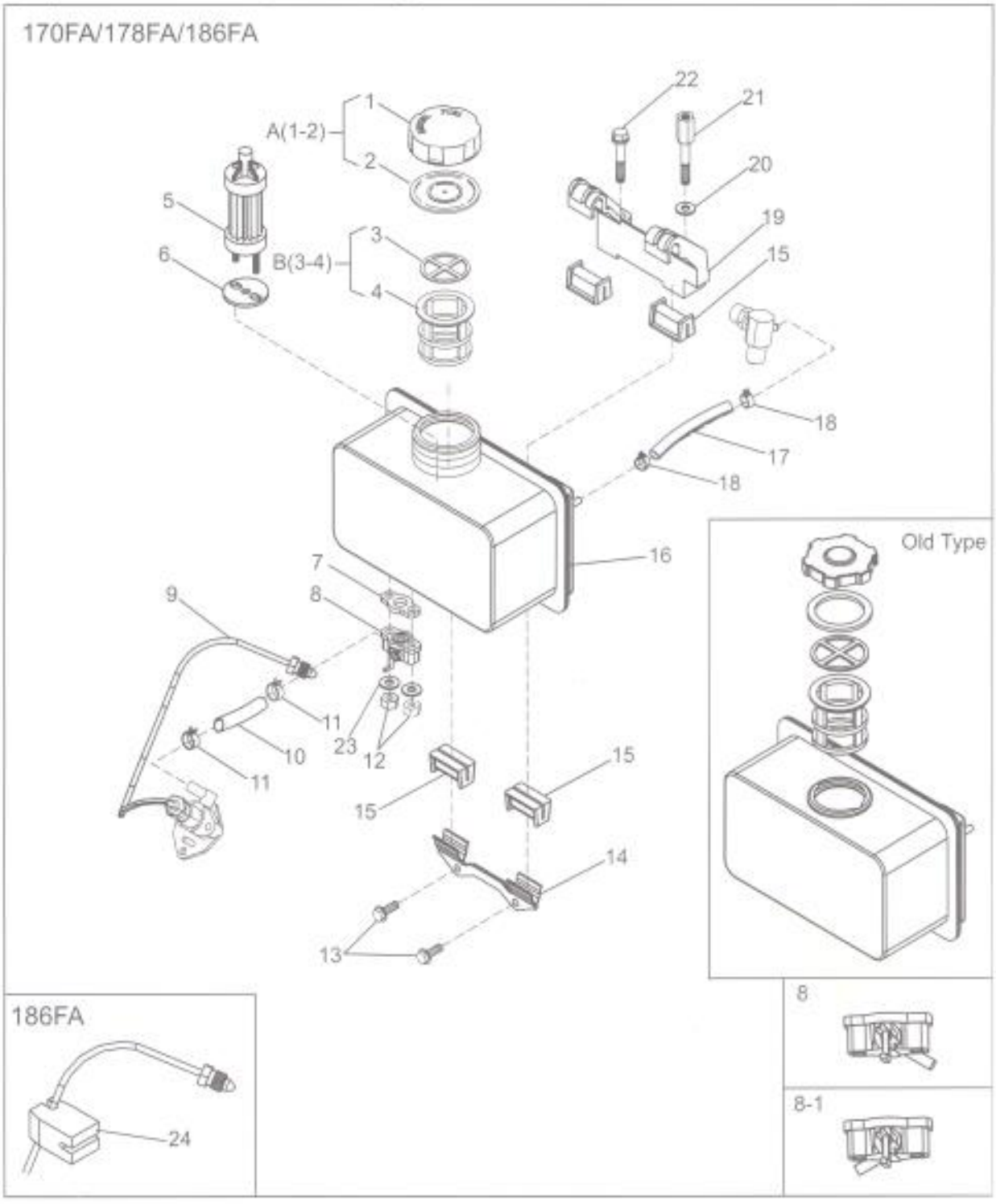
(8) Muffler Assembly

NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	6170-08000A2			Nut M8			2		
2	93-08A			Washer 8			2		
3	97.1-08A			Flat Washer 8			2		
4	170F-08200	178F-08200	186F-08200	Muffler			1		
5	96.1-06A			Flat Washer 6			2		
6	5789-06016A2	5789-08016A2		Bolt M6X16	Bolt M8X16		2		
7	170F-08100	178F-08100	186F-08100	Muffler Cover			1		
8	5789-06008A2			Bolt M6X8			6		10

