

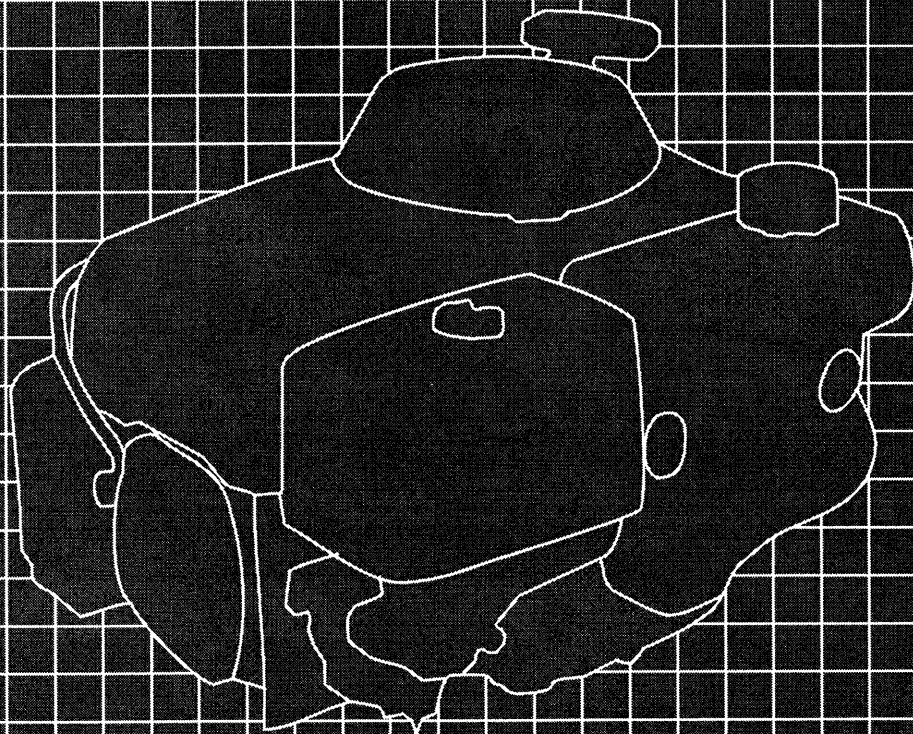
HONDA

E N G I N E S

SHOP MANUAL

GXV270 • GXV340

PROPANE • SUPPLEMENT



PREFACE

This manual covers the construction, function and servicing procedures of Honda GXV270 and GXV340 engines. Careful observance of these instructions will result in better, safer service work.

WARNING Indicates 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.

CAUTION: Detailed descriptions of *standard* workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause **PERSONAL INJURY** to service personnel or could damage the product or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by American Honda, might be done, or of the possible hazardous consequences of each conceivable way, nor could American Honda investigate all such ways. Anyone using service procedures or tools, whether or not recommended by American Honda, *must satisfy himself thoroughly* that neither personal safety nor product safety will be jeopardized by the service methods or tools selected.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at any time without notice. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher. This includes text, figures and tables.

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NOTES

1. SPECIFICATIONS
2. PERFORMANCE CURVES**3. DIMENSIONAL DRAWINGS**

1. SPECIFICATIONS

DIMENSIONS AND WEIGHTS

	GXV 270	GXV 340
Length	410 mm (16.1 in)	430 mm (16.9 in)
Width	385 mm (15.2 in)	
Height	405 mm (15.9 in)	410 mm (16.1 in)
Dry weight	28 kg (62 lb)	32 kg (71 lb)
Operating weight	30.5 kg (67.2 lb)	33.5 kg (73.9 lb)

ENGINE

Model	GXV270	GXV340
Type	4-Stroke, overhead valve, single cylinder	
Displacement	270 cc (16.5 cu in)	337 cc (20.6 cu in)
Bore and stroke	77 x 58 mm (3.0 x 2.3 in)	82 x 64 mm (3.23 x 2.52 in)
Max. horsepower	6.34 kW (8.5 HP)/3,600 min ⁻¹ (rpm)	8.20 kW (11 HP)/3,600min ⁻¹ (rpm)
Max. torque	18 N·m (180 kg-cm, 13.0 ft-lb)/2,500min ⁻¹ (rpm)	23 N·m (230 kg-cm, 17 ft-lb)/2,500 min ⁻¹ (rpm)
Compression ratio	7.8 : 1	7.7 : 1
Fuel consumption	321 g/kWh (240 g/HPh, 0.53 lb/HPh)	313 g/kWh (230 g/HPh, 0.51 lb/HPh)
Cooling system	Forced air	
Ignition system	Transistorized magneto	
Ignition timing	20 ± 2° B.T.D.C.	
Spark plug	BPR5ES (NGK), W16EPR-U (ND)	
Carburetor	Horizontal butterfly valve	
Air cleaner	Dual element	
Governor	Centrifugal mechanical governor	
Lubrication system	Pressure and splash	
Oil capacity	1.1 ℓ (1.2 US qt, 1.0 Imp qt)	
Starting system	Recoil and electric	
Stopping system	Primary circuit ground	
Fuel tank capacity	2.0 ℓ (0.53 US gal, 0.44 Imp gal)	2.3 ℓ (0.61 US gal, 0.51 Imp gal)
Fuel used	Regular automotive gasoline (86 pump octane; unleaded preferred)	
PTO shaft rotation	Counterclockwise (from PTO side)	

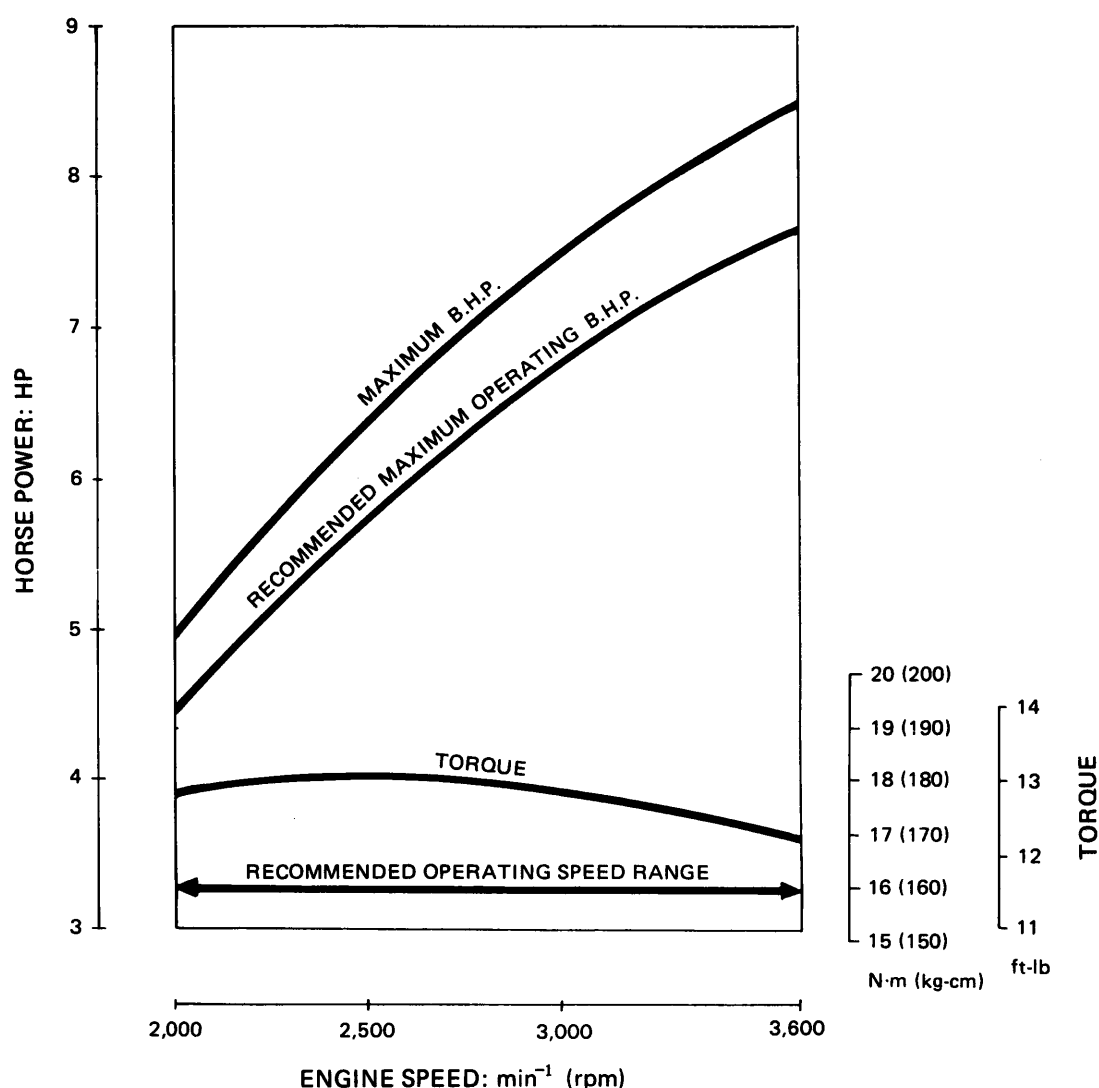
NOTE: Specifications are subject to change without notice.

2. PERFORMANCE CURVES

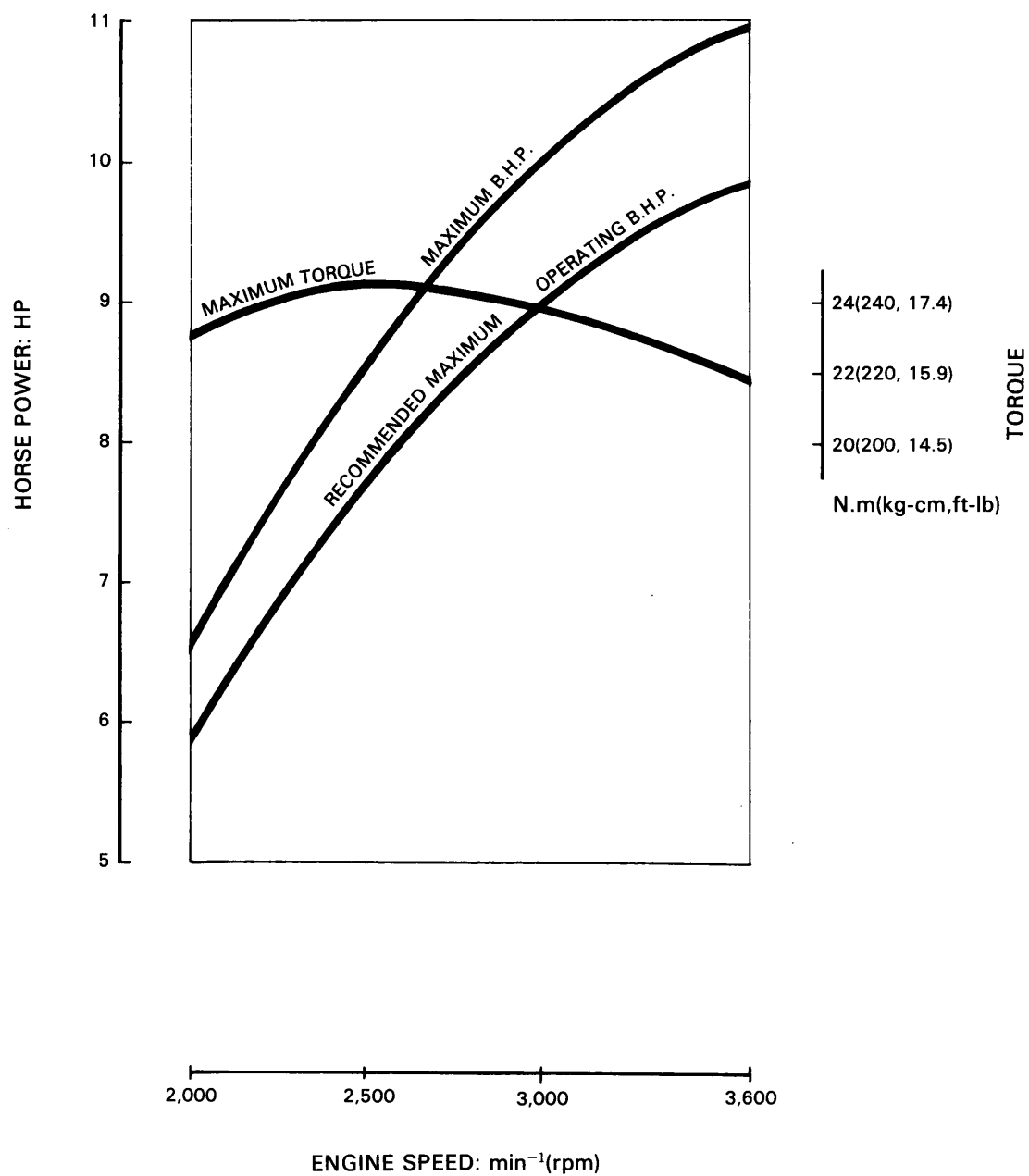
Tests were conducted according to SAE standard No. J607a.

Power curves are for standard sea level atmospheric pressure of 29.92 in. (760 mm) Hg at a temperature of 60°F (15.6°C). Power curves are of a standard test engine equipped with standard air cleaner, muffler and other power consuming devices. Power output will decrease 3.5 % for each 1,000 ft. (305 m) of elevation above sea level and 1 % for each 10°F (5.6°C) rise above the standard temperature of 60°F (15.6°C). As shipped, production engines will develop not less than 90 % of the "Maximum B.H.P.". After being run-in, they will develop not less than 95 % of the "Maximum B.H.P." For practical operations, the B.H.P. load and engine speed should be within the limits defined by the "Recommended Maximum Operating B.H.P." curve. Continuous operation should be limited to 85 % of the Maximum B.H.P.

〈GXV 270〉



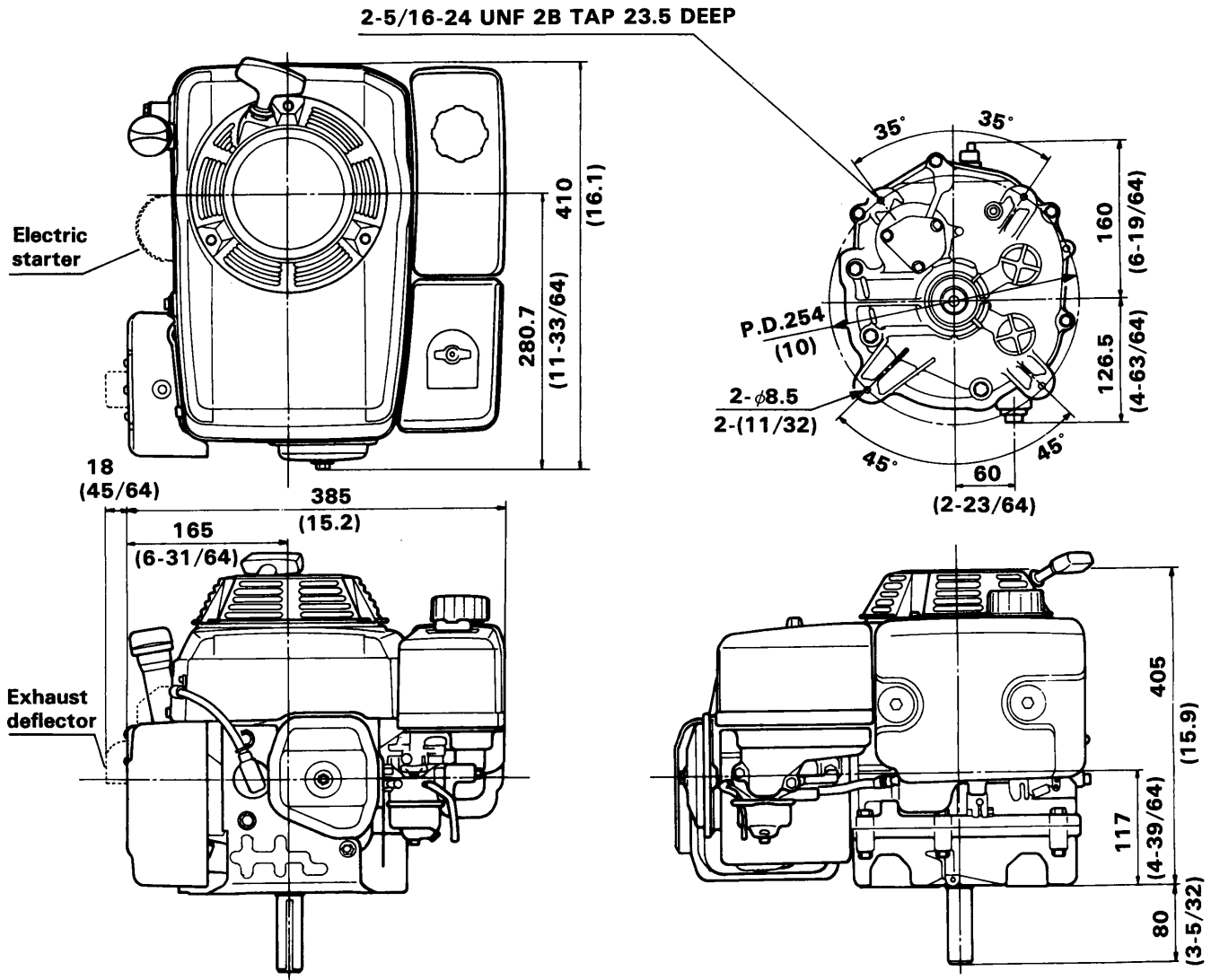
〈GXV 340〉



3. DIMENSIONAL DRAWINGS

<GXV 270>

Unit: mm (in)

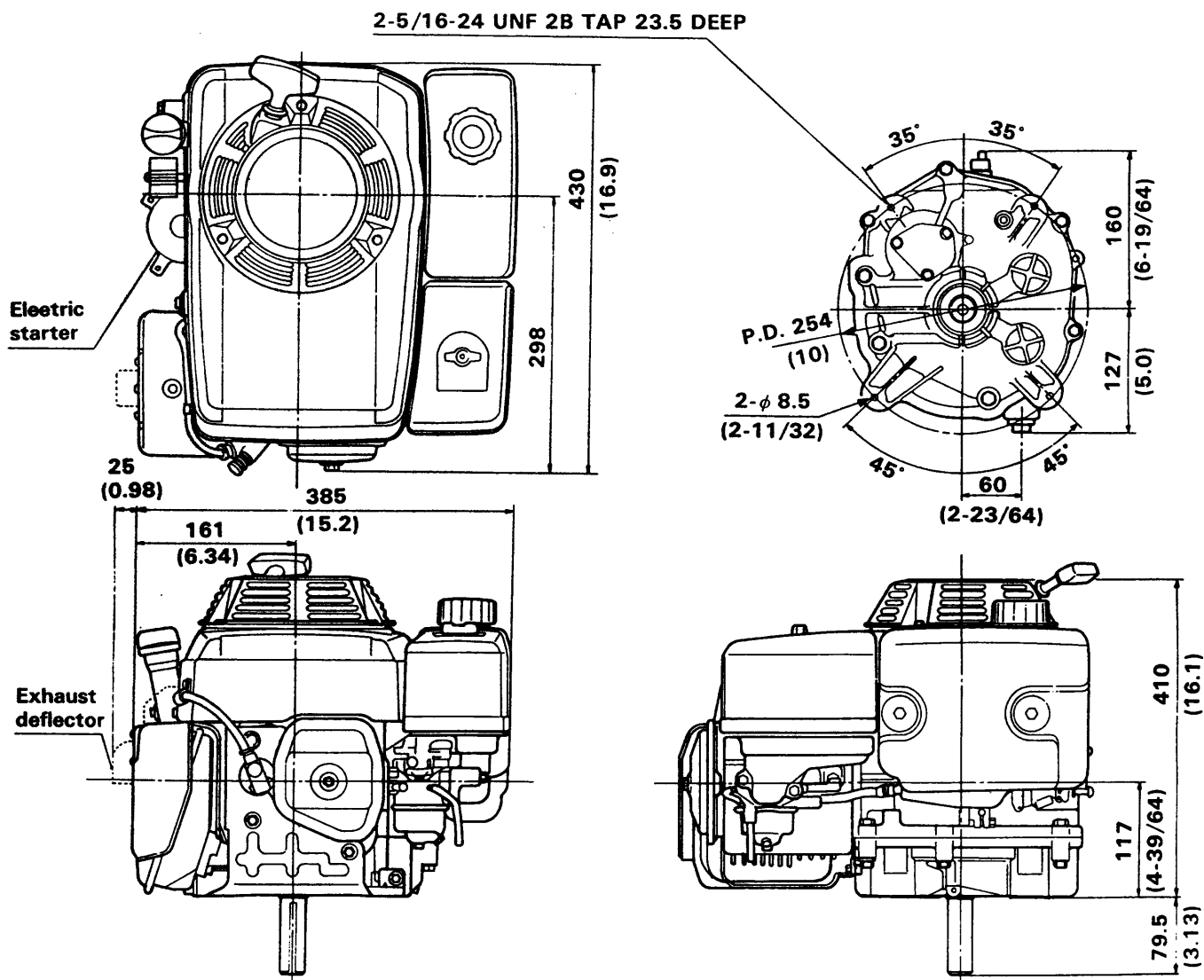


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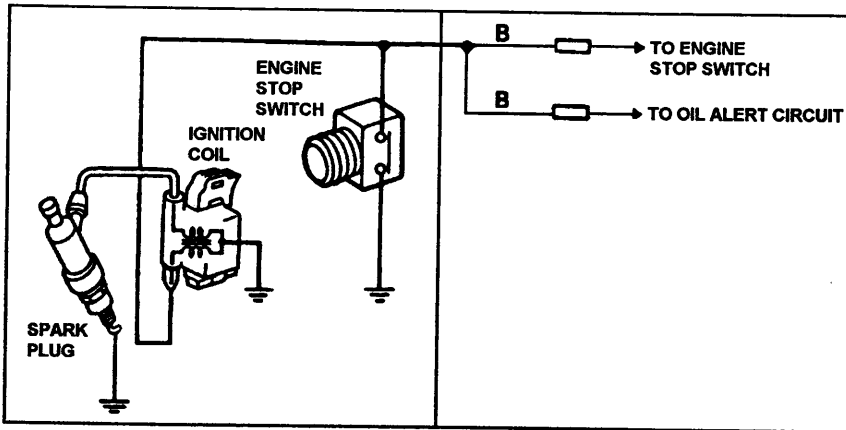
GXV270·GXV340

