

A FEW WORDS ABOUT SAFETY

SERVICE INFORMATION

The service and repair information contained in this manual is intended for use by qualified, professional technicians. Attempting service or repairs without the proper training, tools, and equipment could cause injury to you or others. It could also damage the engine or create an unsafe condition.

This manual describes the proper methods and procedures for performing service, maintenance, and repairs. Some procedures require the use of special tools. Any person who intends to use a replacement part, service procedure, or a tool that is not recommended by Honda, must determine the risks to their personal safety and the safe operation of the engine.

If you need to replace a part, use genuine Honda parts with the correct part number, or an equivalent part. We strongly recommend that you do not use replacement parts of inferior quality.

For Your Customer's Safety

Proper service and maintenance are essential to the customer's safety and the reliability of the engine. Any error or oversight while servicing an engine can result in faulty operation, damage to the engine, or injury to others.

For Your Safety

Because this manual is intended for the professional service technician, we do not provide warnings about many basic shop safety practices (eg, Hot parts – wear gloves). If you have not received shop safety training or do not feel confident about your knowledge of safe servicing practices, we recommend that you do not attempt to perform the procedures described in this manual.

Some of the most important general service safety precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing service and repair procedures. Only you can decide whether or not you should perform a given task.

Important Safety Precautions

- Make sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and using safety equipment. When performing any service task, be especially careful of the following:
 - ☐ Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
 - ☐ Protect your eyes by using proper safety glasses, goggles, or face shields any time you hammer, drill, grind, or work around pressurized air or liquids, and springs or other stored-energy components. If there is any doubt, put on eye protection.
 - ☐ Use other protective wear when necessary, for example, gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
- Make sure the engine is off before you begin any servicing procedures, unless the instructions tell you to do otherwise. This will help eliminate several potential hazards:
 - ☐ Carbon monoxide poisoning from engine exhaust. Be sure there is adequate ventilation whenever you run the engine.
 - ☐ Burns from hot parts. Let the engine and exhaust system cool before working in those areas.
 - ☐ Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers, and clothing are out of the way.
- Gasoline vapors are explosive. To reduce the possibility of a fire or explosion, be careful when working around gasoline.
 - ☐ Use only a nonflammable solvent, not gasoline, to clean parts.
 - ☐ Never drain or store gasoline in an open container.
 - ☐ Keep all cigarettes, sparks, and flames away from all fuel-related parts.

WARNING

Improper service or repairs can create an unsafe condition that can cause your customer or others to be seriously hurt or killed.

Follow the procedures and precautions in this manual and other service materials carefully.

WARNING

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.

Follow the procedures and precautions in this manual carefully.

NAVIGATION QUICKTIPS – ELECTRONIC SHOP MANUAL

- ⏪ to the 1st page of the manual
- ⏩ Back one page
- ⏪ Forward one page
- ⏩ to the last page of the manual

File Name: Shows the Shop Manual Model/Serial Number that you are looking at:
Eg3500 (410001–4110497)

Page Magnification

Print

'+' click to open more bookmarks
'-' click to condense the bookmarks

Clicking on a bookmark will take you to that page

CONTROL BOX

DISASSEMBLY/REASSEMBLY

GREEN BOX LINKS
Click here to go to this page in the manual

Retrace your steps:

⏪ backward, or ⏩ Forward within the CD.

Click INDEX to go BACK to the serial number page



Use hand to grab the page and move it up/down; left/right, depending on page view magnification.



To magnify page image: Click on button, place the magnifying glass on the area to zoom in and click. Hold the CTRL key and click to zoom out.

SPECIFICATIONS

Model	GSV190
Type	4-stroke, overhead camshaft single cylinder
Displacement	187 cc (11.4 cu-in)
Bore x stroke	69 x 50 mm (2.7 x 2.0 in)
Maximum horsepower	4.8 kW (6.5 HP) at 3,600 rpm
Maximum torque	13.2 N·m (1.35 kg/m, 9.74 lb-ft) at 2,500 rpm
Compression ratio	8.5 : 1
Fuel consumption	313g/kWh (230g / HPh, 0.51 lb/HPh)
Cooling system	Forced-air
Ignition system	Transistorized magneto ignition
Ignition timing	20° B.T.D.C
Spark plug	BPR6ES (NGK)
Carburetor	Horizontal type, butterfly valve
Governor	Centrifugal mechanical governor
Lubrication system	Splash
Oil capacity	0.55 ℓ. (0.58 US qt, 0.48 Imp qt)
Recommended operating ambient temperature	-5°C–40°C (23°F–104°F)
Starting system	Recoil starter
Stopping system	Ignition primary circuit ground
Fuel used	Unleaded gasoline with a pump octane number 86 or higher
Fuel tank capacity	1.1 ℓ (0.29 US gal, 0.24 Imp gal)
PTO shaft rotation	Counterclockwise (from PTO shaft side)
Noise level	76dBa at 7m

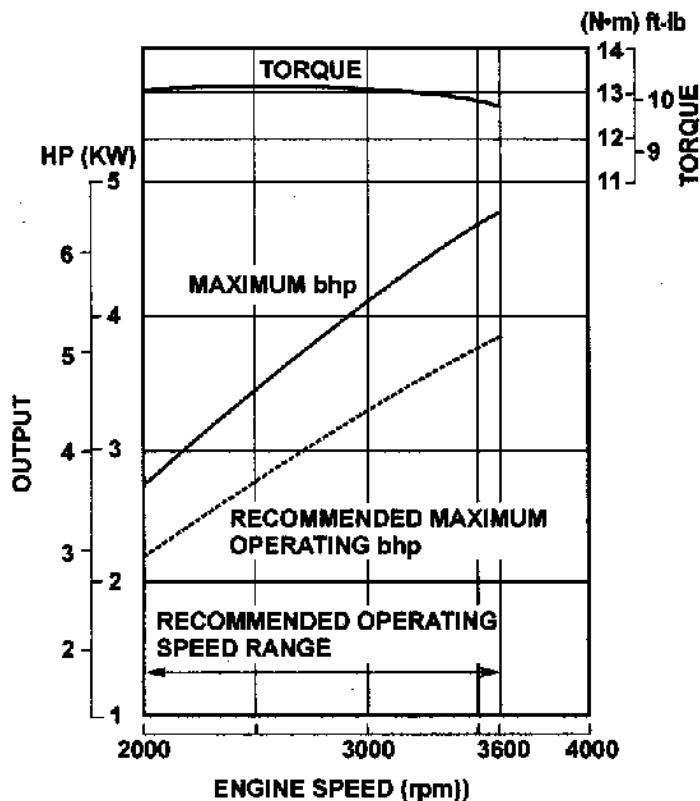
DIMENSIONS AND WEIGHTS

GSV190

PTO type Item	N1	N2	N3	N4	N5
Overall length	370.5 mm (14.6 in)	370.5 mm (14.6 in)	370.5 mm (14.6 in)	370.5 mm (14.6 in)	370.5 mm (14.6 in)
Overall width	342.5 mm (13.5 in)	342.5 mm (13.5 in)	342.5 mm (13.5 in)	342.5 mm (13.5 in)	342.5 mm (13.5 in)
Overall height	368 mm (14.5 in)	349 mm (13.7 in)	368 mm (14.5 in)	349 mm (13.7 in)	366 mm (13.7 in)
Dry weight	11.2 kg (24.7 lb)	11.2 kg (24.7 lb)	11.2 kg (24.7 lb)	12.3 kg (27.1 lb)	12.3 kg (27.1 lb)
Operating weight	12.5 kg (27.6 lb)	12.5 kg (27.6 lb)	12.5 kg (27.6 lb)	13.6 kg (30.0 lb)	13.6 kg (30.0 lb)

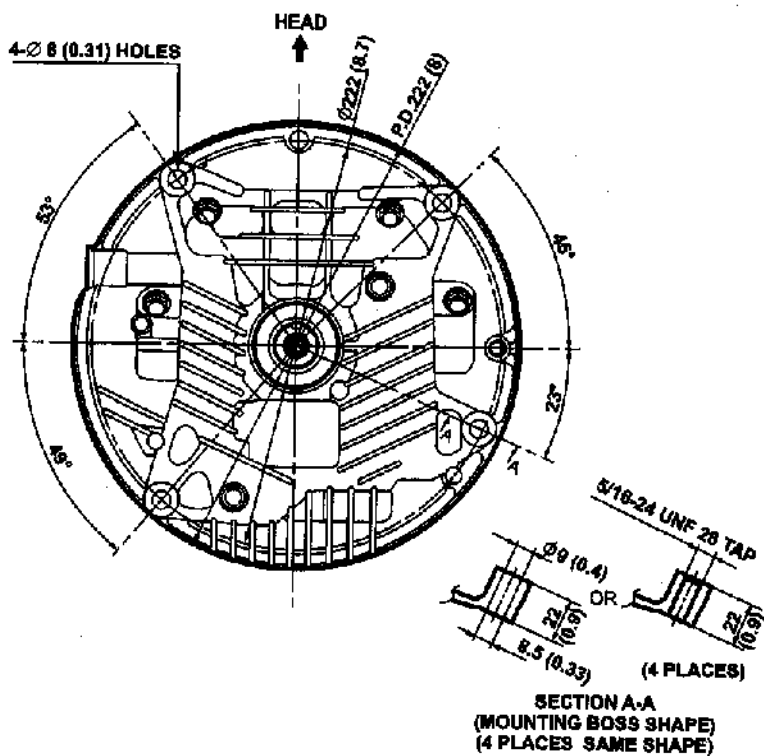
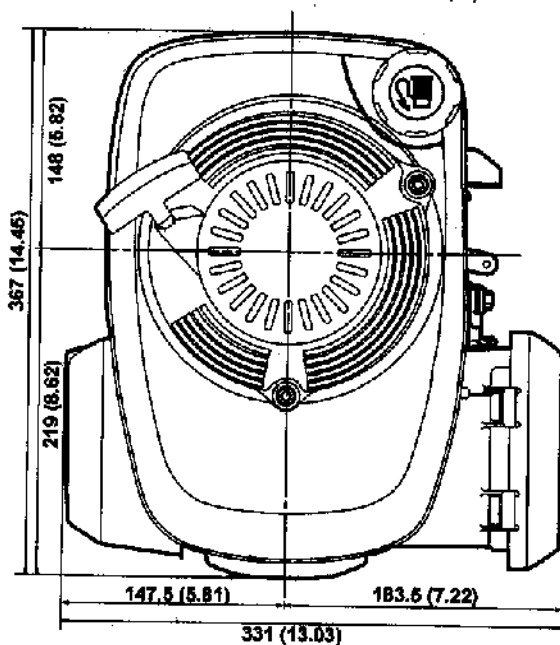
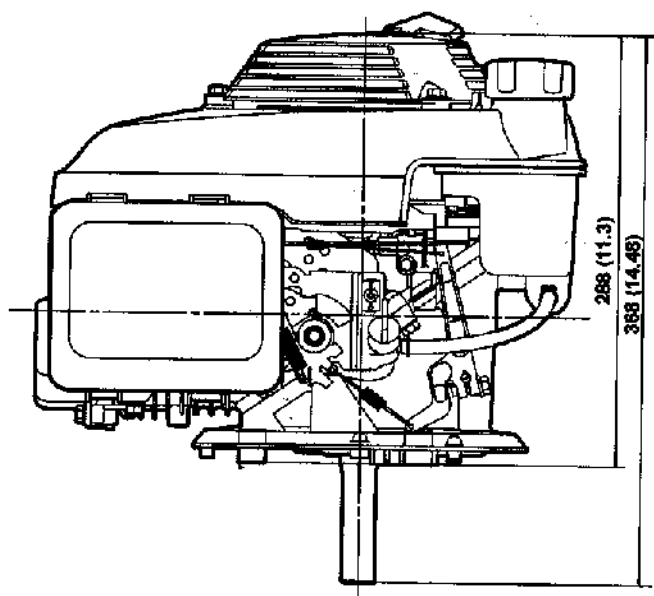
PERFORMANCE CURVES

Power curves are according to SAE standard No. J-1995. For practical operations, the bhp load and engine speed should not exceed the limit defined by the "Recommended Maximum Operating bhp" curve. Continuous operation should not exceed 80% of the "Maximum bhp".



DIMENSIONAL DRAWINGS

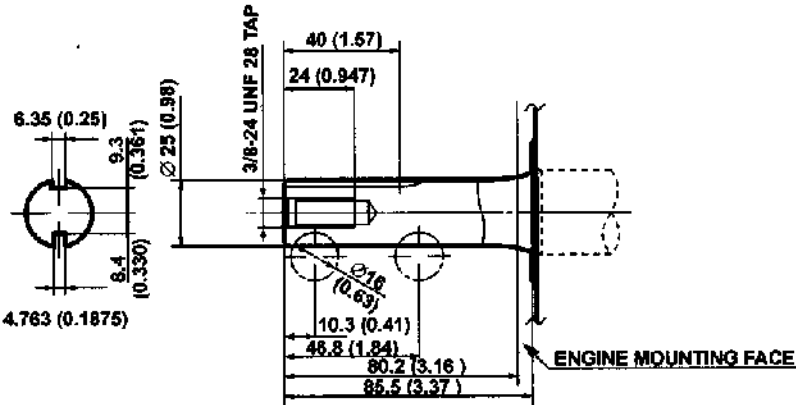
Unit: mm (in)



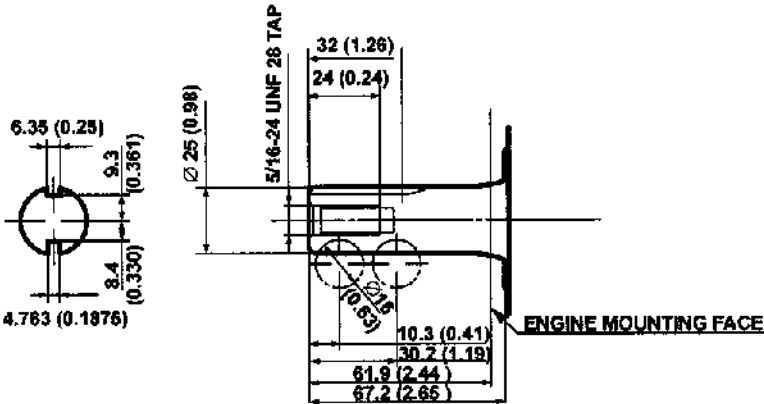
PTO DIMENSIONAL DRAWINGS

Unit: mm (in)