(9) Lube Oil Assembly

NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	5789-06012A2			Bolt M6X12			3		
2	170F-09001			Oil Pump Cover			1		
3	3452.1-345180			O-Ring 34.5X1.8			1		
4	170F-09100		186F-09100	Lube Oil Pump Assy			1		
a	170F-09103			Outer Rotor			1		
b	170F-09101			Inner Rotor			1		
c	170F-09102		186F-09102	Oil Pump Shaft			1		
5	119.1-03016			Pin 3X16			1		
6	3452.1-190265			O-Ring 19X2.65			1		
7	170F-09200			Lube Oil Filter Assy			1		
8	5789-06014A2			Bolt M6X14			1		
9	170F-09003			Lube Oil Pipe			1		
10	178F-09002			Oil Pump Gear			1		

(10) Fuel Tank&Fuel Pipe Assembly

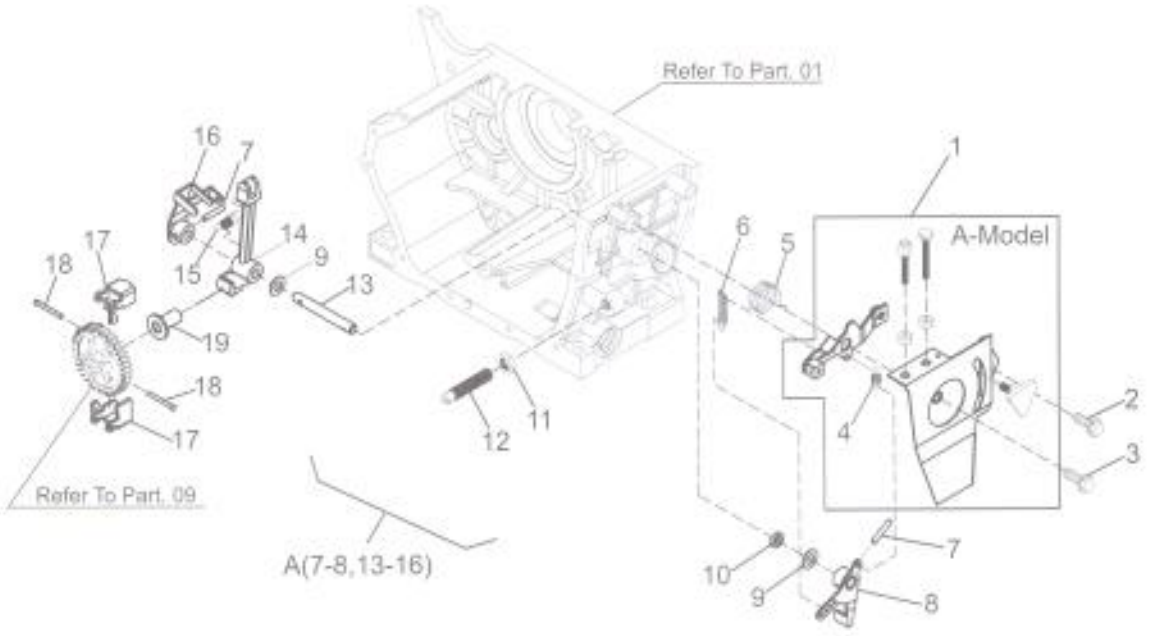


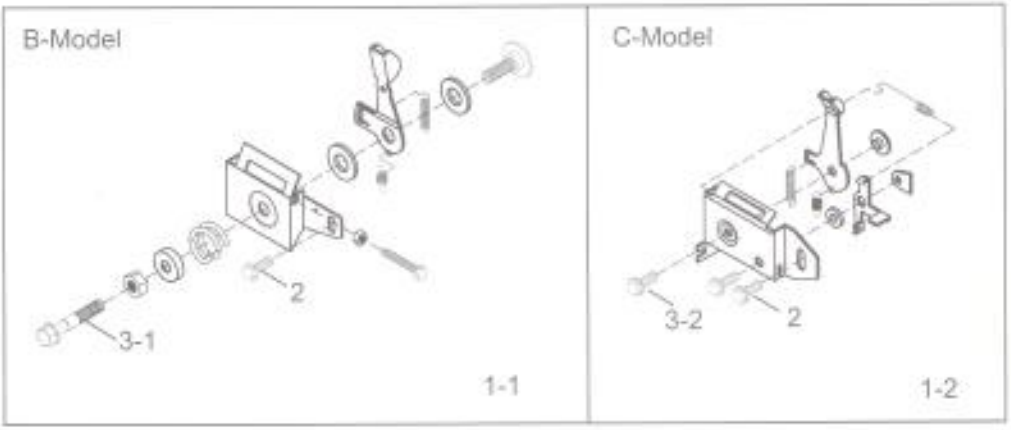
(10) Fuel Tank&Fuel Pipe Assembly

NO	PART NUMBER			DESCRIPTION			QTY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
A	170F-10100P			Fuel Tank Cap Assy			1		
1	170F-10101P			Fuel Tank Cap			1		
2	170F-10102P			Fuel Tank Cap Gasket			1		
B	170F-10020a			Fuel Cup Assy			1		
3	170F-10022a			Fuel Level Mark			1		
4	170F-10021a			Filter Cup			1		