<GXV 340>

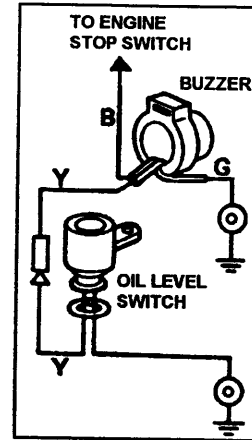
Unit: mm (in)



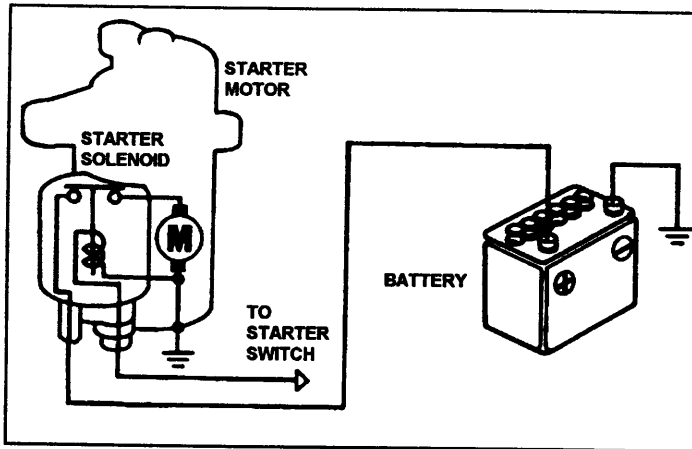
WIRING DIAGRAMS



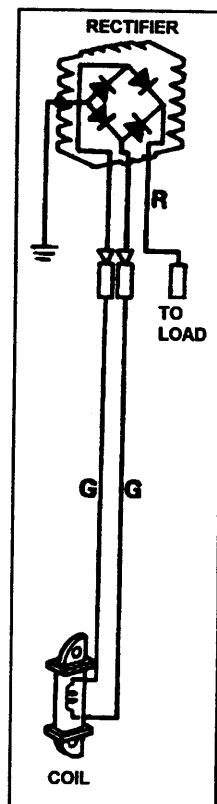
BASIC CIRCUIT



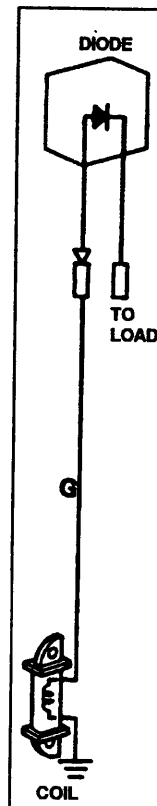
OIL ALERT CIRCUIT



12V STARTER CIRCUIT



3A CHARGING SYSTEM



1A CHARGING SYSTEM



LAMP COIL SYSTEM

B	BLACK
Y	YELLOW
G	GREEN
R	RED
W	WHITE

- | | |
|---------------------------|-------------------------|
| 1. GENERAL SAFETY | 5. TORQUE VALUES |
| 2. SERVICE RULES | 6. SPECIAL TOOLS |
| 3. SERIAL NUMBER LOCATION | 7. TROUBLESHOOTING |
| 4. MAINTENANCE STANDARDS | 8. MAINTENANCE SCHEDULE |

1. GENERAL SAFETY

Pay attention to these symbols and their meaning:

 **WARNING** Indicates a strong possibility of severe personal injury or death if instructions are not followed.

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

 WARNING

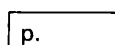
- Stop the engine and remove the spark plug before servicing.
- If the motor must be running to do some work, make sure the area is well ventilated. Never run the engine in a closed area.
- The exhaust contains poisonous carbon monoxide gas.
- Gasoline is extremely flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.

CAUTION:

Keep away from rotating or hot parts and spark plug wires when the engine is running.

2. 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 unit.
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 bolt 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 surface 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 female threads and ruin the hole.
8. Use only metric tools when servicing this unit. Metric bolts, nuts and screws are not interchangeable with nonmetric fasteners. The use of incorrect tools and fasteners may damage the unit.
9. Follow the instructions represented by these symbols when they are used:



Indicates the reference page

0 x 0 (O):

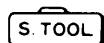
Indicates the size and quantity of bolts used.



: Apply oil.



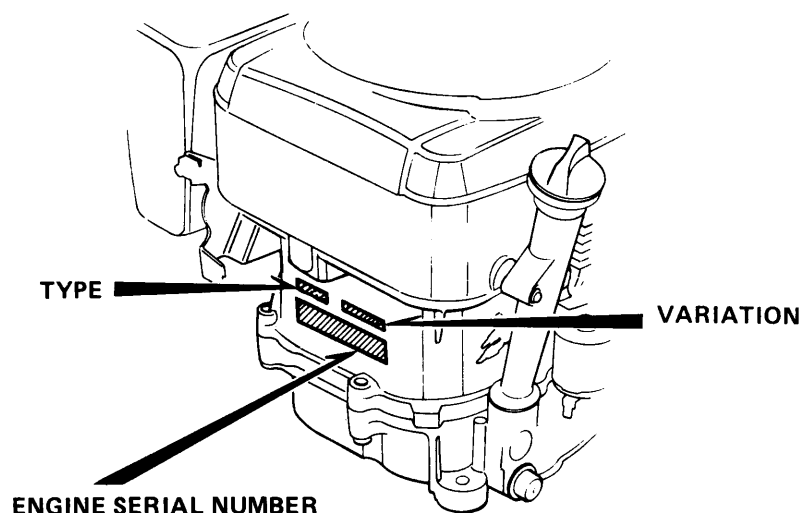
: Apply grease.



: Use special tool.

3. SERIAL NUMBER LOCATION

The engine serial number, the type and the variation are stamped on the crankcase. Refer to these when ordering parts or making technical inquiries.



4. MAINTENANCE STANDARDS

Unit : mm (in)

Part	Item	Standard		Service limit	
		GXV270	GXV340	GXV270	GXV340
Engine	Maximum rpm	3,400±150 min ⁻¹ (rpm)	←	←	←
	Idle rpm	1,400±150 min ⁻¹ (rpm)	←	←	←
	Cylinder compression	6.0–8.5 kg/cm ² (85–121 psi) at 600 min ⁻¹ (rpm)	←	←	←
Cylinder	Sleeve ID	77.000(3.0315)	82.000(3.2283)	77.17(3.038)	82.17(3.235)
Piston	Skirt OD	76.985(3.0309)	81.985(3.2277)	76.85(3.026)	81.85(3.222)
	Piston-to-cylinder clearance	0.015–0.052(0.0006–0.0020)	←	0.12(0.005)	←
	Piston pin bore ID	18.002(0.7087)	20.002(0.7875)	18.048(0.7120)	20.042(0.7891)
	Piston pin OD	18.000(0.7087)	20.000(0.7874)	17.954(0.7068)	19.95(0.785)
	Piston-to-piston pin clearance	0.002–0.014(0.0001–0.0006)	←	0.08(0.003)	←
Piston ring	Ring side clearance	0.015–0.045(0.0006–0.0018)	0.030–0.060(0.0012–0.0024)	0.15(0.006)	←
	Ring end gap	0.2–0.4(0.008–0.016)	←	1.0(0.04)	←
Connecting rod	Small end ID	18.005(0.7089)	20.005(0.7876)	18.07(0.711)	20.07(0.790)
	Big end ID	33.025(1.3002)	36.025(1.4183)	33.07(1.302)	36.07(1.420)
	Big end oil clearance	0.040–0.066(0.0016–0.0026)	←	0.12(0.005)	←
	Big end side clearance	0.1–0.7(0.004–0.028)	←	1.1(0.043)	←
Crankshaft	Crankpin OD	32.985(1.2986)	35.985(1.4167)	32.92(1.296)	35.93(1.415)
Valve	Valve clearance IN	0.15±0.02(0.006±0.001)	←	←	←
	EX	0.20±0.02(0.008±0.001)	←	←	←
	Stem OD IN	6.590(0.2594)	←	6.425(0.2530)	←
	EX	6.550(0.2579)	←	6.375(0.2510)	←
	Guide ID IN/EX	6.600(0.2598)	←	6.662(0.2623)	←
	Guide-to-stem clearance IN	0.010–0.037(0.0004–0.0015)	←	0.10(0.004)	←
	EX	0.050–0.077(0.0020–0.0030)	←	0.12(0.005)	←
	Seat width	1.1(0.043)	←	2.0(0.08)	←
	Spring free length	39.0(1.54)	←	37.5(1.48)	←
Camshaft	Cam lobe height IN	33.00(1.299)	←	32.75(1.289)	←
	EX	32.60(1.283)	←	32.35(1.274)	←
	Journal OD	15.984(0.6293)	←	15.916(0.6266)	←
Crankcase	Camshaft holder ID	16.000(0.6299)	←	16.05(0.632)	←
Carburetor	Main jet	# 85	# 88	←	←
	Float height	11.9–14.5(0.47–0.57)	←	←	←
	Pilot screw opening	2-1/4 turns out	2-1/2 turns out	←	←
Spark plug	Gap	0.7–0.8(0.028–0.031)	←	←	←
Ignition coil	Resistance Primary coil	0.7–0.9Ω	←	←	←
	Secondary coil	6.3–7.7kΩ	←	←	←
	Air gap	0.4±0.2(0.016±0.008)	←	←	←
Starter motor	Brush length	12(0.47)	←	8.5(0.34)	←
	Commutator mica depth	1.0(0.04)	←	0.2(0.01)	←
Charging coil	Resistance	3.0–4.0Ω	←	←	←
Oil pump	Pump body ID	29.00(1.142)	←	29.21(1.150)	←
	Inner rotor-to-outer rotor clearance	0.18(0.007)	←	0.30(0.012)	←
	Outer rotor-to-body clearance	0.15–0.20(0.006–0.008)	←	0.26(0.010)	←
	Outer rotor height	7.48(0.294)	←	7.45(0.293)	←
	Pump body depth	7.50(0.295)	←	7.56(0.298)	←
	Rotor-to-body side clearance	0.02–0.09(0.0008–0.0035)	←	0.11(0.0043)	←

5. TORQUE VALUES

Unit: N·m (kg·cm, ft·lb)

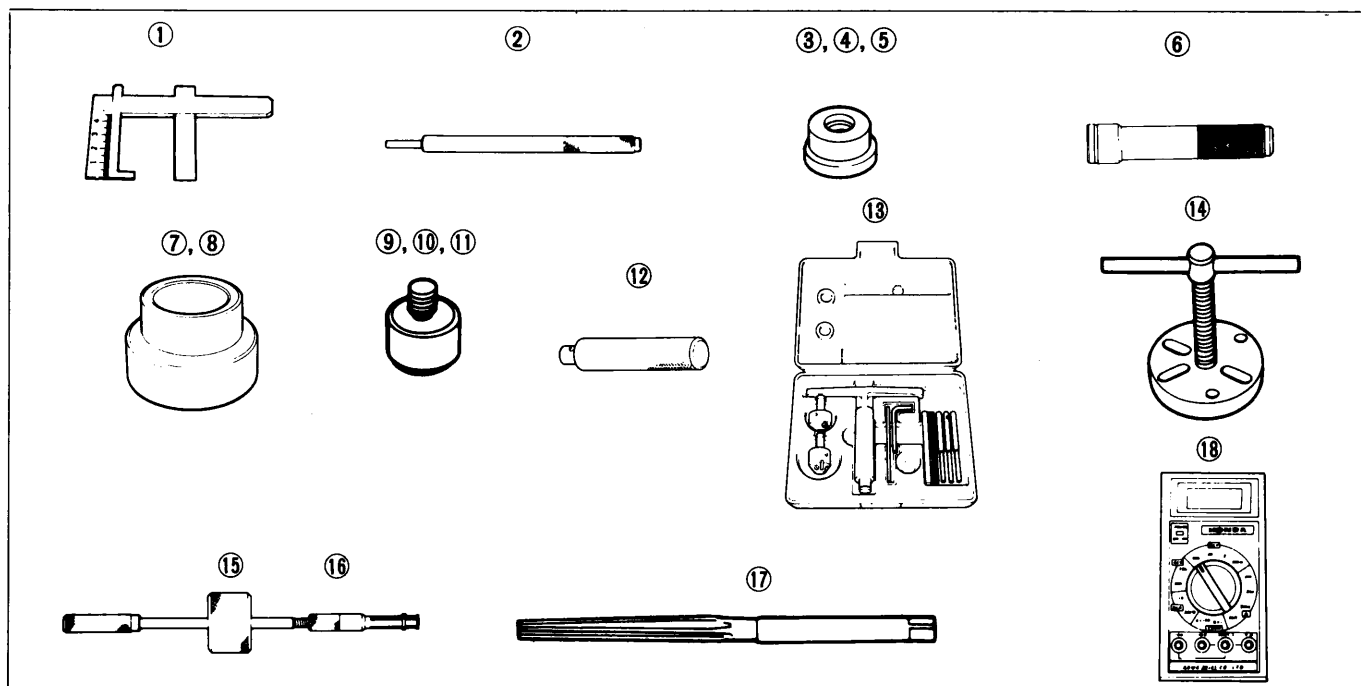
Fastener	Fastener size	Torque values
Cylinder head bolt	10 x 1.25 x 80 mm	32–38 (320–380, 23.1–27.5)
Pivot adjusting nut	6 x 0.5 mm	8–12 (80–120, 5.8–8.7)
Push rod guide pivot bolt	8 x 1.25 mm (Special bolt)	22–26 (220–260, 15.9–18.8)
Oil pan bolt	8 x 1.25 x 40 mm	22–26 (220–260, 15.9–18.8)
Connecting rod bolt	8 x 1.25 mm (Special bolt)	12–16 (120–160, 8.7–11.6)
Air cleaner body cap nut	6 x 1.0 mm	7–10 (70–100, 5.1–7.2)
Muffler mounting nut	8 x 1.25 mm	22–26 (220–260, 15.9–18.8)
Exhaust pipe mounting nut	8 x 1.25 mm	22–26 (220–260, 15.9–18.8)
Flywheel mount nut	16 x 1.5 mm (Special nut)	110–120 (1,100–1,200, 79.5–86.8)
Oil drain plug	20 x 1.5 mm	40–50 (400–500, 28.9–36.2)
Cylinder head cover bolt	6 x 1.0 mm	7–10 (70–100, 5.1–7.2)
Fuel tank mount bolt	8 x 1.25 mm	22–26 (220–260, 15.9–18.8)
Standard torque values	5 mm bolt, nut	4–7 (40–70, 2.9–5.1)
	6 mm bolt, nut	8–12 (80–120, 5.8–8.7)
	8 mm bolt, nut	20–28 (200–280, 14.5–20.2)
	10 mm bolt, nut	35–40 (350–400, 25.3–28.9)
	12 mm bolt, nut	50–60 (500–600, 36.2–43.4)

NOTE: Use standard torque values for fasteners that are not listed in this table.

6. SPECIAL TOOLS

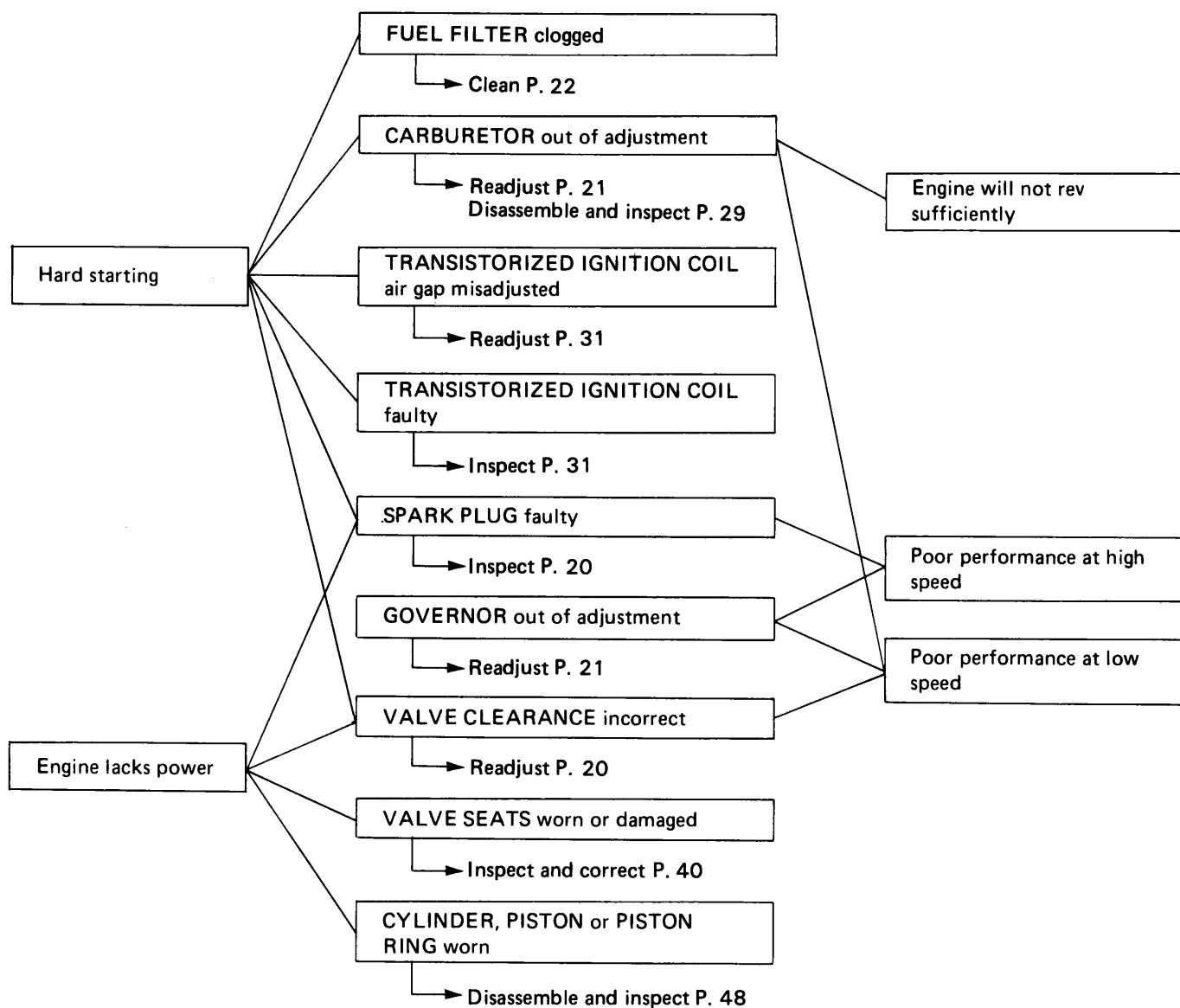
Tool name	Tool number	Application
1. Float level gauge	07401-0010000	Carburetor float level inspection
2. Valve guide driver, 6.6 mm	07942-6570100	Valve guide removal/installation
3. Attachment, 32 x 35 mm	07746-0010100	Balancer bearing 6202 installation
4. Attachment, 62 x 68 mm	07746-0010500	Crankshaft bearing 6206 (crankcase side) installation (GXV270)
5. Attachment, 72 x 75 mm	07746-0010600	Crankshaft bearing 6207 (crankcase side) installation (GXV340)
6. Driver	07746-0030100	Driver handle for attachments (7) and (8)
7. Attachment, I.D. 30 mm	07746-0030300	Crankshaft bearing 6206 (crankshaft side) (GXV270) and timing gear installation
8. Attachment, I.D. 35 mm	07746-0030400	Crankshaft bearing 6207 (crankshaft side) (GXV340) and balancer drive gear installation
9. Pilot, 15 mm	07746-0040300	Balancer bearing 6202 installation
10. Pilot, 30 mm	07746-0040700	Crankshaft bearing 6206 (crankcase side) installation (GXV270)
11. Pilot, 35 mm	07746-0040800	Crankshaft bearing 6207 (crankshaft side) installation (GXV340)
12. Driver	07749-0010000	Driver handle for attachments (3),(4) and (5), and pilots (9),(10) and (11)
13. Valve seat cutter # 114 60°	07780-P01020A	Valve seat reconditioning
Valve seat cutter # 128 30°-45°	07780-P01010B	Valve seat reconditioning
Solid pilot bar, 6.60 mm	07781-P02010A	Valve seat reconditioning
Solid pilot bar, 6.62 mm	07781-P02020A	Valve seat reconditioning
Solid pilot bar, 6.65 mm	07781-P02030A	Valve seat reconditioning
T-wrench, #505	07782-P01010A	Valve seat reconditioning
T-wrench adapter, #503-1	07782-P01020A	Valve seat reconditioning
Accessory package, #246	07782-P01030A	Valve seat reconditioning
14. Flywheel puller	07935-8050003*	Flywheel removal 24.03
15. Remover weight	07936-3710200	Use with bearing remover (16)
16. Bearing remover, 15 mm	07936-KC10500	Balancer bearing removal
17. Valve guide reamer, 6.6 mm	07984-ZE20000	Valve guide I.D. reaming
18. Digital multimeter	KS-AHM-32-003	Electrical testing