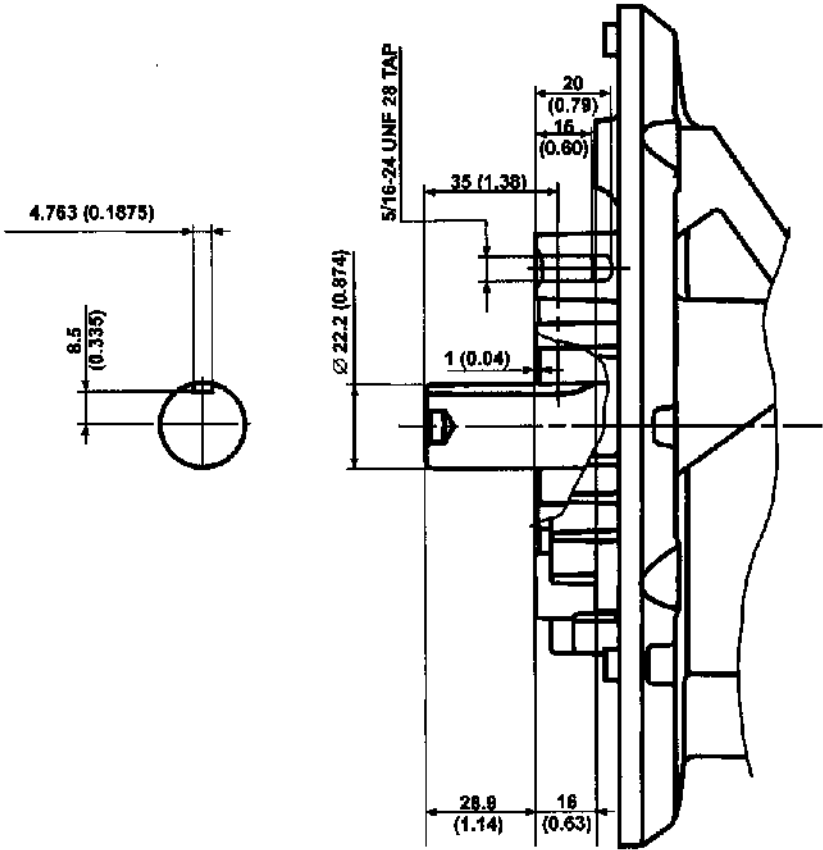
N3 type



N4 type

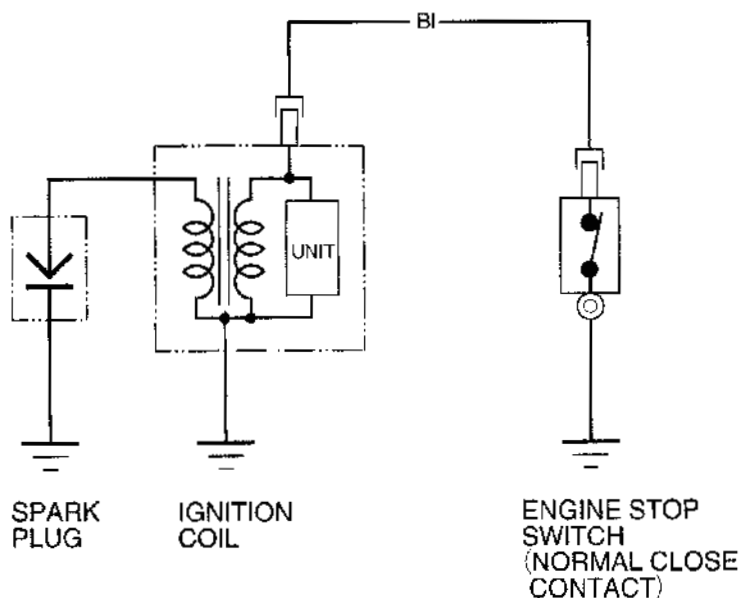


N5 type



WIRING DIAGRAMS

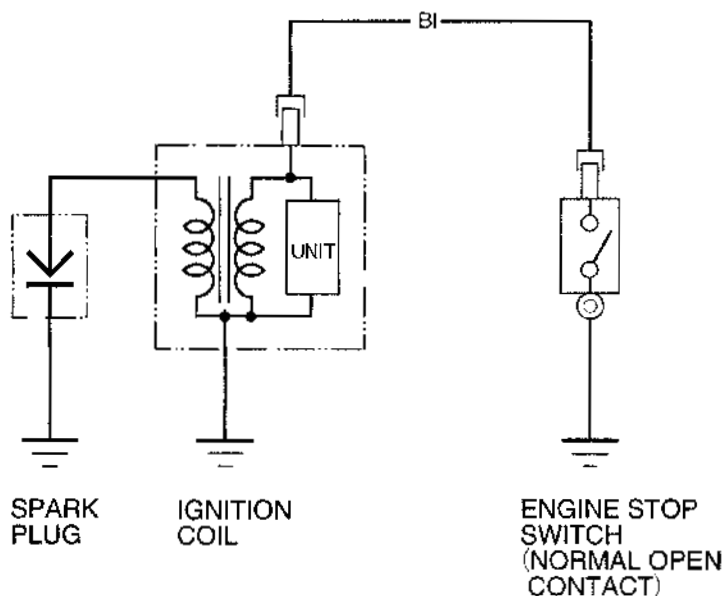
• With flywheel brake



Bl	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray

ENGINE	SWITCH CONTACT
RUN	OPEN
STOP	CLOSE

• Without flywheel brake



Bl	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray

ENGINE	SWITCH CONTACT
RUN	OPEN
STOP	CLOSE

THE IMPORTANCE OF PROPER SERVICING

Proper servicing is essential to the safety of the operator and the reliability of the engine. Any error or oversight made by the technician while servicing can easily result in faulty operation, damage to the engine or injury to the operator.

WARNING

**Improper servicing can cause an unsafe condition that can lead to serious injury or death.
Follow the procedures and precautions in this shop manual carefully.**

Some of the most important precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing maintenance or repairs. Only you can decide whether or not you should perform a given task.

WARNING

**Failure to follow maintenance instructions and precautions can cause you to be seriously hurt or killed.
Follow the procedures and precautions in this shop manual carefully.**

IMPORTANT SAFETY PRECAUTIONS

Be sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and safety equipment. When performing maintenance or repairs, be especially careful of the following:

- **Read the instructions before you begin, and be sure you have the tools and skills required to perform the tasks safely.**

Be sure the engine is off before you begin any maintenance or repairs. This will reduce the possibility of several hazards:

- **Carbon monoxide poisoning from engine exhaust.**

Be sure there is adequate ventilation whenever you run the engine.

- **Burns from hot parts.**

Let the engine cool before you touch it.

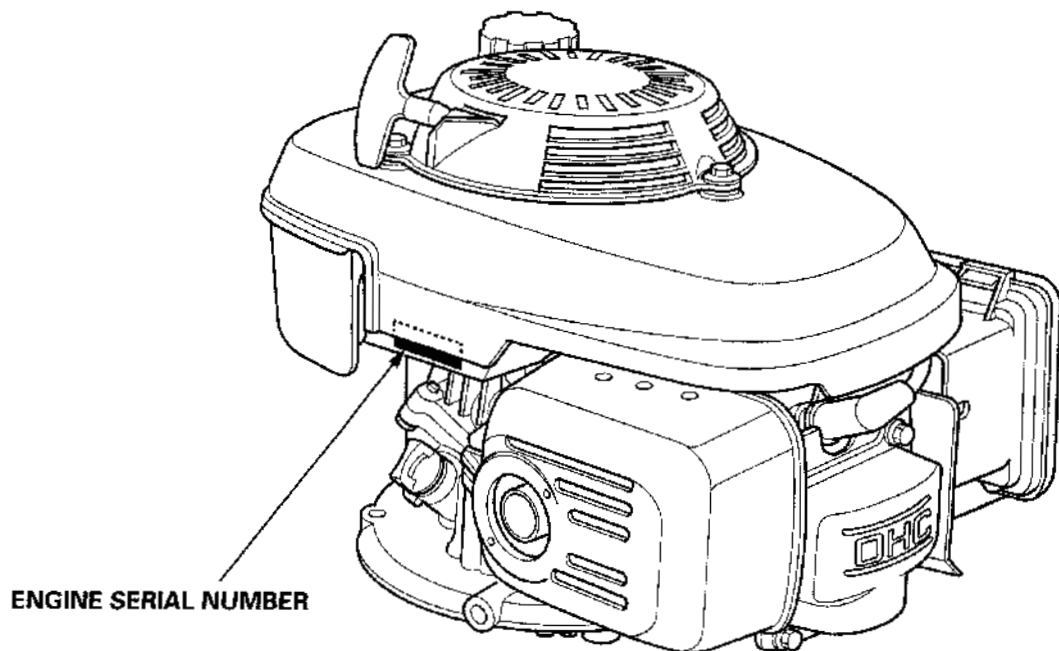
- **Injury from moving parts.**

Do not run the engine unless the instruction tells you to do so. Even then, keep your hands, fingers, and clothing away.

To reduce the possibility of a fire or explosion, be careful when working around gasoline. Use only a nonflammable solvent, not gasoline, to clean parts. Keep all cigarettes, sparks, and flames away from all fuel-related parts.

SERIAL NUMBER LOCATION

The engine serial number is stamped on the cylinder barrel. Refer to this when ordering parts or making technical inquiries.

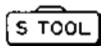


SERVICE RULES

1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may damage the engine.
2. Use the special tools designed for the product.
3. Install new gaskets, O-rings, etc. when reassembling.
4. When torquing bolts or nuts, begin with larger-diameter or inner bolts first and tighten to the specified torque diagonally, unless a particular sequence is specified.
5. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
6. After reassembly, check all parts for proper installation and operation.
7. Many screws used in this machine are self-tapping. Be aware that cross-threading or overtightening these screws will strip the threads and ruin the hole.
8. Use only metric tools when servicing this engine. Metric bolts, nuts and screws are not interchangeable with nonmetric fasteners. The use of incorrect tools and fasteners will damage the engine.
9. Follow the instructions represented by these symbols when they are used:



:Apply grease



:Use special tool



:Apply oil

○ x ○ (○): Indicates the diameter, length, and number of the flange bolt used.

MAINTENANCE STANDARDS

Part	Item	Standard	Service limit
Engine	Maximum speed	3,100 ± 150 rpm	—
	Idle speed	1,700 ± 150 rpm	—
	Cylinder compression	0.49 MPa (5.0 kgf/cm ² , 71 psi) at 600 rpm	—
Carburetor	Main jet	#70	—
	Float height	9.2 mm (0.36 in)	—
	Pilot screw opening	1-5/8 turns out	—
Spark plug	Gap	0.7 - 0.8 mm (0.028 - 0.031 in)	—

MAINTENANCE STANDARDS

Part	Item	Standard	Service limit
Spark plug	Gap	0.7 – 0.8 mm (0.028 – 0.031 in)	—
Ignition coil	Resistance	Primary coil 1.0 – 1.2 Ω	—
		Secondary coil 10.6 – 12.8 k Ω	—
	Air gap (at flywheel)	0.2 – 0.6 mm (0.008 – 0.024 in)	—

MAINTENANCE STANDARDS

Part	Item		Standard	Service limit
Valves	Valve clearance (cold)	IN	0.15 ± 0.04 mm	—
		EX	0.20 ± 0.04 mm	—
	Stem O. D.	IN	5.48 mm (0.216 in)	5.318 mm (0.2094 in)
		EX	5.44 mm (0.214 in)	5.275 mm (0.2077 in)
	Guide I. D.	IN/EX	5.50 mm (0.217 in)	5.572 mm (0.2194 in)
	Seat width	IN/EX	0.7 mm (0.028 in)	1.8 mm (0.07 in)
	Spring free length	IN/EX	34.0 mm (1.34 in)	32.5 mm (1.28 in)
	Valve head diameter	IN	25.0 mm (0.98 in)	—
		EX	24.0 mm (0.94 in)	—

MAINTENANCE STANDARDS

Part	Item	Standard	Service limit
Connecting rod	Small end I. D. Big end I. D. Big end oil clearance Big end axial clearance	13.005 mm (0.5120 in) 30.02 mm (1.1819 in) 0.040 – 0.063 mm (0.0016 – 0.0025 in) 0.1 – 0.4 mm (0.004 – 0.016 in)	13.07 mm (0.515 in) 30.066 mm (1.1837 in) 0.12 mm (0.005 in) 0.8 mm (0.031 in)
Crankshaft	Main journal O. D. PTO side Flywheel side Crank pin O. D.	27.993 mm (1.1021 in) 25.393 mm (0.9997 in) 29.980 mm (1.1803 in)	27.933 mm (1.0997 in) 25.333 mm (0.9974 in) 29.92 mm (1.1780 in)
Cam pulley	Cam height Cam pulley I. D. (Bearing) Cam pulley shaft O. D.	37.394 mm (1.4722 in) 10.027 mm (0.3948 in) 9.987 mm (0.3932 in)	37.369 mm (1.4712 in) 10.075 mm (0.3967 in) 9.920 mm (0.3906 in)
Rocker arm	Rocker arm I. D. Rocker arm shaft O. D. Rocker arm shaft bearing I. D. Rocker arm shaft bearing-to-rocker arm shaft clearance	6.000 mm (0.2362 in) 5.990 mm (0.2358 in) 6.000 mm (0.2362 in) 0.010–0.058 mm (0.0004–0.0023 in)	6.043 mm (0.2379 in) 5.953 mm (0.2344 in) 6.043 mm (0.2379 in) 0.07 mm (0.003 in)
Flywheel brake	Brake shoe thickness	—	3.0 mm (0.12 in)

MAINTENANCE STANDARDS

Part	Item	Standard	Service limit	
Piston	Skirt O. D.	68.985 mm (2.7159 in) 0.031 - 0.070 mm (0.0012 - 0.0028 in)	68.885 mm (2.7120 in) 0.12 mm (0.005 in)	
	Piston-to-cylinder clearance	0.031 - 0.070 mm (0.0012 - 0.0028 in)	0.12 mm (0.005 in)	
	Piston pin bore I. D.	13.002 mm (0.5119 in)	13.048 mm (0.5137 in)	
	Pin O. D.	13.000 mm (0.5118 in)	12.954 mm (0.5100 in)	
Piston ring	Ring width	Top/second Oil	1.5 mm (0.06 in) 2.5 mm (0.10 in)	1.37 mm (0.054 in) 2.37 mm (0.093 in)
	Ring side clearance	Top Second	0.035 - 0.065 mm (0.0013 - 0.0026 in) 0.015 - 0.049 mm (0.0006 - 0.0019 in)	0.15 mm (0.006 in) 0.15 mm (0.006 in)
	Ring end gap	Top Second Oil	0.20 - 0.35 mm (0.008 - 0.014 in) 0.30 - 0.45 mm (0.012 - 0.018 in) 0.15 - 0.35 mm (0.006 - 0.014 in)	1.0 mm (0.04 in) 1.0 mm (0.04 in) 1.0 mm (0.04 in)
	Cylinder	Sleeve I. D.	69.000 mm (2.7165 in)	69.165 mm (2.7230 in)
	Cylinder barrel	Main journal I. D.	25.420 mm (1.0008 in)	25.466 mm (1.0026 in)
		Crankshaft axial clearance	0.15 - 0.75 mm (0.006 - 0.030 in)	1.0 mm (0.04 in)
Oil pan	Main journal I. D.	28.020 mm (1.1031 in)	28.066 mm (1.1050 in)	