5	170F-10300	178F-10300	186F-10300	Filter Element Assy			1		
6	170F-10007			Filter Gasket			1		
7	170F-10405			Fuel Tank Cock Gasket			1		
8	170F-10400			Fuel Tank Cock Assy			1		
8-1	170F-10400A			Fuel Tank Cock Assy			1		
9	170FA-10500	178FA-10500	186FA-10500E	Fuel Injection Pipe Assy(For small fuel tank)			1		
			186FA-10500G	Fuel Injection Pipe Assy(For large fuel tank)			1		
		178FA-10500D	186FA-10500D	Fuel Injection Pipe Assy(For silence type)			1		
10	170F-10009			Fuel Oil Pipe			1		
11	170F-10011			Clamp			2		
12	6170-06000A2			Nut M6			2		
13	5789-06014A2			Bolt M6X14			2		
14	170F-10014			Lower Stay Assy			1		
15	170F-10002			Damper			4		
16	170F-10200P	178F-10200P	186F-10200P	Fuel Tank Assy			1		
17	170F-10012			Fuel Oil Return Pipe			1		
18	170F-10013			Clamp			2		
19	170F-10001	178F-10001	186F-10001	Upper Stay			1		
20	97.1-08A			Flat Washer 8			1		
21	170F-10003			Lifting Bolt			1		
22	5789-08045A2			Bolt M8X45			1		
23	97.1-06A			Flat Washer 6			2		
24			186FA-10015	Pipe damper			1		