*10 Gear puller
2 Arm puller*

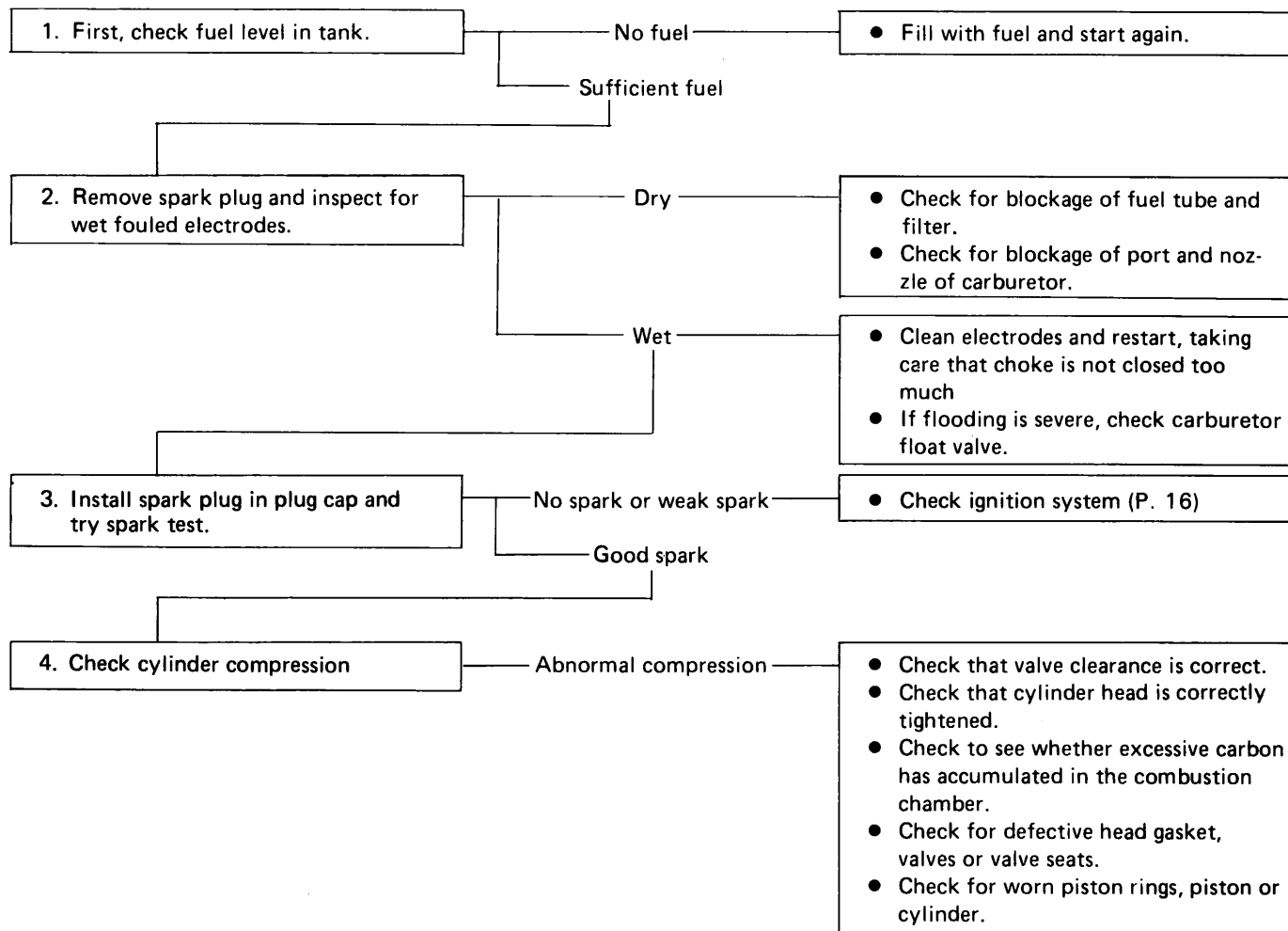


7. TROUBLESHOOTING

a. GENERAL SYMPTOMS AND POSSIBLE CAUSES



b. HARD STARTING

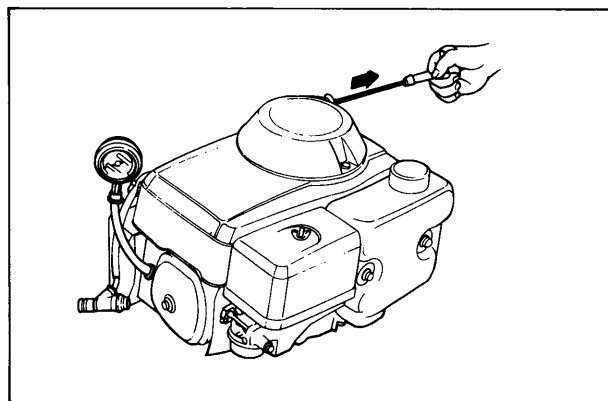


CYLINDER COMPRESSION CHECK

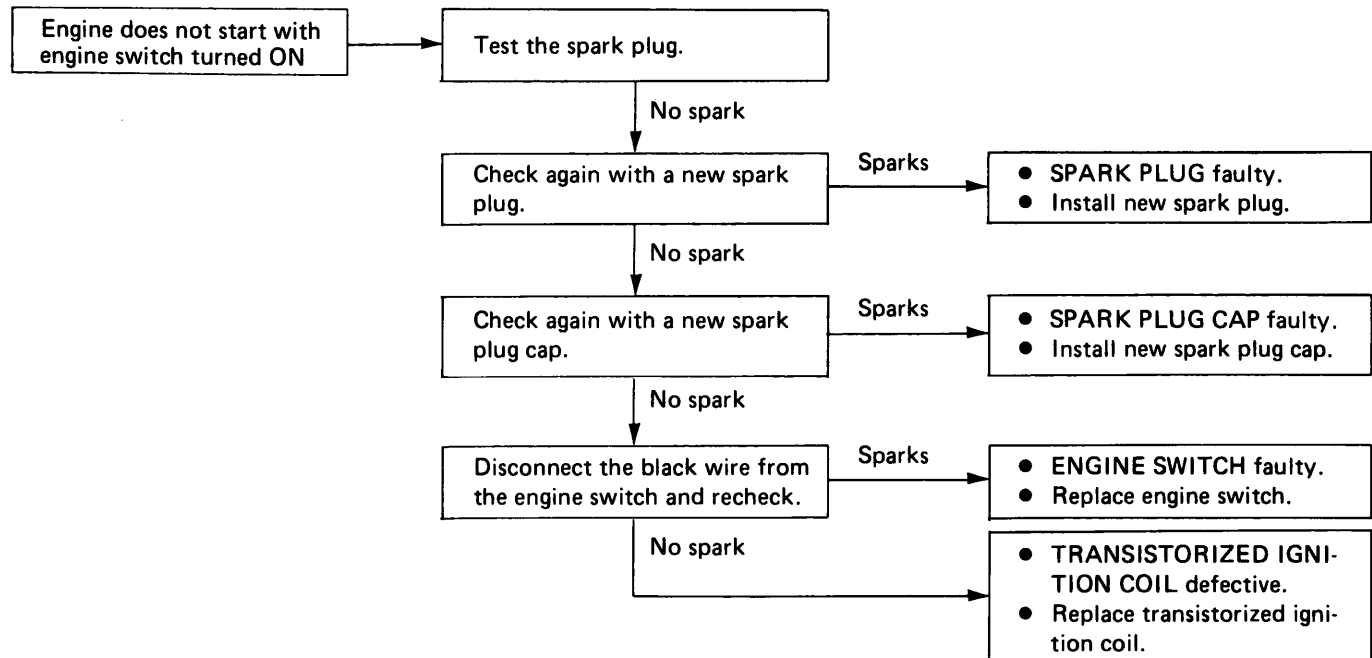
(mechanical decompressor engaged)

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

Cylinder compression	6.0–8.5 kg/cm ² (85–121 psi) at 600 min ⁻¹ (rpm)
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c. IGNITION SYSTEM

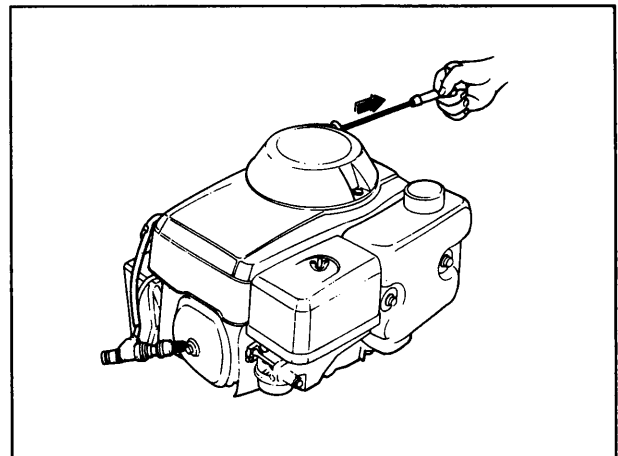


SPARK TEST

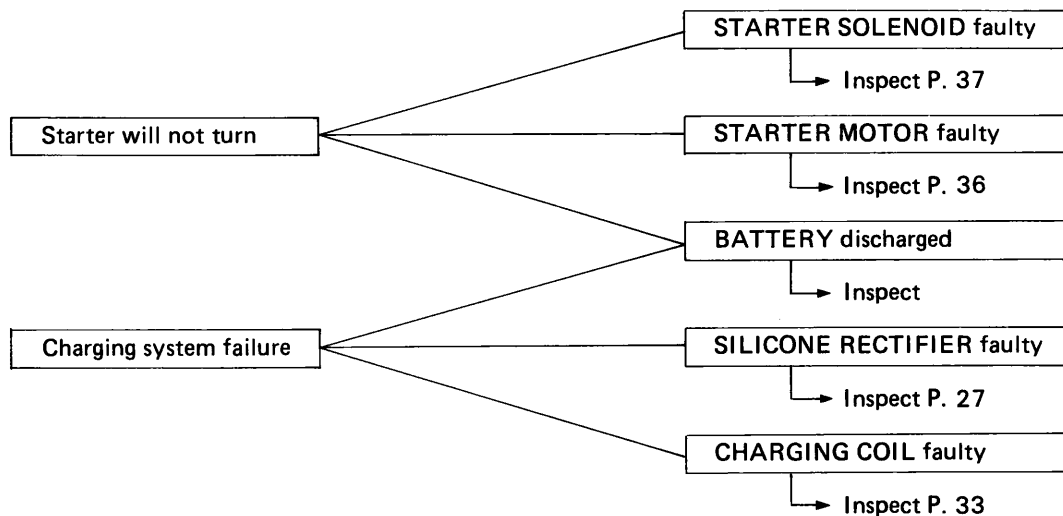
- 1) Remove the spark plug, attach it to the spark plug cap, and ground the side electrode against the cylinder head cover.
- 2) Turn on the engine switch, pull the recoil starter and check to see if sparks jump across the electrodes.

WARNING

- Never hold the spark plug lead with wet hands while performing this test.
- Make sure that no fuel has been spilled on the engine and plug is not wet with fuel.
- To avoid fire hazards, do not allow sparks near the plug hole.



d. ELECTRIC STARTING SYSTEM



8. MAINTENANCE SCHEDULE

REGULAR SERVICE PERIOD Performed at every indicated month or operating hour interval whichever comes first.		EACH USE	FIRST MONTH OR 20 HRS	EVERY 3 MONTHS OR 50 HRS	EVERY 6 MONTHS OR 100 HRS	EVERY YEAR OR 300 HRS
ITEM						
Engine oil	Check level	○				
	Change		○		○	
Air cleaner	Check	○				
	Clean			○*		
Spark plug	Clean-Readjust				○	
Spark arrester (optional part)	Clean				○	
Valve clearance	Check-Readjust					○
Fuel tank and filter	Clean					○
Fuel line	Check (Replace if necessary)	Every 3 years				

* Service more frequently when used in dusty areas.

NOTE

1. ENGINE OIL
2. AIR CLEANER
3. SPARK PLUG
4. VALVE CLEARANCE

5. CARBURETOR
6. GOVERNOR
7. FUEL FILTER
8. SPARK ARRESTER (Optional)

1. ENGINE OIL

NOTE: Draining can be performed rapidly and completely while the engine is still warm.

- 1) Remove the oil filler cap/dipstick and drain plug. Allow the oil to drain completely.
- 2) Reinstall the drain plug, and tighten it securely.
- 3) Fill the crankcase with the recommended engine oil to the upper level mark on the dipstick. Reinstall the oil filler cap/dipstick.

NOTE:

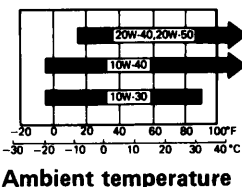
- Check the oil level with the dipstick fully inserted but not screwed in.
- Be sure the engine is upright, not tilted, when checking the engine oil level.

RECOMMENDED ENGINE OIL:

SAE 10W-40 is recommended for general, all-temperature use; service classification SE or SF.

OIL CAPACITY:

1.1 ℓ (1.2 US qt, 1.0 Imp qt)



CAUTION: Used motor oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

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

2. AIR CLEANER

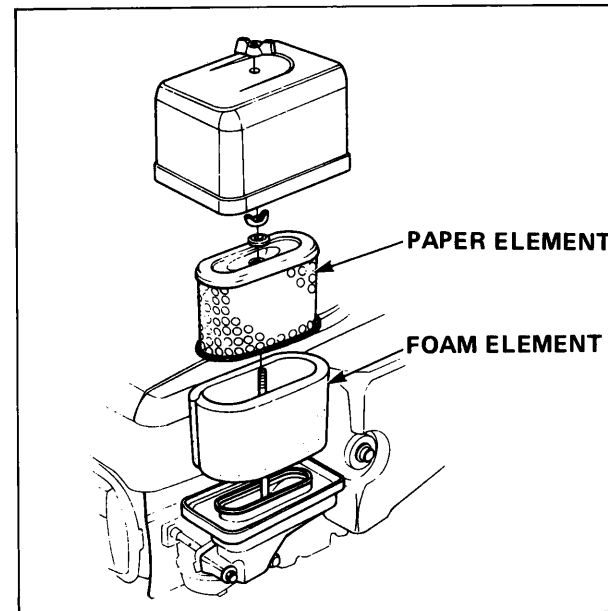
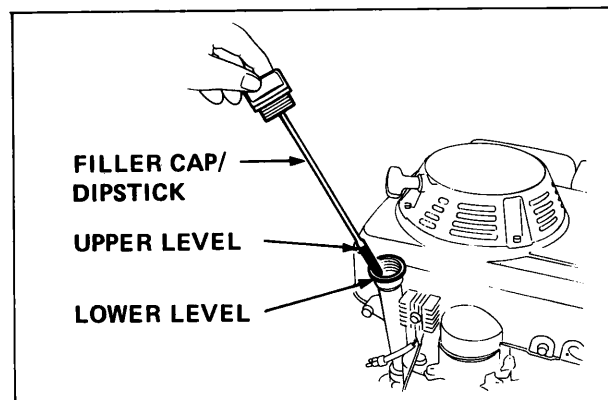
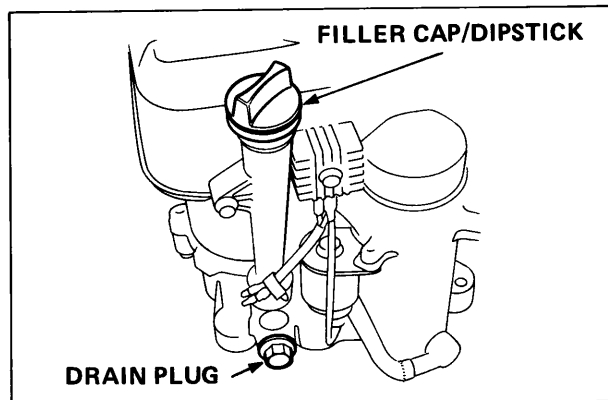
- 1) Foam element: Wash in nonflammable or high flashpoint solvent and dry.

WARNING Do not use gasoline or low flashpoint solvent for cleaning. They are flammable and are explosive under certain conditions.

Dip the foam element in clean engine oil, and squeeze out excess oil.

- 2) Paper element: Tap the element lightly on a hard surface to remove dirt, or blow compressed air through the filter from the inside. If extremely dirty or damaged, replace the element.

CAUTION: Do not try to brush off the dirt. Brushing will force dirt into the filter fibers.



3. 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 it if the insulator is cracked or chipped. The center electrode should have square edges and the side electrode should not be eroded. Remove any deposits with a wire brush.
- 4) Check the plug gap with a wire-type feeler gauge and adjust the gap as necessary by bending the side electrode.

Electrode gap	0.7–0.8 mm (0.028–0.031 in)
Standard spark plug	BPR5ES (NGK), W16EPR-U (ND)

- 5) Make sure the sealing washer is in good condition, and with the washer attached, thread the plug in by hand to prevent cross-threading.
- 6) After the spark plug is seated, tighten with a spark plug wrench to compress the washer.

NOTE: If installing a new spark plug, tighten 1/2 turn after the spark plug seats to compress the washer. If reinstalling a used spark plug, tighten 1/8–1/4 turn after the spark plug seats to compress the washer.

CAUTION:

- The plug must be securely tightened. An improperly tightened plug can become very hot and possibly damage the engine.
- Never use a spark plug with an improper heat range.

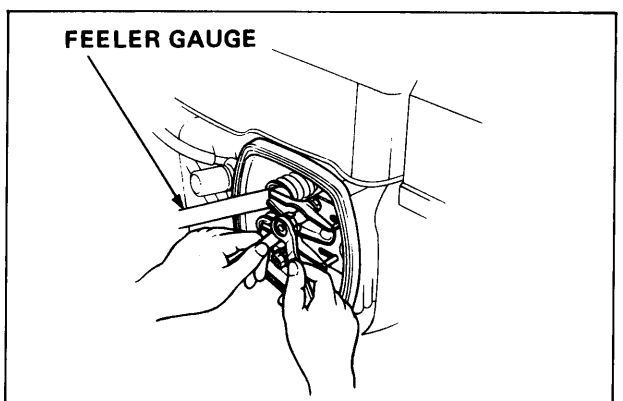
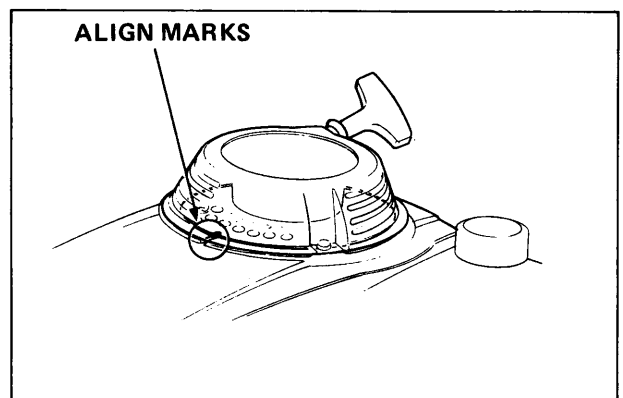
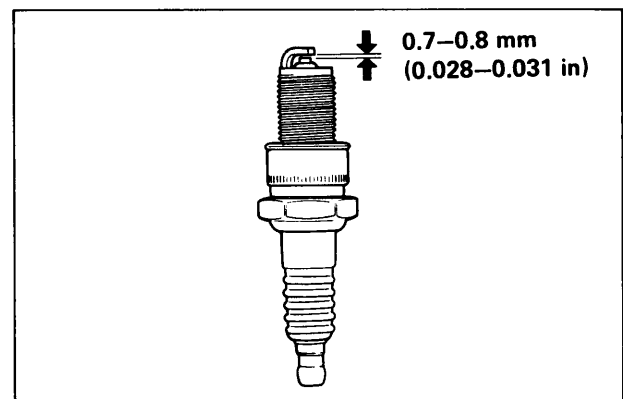
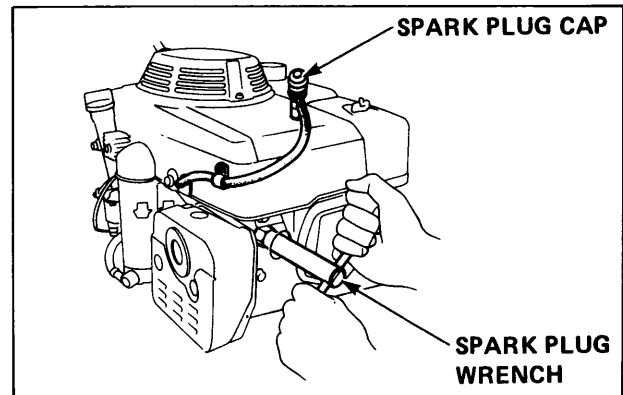
4. VALVE CLEARANCE

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

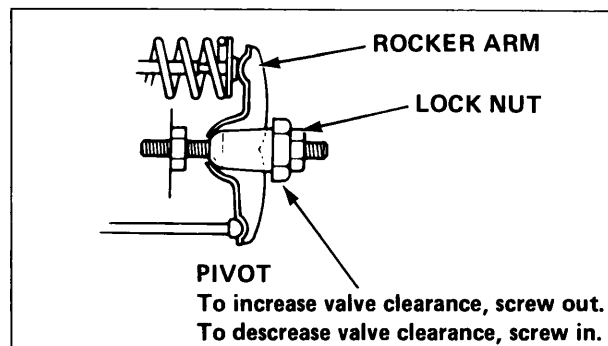
- 1) Remove the cylinder head cover, and set the piston at top dead center of the compression stroke (both valves fully closed). The cutout mark in the starter pulley will align with the index mark on the fan cover when the piston is at top dead center of the compression or exhaust stroke.

- 2) Insert a feeler gauge between the rocker arm and valve to measure valve clearance.

Standard valve clearance	IN	0.15 ± 0.02 mm (0.006 ± 0.001 in)
	EX	0.20 ± 0.02 mm (0.008 ± 0.001 in)



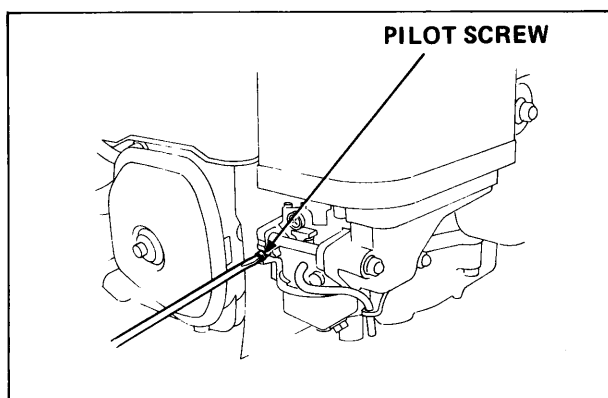
- 3) If adjustment is necessary, proceed as follows:
 - a. Hold the rocker arm pivot and loosen the pivot lock nut.
 - b. Turn the rocker arm pivot to obtain the specified clearance.
 - c. Retighten the lock nut while holding the rocker arm pivot.
 - d. Recheck valve clearance after tightening the lock nut.