TORQUE VALUES

Item	Thread Dia. (mm)	Torque		
		N•m	kgf•m	lbf•ft
Oil pan bolt	M6 x 1.0 (CT)	12	1.2	9
Connecting rod bolt	M7 x 1.0	12	1.2	9
Valve adjusting lock nut	M5 x 0.5	8	0.8	5.8
Cylinder head cover bolt	M6 x 1.0	12	1.2	9
Flywheel nut	M14 x 1.5	75	7.6	55
Governor arm nut	M6 x 1.0	10	1.0	7
Breather cover bolt	M6 x 1.0	12	1.2	9
Air cleaner case bolt	M6 x 1.0 (CT)	10	1.0	7
	M6 x 1.0	10	1.0	7
Muffler bolt	M6 x 1.0 (CT)	12	1.2	9
Recoil starter nut	M6 x 1.0	8.5	0.85	6.1
Fan cover stud bolt	M6 x 1.0	12	1.2	9
Fuel valve bracket screw	M5 x 0.8	3	0.3	2.2
Governor holder bolt	M6 x 1.0	12	1.2	9
Spark plug	M14 x 1.25	20	2.0	14

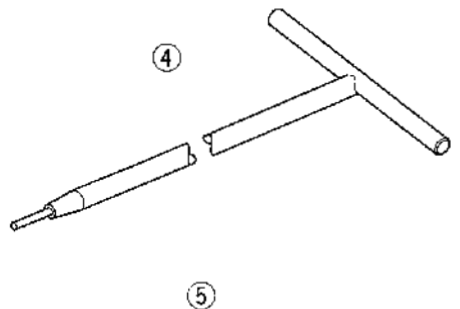
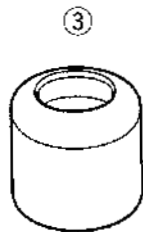
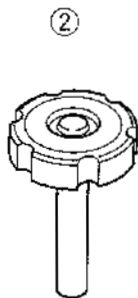
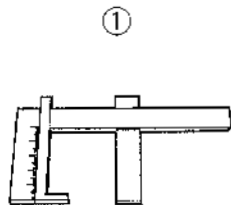
- NOTE:
- Use standard torque values of fasteners that are not listed in this table.
 - (CT) indicates a self-tapping bolt.

• STANDARD TORQUE VALUE

Item	Thread Dia. (mm)	Torque		
		N•m	kgf•m	lbf•ft
Screw	5 mm	4	0.4	2.9
	6 mm	9	0.9	6.5
Bolt and nut	5 mm	5	0.5	3.6
	6 mm	10	1.0	7
	8 mm	21	2.1	15
	10 mm	34	3.5	25
	12 mm	54	5.5	40
Flange bolt and nut	6 mm	12	1.2	9
	8 mm	26	2.7	20
	10 mm	39	4.0	29
SH bolt	6 mm	9	0.9	6.5

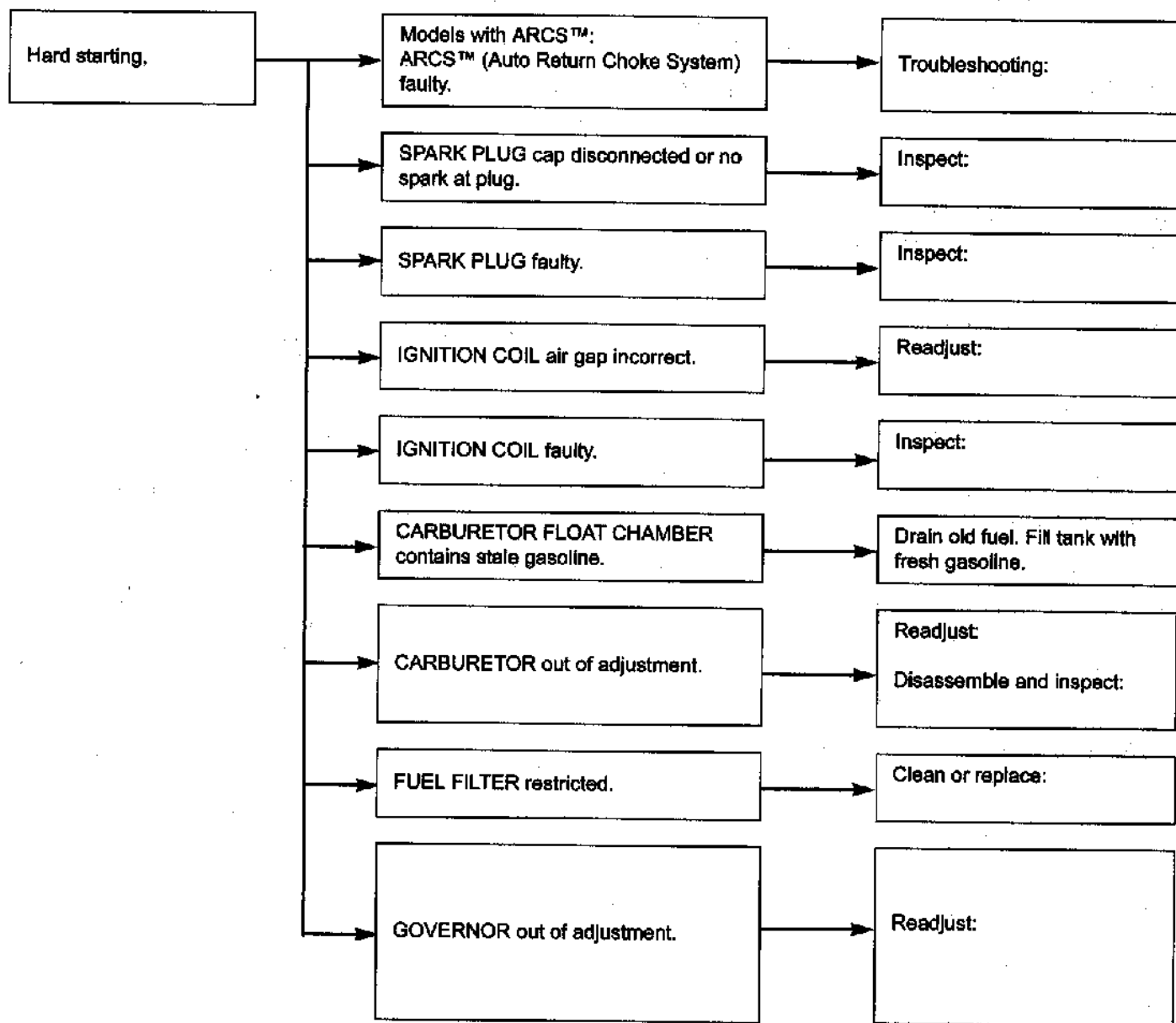
SPECIAL TOOLS

Tool name	Tool number	Application
1. Float level gauge	07701-0010000	Carburetor float level inspection
2. Valve adjusting wrench B	07708-0030400	Valve clearance adjustment
3. Valve seat cutter 45° $\varnothing 27.2$	07780-0010200	Valve seat reconditioning (IN/EX)
4. Cutter holder	07981-VA20100 or 07981-VA20101	Valve seat reconditioning
5. Cleaning brush	07998-VA20100	Combustion chamber cleaning



TROUBLESHOOTING

a. GENERAL SYMPTOMS AND POSSIBLE CAUSES



Engine lacks power



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graph LR; A[Engine lacks power] --> B[Models with ARCS™: ARCS™ (Auto Return Choke System) faulty.]; A --> C[SPARK PLUG faulty.]; A --> D[AIR CLEANER restricted]; A --> E[SPARK ARRESTER restricted.]; A --> F[GOVERNOR out of adjustment.]; A --> G[VALVE CLEARANCE incorrect.]; A --> H[VALVE OR VALVE SEAT worn or damaged.]; A --> I[CYLINDER, PISTON, or PISTON RINGS worn.]; B --> J[Troubleshooting:]; C --> K[Inspect:]; D --> L[Clean:]; E --> M[Clean:]; F --> N[Readjust:]; G --> O[Readjust:]; H --> P[Inspect and correct:]; I --> Q[Disassemble and inspect:];
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Models with ARCS™:
ARCS™ (Auto Return Choke System)
faulty.

Troubleshooting:

SPARK PLUG faulty.

Inspect:

AIR CLEANER restricted

Clean:

SPARK ARRESTER restricted.

Clean:

GOVERNOR out of adjustment.

Readjust:

VALVE CLEARANCE incorrect.

Readjust:

VALVE OR VALVE SEAT worn or
damaged.

Inspect and correct:

CYLINDER, PISTON, or PISTON RINGS
worn.

Disassemble and inspect:

Poor performance at
high speed.

AIR CLEANER restricted

Clean:

Models with ARCS™:
ARCS™ (Auto Return Choke System)
faulty.

Troubleshooting:

SPARK PLUG faulty.

Inspect:

GOVERNOR out of adjustment.

Readjust:

CARBURETOR out of adjustment.

Readjust:

Disassemble and inspect:

Poor performance at
low speed.

AIR CLEANER restricted

Clean:

Models with ARCS™:
ARCS™ (Auto Return Choke System)
faulty.

Troubleshooting:

GOVERNOR out of adjustment.

Readjust:

CARBURETOR out of adjustment.

Readjust:

Disassemble and inspect:

Engine will not rev sufficiently.

Models with ARCS™:
ARCS™ (Auto Return Choke System)
faulty.

Troubleshooting:

SPARK PLUG faulty.

Inspect:

CARBURETOR out of adjustment.

Readjust:

Disassemble and inspect:

GOVERNOR out of adjustment.

Readjust:

IGNITION COIL faulty.

Inspect:

SPARK ARRESTER restricted.

Clean:

Poor performance at high speed.

AIR CLEANER restricted

Clean:

Models with ARCS™:
ARCS™ (Auto Return Choke System)
faulty.

Troubleshooting:

SPARK PLUG faulty.

Inspect:

GOVERNOR out of adjustment.

Readjust:

CARBURETOR out of adjustment.

Readjust:

Disassemble and inspect:

Poor performance at low speed.

AIR CLEANER restricted

Clean:

Models with ARCS™:
ARCS™ (Auto Return Choke System)
faulty.

Troubleshooting:

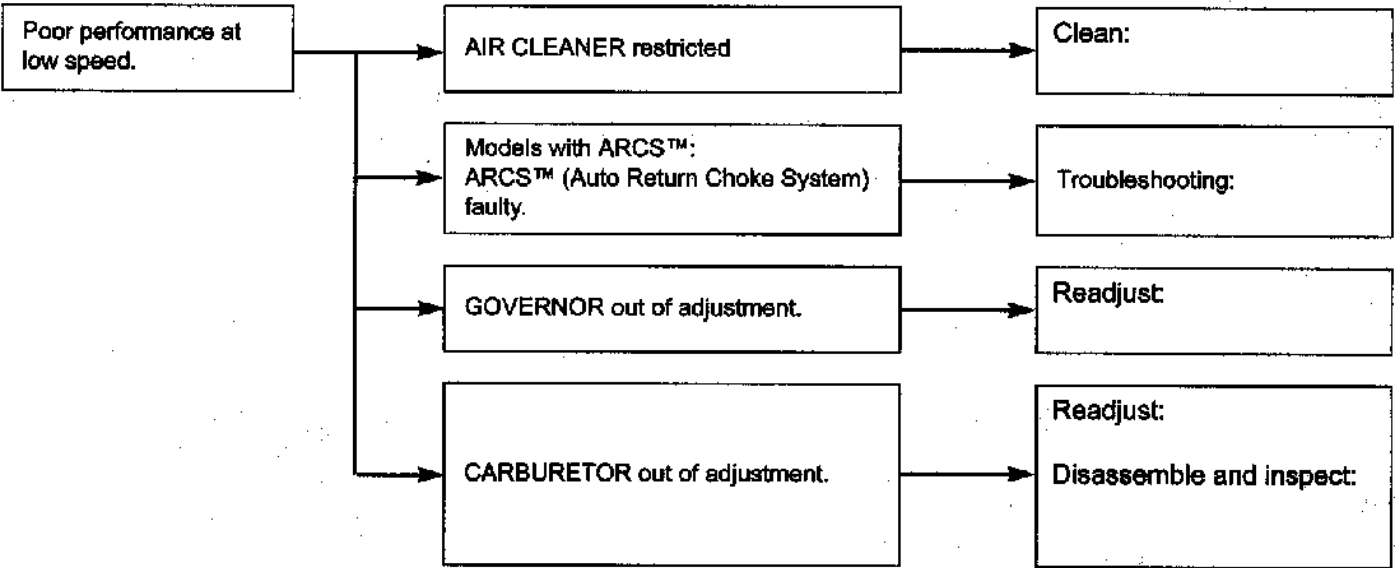
GOVERNOR out of adjustment.

Readjust

CARBURETOR out of adjustment.

Readjust:

Disassemble and inspect:



Hard starting.

CARBURETOR FLOAT CHAMBER contains stale gasoline.

Drain old fuel. Fill tank with fresh gasoline.

SPARK PLUG disconnected or no spark at plug.

Inspect:

FUEL FILTER clogged.

Clean:

CARBURETOR out of adjustment.

Readjust:
Disassemble and inspect:

IGNITION COIL air gap incorrect.

Readjust:

IGNITION COIL faulty.

Inspect:

SPARK PLUG faulty.

Inspect:

GOVERNOR out of adjustment.

Readjust:

Models with ARCS™:
ARCS™ (Auto Return Choke System) faulty.

Troubleshooting:

Engine lacks power.

SPARK PLUG faulty.

Inspect:

AIR CLEANER restricted.

Clean:

GOVERNOR out of adjustment.

Readjust:

VALVE CLEARANCE incorrect.

Readjust:

VALVE OR VALVE SEAT worn or damaged.

Inspect and correct:

CYLINDER, PISTON or PISTON RING worn.

Disassemble and inspect:

SPARK ARRESTER restricted.

Clean or replace:

Models with ARCS™:
ARCS™ (Auto Return Choke System) faulty.

Troubleshooting:

Engine will not rev sufficiently.

IGNITION COIL faulty.

Inspect:

CARBURETOR out of adjustment.

Readjust:

Disassemble and inspect:

SPARK PLUG faulty.

Inspect:

GOVERNOR out of adjustment.

Readjust:

**Models with ARCS™:
ARCS™ (Auto Return Choke
System) faulty.**

Troubleshooting:

Poor performance at high speed.

CARBURETOR out of adjustment.

Readjust:

Disassemble and inspect:

SPARK PLUG faulty.

Inspect:

AIR CLEANER restricted.

Clean:

GOVERNOR out of adjustment.