(11) Governor&Control System

170FA/178FA/186FA



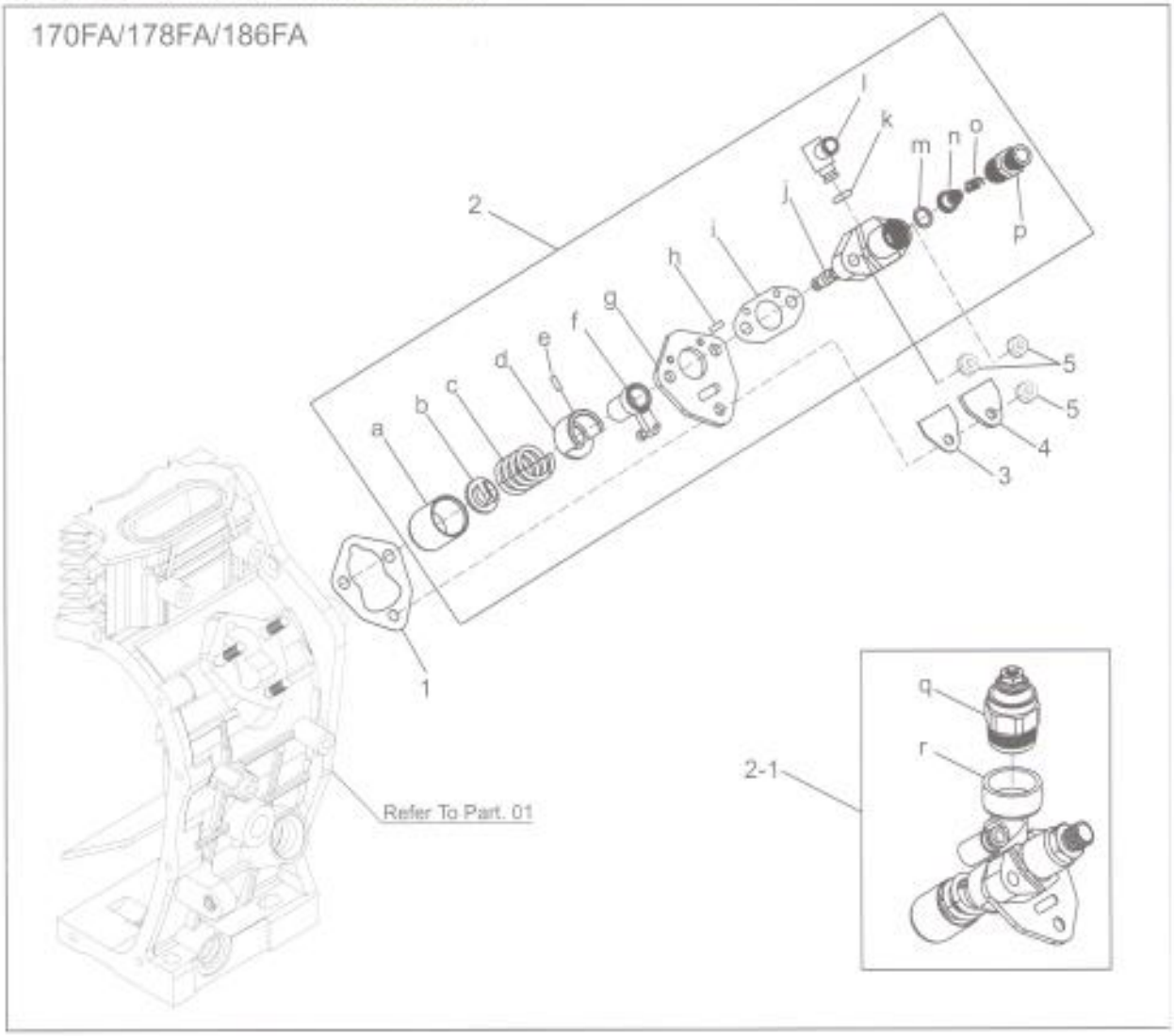


(11) Governor&Control System

NO	PART NUMBER			DESCRIPTION			QTY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170F-11300AM			Handle Bracket Assy			1		
1-1	170F-11300BM			Handle Bracket Assy			1		
1-2	170F-11300CM			Handle Bracket Assy			1		
2	5789-06014A2			Bolt M6X14			1		
3	5789-06020A2			Bolt M6X20			1		
3-1	5789-06045A2			Bolt M6X45			1		
3-2	5789-06025A2			Bolt M6X25			1		
4	170F-11006			Return Spring Ⅱ			1		
5	170F-11005			Return Spring Ⅰ			1		
6	170F-11007		186F-11007	Governor Spring			1		
A	170FA-11100			Lever Fork Assy			1		
7	117-03012			Taper Pin 3X12			2		
8	170F-11110			Lever Fork Part			1		
9	170F-11003			Lever Shaft Washer			2		
10	170F-11008			Lever Shaft Oil Seal			1		
11	6173-10125A2			Nut M10X1.25			1		
12	170F-11200			Fuel Controller Assy			1		
13	170FA-11102			Lever Shaft			1		
14	170FA-11101	178FA-11101	186FA-11101	Lever Fork			1		
15	170FA-11103			Spring			1		
16	170FA-11120			Balancer			1		
17	170F-11001			Governor Weight			2		
18	170F-11002			Pin			2		
19	170F-11004	178F-11004		Tappet Speed Regulator			1		