5. CARBURETOR

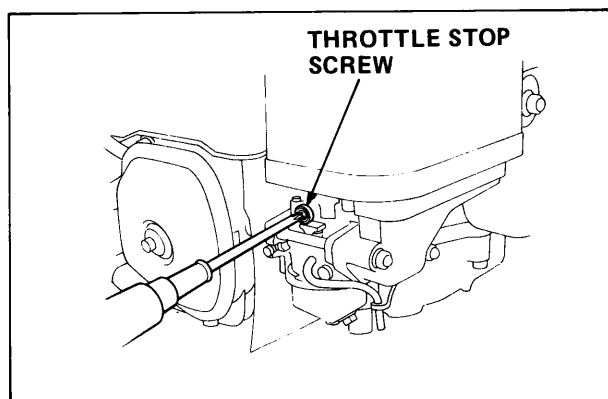
- 1) Start the engine and allow it to warm up to normal operating temperature.
- 2) With the engine idling, turn the pilot screw in or out to the setting that produces the highest idle rpm. The correct setting will usually be obtained at approximately the following number of turns out from the fully closed (lightly seated) position.

Pilot screw opening	GXV 270	2- 1/4 turns out
	GXV 340	2- 1/2 turns out



- 3) After the pilot screw is correctly adjusted, turn the throttle stop screw to obtain the standard idle speed.

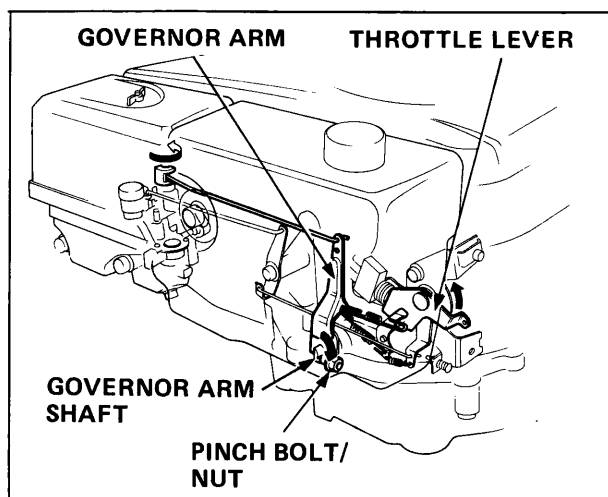
Standard idle speed	1,400 ± 150 min ⁻¹ (rpm)
---------------------	-------------------------------------



6. GOVERNOR

- 1) Loosen the nut on the governor arm pinch bolt, and move the governor arm to fully open the throttle.
- 2) Rotate the governor arm shaft as far as it will go in the same direction the governor arm moved to open the throttle.
- 3) Start the engine and allow it to warm up to normal operating temperature. Move the throttle lever to run the engine at the standard maximum speed, and check the engine speed.

Standard maximum speed	3,400 ± 150 min ⁻¹ (rpm)
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7. FUEL FILTER

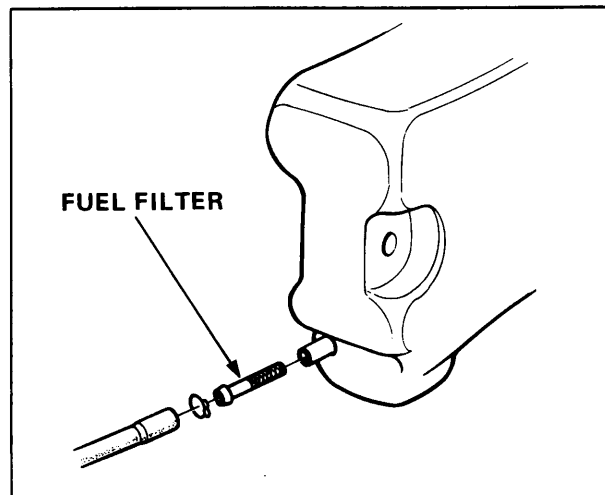
- 1) Drain the fuel into a suitable container, and remove the fuel tank.
- 2) Disconnect the fuel line, and pull the fuel filter out of the fuel line.
- 3) Clean the filter with solvent, and check to be sure the filter screen is undamaged.

NOTE: Also flush and clean the fuel tank, if necessary.

- 4) Install the filter into the fuel tank and connect the fuel line. After installation, check for leaks.

WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks in the area.
- After installing the fuel filter, check for leaks, and make sure the area is dry before starting the engine.



8. SPARK ARRESTER (Optional)

WARNING

If the engine has been running, the muffler will be very hot. Allow it to cool before proceeding.

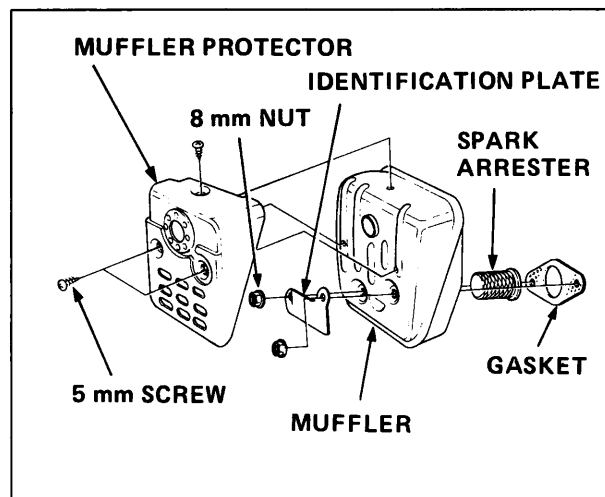
- 1) Remove the three 5 mm screws and the muffler protector.
- 2) Remove the two 8 mm nuts and remove the identification plate, muffler and gasket.
- 3) Remove the spark arrester from the muffler.

CAUTION: Be careful not to damage the spark arrester screen.

- 4) Check for carbon deposits on the spark arrester, and clean if necessary.

NOTE: The spark arrester must be free of breaks and holes. Replace, if necessary.

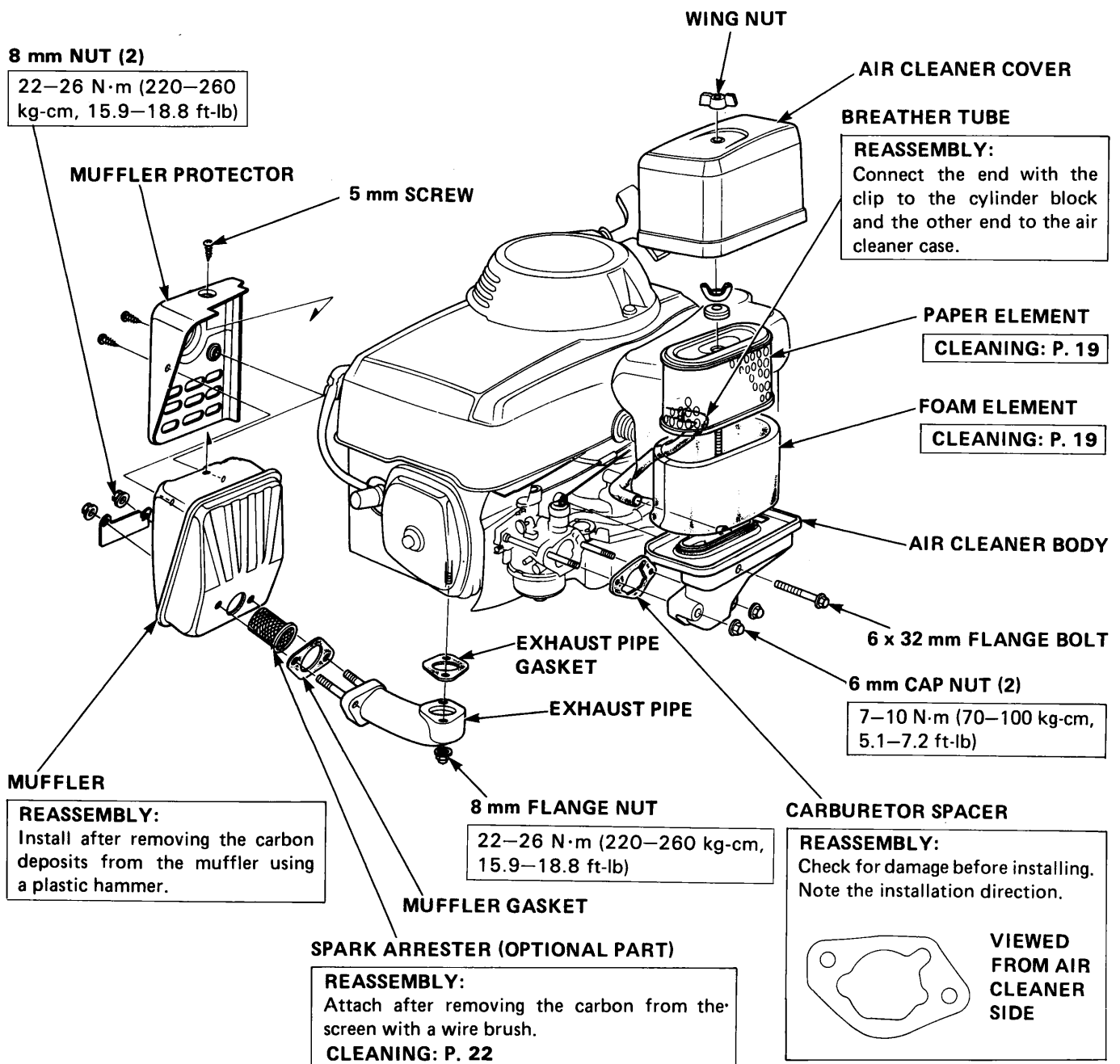
- 5) Install the spark arrester and muffler in the reverse order of removal.



- | | |
|--------------------------------------|--------------------------------|
| 1. AIR CLEANER, MUFFLER | 5. FLYWHEEL |
| 2. RECOIL STARTER, FUEL TANK | 6. STARTER MOTOR |
| 3. CARBURETOR | 7. CYLINDER HEAD, VALVES |
| 4. IGNITION COIL, ENGINE STOP SWITCH | 8. OIL PAN, GOVERNOR, OIL PUMP |
| | 9. CRANKSHAFT, PISTON |

1. AIR CLEANER, MUFFLER

a. DISASSEMBLY/REASSEMBLY

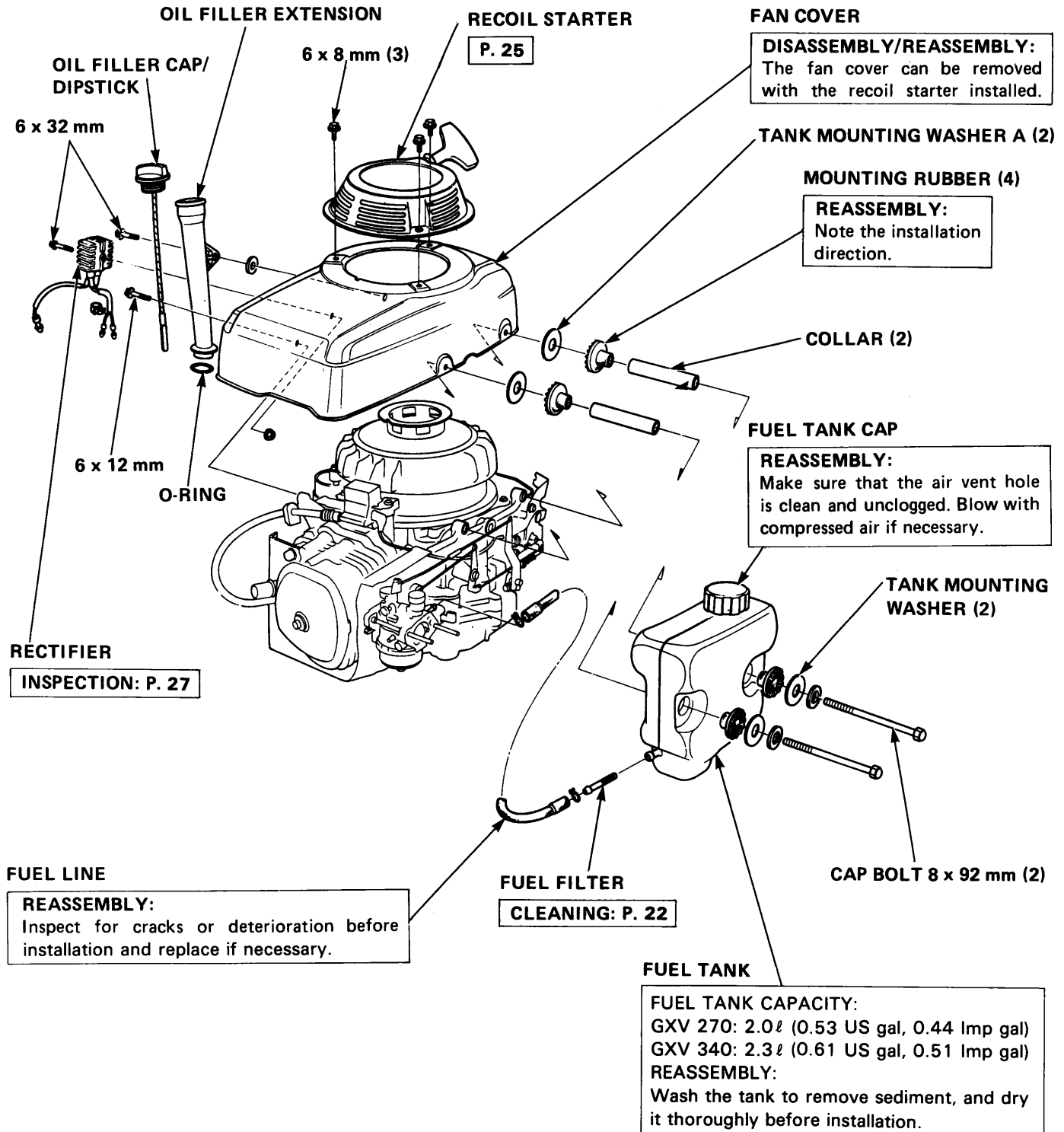


2. RECOIL STARTER, FUEL TANK

a. DISASSEMBLY/REASSEMBLY

WARNING

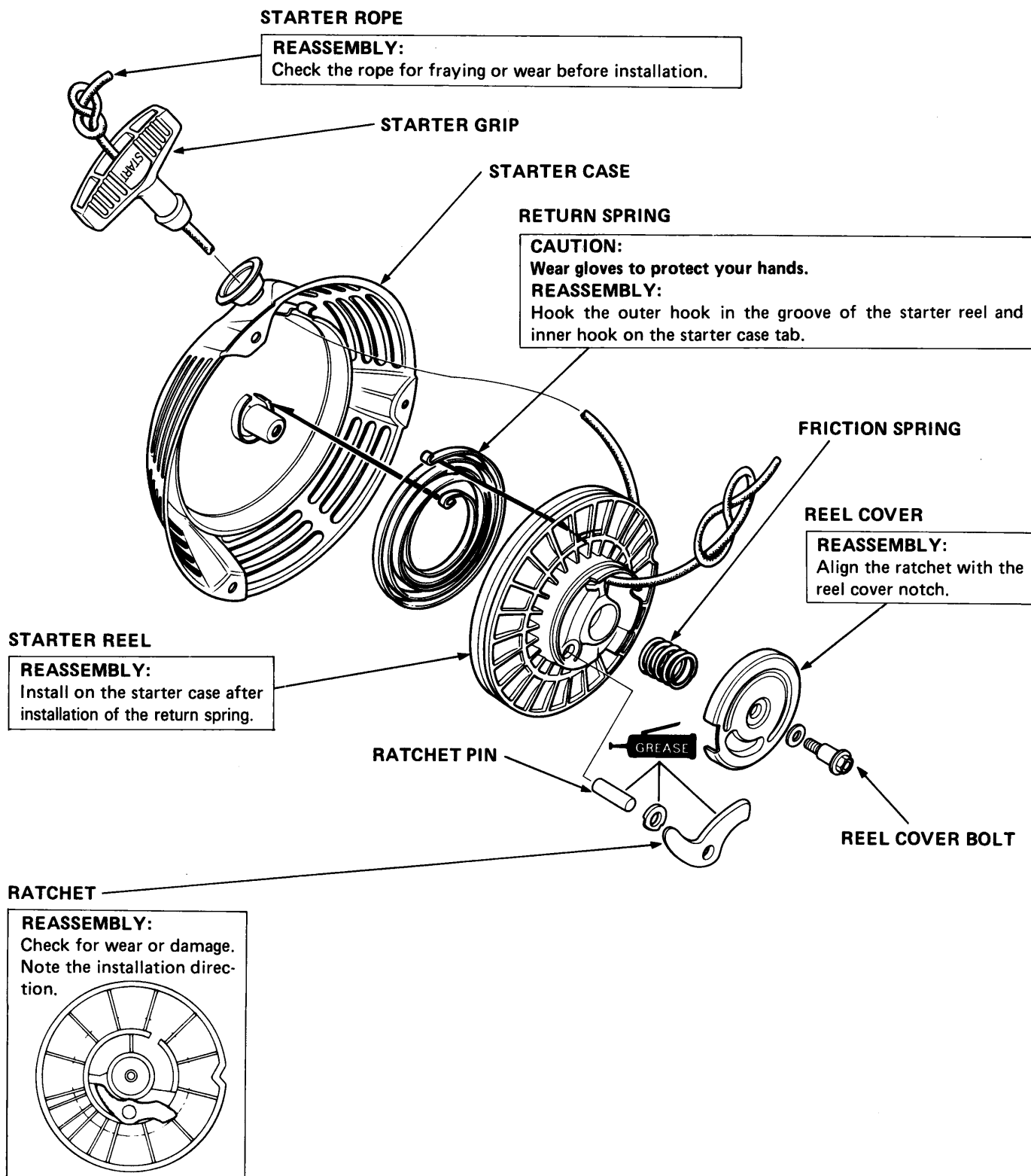
- Before disassembly, drain the tank and fuel line completely.
- Fuel vapor or spilled fuel may ignite.



● RECOIL STARTER

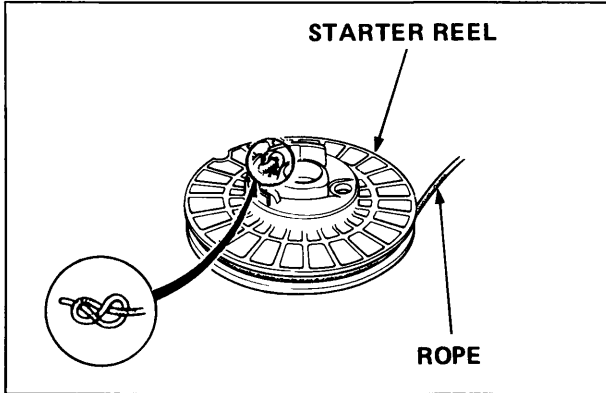
REASSEMBLY:

Remove dirt and debris before installation. Position the starter grip on the opposite side of the cylinder head.

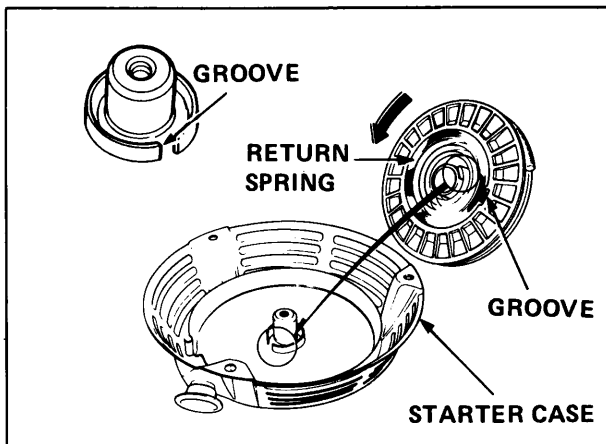


● RECOIL STARTER ASSEMBLY

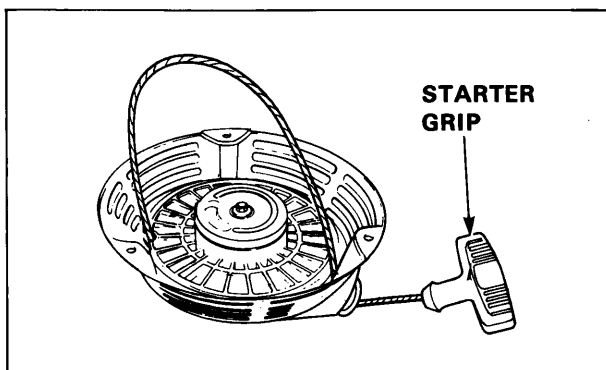
- 1) Feed the end of the rope through the hole in the starter reel, and tie the rope end.
Wind the rope onto the reel in the direction shown, and wedge the rope end in the notch on the edge of the reel.



- 2) Hook the spring outer hook in the reel groove, and install the reel on the starter case, so that the spring inner hook is hooked to the starter case tab by turning the reel counterclockwise.

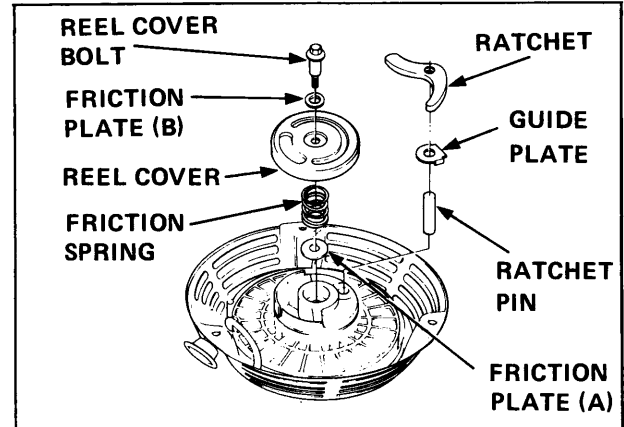


- 3) With a short length of the rope extending from the reel notch, pull the end of the rope out of the case, feed it through the starter grip, and tie a knot in the end of the rope.