Readjust:

**Models with ARCS™:
ARCS™ (Auto Return Choke
System) faulty.**

Troubleshooting:

Poor performance at low speed.

CARBURETOR out of adjustment.

Readjust:

Disassemble and inspect:

AIR CLEANER restricted.

Clean:

GOVERNOR out of adjustment.

Readjust:

VALVE CLEARANCE incorrect.

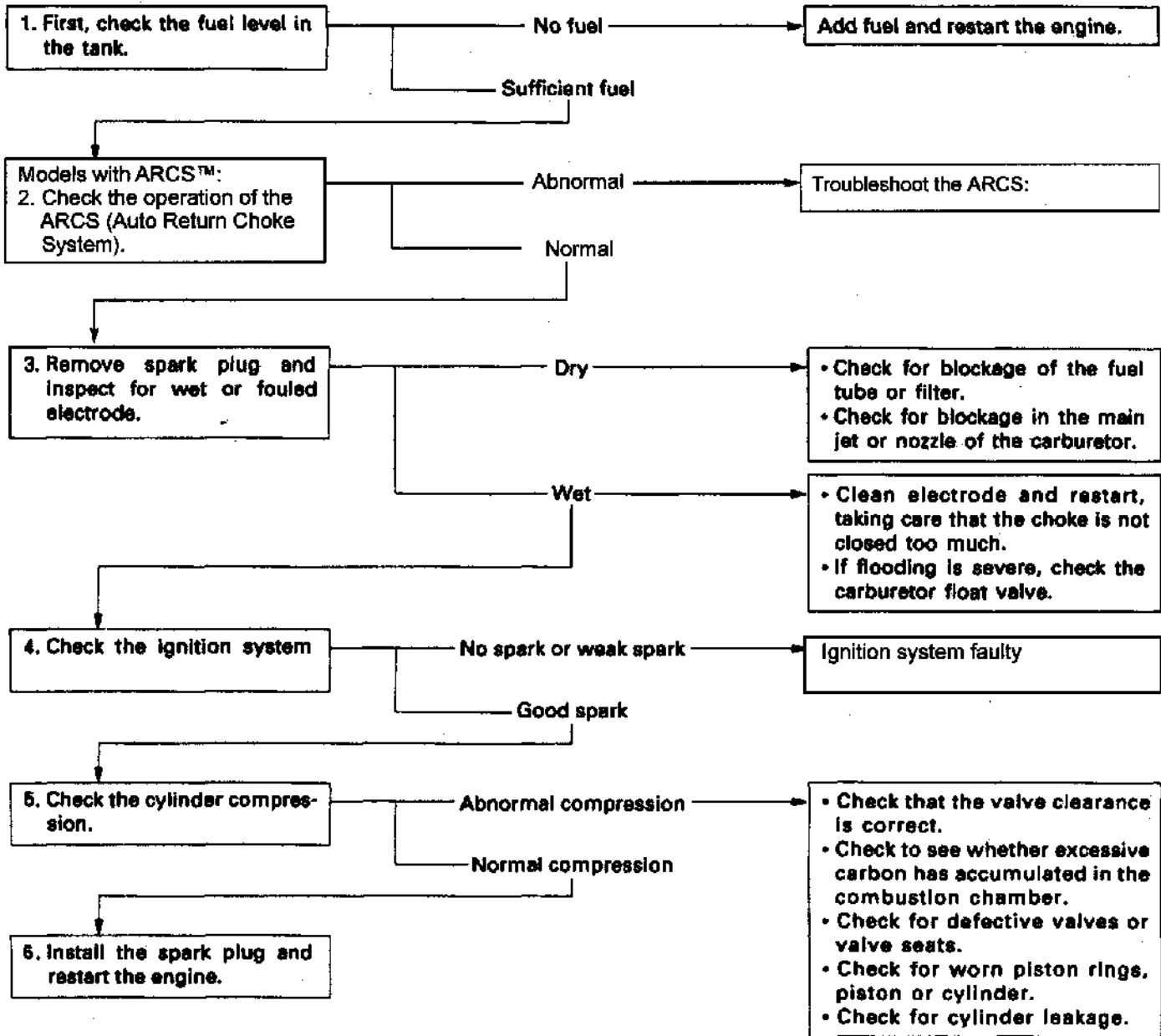
Readjust:

**Models with ARCS™:
ARCS™ (Auto Return Choke
System) faulty.**

Troubleshooting:

b. HARD STARTING

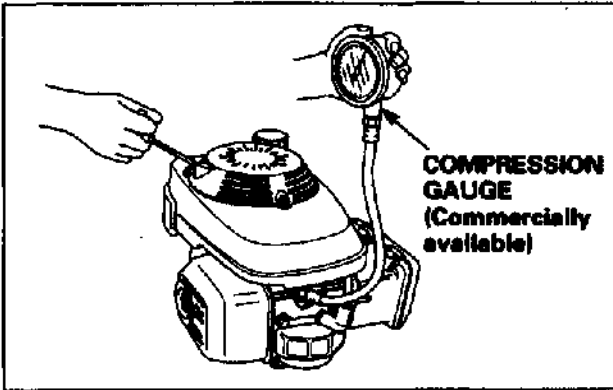
Move the fuel valve to the ON position.



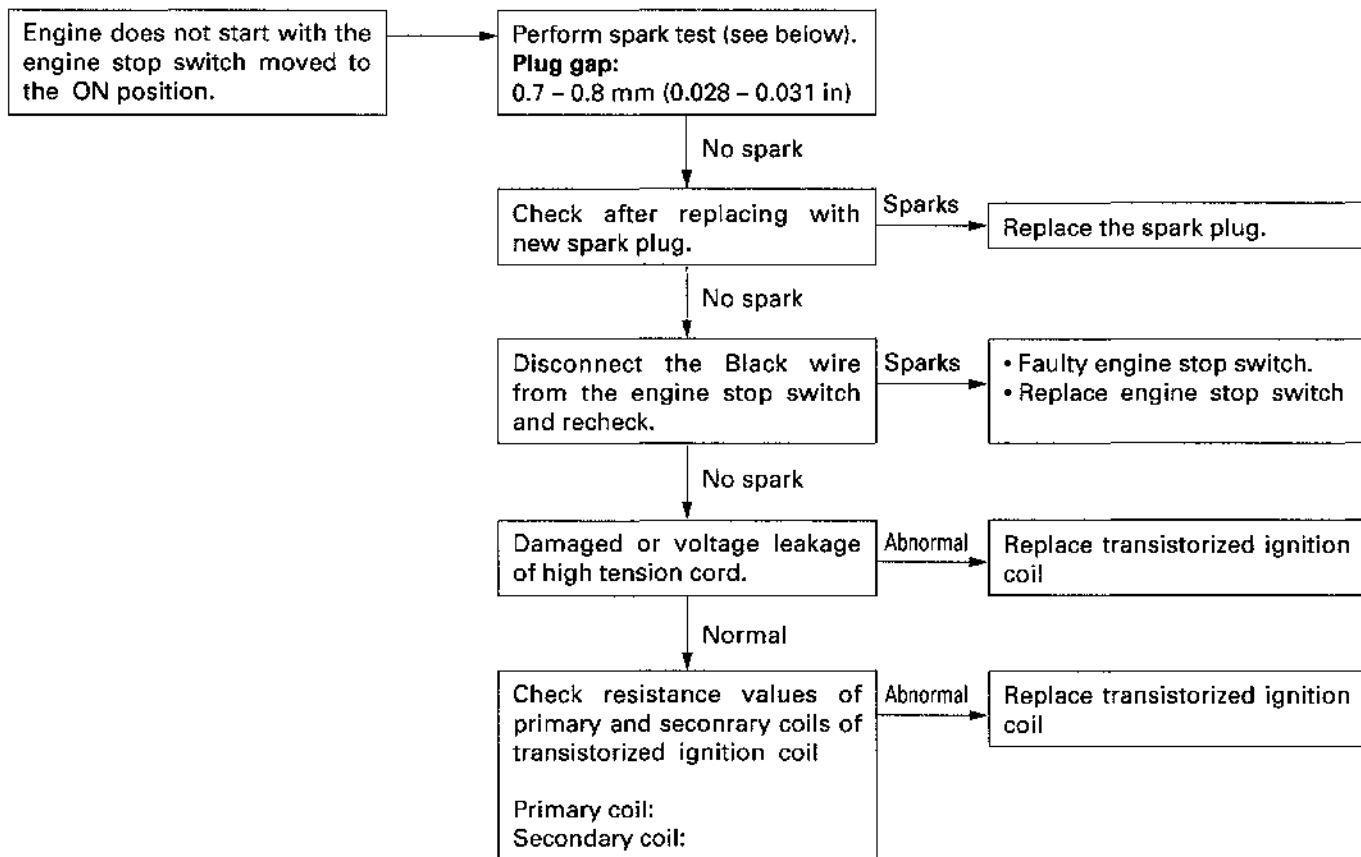
CYLINDER COMPRESSION CHECK

- 1) Remove the spark plug and install a compression gauge in the spark plug hole.
- 2) Pull the recoil starter several times with force and measure the cylinder compression

Compression	0.49 MPa (5.0 kgf/cm², 71 psi) at 600 rpm
-------------	--



IGNITION SYSTEM



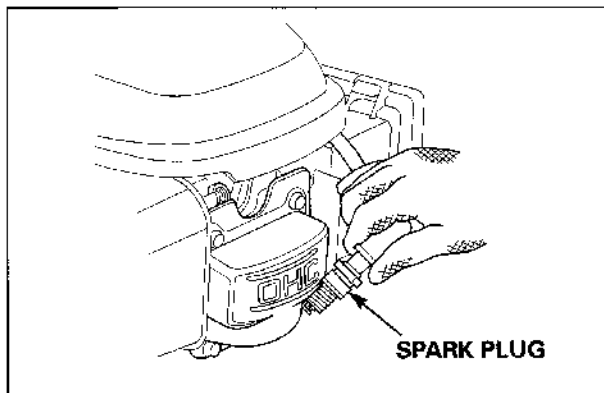
SPARK PLUG TEST

- 1) Remove the spark plug, attach it to the spark plug cap, and ground the side electrode against the cylinder head cover.
- 2) Pull the flywheel brake lever to the RUN position (with flywheel brake) or move the control lever to the SLOW position (without flywheel brake), pull the recoil starter and check to see if sparks jump across the electrodes.

⚠ WARNING

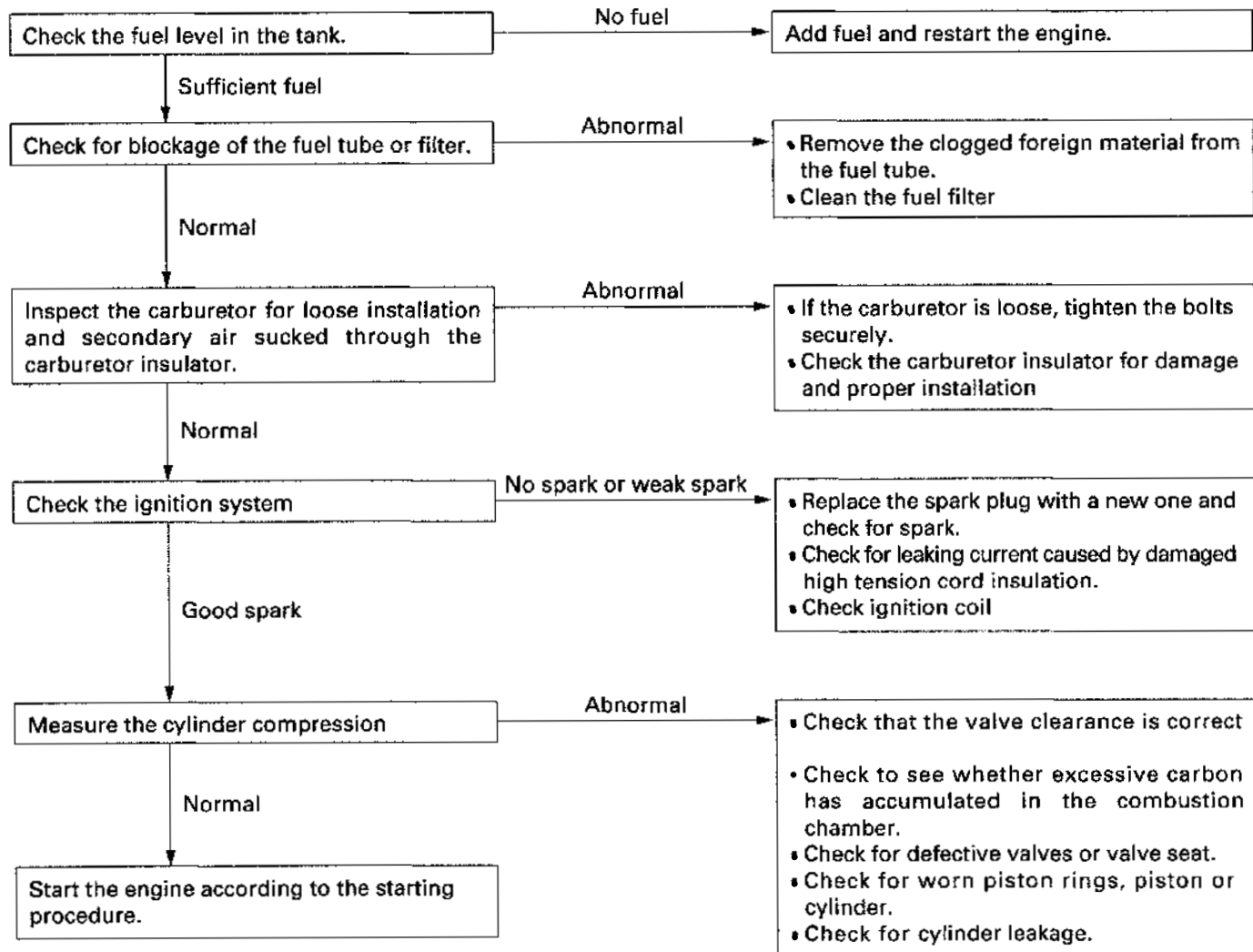
Gasoline is highly flammable and explosive.
If ignited, gasoline can burn you severely.

- Be sure there is no spilled fuel near the engine.
- Place the spark plug away from the spark plug hole.