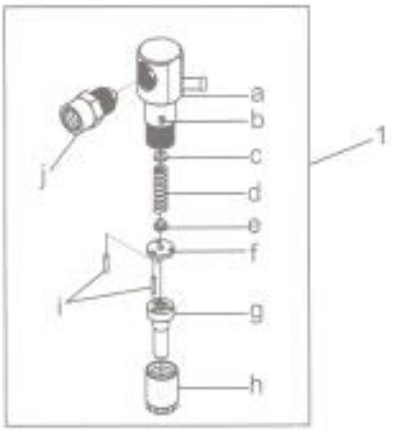
(12) Fuel Injection Pump Assembly

170FA/178FA/186FA



(13) Fuel Nozzle Assembly

170FA/178FA/186FA



(12) Fuel Injection Pump Assembly

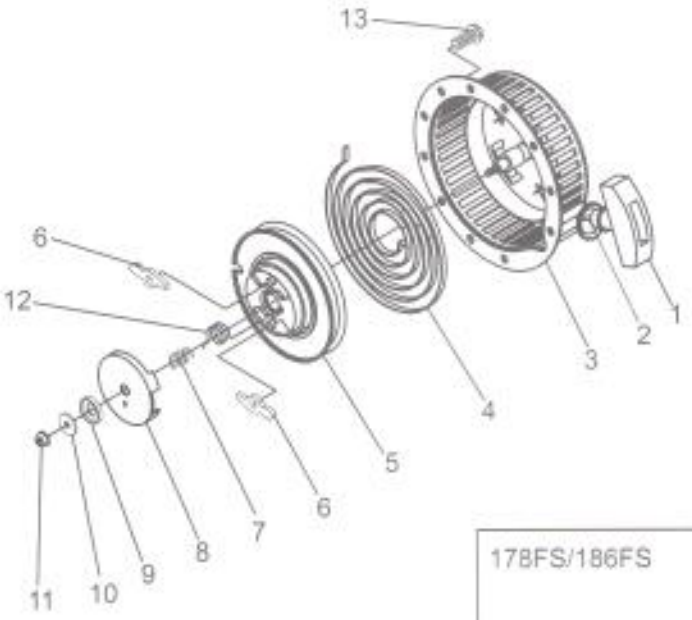
NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170F-12001			Shim Set			1~2		
2	170F-12000	178F-12000	186F-12000	Fuel Injection Pump Assy			1		
2-1	170F-12000D	178F-12000D	186F-12000D	Fuel Injection Pump Assy			1		
a	170F-12300			Tappet			1		
b	170F-12009			Spring Seat			1		
c	170F-12008			Plug Spring			1		
d	170F-12007			Spring Supporting Mass			1		
e	879.1-03008			Spring Pin 3X8			1		
f	170F-12006			Fuel Control Lever Assy			1		
g	170F-12005			Connection Board			1		
h	879.1-02006			Spring Pin 2X6			2		
i	170F-12004			Gasket			1		
j	170F-12200	178F-12200	186F-12200	Fuel Oil Pump Body&Plunger Assy			1		
k	3452.1-087150			O-Ring 5.7X1.5			1		
l	170F-12400			In-line Joint Assy			1		
m	170F-12011			Delivery Valve Seal Gasket			1		
n	170F-12100	178F-12100		Delivery Valve Assy			1		
o	170F-12012			Delivery Valve Spring			1		
p	170F-12013			Delivery Valve Holder			1		
q	170F-12500D			Solenoid Valve Assy			1		
r	170F-12601D			Solenoid Valve Seat			1		
3	170F-12003			Seal Gasket			1		
4	170F-12002			Seal Plate			1		
5	6177.1-06000A2			Nut M6			3		

(13) Fuel Nozzle Assembly

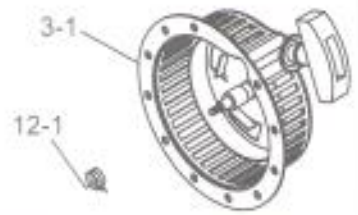
NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170FA-13000	178FA-13000	186FA-13000	Fuel Nozzle Assy			1		
a	170FA-13200			Fuel Nozzle Holder Assy			1		
b	879.1-03009	879.1-03005		Spring Pin 3X9	Spring Pin 3X5		1		
c	170FA-13007			Pressure Regulation Shim			1~3		
d	170FA-13006			Nozzle Spring			1		
e	170FA-13005			Spring Seat			1		
f	170FA-13003			Valve Spacer			1		
g	170FA-13100	178FA-13100	186FA-13100	Nozzle Valve			1		
h	170FA-13002			Nozzle Nut			1		
i	170FA-13004			Pin			2		
j	170F-13300			Filter Assy			1		