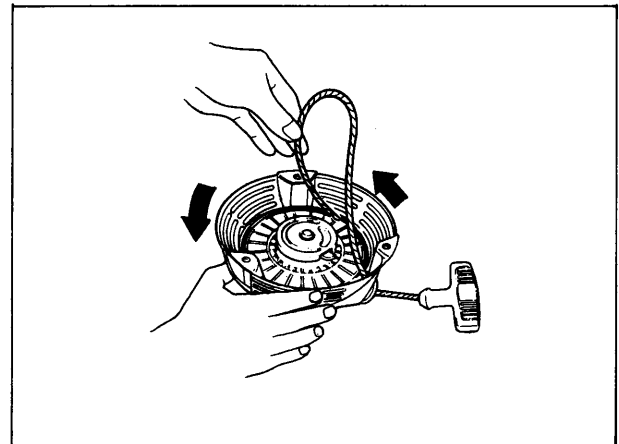


- 4) Install the friction plate, friction spring, ratchet pin, guide plate, and reel cover. Tighten the reel cover bolt.

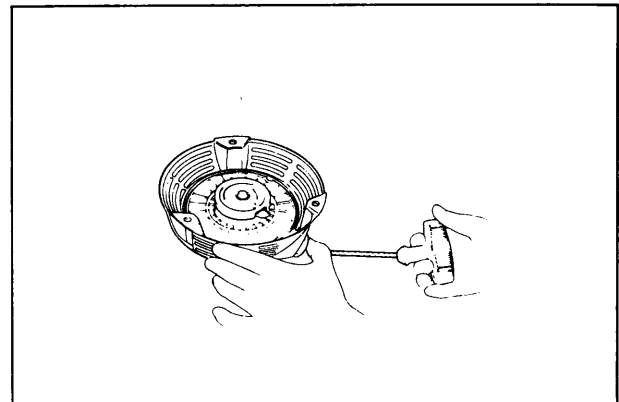
Torque: 8–12 N·m (80–120 kg-cm, 5.8–8.7 ft-lb)



- 5) Turn the reel about three turns in the direction shown by the arrow to preload the return spring.



- 6) Check the operation of the ratchet by pulling the starter rope out several times.



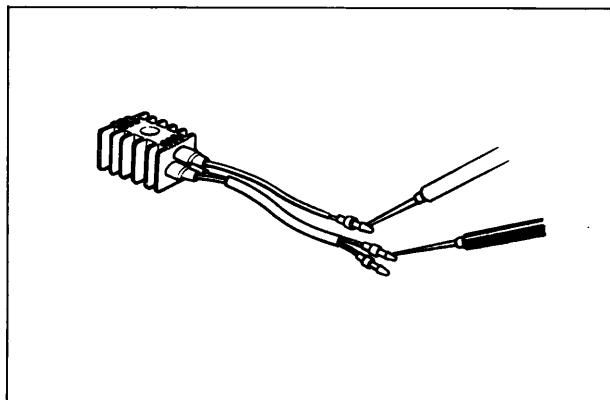
b. INSPECTION

● SILICONE RECTIFIER

Using the R x 100 Ω range of the digital tester, check the resistance between the terminals and rectifier body.

Unit: k Ω

$\oplus$ probe $\ominus$ probe	Red	Green	Green	Body
Red		∞	∞	∞
Green	0.1–20		∞	∞
Green	0.1–20	∞		∞
Body	0.5–50	0.1–20	0.1–20	



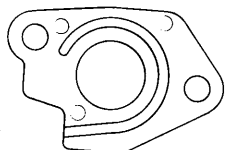
3. CARBURETOR

a. DISASSEMBLY/REASSEMBLY

CARBURETOR INSULATOR

REASSEMBLY:

Remove the dirt with compressed air before installation.
Note the installation direction.

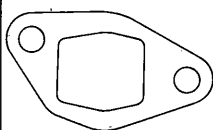


**VIEWED FROM
CARBURETOR
SIDE**

INSULATOR GASKET

REASSEMBLY:

Note the installation direction.



**VIEWED FROM
CARBURETOR
SIDE**

CARBURETOR GASKET

GOVERNOR ROD

CHOKE ROD

6 mm BOLT

CHOKE JOINT LEVER

GOVERNOR SPRING

6 x 12 mm

IDLE SPRING

GOVERNOR ARM

ADJUSTMENT: P. 21

JOINT ROD

CONTROL ASSEMBLY

CARBURETOR

DISASSEMBLY:

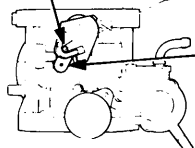
Pull the carburetor forward to a point where the groove in the throttle arm lines up with the rod, and lift the rod out of its hole.

REASSEMBLY: P. 29

GROOVE

GOVERNOR ROD

THROTTLE ARM



CAUTION:

After reassembly, make sure that the throttle/choke/governor linkage does not interfere with any parts.

CAUTION:

Remove the drain bolt and drain the carburetor before disassembly. Fuel vapor or spilled fuel may ignite.

PILOT SCREW

REASSEMBLY:
Inspect for wear or damage before installation.
ADJUSTMENT: P. 21

MAIN NOZZLE

REASSEMBLY:
Clean thoroughly with compressed air before installation.

MAIN JET

REASSEMBLY:
Clean thoroughly with compressed air before installation.

FLOAT

REASSEMBLY:
Check for smooth movement after installation.

FLOAT CHAMBER

SET BOLT

CAUTION:
After assembly, check for any sign of fuel leakage.

THROTTLE STOP SCREW
ADJUSTMENT: P. 21

FLOAT PIN

FLOAT VALVE

REASSEMBLY:
Check for worn valve or weak spring before installation.



FLOAT CHAMBER GASKET

SEALING WASHER

DRAIN BOLT

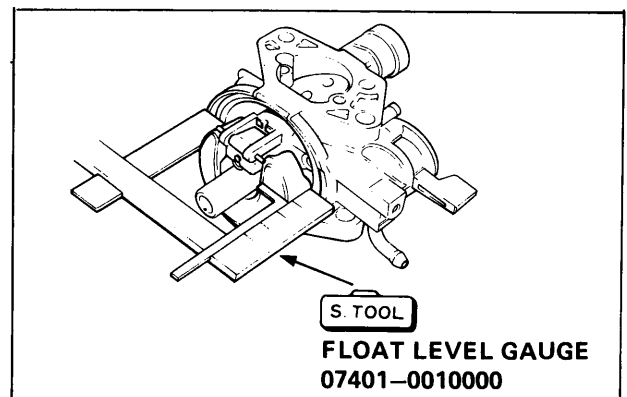
b. INSPECTION

● FLOAT LEVEL HEIGHT

Place the carburetor in an upright position and measure the distance between the float top and carburetor body when the float just contacts the float valve.

Standard float height	11.9–14.5 mm (0.47–0.57 in)
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- If the height is out of specification, replace the float.



4. IGNITION COIL, ENGINE STOP SWITCH

a. DISASSEMBLY/REASSEMBLY

IGNITION COIL

INSPECTION/ADJUSTMENT: P. 31

SPARK PLUG LEAD

REASSEMBLY:

Check for cracked or damaged insulation; replace if necessary.

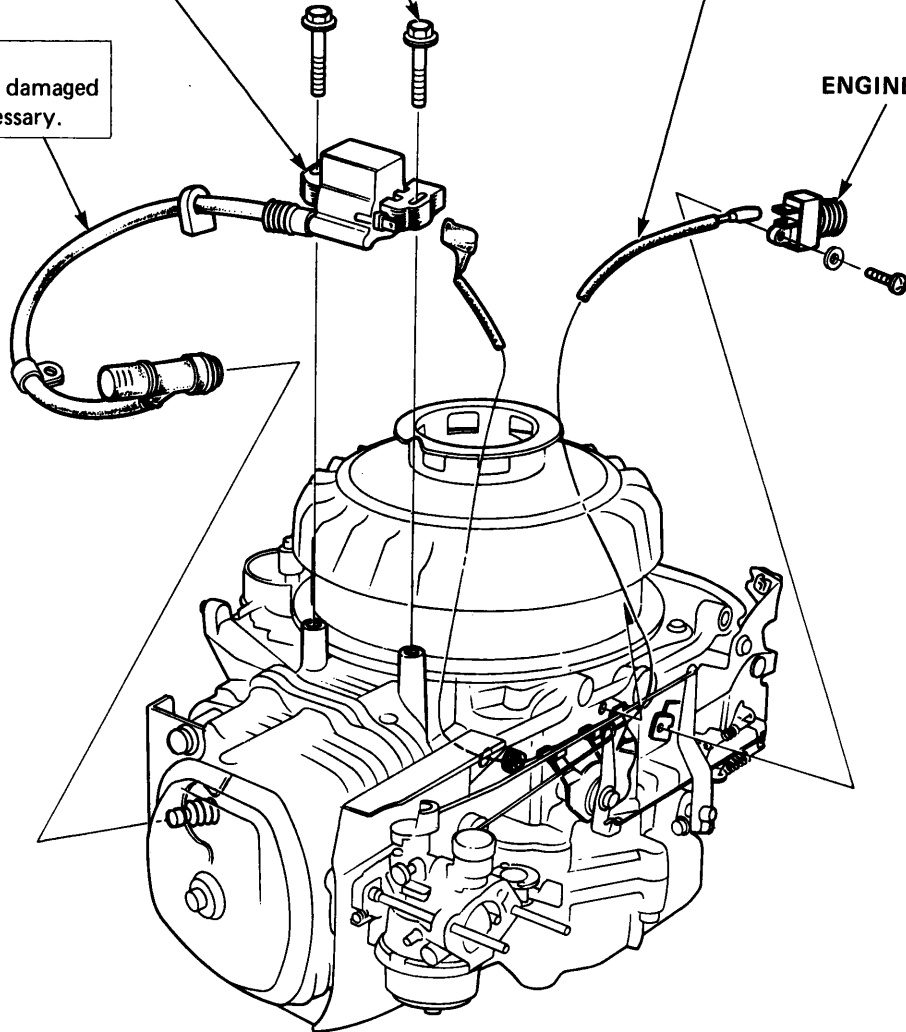
6 x 28 mm (2)

ENGINE STOP SWITCH LEAD

REASSEMBLY:

Route the switch lead along the cylinder block and secure it with the clamps and grommet.

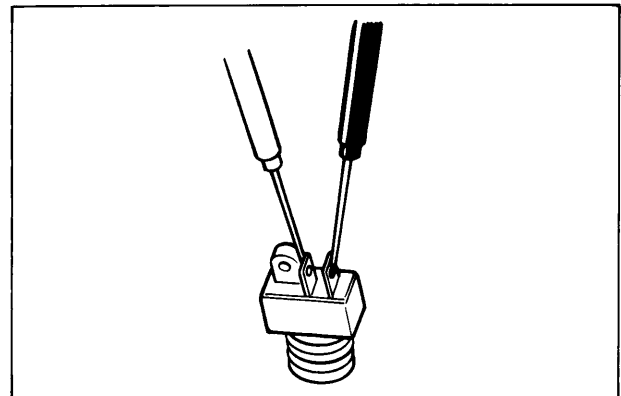
ENGINE STOP SWITCH



b. INSPECTION/ADJUSTMENT

● ENGINE STOP SWITCH

Check for continuity between the terminals.
There should be continuity when the switch is depressed and no continuity when the switch is released.



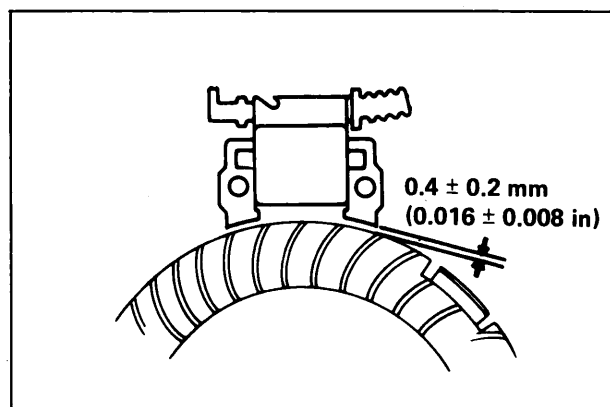
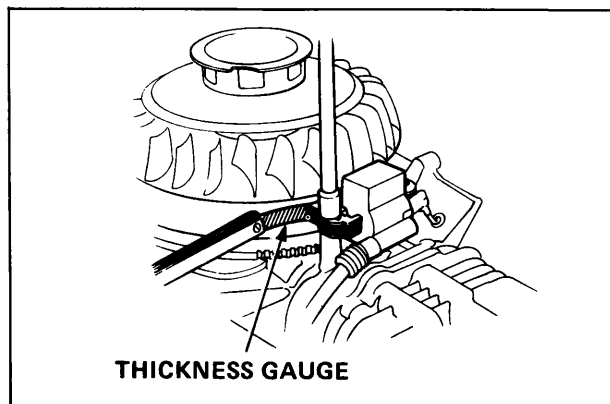
● TRANSISTORIZED IGNITION COIL

AIR GAP ADJUSTMENT

- 1) Loosen the ignition coil mounting bolts.
- 2) Insert the thickness gauge or a piece of paper of the proper thickness between the transistorized ignition coil and the flywheel.
- 3) Push the transistorized ignition coil firmly against the flywheel and tighten the bolts.

Specified air gap	$0.4 \pm 0.2 \text{ mm}$ ($0.016 \pm 0.008 \text{ in}$)
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NOTE: Avoid the magnet part of the flywheel when adjusting.

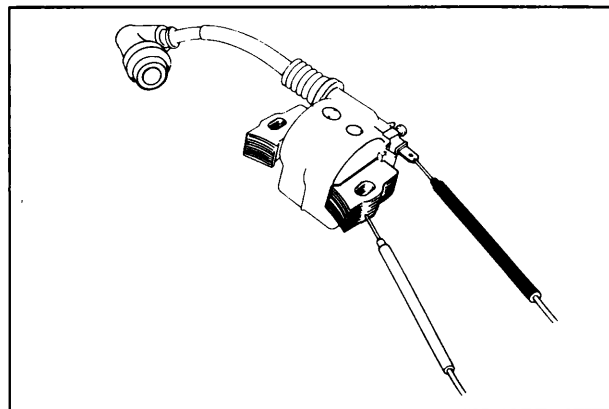


COIL TEST (for a dynamic test, see page 16)

<Primary Side>

Measure the resistance of the primary coil by attaching one ohm-meter lead to the ignition coil's primary (black) lead while touching the other test lead to the iron core.

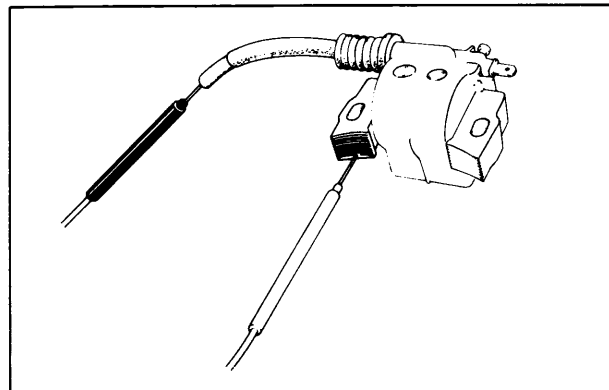
Primary side resistance value	0.7–0.9 Ω
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<Secondary Side>

Measure the resistance of the secondary side of the coil by removing the spark plug cap and touching one test lead to the spark plug lead wire while touching the other lead to the coil's iron core.

Secondary side resistance value	6.3–7.7k Ω
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NOTE: A false reading will result if the spark plug cap is not removed.

5. FLYWHEEL

a. DISASSEMBLY/REASSEMBLY

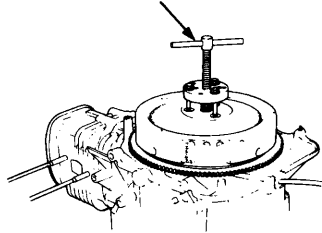
FLYWHEEL

DISASSEMBLY:

Do not hit the flywheel with a hammer.
Remove with a special tool.

S. TOOL

FLYWHEEL PULLER
No. 07935-8050003



REASSEMBLY:

Make sure there are no metal objects
stuck to the magnets.
Clean the crankshaft tapered surface
before installation.

16 mm SPECIAL NUT

110–120 N·m (1,100–1,200 kg-cm, 79.5–86.8 ft-lb)

DISASSEMBLY/REASSEMBLY:

Hold the flywheel by placing a screwdriver into the
pulley.

STARTER PULLEY

REASSEMBLY:

Install by aligning the hole in the
pulley with the lug on the cooling
fan.

COOLING FAN

REASSEMBLY:

Install by aligning the three lugs
on the rear side of the fan with
the small hole in the flywheel.
When disassembling and assem-
bling, take care not to damage
the fan blades.

CHARGING COIL

INSPECTION: P.33

REASSEMBLY:

Route the charging coil wire
between the coil mounting
boss and starter gear cover
flange.

WOODRUFF KEY

REASSEMBLY:

After installing the flywheel,
check to be sure that the
woodruff key is still in its slot
on the crankshaft.

6 x 12 mm (2)

6 x 12 mm (2)

BREATHER CAP

REASSEMBLY:

Install with the lug toward
the crankcase.

BREATHER CAP GASKET

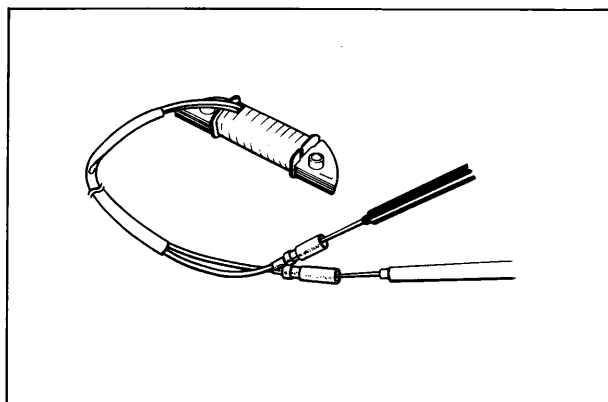
BREATHER VALVE

b. INSPECTION

• **CHARGING COIL**

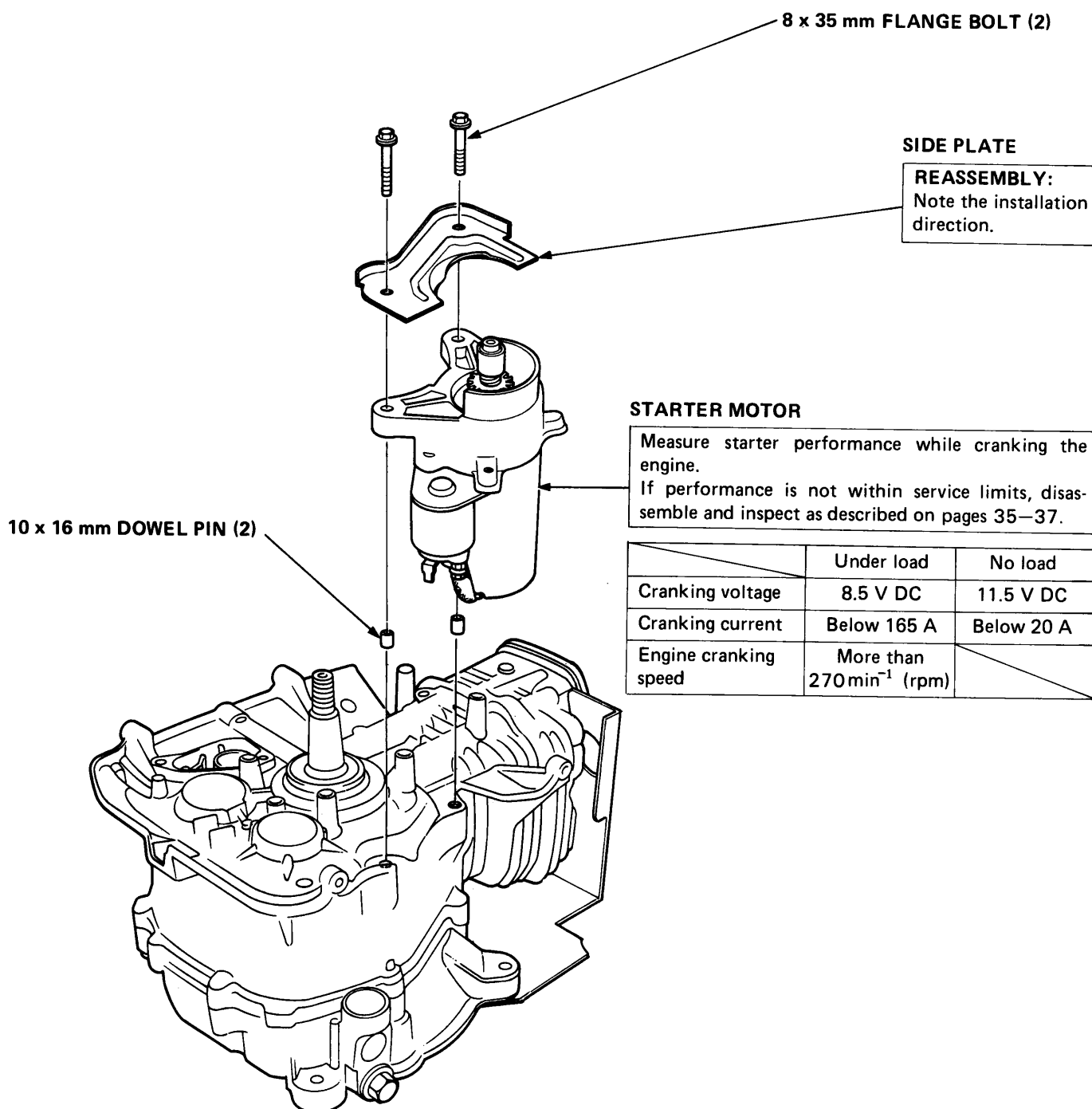
The charging coil can be checked without removing it.
Using an ohmmeter, measure the resistance between the terminals.