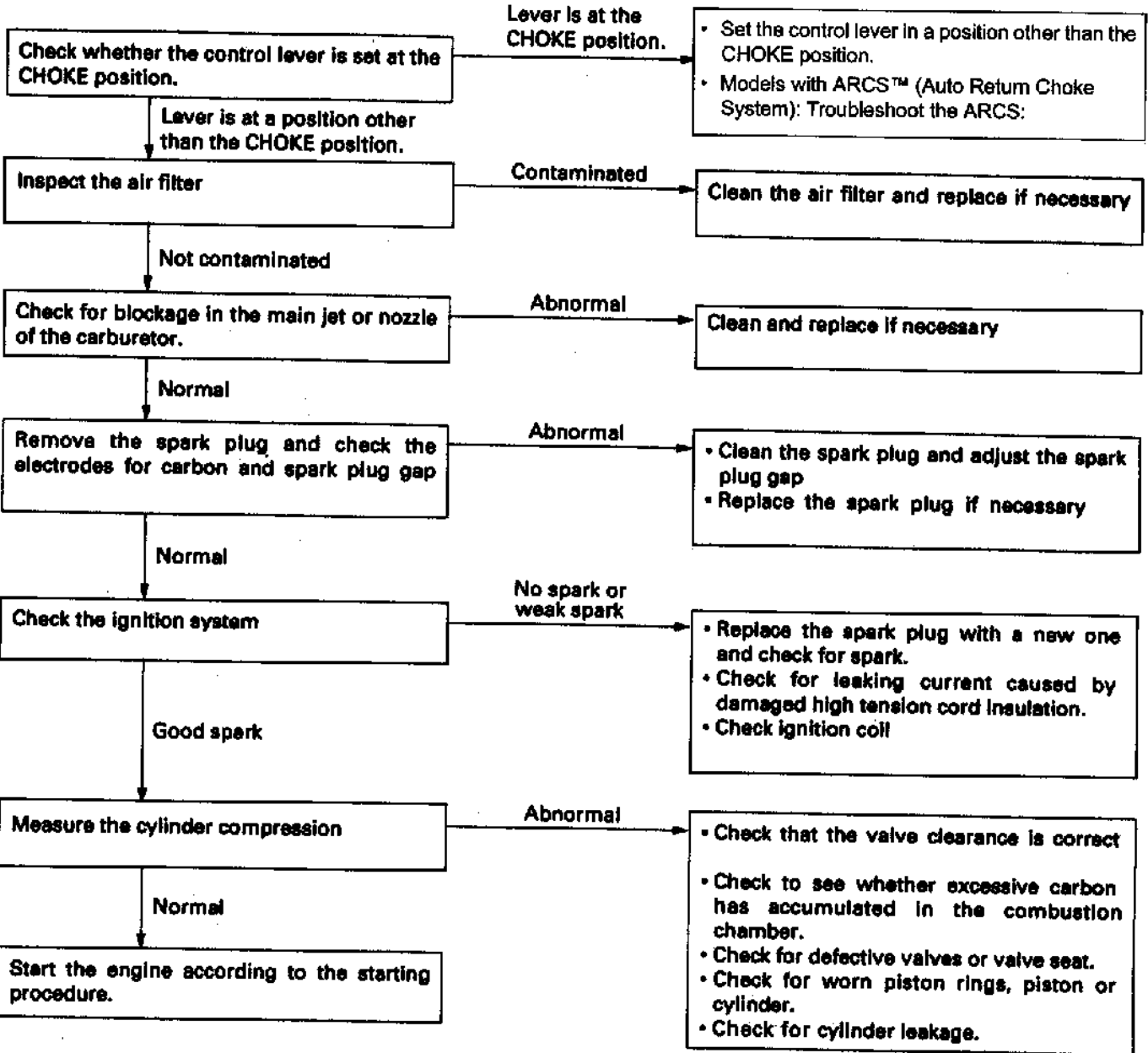


ENGINE STARTS BUT THEN STALLS

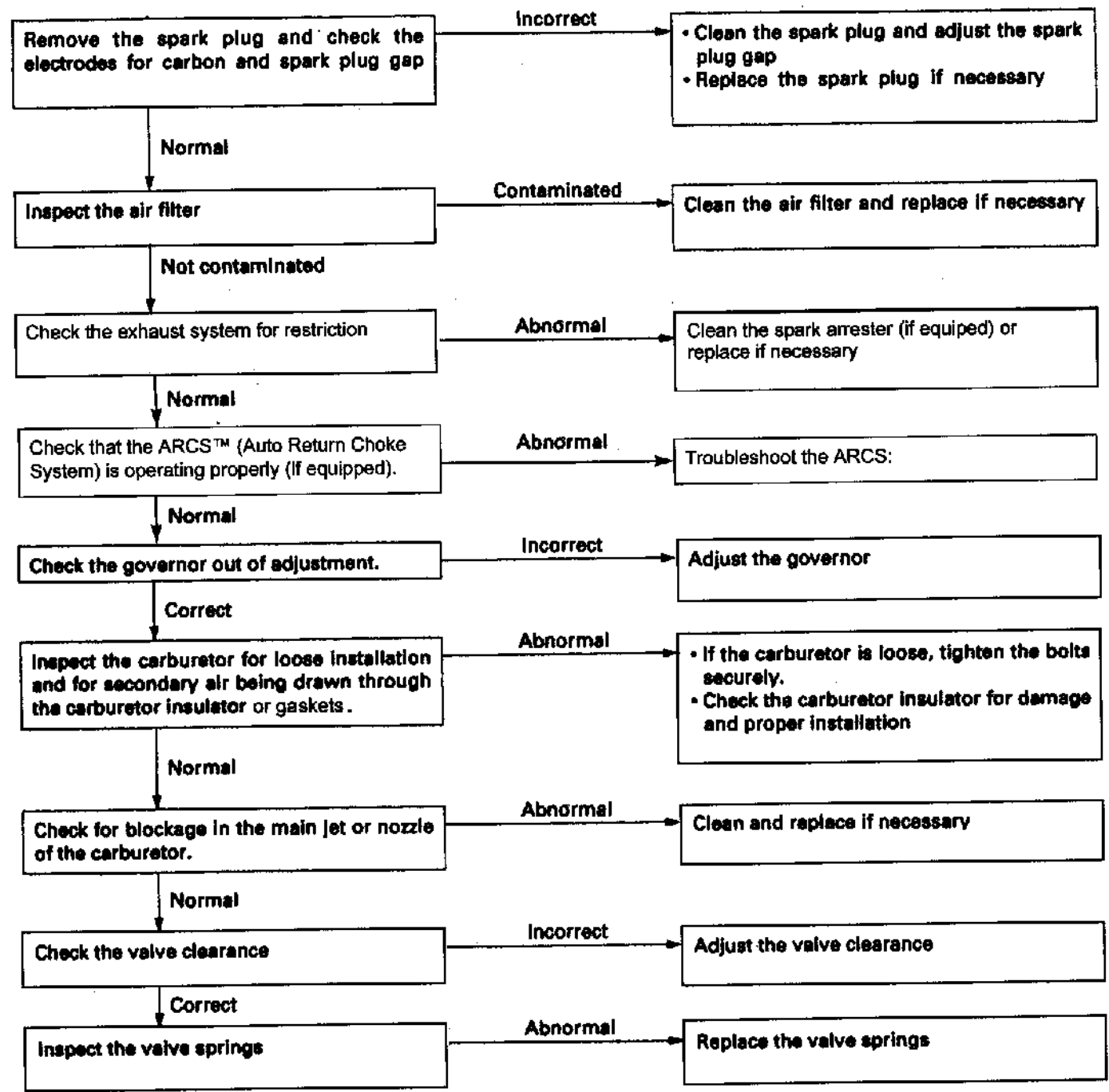
Move the fuel valve to the ON position.



9. ENGINE LACKS POWER



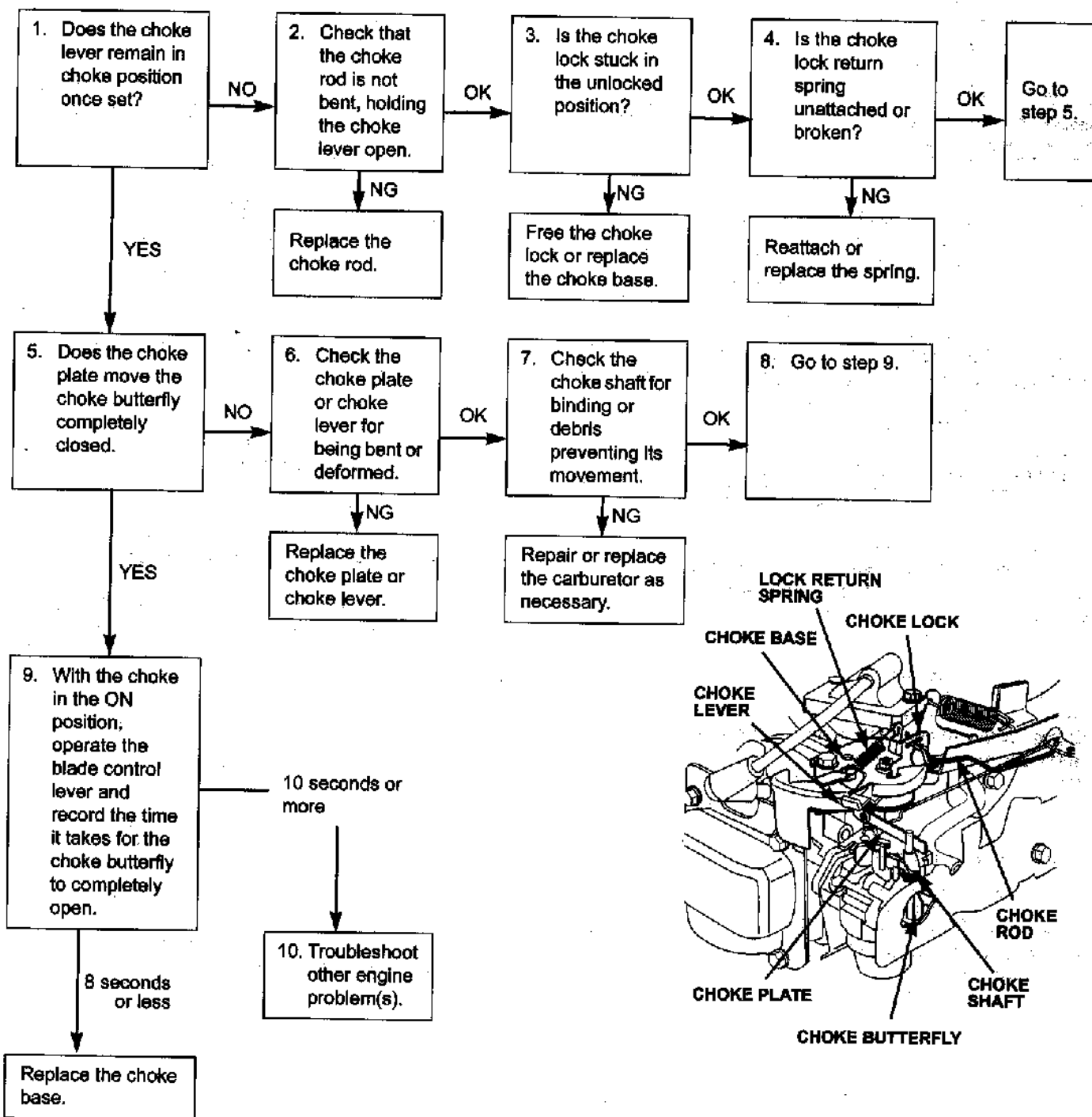
f. ENGINE SPEED DOES NOT INCREASE



g. ARCS™ (AUTOMATIC RETURN CHOKE SYSTEM)

After setting the choke lever to the choke ON position, and operating the blade control lever:

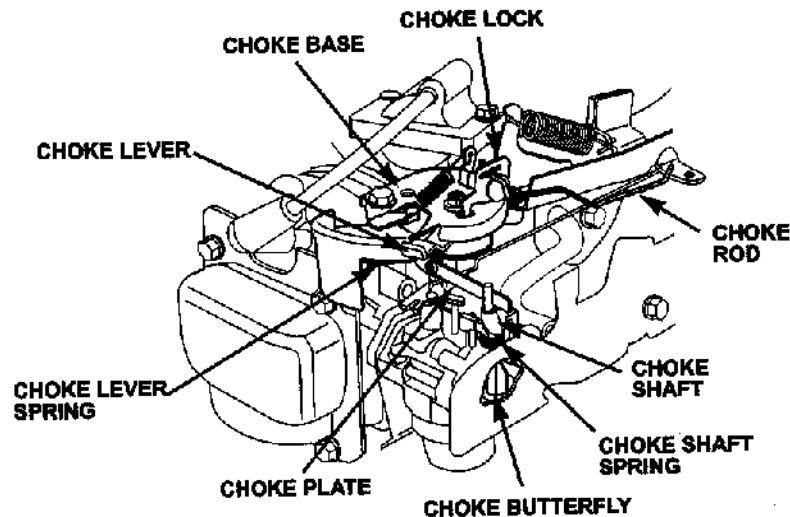
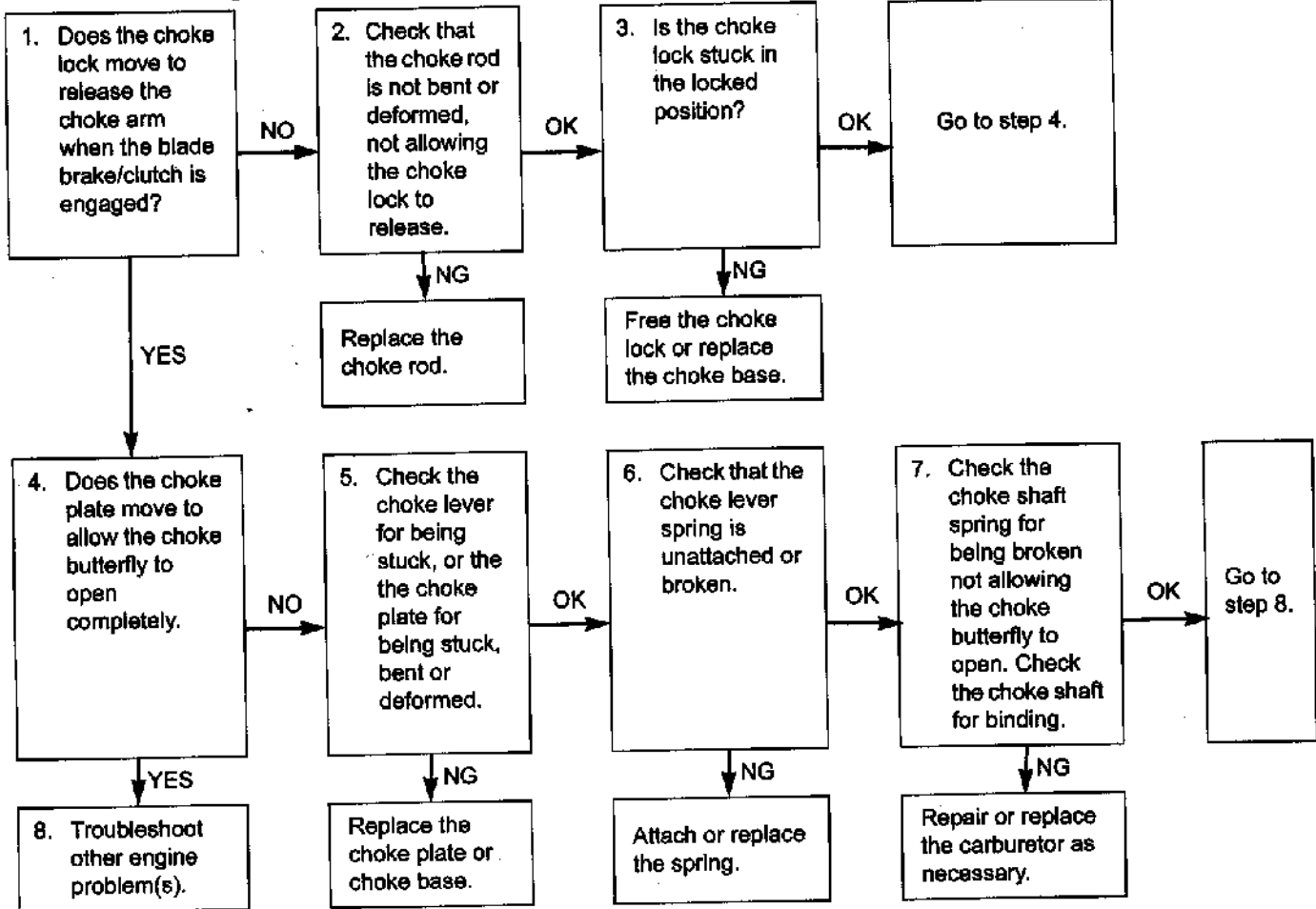
- Engine will not start.