(14) Recoil Starter Assembly

170FA/178FA/186FA

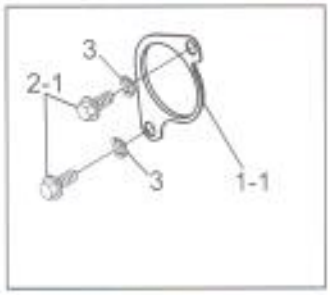


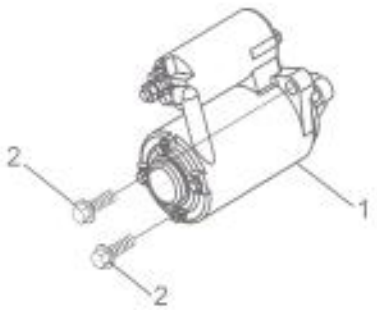
178FS/186FS



(15) Starter Assembly

170FA/178FA/186FA





(14) Recoil Starter Assembly

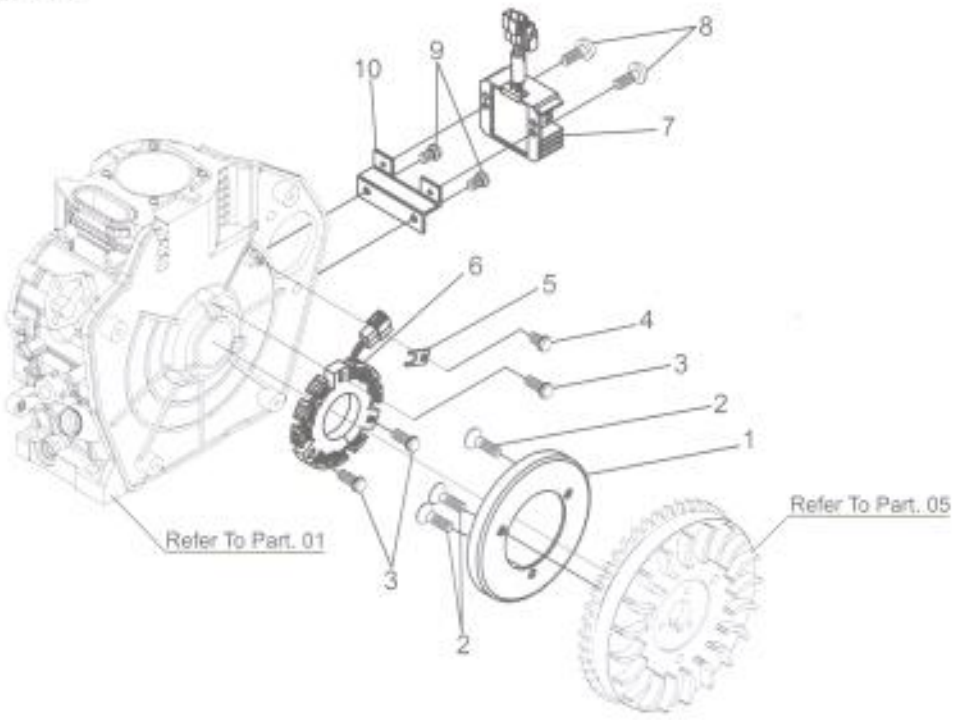
NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170F-14007	178F-14007		Starter Handle			1		
2	170F-14005	178F-14005		Starter Rope			1		
3	170F-14100	178F-14100	186F-14100	Case Assy			1		
4	170F-14006	178F-14006	186F-14006	Spiral Spring			1		
5	170F-14001	178F-14001	186F-14001	Reel			1		
6	170F-14008	178F-14008		Starting Claw			2		
7	170F-14009	178F-14009		Friction Spring			1		
8	170F-14004	178F-14004		Guide of Starting Claw			1		
9	170F-14002	178F-14002		Friction Plate			1		
10	170F-14003	178F-14003		Washer			1		
11	6187.1-06000A2			Nut M6			1		
12	170F-14011	178F-14011		Return Spring			1		
13	5789-06008A2			Bolt M6X8			4		
178FS/186FS									
3-1		178FS-14100	186FS-14100	Case Assy				1	
12-1		178FS-14011		Return Spring				1	

(15) Starter Assembly

NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170F-15100A			Starter Motor Assy(0.80kW)			1		
	170F-15100B			Starter Motor Assy(0.90kW)			1		
1-1	170F-15200			Cover of Starting Motor Hole			1		
2	5789-10030A2			Bolt M10X30			2		
2-1	5783-10020A2			Bolt M10X20			2		
3	93-10A			Washer 10			2		
178FS/186FS									
1-2		178FS-15100		Starter Motor Assy(0.80kW)				1	

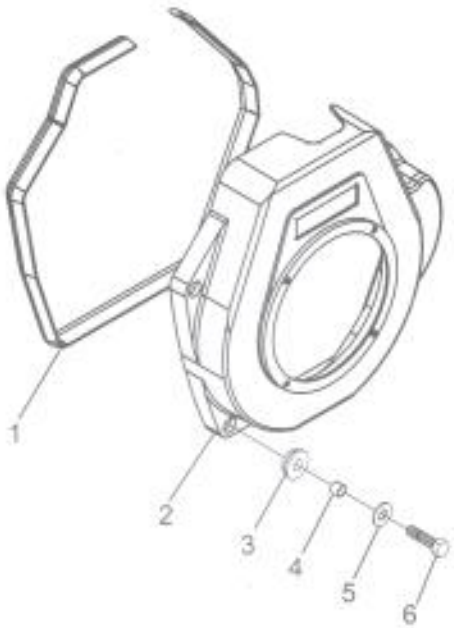
(16) Dynamo Assembly

170FA/178FA/186FA



(17) Cooling Device Assembly

170FA/178FA/186FA



178F-D(3500SE)
186F-D(5000SE)

2-1

(16) Dynamo Assembly

NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170F-16100			Rotor Parts of the Dynamo			1		
2	819.1-06014A3			Screw M6X14			3		
3	5789-06020A2			Bolt M6X20			3		
4	5783-06012A2			Bolt M6X12			1		
5	170F-16001			Cord Clamp			1		
6	170F-16200			Stator Parts of the Dynamo			1		
7	170F-16400A			Regulator			1		
	170F-16400B			Regulator			1		
8	823-06012A3			Screw M6X12			2		
9	5789-06014A2			Bolt M6X14			2		
10	170F-16301			Bracket			1		