Charging coil resistance value	3.0—4.0 Ω
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6. STARTER MOTOR

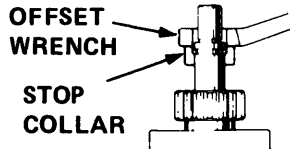
a. DISASSEMBLY/REASSEMBLY



PINION GEAR

DISASSEMBLY:

Hold the armature upright, place an offset wrench over the pinion stop collar, and drive the collar down exposing the snap ring. Remove the snap ring; then remove the collar and pinion gear.

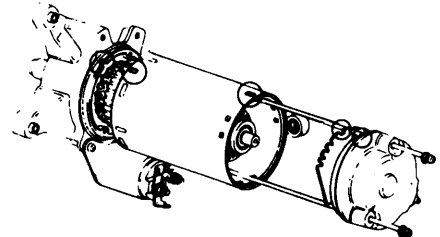


REASSEMBLY:

Check for smooth movement by rotating the pinion gear. Check the gear teeth for wear or damage; replace if necessary. Also, check the flywheel ring gear teeth if the pinion gear teeth are damaged.

REASSEMBLY:

Align the tabs on the brush holder plate with the grooves in the housing. Also align the tabs on the field coil housing with the grooves in the drive side housing, brush holder and starter end cover.



STARTER END COVER

BRUSH P. 37

REASSEMBLY:

Push in the brushes so they do not interfere with the commutator.

THRUST WASHER

REASSEMBLY:

Do not forget to install.

STOP COLLAR

SNAP RING

DISASSEMBLY:

Drive down the stop collar to remove. Replace whenever disassembled.

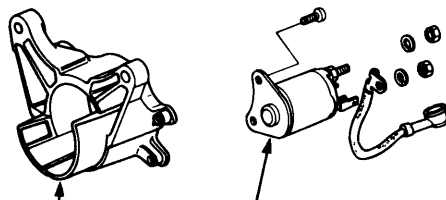
COMMUTATOR

BRUSH HOLDER PLATE

HOUSING

REASSEMBLY:

Make sure that there is no obstruction on the magnets.



STARTER SOLENOID

P. 37

DRIVE SIDE HOUSING

ARMATURE P.36,37

REASSEMBLY:

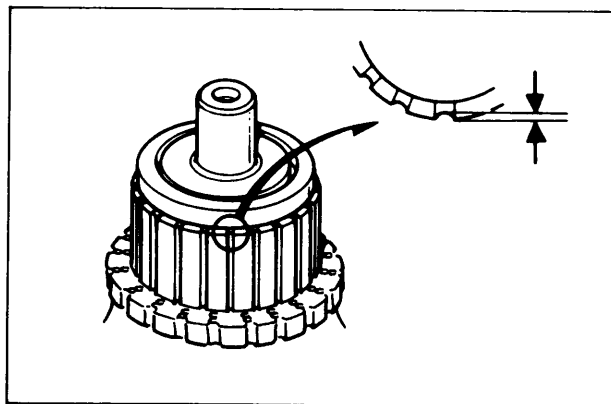
Visually inspect the commutator surface for dust, rust or other damage. If necessary, wipe it with a clean lint-free cloth. If rusted or damaged, dress with a fine emery cloth.

b. INSPECTION

• MICA DEPTH

If the grooves are clogged or mica depth is less than the service limit, recut the grooves, using a hacksaw blade or a small file.

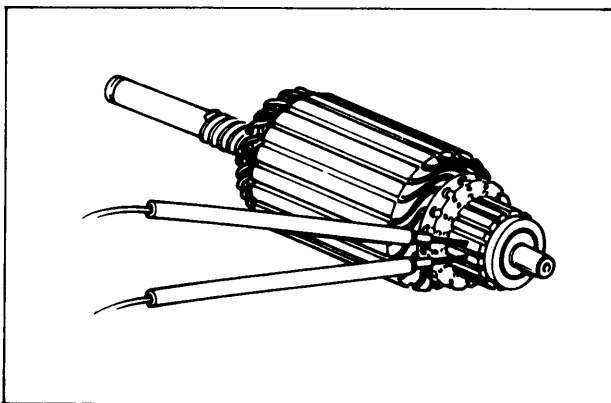
Service limit	0.2 mm (0.01 in)
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• ARMATURE

CONTINUITY CHECK – SEGMENTS

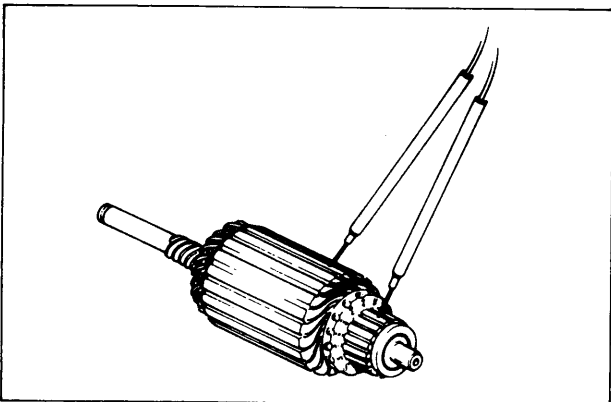
Check for continuity between each segment. If an open circuit exists between any two segments, replace the armature.



SHORT CIRCUIT TEST – CORE-TO-COMMUTATOR

Check for continuity between the commutator and armature coil core.

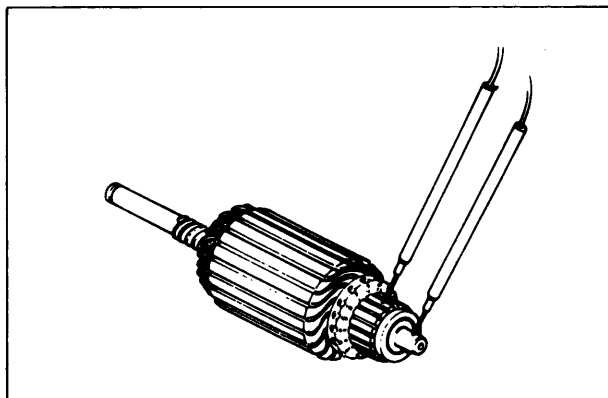
If continuity exists, replace the armature.



SHORT CIRCUIT TEST – SHAFT-TO-COMMUTATOR

Check for continuity between the commutator and armature shaft.

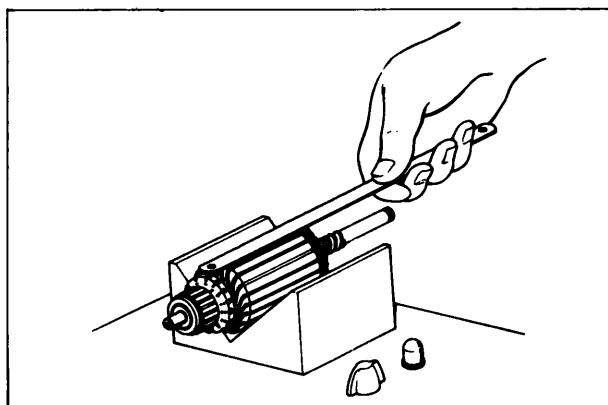
If there is continuity, replace the armature.



SHORT CIRCUIT TEST – ARMATURE

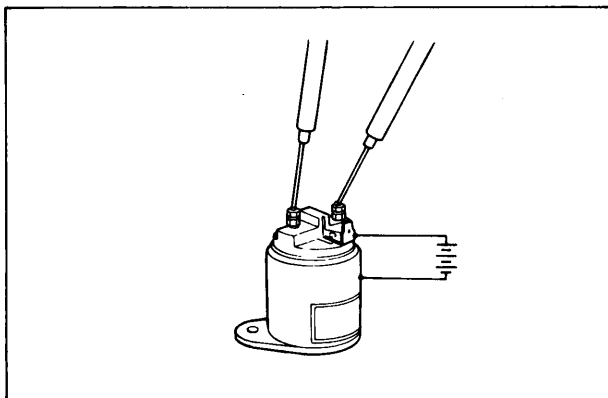
Place the armature on the armature tester (commercially available).

Hold a hacksaw blade on the armature core. If the blade is attracted to the core or vibrates while the core is turned, the armature is shorted. Replace the armature.



● STARTER SOLENOID

Connect a 12 V battery between the starter terminal and the solenoid body and check for continuity between the terminals. Continuity should exist when the battery is connected and not exist when the battery is disconnected.

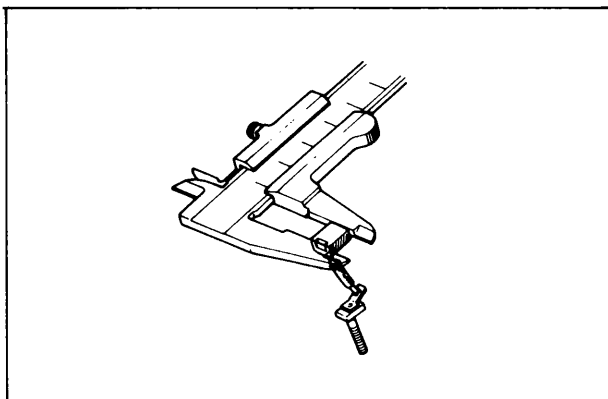


● BRUSH LENGTH

Measure the brush length.

If brush length is less than service limit, replace the brush and brush holder plate.

Standard	Service limit
12 mm (0.47 in)	8.5 mm (0.34 in)



7. CYLINDER HEAD, VALVES

a. DISASSEMBLY/REASSEMBLY

ONE-WAY VALVE PLATE

REASSEMBLY:

Install the valve plate with the lug on the plate toward the cylinder block.

CYLINDER
BLOCK
SIDE



CYLINDER HEAD

DISASSEMBLY/REASSEMBLY:

- Loosen and tighten the bolts in a crisscross pattern in 2–3 steps.
- Before installation, remove carbon deposits from the combustion chamber and inspect the valve seats.
- Measure the cylinder compression after reassembly.

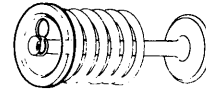
VALVE SPRING RETAINER

DISASSEMBLY:

Push down and slide the retainer to the side, so the valve stem slips through the hole at the side of the retainer.

REASSEMBLY:

NOTE: The exhaust valve retainer has a larger center recess than the intake valve retainer, so it can accept the valve rotator.



CAUTION: Do not remove the valve spring retainers while the cylinder head is installed, or the valves will drop into the cylinder.

ONE-WAY VALVE INTAKE VALVE

REASSEMBLY:

Do not interchange with the exhaust valve.

VALVE HEAD DIAMETER

GXV270: IN: 30.0mm(1.18in)

EX: 26.0mm(1.02in)

GXV340: IN: 35mm(1.38in)

EX: 31mm(1.22in)

EXHAUST VALVE

REASSEMBLY:

Before installation, remove carbon deposits and inspect the valve.

PUSH ROD (2)

REASSEMBLY:

Check both ends for wear and check the rod for straightness. Make sure the rod ends are firmly seated in the lifters.

PIVOT BOLT (2)

22–26 N·m
(220–260 kg-cm,
15.9–18.8 ft-lb)

VALVE
ROCKER ARM

ROCKER ARM
PIVOT

PIVOT ADJUSTING
NUT

8–12 N·m
(80–120 kg-cm,
5.8–8.7 ft-lb)

DOWEL PIN (2)

CYLINDER
HEAD
GASKET

CYLINDER HEAD
BOLT (2)

32–38 N·m (320–
380 kg-cm, 23.1–
27.5 ft-lb)

VALVE
SPRING

VALVE SPRING
SEAT

VALVE GUIDE
P. 40

PUSH ROD
GUIDE

VALVE ROTATOR
(Exhaust valve only)

REASSEMBLY:

CAUTION: If the valve rotator is not installed, the exhaust valve may drop into the cylinder when starting the engine.

UNDER
COVER
STAY

FLANGE BOLT
6 x 12 mm (3)

UNDER
COVER

CYLINDER HEAD
COVER

HEAD COVER
WASHER

HEAD COVER
BOLT

7–10 N·m
(70–100 kg-cm,
5.1–7.2 ft-lb)

RUBBER BUSHING

CYLINDER HEAD COVER
GASKET

REASSEMBLY:

Note the installation direction.

CYLINDER
HEAD



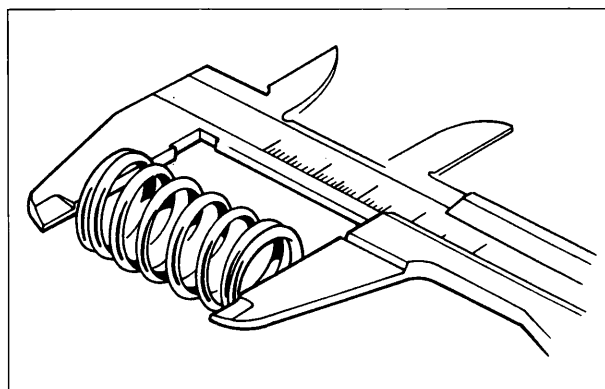
b. INSPECTION

● VALVE SPRING FREE LENGTH

Measure the free length of the valve springs.

Standard	Service limit
39.0 mm (1.54 in)	37.5 mm (1.48 in)

Replace the springs if they are shorter than the service limit.

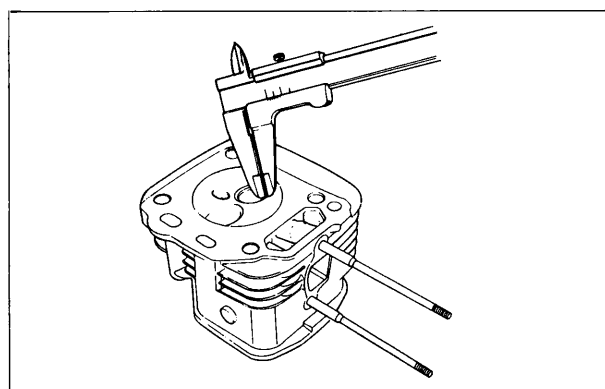


● VALVE SEAT WIDTH

Measure the valve seat width.

Standard	Service limit
1.1 mm (0.043 in)	2.0 mm (0.08 in)

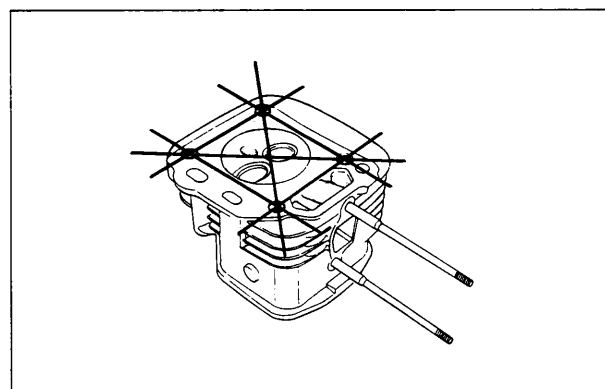
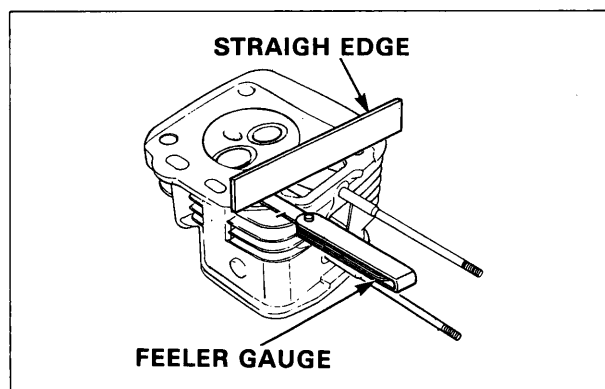
If the valve seat width is under the standard, or over the service limit, recondition the valve seat. (P. 58)



● CYLINDER HEAD

Remove carbon deposits from the combustion chamber. Clean off any gasket material from the cylinder head surface. Check the spark plug hole and valve areas for cracks. Check the cylinder head for warpage with a straight edge and a feeler gauge.

Service limit	0.10 mm (0.004 in)
---------------	--------------------

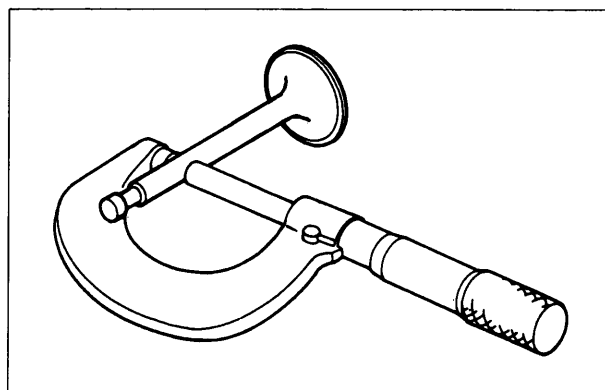


● VALVE STEM OD

Inspect each valve for face irregularities, bending or abnormal stem wear. Replace the valve if necessary.
Measure and record each valve stem O.D.

	Standard	Service limit
IN	6.590 mm (0.2594 in)	6.425 mm (0.2530 in)
EX	6.550 mm (0.2579 in)	6.375 mm (0.2510 in)

Replace the valves if their O.D. is smaller than the service limit.



● VALVE GUIDE ID

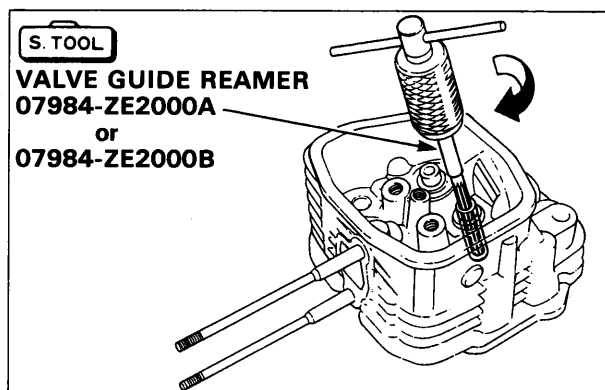
NOTE:

Ream the valve guides to remove any carbon deposits before measuring

Measure and record each valve guide I.D.

Standard	Service limit
6.60 mm (0.260 in)	6.66 mm (0.262 in)

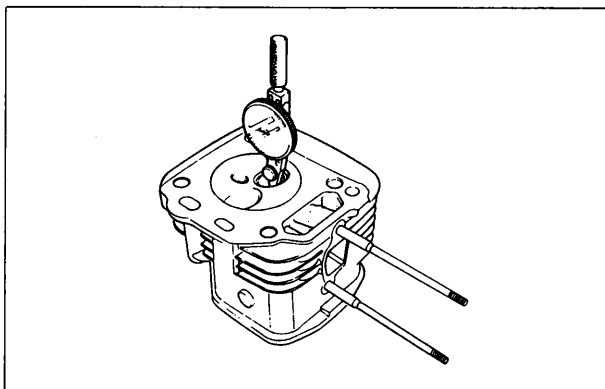
Replace the guides if they are over the service limit.



● GUIDE-TO-STEM CLEARANCE

Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

	Standard	Service limit
IN	0.010–0.037 mm (0.0004–0.0015 in)	0.10 mm (0.004 in)
EX	0.050–0.077 mm (0.0020–0.0030 in)	0.12 mm (0.005 in)



If the stem-to-guide clearance exceeds the service limit, determine if the new guide with standard dimensions would bring the clearance within tolerance. If so, replace any guide as necessary and ream to fit. If the stem-to-guide clearance exceeds the service limit with new guides, replace the valves as well.

NOTE:

Recondition the valve seats whenever the valve guides are replaced.

c. VALVE GUIDE REPLACEMENT

- 1) Chill the replacement valve guides in the freezer section of a refrigerator for about an hour.
- 2) Use a hot plate or oven to heat the cylinder head evenly to 150°C (300°F).
Check the temperature with a temperature indicating stick (available at welding supply stores) or equivalent.

WARNING

To avoid burns, use heavy gloves when handling the heated cylinder head.

CAUTION:

- Do not use a torch to heat the cylinder head; warpage of the cylinder head may result.
- Do not get the head hotter than 150°C (300°F); excessive heat may loosen the valve seats.

- 3) Remove the heated cylinder head from hot plate and support it with wooden blocks. Drive the valve guides out of the head from the combustion chamber side.

CAUTION:

When driving the valve guides out, be careful not to damage the head.

- 4) Remove the new valve guides from the refrigerator one at a time as needed.
- 5) Install the new valve guides from the valve spring side of the cylinder head. Drive each valve guide to the specified height (measured from the top of the valve guide to the cylinder casting as shown).
- 6) After installation, inspect the valve guide for damage. Replace the guide if damaged.

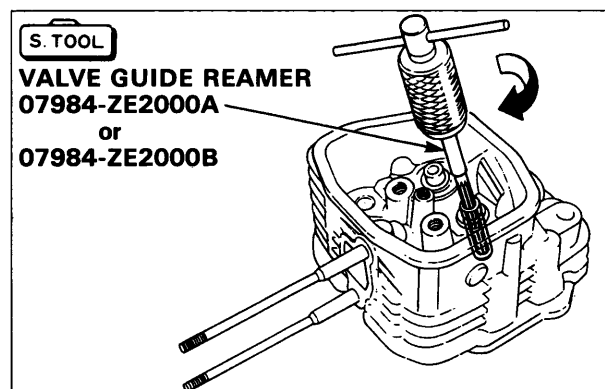
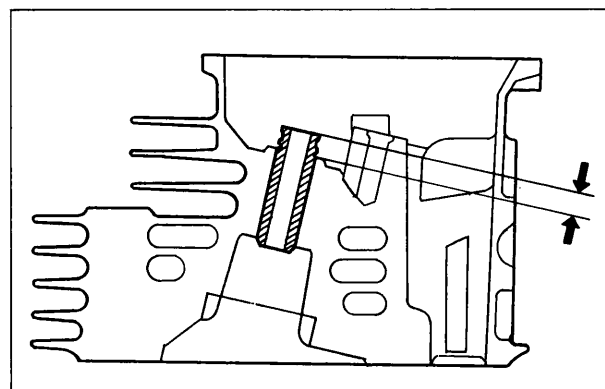
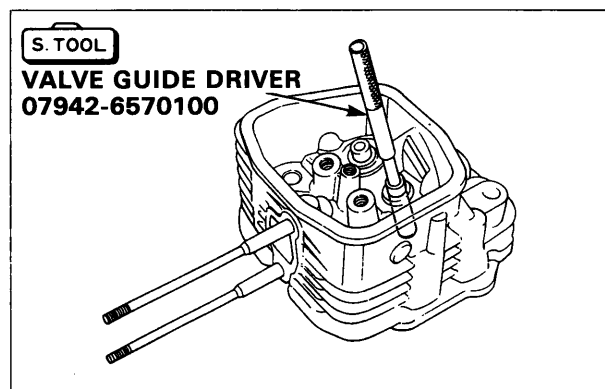
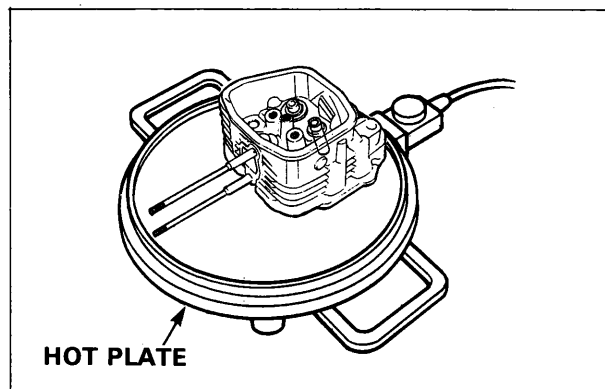
IN	9.0 mm (0.35 in)
EX	7.0 mm (0.28 in)

● VALVE GUIDE REAMING

NOTE:

For best results, be sure the cylinder head is at room temperature before reaming valve guides.