After setting the choke lever to the CHOKE position and the engine starts:

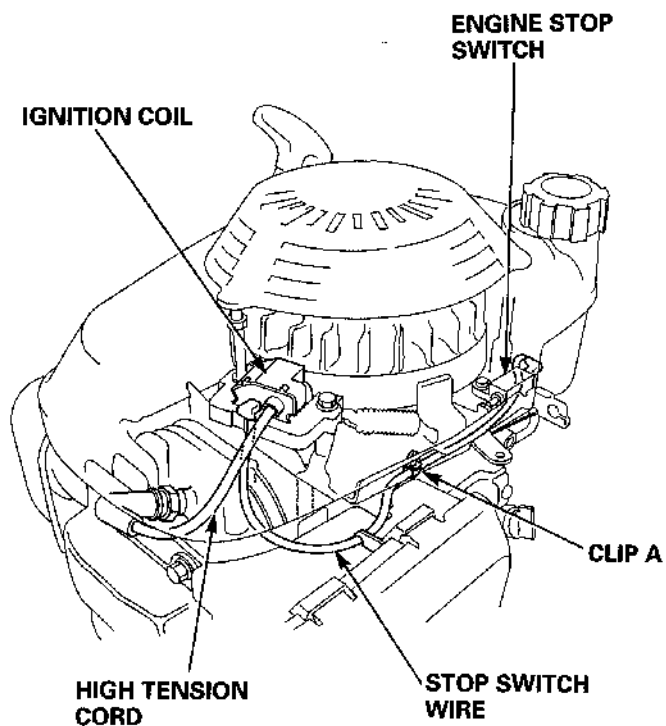
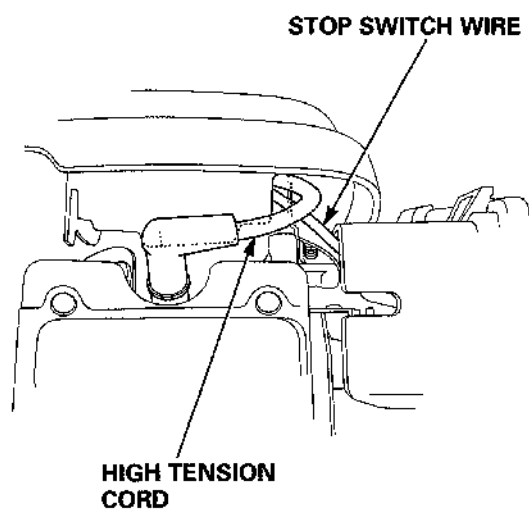
- The engine runs poorly in all throttle positions.

Perform the following with the engine stopped.

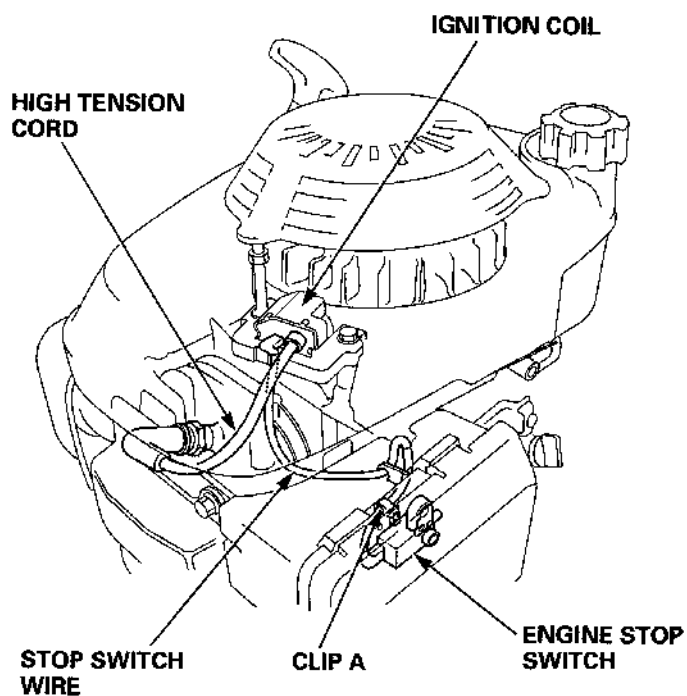
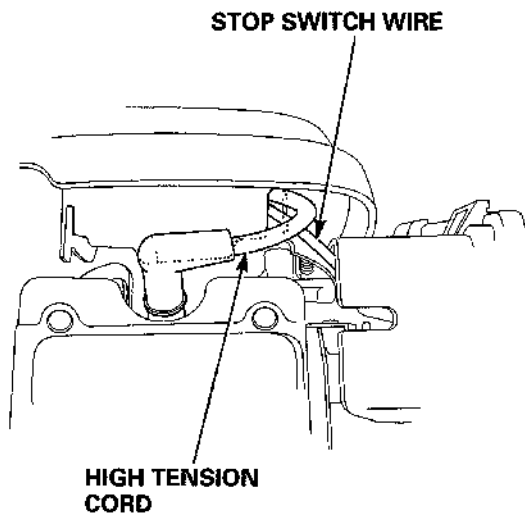


HARNESS ROUTING

- With flywheel brake



- Without flywheel brake



MAINTENANCE SCHEDULE

REGULAR SERVICE PERIOD ITEM Perform at every indicated interval (2)		Before Each Use	First Month or 20 Hours	Every 3 months or 50 hours	Every 6 months or 100 Hours	Every year or 200 Hours
Engine oil	Check level	○				
	Change		○		○	
Air cleaner	Check	○				
	Clean			○ (1)		
	Replace					○ (*)
Flywheel brake shoe	Check		○		○	
Spark plug	Check-adjust				○	
	Replace					○
Spark arrester (optional part)	Clean				○	
Valve Clearance	Check-adjust					○
Combustion chamber	Clean	After every 250 hours				
Fuel tank and filter	Clean					○
Idle Speed	Check-adjust					○
Fuel tube	Check	Every 2 years (replace if necessary)				

(*) Replace paper element type only.

(1) Service more frequently when used in dusty areas.

(2) For commercial use, log hours of operation to determine proper maintenance intervals.

ENGINE OIL

Oil Level Check:

Check the engine oil level with the engine stopped and the engine on a level surface.

- 1) Remove the oil filler cap, and wipe the dipstick clean.
- 2) Insert the dipstick in the oil filler neck, but do not screw it in. Remove the dipstick and check the oil level.
- 3) If the oil level is near or below the lower limit mark on the dipstick, fill with the recommended oil to the upper limit mark. Do not overfill.
- 4) Tighten the oil filler cap securely.

Oil Change:

Drain the used oil while the engine is warm. Warm oil drains quickly and completely.

- 1) Remove the oil filler cap.
Tilt the engine toward the oil filter cap side and drain the used oil into a suitable container.

Please dispose of used motor oil in a manner that is compatible with the environment. We suggest you take used oil in a sealed container to your local recycling center or service station for reclamation. Do not throw it in the trash, pour it on the ground, or down a drain.

CAUTION:

Used engine oil contains substances that have been identified as carcinogenic.

If repeatedly left in contact with the skin for prolonged periods, it may cause skin cancer.

Wash your hands thoroughly with soap and water as soon as possible after contact with used engine oil.

- 2) With the engine on a level surface, refill with the recommended oil to the upper limit mark.

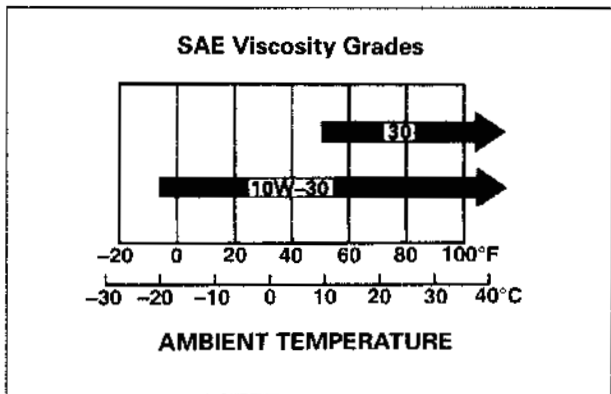
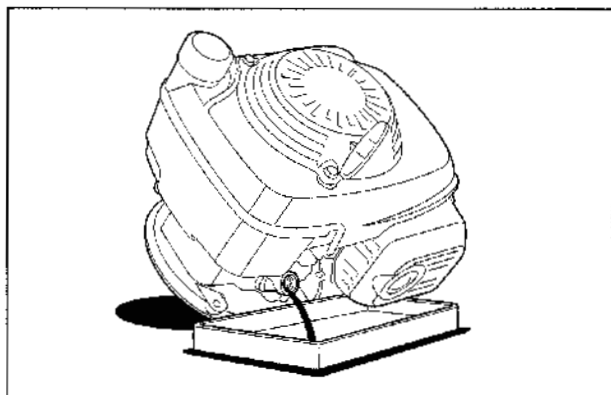
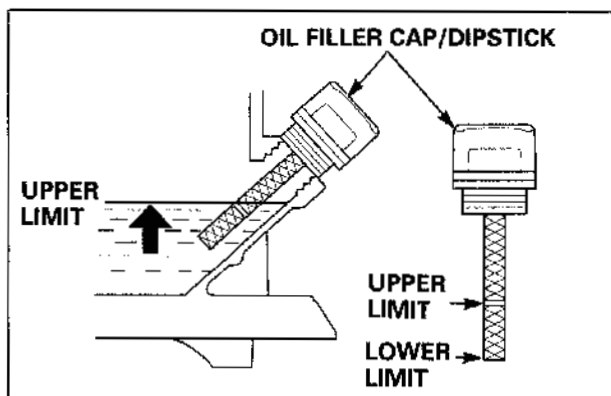
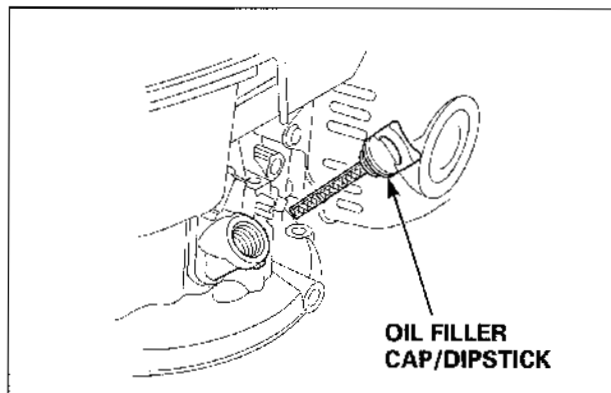
Engine oil capacity

Recommended operating
ambient temperature

Oil is a major factor affecting performance and service life. Use 4-stroke automotive detergent oil.

SAE 10W-30 is recommended for general use. Other viscosities shown in the chart may be used when the average temperature in your area is within the recommended range. The SAE oil viscosity and service classification are in the API label on the oil container. Honda recommends that you use API SERVICE category SF or SG oil.

- 3) Tighten the oil filter cap securely.



AIR CLEANER

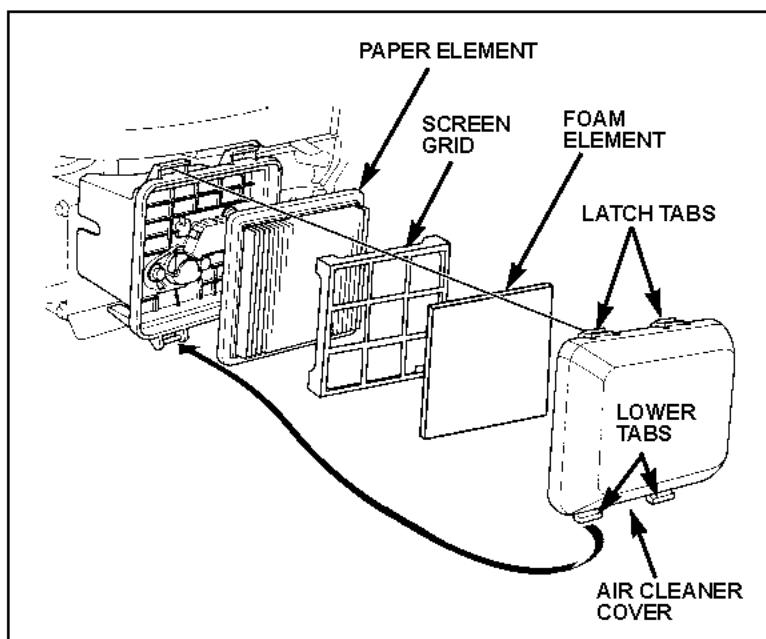
Cleaning

A dirty air filter will restrict air flow to the carburetor, reducing engine performance. If the filter is operated in dusty areas, clean the air filter more often than specified in the MAINTENANCE SCHEDULE.

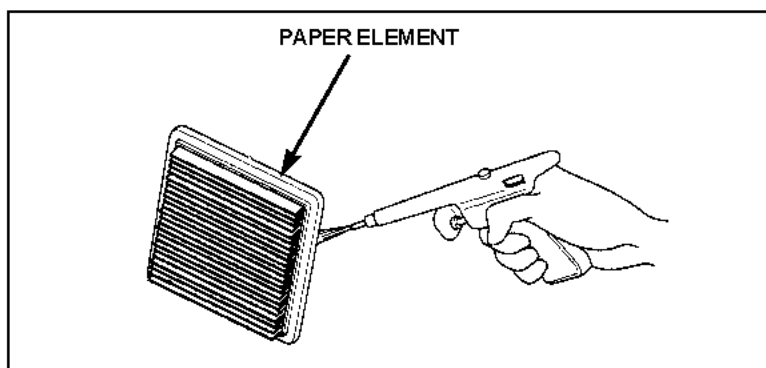
NOTICE

Operating the engine without an air filter or with a damaged air filter, will allow dirt to enter the engine, causing rapid engine wear. This type of damage is not covered by the Distributor's Limited Warranty.