(17) Cooling Device Assembly

NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170F-17003	178F-17003	186F-17003	Fan Case Seal			1		
2	170F-17100	178F-17100	186F-17100	Fan Case Assy			1		
2-1		178F-17100D	186F-17100D	Fan Case Assy				1	
3	170F-17002			Cushion,Rubber			4		
4	170F-17001			Collar			4		
5	96.1-06A			Flat Washer 6			4		
6	5783-06022A2		5783-06025A2	Bolt M6X22		Bolt M6X25	4		
178FS/186FS									
2		178FS-17100	186FS-17100	Fan Case Assy				1	

17.Easy destroyed and other parts

17-1.Easy destroyed parts

NO	PART NUMBER			DESCRIPTION			Q'TY			Whereabouts		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
1	170F-10300	178F-10300	186F-10300	Filter Element Assy			1			(10) Fuel Tank&Fuel Pipe Assy		
2	170F-07100		186F-07100	Air Cleaner Element Assy			1			(7) Air Cleaner Assy		
3	170FA-13100	178FA-13100	186FA-13100	Nozzle Valve			1			(13) Fuel Nozzle Assy		
4	170FA-02009			Spacer			1			(2) Cylinder Head Assy		
5	170F-14000	178F-14000	186F-14000	Recoil Starter Assy			1			(14) Recoil Starter Assy		
6	170FA-03003		186FA-03003	Bonnet Gasket			1			(3) Cylinder Head Bonnet Assy		

17-2. O-Ring Sets

NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
a	170F-01008	178F-01008	186F-01008	Rectangle Ring			1		
b	3452.1-190265			O-Ring 19X2.65			2		
c	3452.1-093150			O-Ring 9.3X1.5			1		
d	3452.1-190265			O-Ring 19X2.65			1		
e	3452.1-345180			O-Ring 34.5X1.8			1		

17-3. Bearings

NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
g	276-6306P5	276-6307P5	276-6308P5	Ball Bearing 6306P5	6307P5	6308P5	1		
h	276-6205P5	276-6206P5	276-6207P5	Ball Bearing 6205P5	6206P5	6207P5	1		
i	290-HKH0810			Needle Bearing 081410			2		
j	290-HK1512			Needle Bearing 152112			1		
k	276-6202P6		276-6203P6	Ball Bearing 6202P6		6203P6	2		

17-4. Oil Seals

NO	PART NUMBER			DESCRIRTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
l	9877.1-254210	9877.1-304510	9877.1-355010	Oil Seal 25X42X10	Seal 30X45X10	Seal 35X50X10	1		
m	9877.1-304508		9877.1-355008	Oil Seal 30X45X8		Seal 35X50X8	1		
n	170F-11008			Lever Shaft Oil Seal			1		
o	170F-02006	178F-02006	186F-02006	Valve Stem Seal			2		

17-5. Gasket sets

NO	PART NUMBER			DESCRIPTION			Q'TY		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
p	170F-01100			Oil Plug Seal Assy			1		
q	170F-12001			Shim Set			1~2		
r	170F-12003			Seal Gasket			1		
s	170F-01015	178F-01015	186F-01015	Crank Case Gasket			1		
t	170F-02011	178F-02011	186F-02011	Air Intake Gasket			1		
u	170F-02012		186F-02012	Muffler Gasket			1		
v	170FA-03003		186FA-03003	Bonnet Gasket			1		
w	170F-07001		186F-07001	Air Cleaner Gasket			1		
x	170F-10007			Filter Gasket			1		
y	170F-10405			Fuel Tank Cock Gasket			1		
z	170FA-01013	178FA-01013	186FA-01013	Cylinder Head Gasket			1		