- 1) Coat the reamer and valve guide with cutting oil.
- 2) Rotate the reamer clockwise through the valve guide the full length of the reamer.
- 3) Continue to rotate the reamer clockwise while removing it from the valve guide.



- 4) Thoroughly clean the cylinder head to remove any cutting residue.
- 5) Check the valve guide bore; it should be straight, round and centered in the valve guide. Insert the valve and check operation. If the valve does not operate smoothly, the guide may have been bent during installation. Replace the valve guide if it is bent or damaged.
- 6) Check the Valve Guide-to-Stem Clearance (P40).

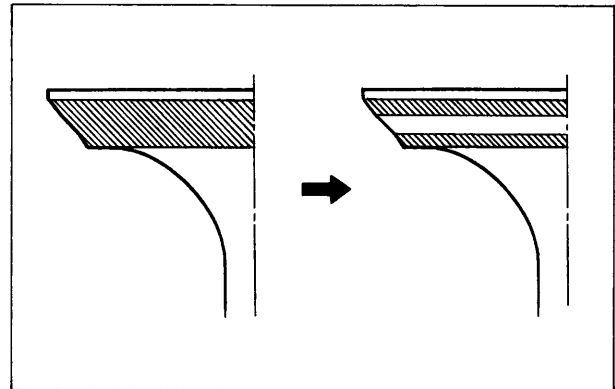
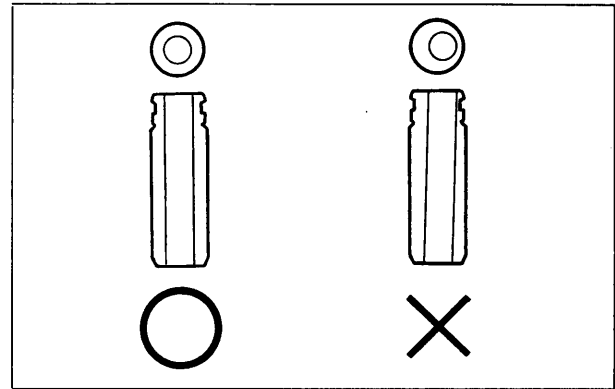
d. VALVE SEAT RECONDITIONING

- 1) Thoroughly clean the combustion chambers and valve seats to remove carbon deposits. Apply a light coat of Prussian Blue or erasable felt-tipped marker ink to the valve faces.
- 2) Insert the valves, and then lift them and snap them closed against their seats several times. Be sure the valve does not rotate on the seat. The transferred marking compound will show any area of the seat that is not concentric.

NOTE:

Follow Valve Seat Cutter Manufacturer's Instructions.

- 3) Using a 45° cutter, remove enough material to produce a smooth and concentric seat. Turn the cutter clockwise, never counterclockwise. Continue to turn the cutter as you lift it from the valve seat.



S. TOOL

SOLID PILOT BARS
 6.60 mm No. 07781-P02010A
 6.62 mm No. 07781-P02020A
 6.65 mm No. 07781-P02030A

T-WRENCH, # 505
 No. 07782-P01010A

T-WRENCH ADAPTER, # 503-1
 No. 07782-P01020A

ACCESSORY PACKAGE, # 246
 No. 07782-P01030A

VALVE SEAT CUTTERS

114
 No. 07780-P01020A

128
 No. 07780-P01010B

- 4) Use the 30°-32° and 60° cutters to narrow and adjust the valve seat so that it contacts the middle of the valve face. The 30°-32° cutter removes material from the top edge. The 60° cutter removes material from the bottom edge. Be sure that the width of the finished valve seat is within specification.

● VALVE SEAT WIDTH

Standard	Service limit
1.1 mm (0.043 in)	2.0 mm (0.08 in)

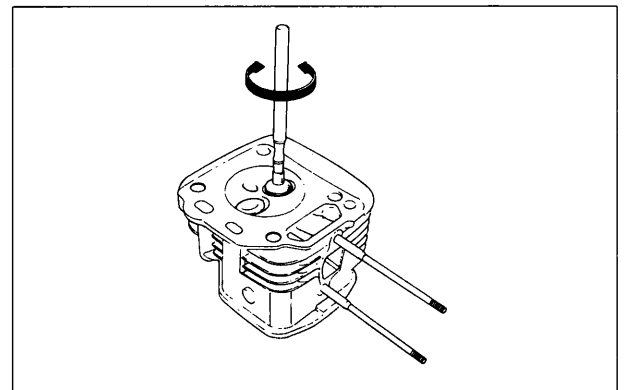
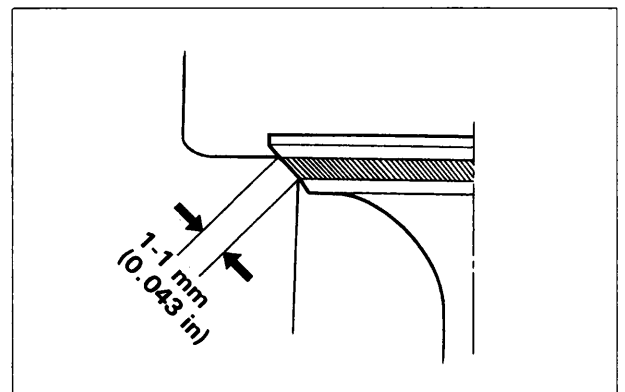
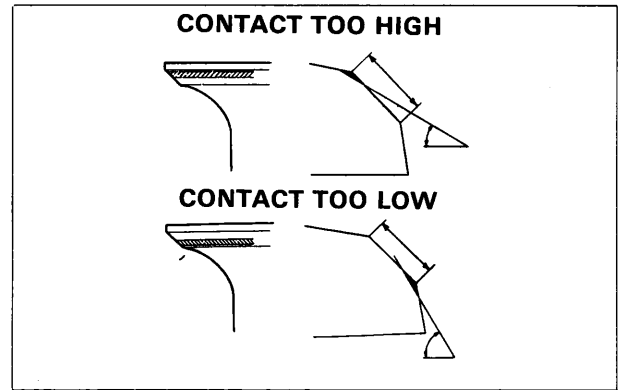
- 5) Make a light pass with 45° cutter to remove any possible burrs at the edges of the seat.
- 6) After resurfacing the seats, inspect for even valve seating. Apply Prussian Blue compound or erasable felt-tipped marker ink to the valve faces. Insert the valves, and then lift them and snap them closed against their seats several times. Be sure the valve does not rotate on the seat. The seating surface, as shown by the transferred marking compound, should have good contact all the way around.
- 7) Lap the valves into their seats, using a hand valve lapper and lapping compound (commercially available).

CAUTION:

To avoid severe engine damage, be sure to remove all lapping compound from the engine before reassembly.

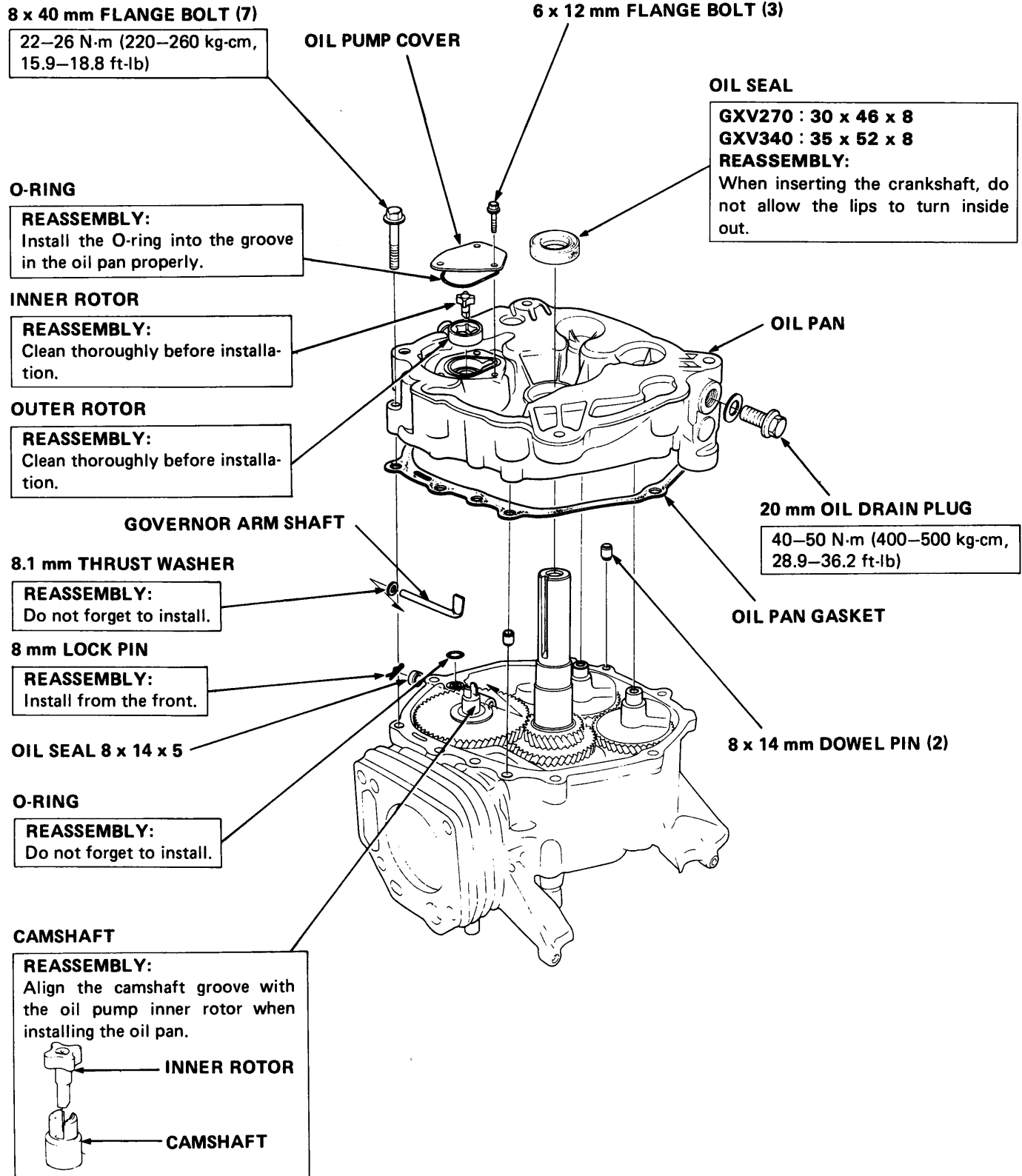
NOTE:

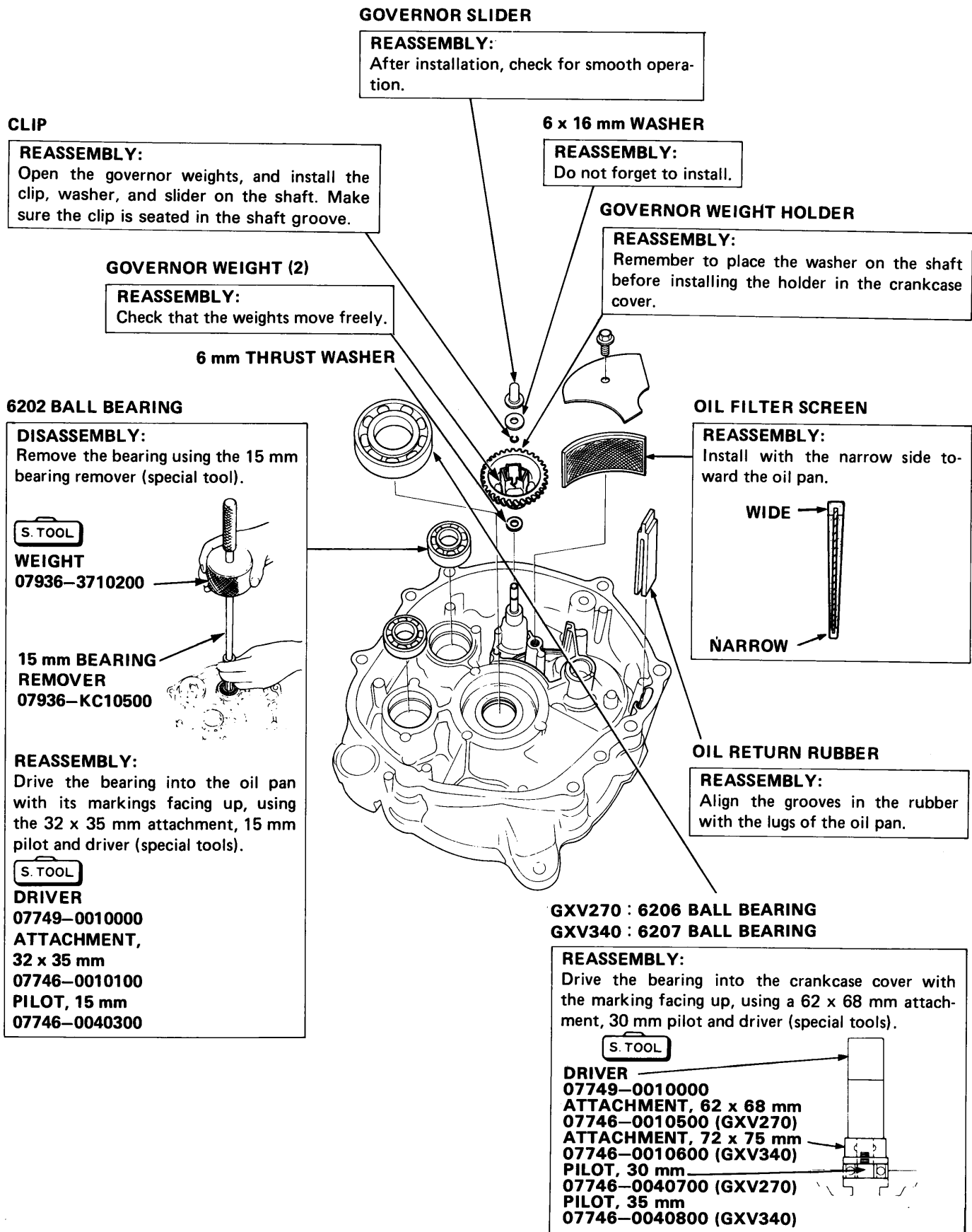
Check valve clearance after reassembly



8. OIL PAN, GOVERNOR, OIL PUMP

a. DISASSEMBLY/REASSEMBLY

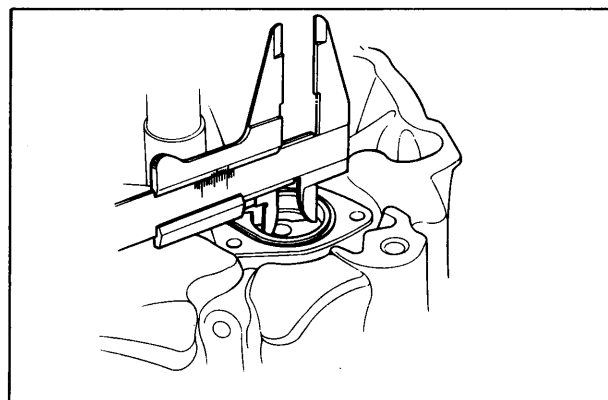




b. INSPECTION

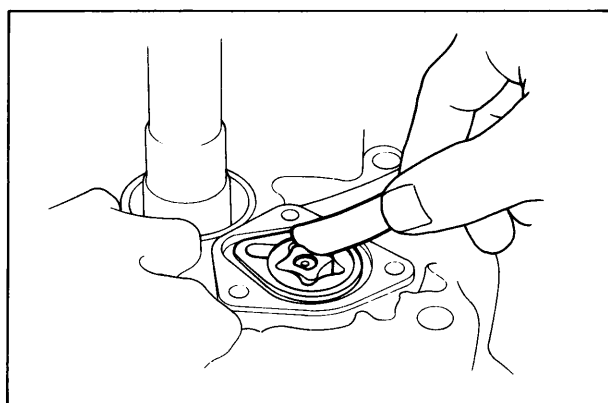
● **PUMP BODY ID**

Standard	Service limit
29.00 mm (1.142 in)	29.21 mm (1.150 in)



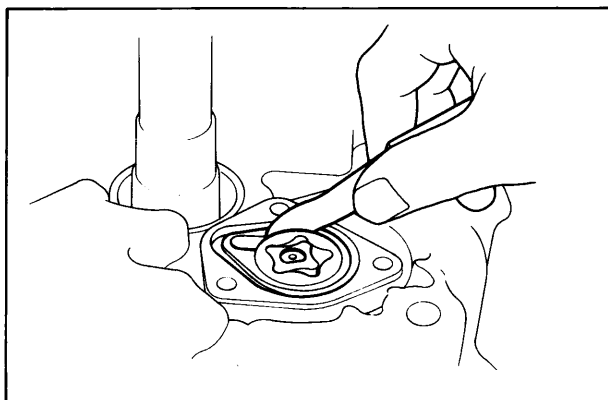
● **INNER ROTOR-TO-OUTER ROTOR CLEARANCE**

Standard	Service limit
0.18 mm (0.007 in)	0.30 mm (0.012 in)



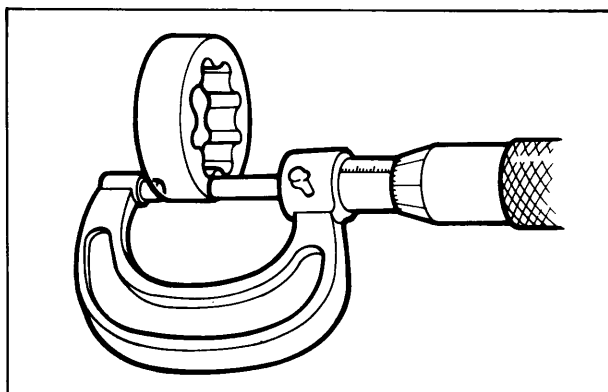
● **OUTER ROTOR-TO-BODY CLEARANCE**

Standard	Service limit
0.15–0.20 mm (0.006–0.008 in)	0.26 mm (0.010 in)



● **OUTER ROTOR HEIGHT**

Standard	Service limit
7.48 mm (0.294 in)	7.45 mm (0.293 in)



HONDA

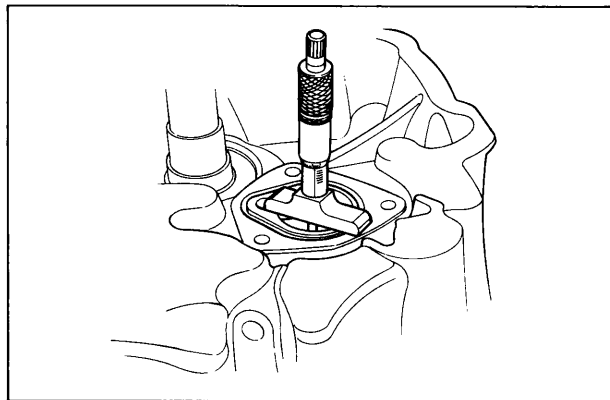
GXV270·GXV340

● PUMP BODY DEPTH

Standard	Service limit
7.50 mm (0.295 in)	7.56 mm (0.298 in)

● ROTOR-TO-BODY SIDE CLEARANCE

Standard	Service limit
0.02–0.09 mm (0.0008–0.0035 in)	0.11 mm (0.0043 in)



9. CRANKSHAFT, PISTON

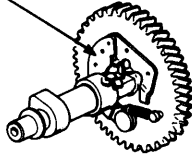
a. DISASSEMBLY/REASSEMBLY

CAMSHAFT

REASSEMBLY:

Check that the decompressor weight moves smoothly, and the spring is not weak or worn.

DECOMPRESSOR WEIGHT



VALVE LIFTER

REASSEMBLY:

Install the lifters immediately before installing the camshaft.

BALANCER B

REASSEMBLY: P. 51

CRANKSHAFT

REASSEMBLY: P. 51

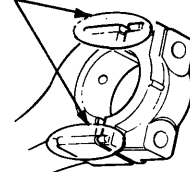
Push in until the bearing touches the crankcase. Be careful not to damage the oil seal.

CONNECTING ROD CAP

REASSEMBLY:

Install the connecting rod cap, aligning the ribs on the rod and cap.

RIBS



CONNECTING ROD BOLT (2)

12–16 N·m (120–160 kg·cm, 8.7–11.6 ft·lb)

BALANCER A

REASSEMBLY: P. 51

PISTON PIN CLIP (2)

REASSEMBLY: P. 49

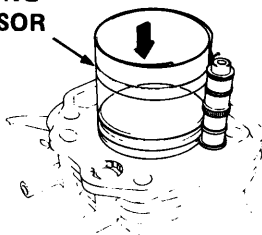
PISTON PIN

PISTON

REASSEMBLY:

Install with the triangle mark toward the push rods, using the piston ring compressor (commercially available).