1. Press the latch tabs on the top of the air cleaner cover, and remove the cover.
2. Remove the foam element from the air cleaner cover.
3. Remove the screen grid from the paper element.
4. Inspect the air filter, and replace if damaged.

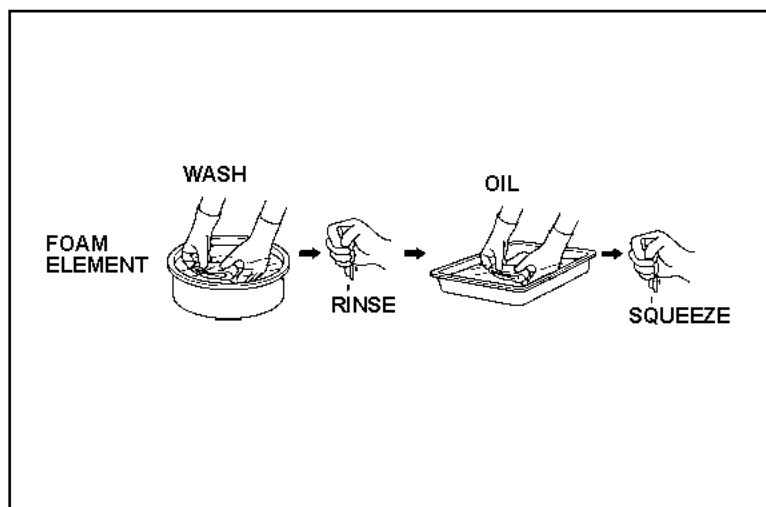


5. Paper Element: Tap the filter several times on a hard surface to remove dirt, or blow compressed air [not exceeding 207 kPa (30 psi)] through the filter from the clean side that faces the engine. Never try to brush off dirt; brushing will force dirt into the fibers.

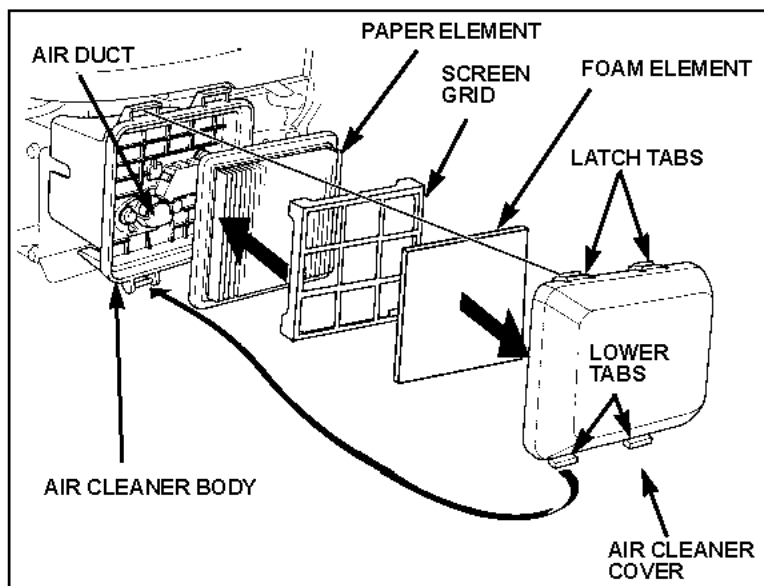


Foam Element: Wash the element in a solution of household detergent and warm water, then rinse thoroughly, or wash in nonflammable or high flash point solvent. Allow the element to dry thoroughly.

Soak the element in clean engine oil and squeeze out the excess oil. The engine will smoke during initial start-up if too much oil is left in the foam, or the oil could saturate the paper element making the engine inoperable.



- Wipe dirt from the inside of the air cleaner cover and air cleaner case, using a moist rag. Be careful to prevent dirt from entering the air duct that leads to the carburetor.
- Reinstall the screen grid over the paper element. Make sure that the screen grid completely surrounds the paper pleats.
- Reinstall the foam element in the air cleaner cover.
- Set the paper element and screen grid in the air cleaner body then install the air cleaner cover.
- Reinstall the air cleaner cover by locking the lower tabs in the bottom of the air cleaner body and snapping the latch tabs in the top of the air cleaner body.



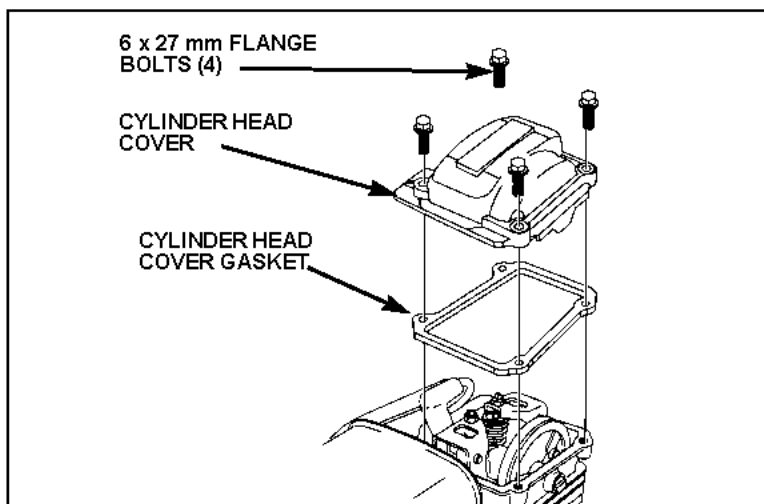
VALVE CLEARANCE

Inspection

Valve clearance inspection and adjustment must be performed with the engine cold.

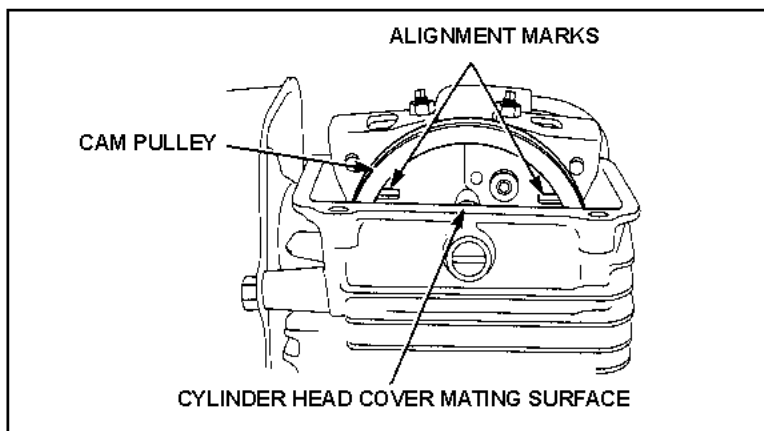
- Place the engine upright with the cylinder head cover facing up.
- Remove the four 6 x 27 mm flange bolts, the cylinder head cover and cylinder head cover gasket.

Replace the cylinder head cover gasket when reassembling.



- Set the piston at top dead center of the compression stroke (both valves fully closed). Top dead center of the compression stroke is in the position where the cylinder head cover mating surface is in line with the cam pulley alignment marks.
- Insert a feeler gauge between the valve stem and the adjusting screw on the rocker arm.

Valve clearance	IN	0.15 ± 0.04 mm
	EX	0.20 ± 0.04 mm



Adjustment

1. Hold the adjusting screw using the special tool, and loosen the lock nut.
2. Turn the adjusting screw to obtain the specified intake and exhaust valve clearance.
Turn the valve adjusting screw out to increase clearance, and in to decrease clearance.

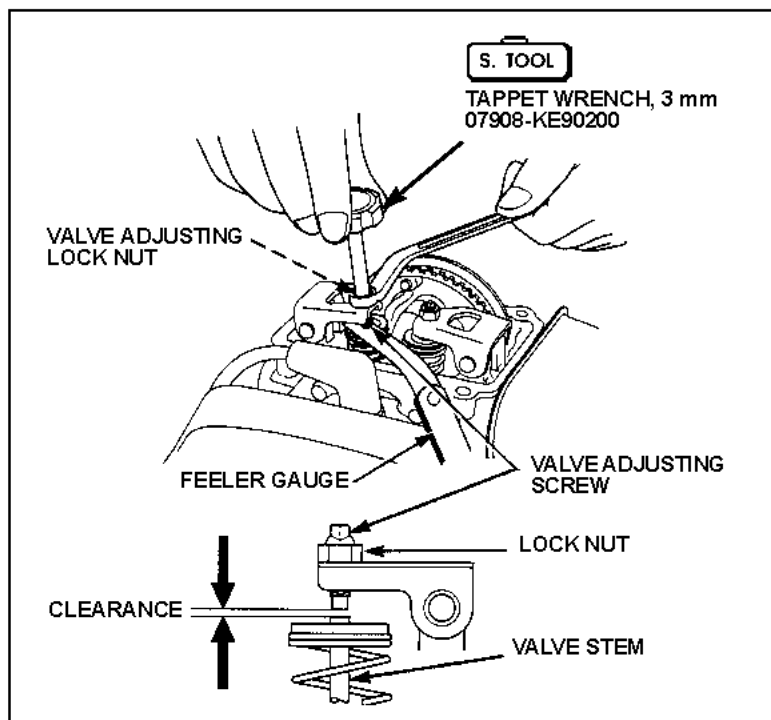
3. Hold the adjusting screw using the special tool, and tighten the lock nut.

TORQUE: 8 N•m (5.8 ft-lb, 72 in-lb)

TOOL: Tappet wrench, 3 mm
07908-KE90200

4. Recheck valve clearance after tightening the lock nut.
5. Install the cylinder head cover using a new gasket. Tighten the four 6 x 27 mm flange bolts to the specified torque.

TORQUE: 12 N•m (8.8 ft-lb, 108 in-lb)

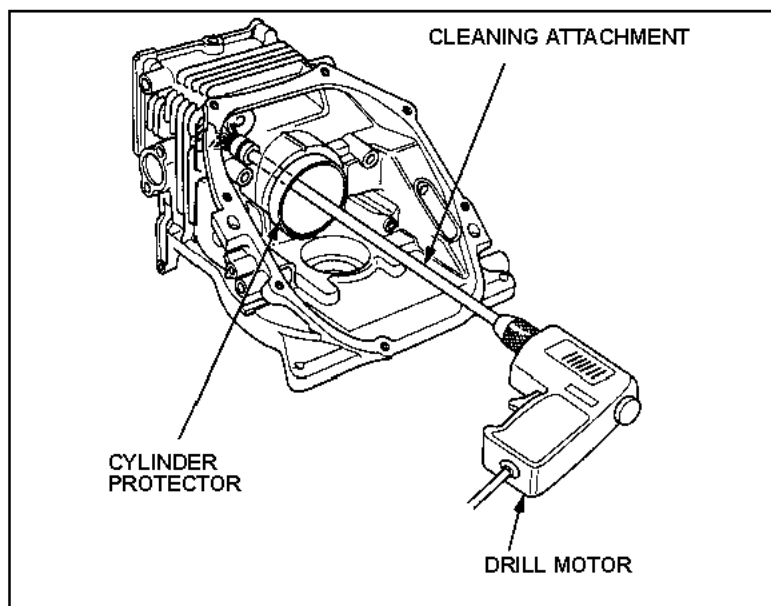


COMBUSTION CHAMBER CLEANING

1. Prepare a cylinder of thick paper or equivalent material, with a diameter large enough to fit against the inner wall of the cylinder, and insert it into the cylinder for protection.
2. Attach the cleaning brush (commercially available) to an electric drill motor and clean the combustion chamber.

NOTICE

- Be sure to insert thick paper into the cylinder to protect the inner wall of the cylinder during cleaning of the combustion chamber.
- Do not press the cleaning brush with force against the combustion chamber.



SPARK PLUG

Inspection/Cleaning:

Standard spark plug

- 1) Clean any dirt from around the spark plug.
- 2) Remove the plug cap, and use a spark plug wrench to remove the plug.
- 3) Visually inspect the spark plug. Discard the plug if the insulator is cracked or chipped.
- 4) Remove carbon or other deposits with a stiff wire brush.
- 5) Measure the plug gap with a wire-type feeler gauge.

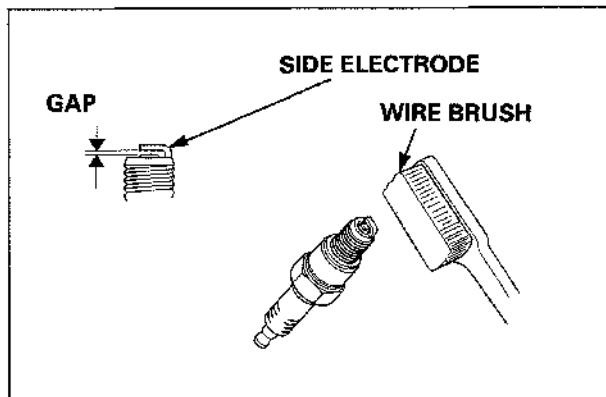
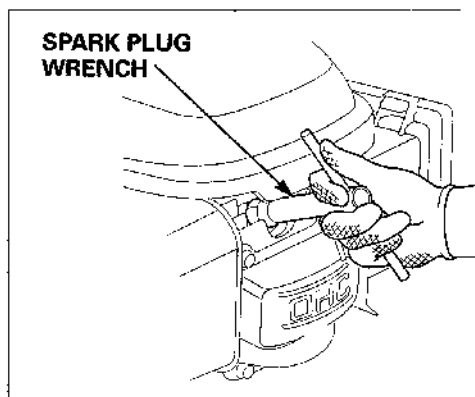
Spark plug gap

If necessary, adjust the gap by bending the side electrode.

- 6) Make sure the sealing washer is in good condition; replace the plug if necessary.
- 7) Install the plug fingertight to seat the washer, then tighten with a plug wrench (an additional 1/2 turn if a new plug) to compress the sealing washer. If you are reusing a plug, tighten 1/8–1/4 turn after the plug seats.

CAUTION:

A loose spark plug can become very hot and can damage the engine. Overtightening the spark plug can damage the threads in the cylinder barrel.



CARBURETOR

Pilot screw:

The pilot screw is fitted with a limiter cap that prevents excessive enrichment of the air-fuel mixture in order to comply with emissions regulations.