18.Valve Clearance

Unit:mm

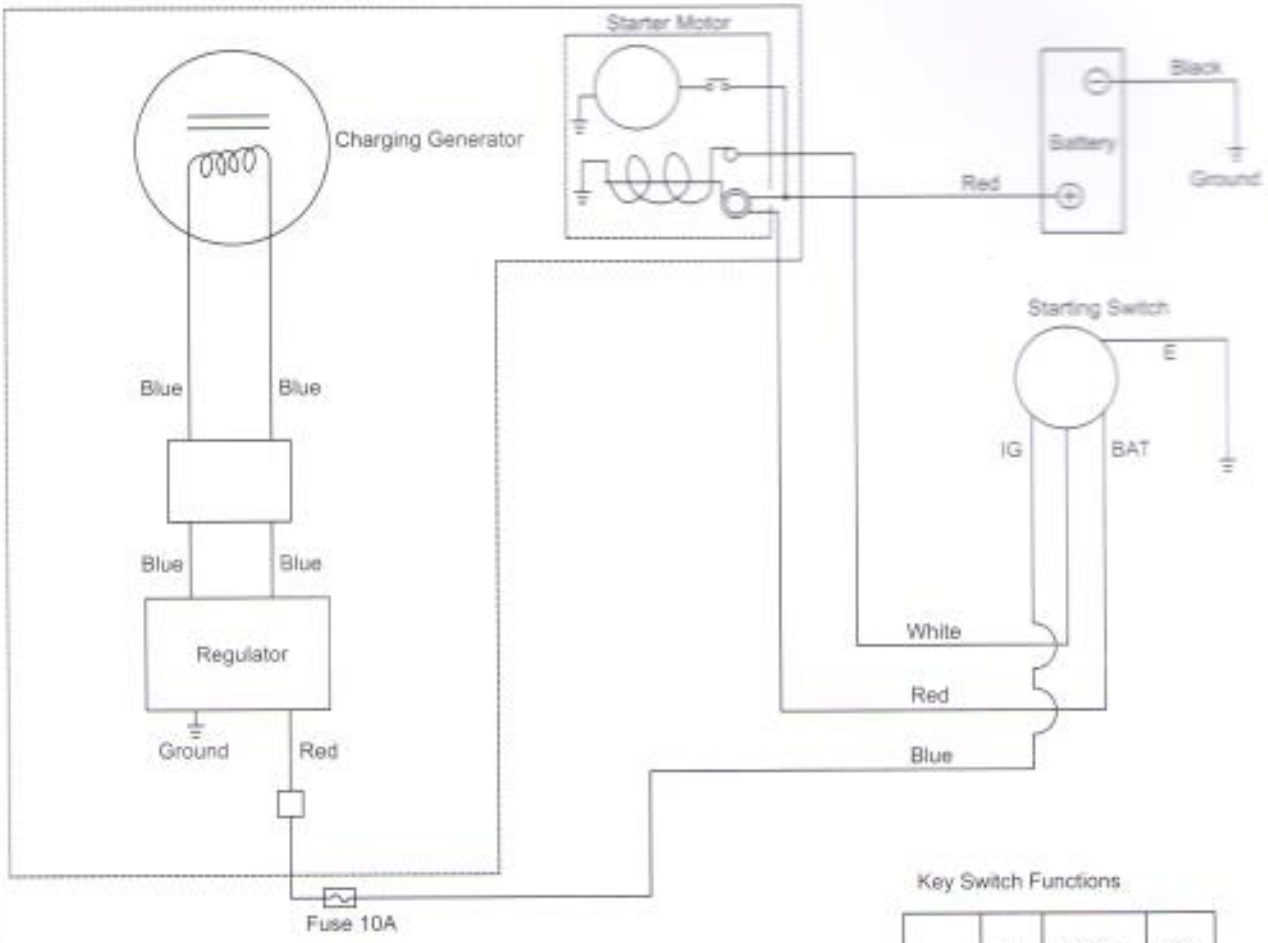
Model / Description	170FA	178FA	186FA
Intake valve	0.10~0.15 (Cold state)		
Exhaust valve	0.10~0.15 (Cold state)		

19. Torques of main bolt&nut

Unit:N.m

NO	DESCRIPTION			SPECIFICATION			TORQUE		
	170FA	178FA	186FA	170FA	178FA	186FA	170FA	178FA	186FA
①	Connecting rod screw			2-M7X1.0		2-M8X1.0	28~30		42~46
②	Cylinder head nut			4-M8X1.25	4-M9X1.25	4-M10X1.5	28~32	42~46	58~62
③	Fly wheel nut			1-M16X1.5		1-M18X1.5	100~110		210~230
④	Nozzle retainer nut			2-M6X1.0			10~12		
⑤	Rocker arm screw			2-M6X1.0		2-M8X1.25	13~15		22~25
⑥	Standard bolt&nut			M6			7~10		
⑦	Standard bolt&nut			M8			18~20		
⑧	Head stud bolts(stud side)			4-M8X1.25	4-M9X1.25	4-M10X1.5	13~15	15~17	25~29
⑨	FO nozzle case nut			1-0.605-40UNS-2B			40~45		
⑩	FO pump stud bolts(stud side)			1-M14X1.5			30~35		

20. Electric schematic diagram of electric starting



Charging Generator	Model	GP9587
	Output Current	1.8~8.0A(DC)
	At Charging Start	≥1600rpm (13V)
	Allowable Ambient Temperature	-20~+65° C
	Combination of Regulator (model)	RS2190
Starter Motor		12V-0.8kW

Key Switch Functions

	E	IG/BAT	ST
OFF	○		
ON		○	
START		○	○

OFF ON START

Part Introduction

1) Battery: 170FA-E:18~24AH
178FA-E:24~36AH
186FA-E:36~45AH

2) Battery Cable: ⊕&⊖ (BVR16)