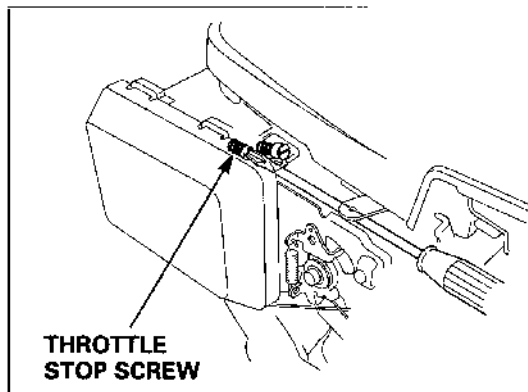
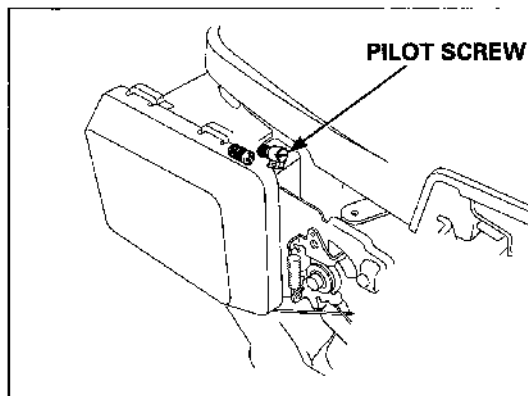
Do not attempt to remove the limiter cap for pilot screw adjustment. The limiter cap cannot be removed without breaking the pilot screw.

Pilot screw adjustment must be performed only when it is dis-assembled

Throttle stop screw:

- 1) Start the engine and allow it to warm up to normal operating temperature.
- 2) With the engine idling, turn the throttle stop screw to obtain the standard idle speed.

Standard idle speed



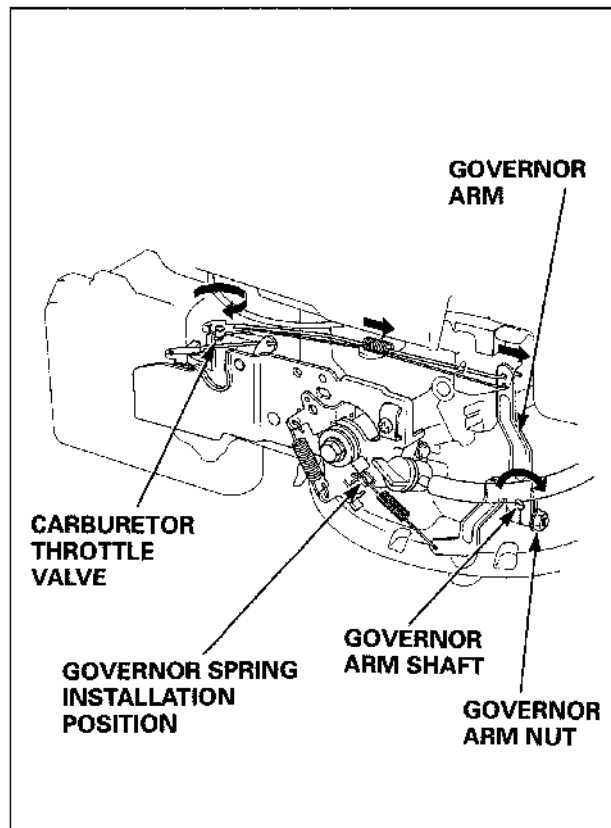
GOVERNOR

Adjustment:

- 1) Loosen the governor arm nut on the governor arm.
- 2) Push the governor arm away from the carburetor, and open the carburetor throttle valve fully.
- 3) Holding the carburetor throttle valve fully open, turn the governor arm shaft clockwise fully, and tighten the governor arm nut to the specified torque.
- 4) Check to see whether the governor arm and the carburetor throttle valve operate smoothly.
- 5) Start the engine and warm it up to the normal operating temperature. Move the control lever to the maximum engine speed position, and check the maximum engine speed.

Maximum speed (no load)

- 6) Adjustment is made at the governor spring installation position of the control lever.



FUEL TANK/FUEL FILTER

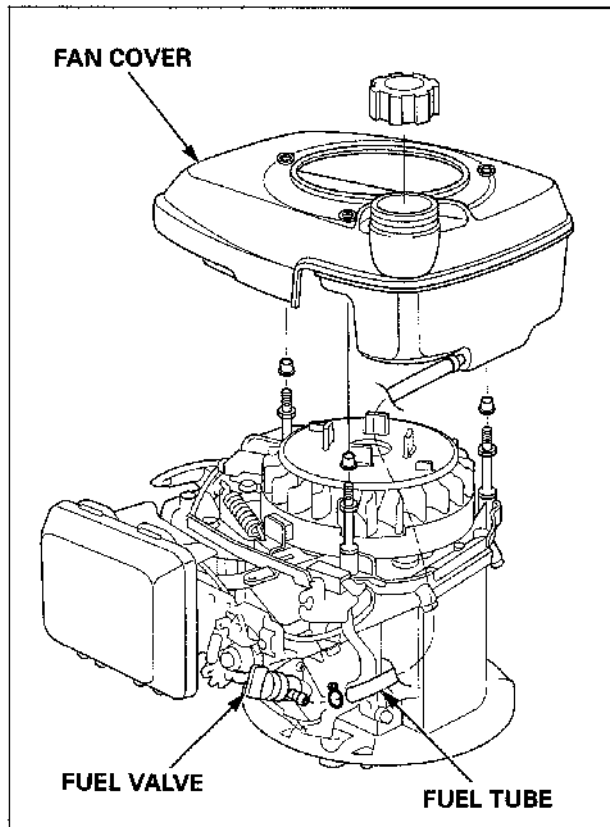
Cleaning:

WARNING

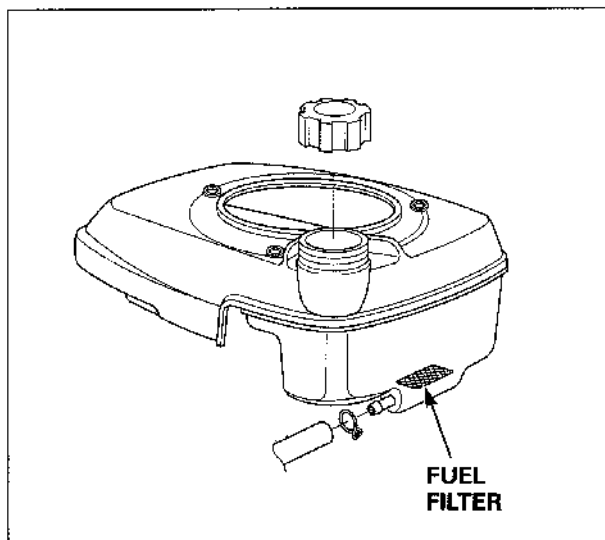
Gasoline is highly flammable and explosive.
You can be burned or seriously injured when handling fuel.

- **Keep heat, sparks, and flame away.**
- **Handle fuel only outdoors.**
- **Wipe up spills immediately.**

- 1) Move the fuel valve to the OFF position, and drain the fuel into a suitable container.
- 2) Remove the recoil starter
- 3) Disconnect the fuel tube from the fuel valve.
- 4) Remove the fan cover.



- 5) Clean the fuel tank. Remove dust and foreign material from the filter in the fuel tank and check the filter for tears.
- 6) Connect the fuel tube to the fuel outlet, and install the fan cover.
- 7) Connect the fuel tube to the fuel valve.
After assembly, check for fuel leaks.



FUEL LINE

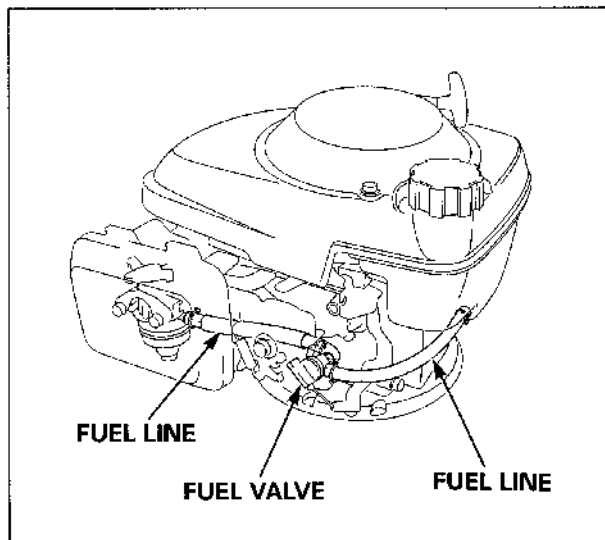
Check:

⚠ WARNING

**Gasoline is highly flammable and explosive.
You can be burned or seriously injured when handling fuel.**

- **Keep heat, sparks, and flame away.**
- **Handle fuel only outdoors.**
- **Wipe up spills immediately.**

- 1) Check the fuel lines for deterioration, cracks or signs of leakage.
- 2) Drain the fuel into a suitable container.
- 3) Replace the fuel lines as necessary.



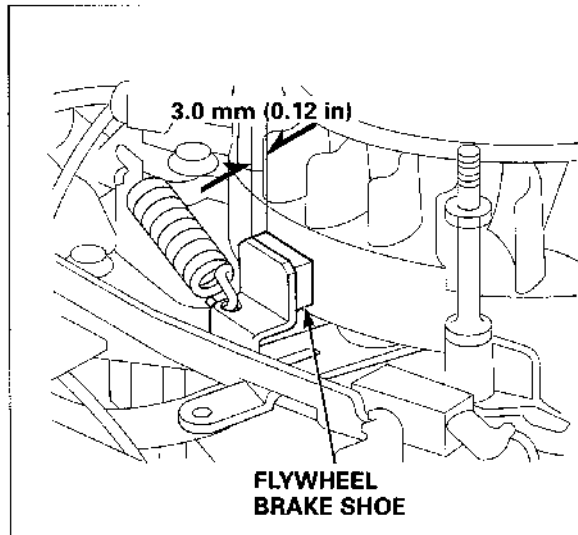
FLYWHEEL BRAKE (if equipped)

Brake shoe thickness inspection:

- 1) Remove the recoil starter
- 2) Remove the fan cover
- 3) Measure the thickness of the brake shoe.

Service limit

- 4) If brake shoe thickness is less than the service limit, replace the flywheel brake



SPARK ARRESTER (optional part)

Cleaning:

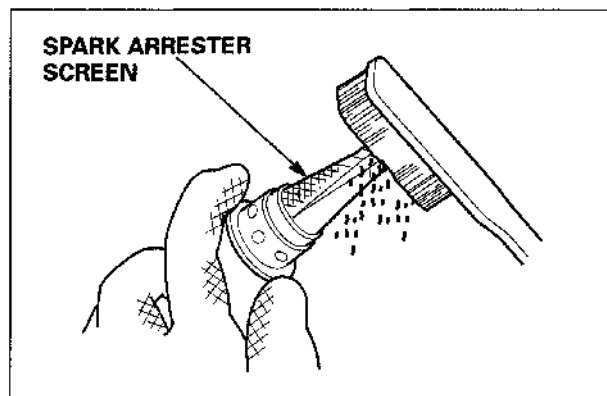
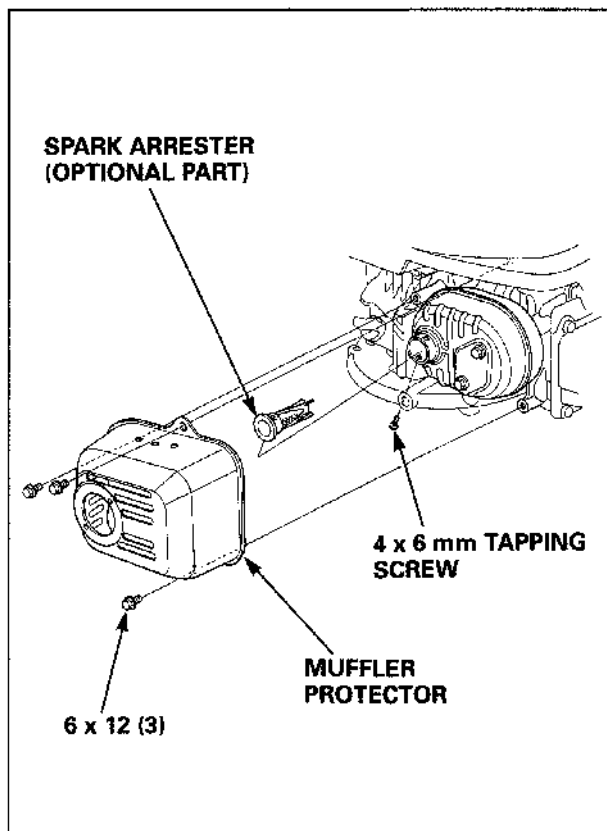
⚠ WARNING

The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Be careful not to touch the muffler while it is hot. Allow it to cool before proceeding.

CAUTION:

The spark arrester must be serviced every 100 hours to maintain its efficiency.

- 1) Remove the three 6 x 12 mm flange bolts from the muffler protector, and remove the muffler protector.
- 2) Remove the 4 x 6 mm tapping screw from the spark arrester, and remove the spark arrester from the muffler.
- 3) Check for carbon deposits around the exhaust port and spark arrester. Clean, if necessary, with a wire brush.
- 4) Replace the spark arrester if there are any breaks or tears.
- 5) Install the spark arrester and muffler protector in the reverse order of removal.



BLADE BRAKE/CLUTCH

Cable Adjustment

Check cable adjustment following equipment manufacturers instructions.

Inspection

Before inspecting brake or clutch wear, it is very important to make sure the blade control lever free play is correct. Inspect following equipment manufacturers instructions.

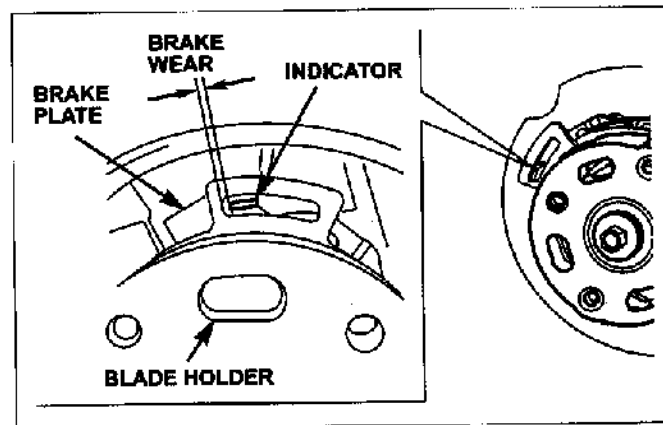
If any measurements are less than the service limit, replace the driven disk and inspect the clutch spring

If the clutch spring is not within specification, replace the clutch spring

Brake Wear

With the blade control lever released, measure the distance between the edge of the brake plate and the indicator.

Standard	Service limit
2.5 mm (0.10 in)	1.5 mm (0.59 in)



Clutch Wear

With the blade control lever in the clutch engaged position, use a clean feeler gauge to measure the distance between the brake plate and the driven disk.

Standard	Service limit
2.0 mm (0.08 in)	0.5 mm (0.20 in)

Blade(s) has been removed for clarity.