PISTON RING COMPRESSOR



6202 BALL BEARING

DISASSEMBLY/REASSEMBLY: P. 45

The 15mm pilot (special tool) is not applicable to the engine serial No. 1100001 and subsequent numbers to install the 6202 ball bearing of the balancer A side. Damage to the crankcase can occur.

GXV270 : 6206 BALL BEARING

GXV340 : 6207 BALL BEARING

REASSEMBLY: P. 50

OIL SEAL 30 x 46 x 8 (GXV270)

OIL SEAL 35 x 52 x 8 (GXV340)

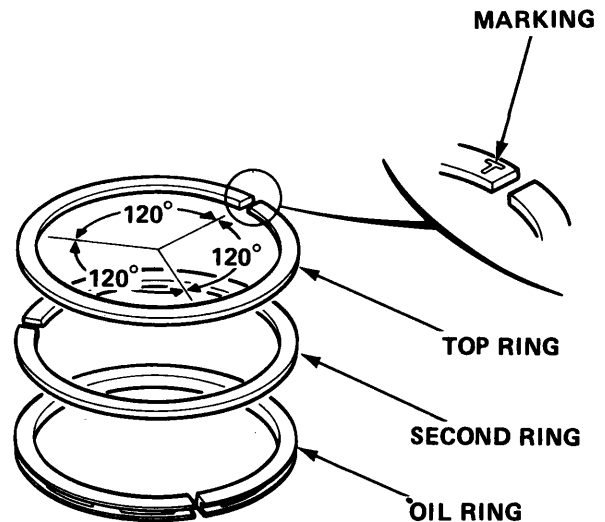
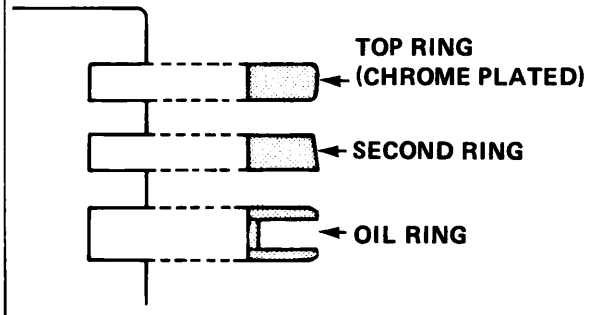
REASSEMBLY: P. 44

• CONNECTING ROD

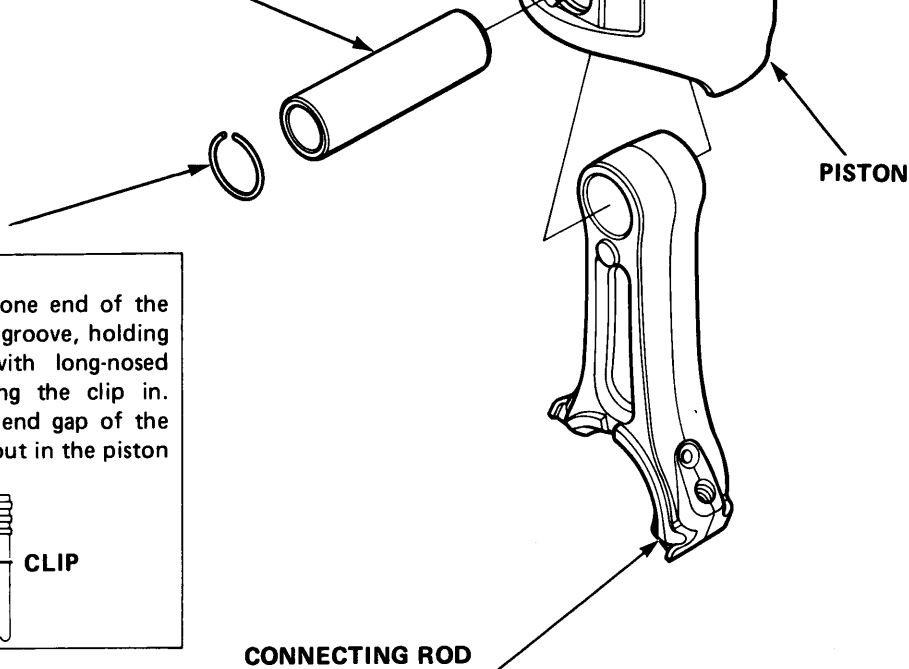
PISTON RING

REASSEMBLY:

- Install all rings with the markings facing upward.
- Make sure that the top and second rings are not interchanged.
- Check that the rings rotate smoothly after installation.
- Space the piston ring end gaps 120 degrees apart, and do not align the gaps with the piston pin bore.



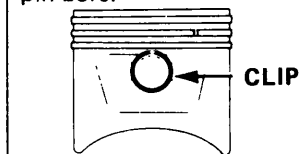
PISTON PIN



PISTON PIN CLIP

REASSEMBLY:

Install by setting one end of the clip in the piston groove, holding the other end with long-nosed pliers, and rotating the clip in. Do not align the end gap of the clip with the cut-out in the piston pin bore.



CONNECTING ROD

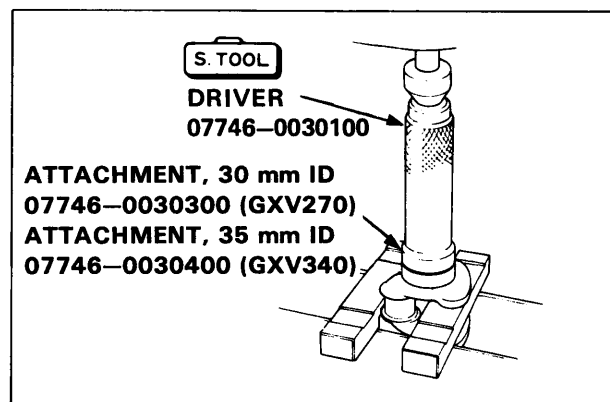
REASSEMBLY:

Install the connecting rod with the long end toward the triangle marked side of the piston.

● CRANKSHAFT BEARING (GXV270 : 6206, GXV340 : 6207)

REASSEMBLY:

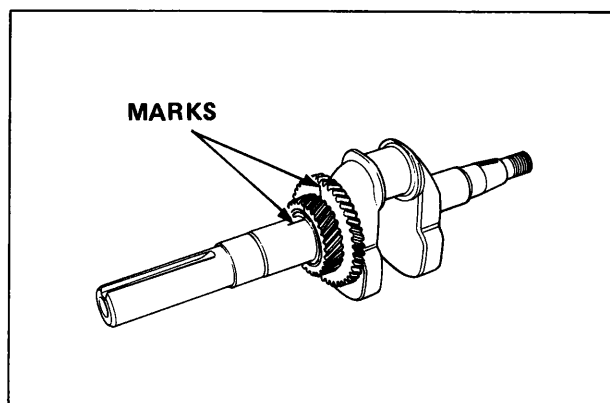
Apply oil to the inside of the bearing and drive the bearing onto the crankshaft using the 30 mm ID attachment and driver (special tools).



● TIMING GEAR/BALANCER GEAR

DISASSEMBLY:

Make a mark on the crankshaft, balancer gear and timing gear, then press the timing and balancer gear out of the crankshaft using a commercially available bearing puller and hydraulic press.

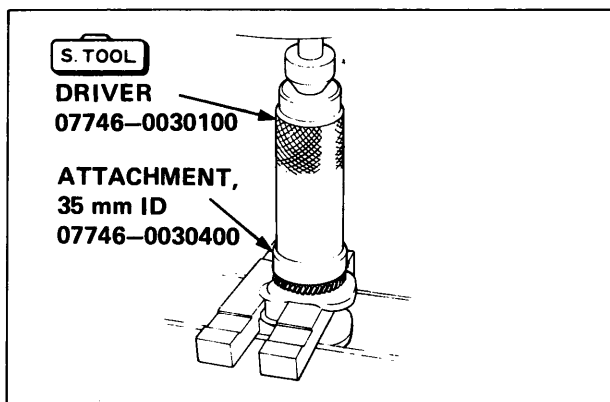


REASSEMBLY:

1) BALANCER DRIVE GEAR OR GOVERNOR DRIVE GEAR

Using the old gear for reference, make a mark at the same position on the new gear.

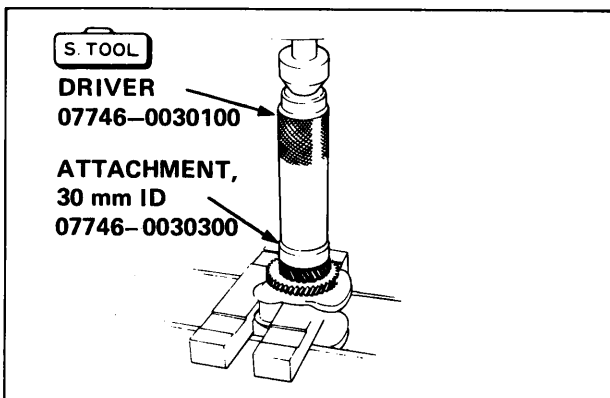
Using a hydraulic press and driver and 35 mm ID attachment (special tools), press onto the crankshaft.



2) TIMING GEAR

Using the old gear for reference, make a mark at the same position on the new gear.

Using a hydraulic press and driver and 30 mm ID attachment (special tools), press onto the crankshaft.



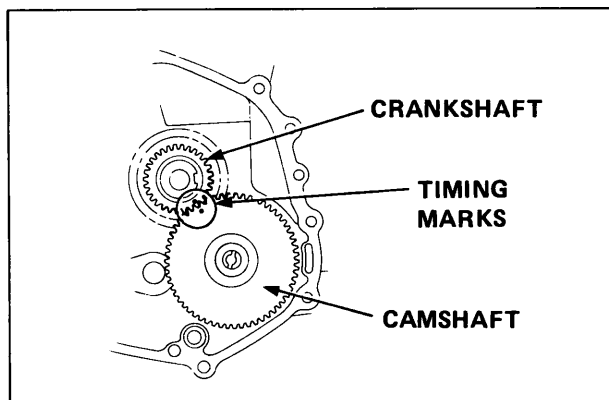
● CRANKSHAFT/CAMSHAFT/BALANCER

REASSEMBLY:

Insert the crankshaft into the crankcase, being careful not to damage the oil seal lips.

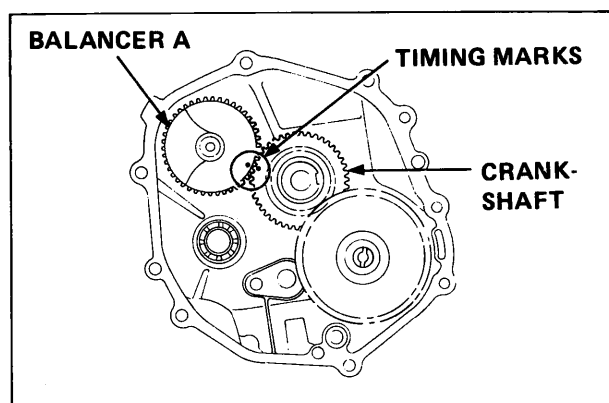
Install the valve lifters into the cylinder block.

Coat the camshaft with clean engine oil and install it into the crankcase, aligning the timing marks on the camshaft and crankshaft.



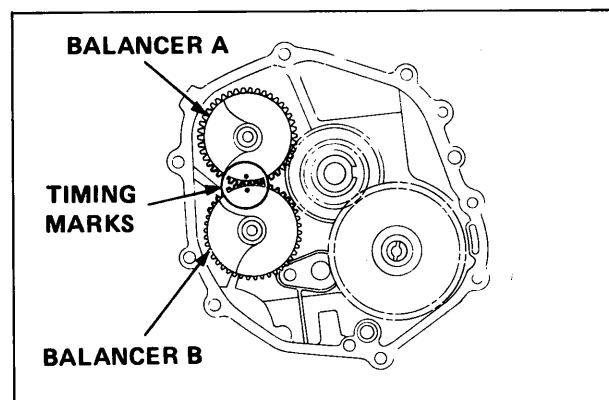
Install balancer A with the weight facing down, aligning the timing marks on balancer A and the crankshaft.

NOTE: Do not interchange balancers A and B. Balancer A has two timing marks.



Install balancer B with the weight facing down, aligning the timing marks on balancers A and B.

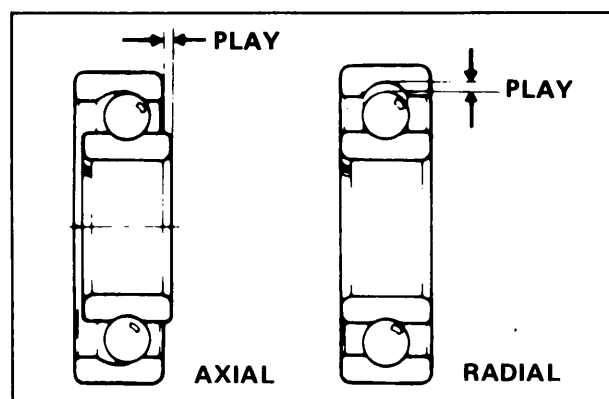
After installation, check that the crankshaft, camshaft, balancers A and B rotate smoothly.



b. INSPECTION

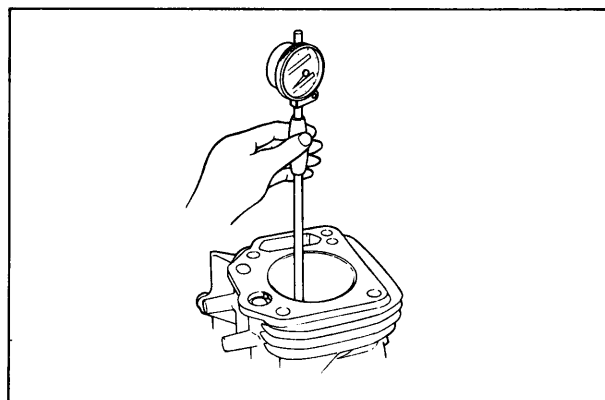
● CAMSHAFT BEARING PLAY

- 1) Wash the bearing in solvent and dry it thoroughly.
- 2) Spin the bearing by hand and check for play.
Replace the bearing if it is noisy or has excessive play.



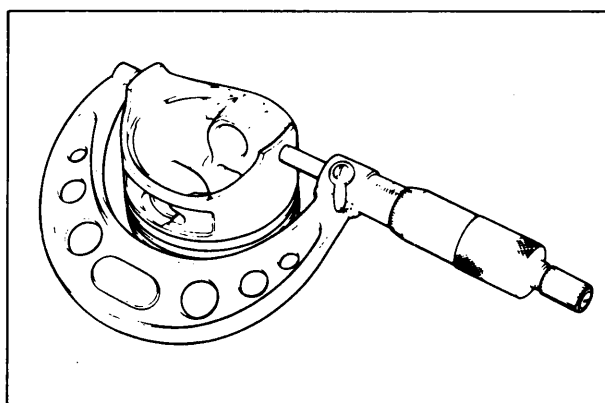
● CYLINDER ID

	Standard	Service limit
GXV270	77.000 mm (3.0315 in)	77.17 mm (3.038 in)
GXV340	82.000 mm (3.2283 in)	82.17 mm (3.235 in)



● PISTON SKIRT OD

	Standard	Service limit
GXV270	76.985 mm (3.0309 in)	76.85 mm (3.026 in)
GXV340	81.985 mm (3.2277 in)	81.85 mm (3.222 in)

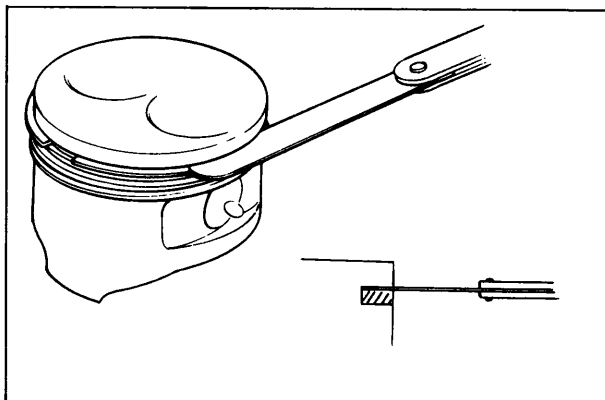


● PISTON-TO-CYLINDER CLEARANCE

	Standard	Service limit
	0.015–0.052 mm (0.0006–0.0020 in)	0.12 mm (0.005 in)

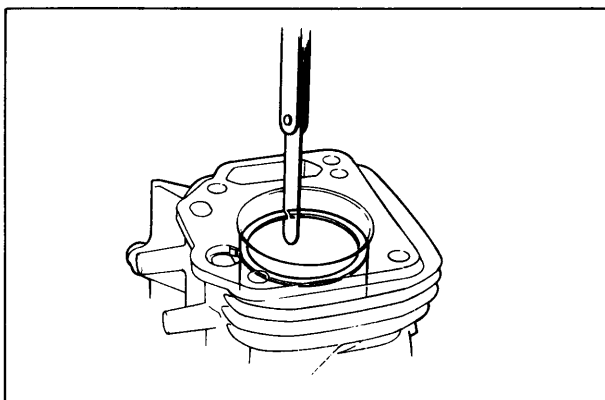
● PISTON RING SIDE CLEARANCE

	Standard	Service limit
GXV270	0.015–0.045 mm (0.0006–0.0018 in)	0.15 mm (0.006 in)
GXV340	0.030–0.060 mm (0.0012–0.0024 in)	



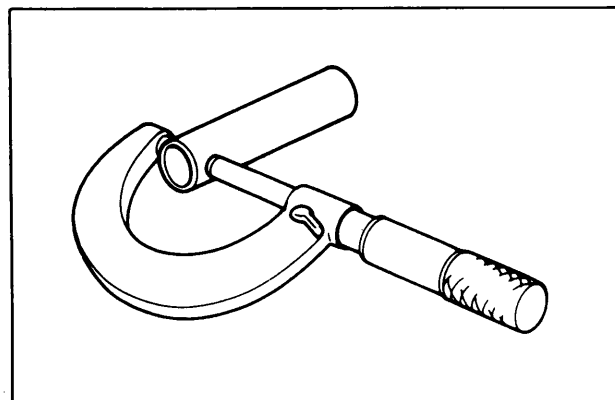
● PISTON RING END GAP

	Standard	Service limit
	0.2–0.4 mm (0.008–0.016 in)	1.0 mm (0.04 in)



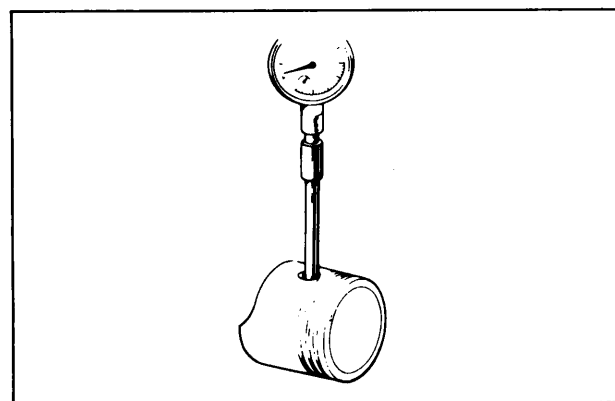
● PISTON PIN OD

	Standard	Service limit
GXV270	18.000 mm (0.7087 in)	17.954 mm (0.7068 in)
GXV340	20.000 mm (0.7874 in)	19.95 mm (0.785 in)



● PISTON PIN BORE ID

	Standard	Service limit
GXV270	18.002 mm (0.7087 in)	18.048 mm (0.7120 in)
GXV340	20.002 mm (0.7875 in)	20.042 mm (0.7891 in)

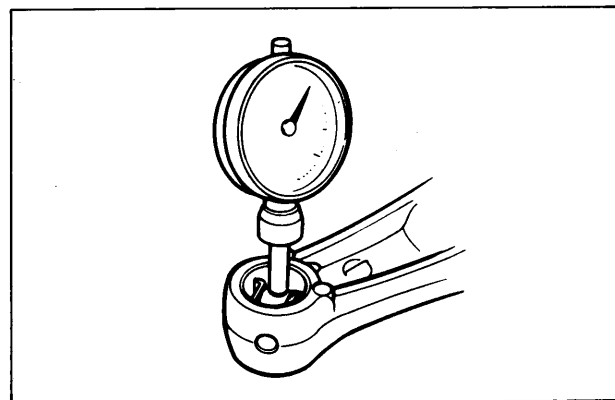


● PISTON-TO-PISTON PIN CLEARANCE

Standard	Service limit
0.002–0.014 mm (0.0001–0.0006 in)	0.08 mm (0.003 in)

● CONNECTING ROD SMALL END ID

	Standard	Service limit
GXV270	18.005 mm (0.7089 in)	18.07 mm (0.711 in)
GXV340	20.005 mm (0.7876 in)	20.07 mm (0.790 in)



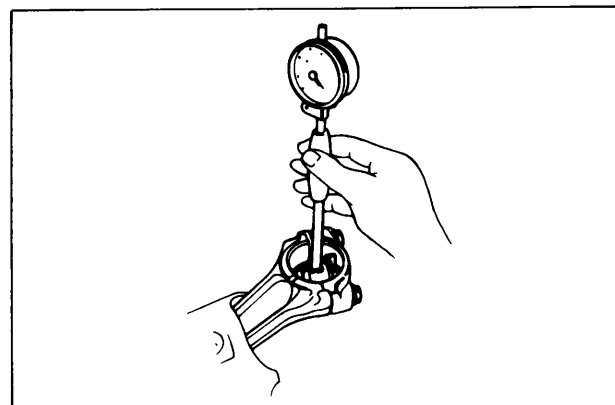
● CONNECTING ROD BIG END ID

ORIGINAL SIZE

	Standard	Service limit
GXV270	33.025–33.041 mm (1.3002–1.3008 in)	33.070 mm (1.3020 in)
GXV340	36.025–36.041 mm (1.4183–1.4189 in)	36.070 mm (1.4201 in)

0.25 mm UNDERSIZE

	Standard	Service limit
GXV270	32.775–32.791 mm (1.2904–1.2910 in)	32.820 mm (1.2921 in)
GXV340	35.775–35.791 mm (1.4085–1.4091 in)	35.820 mm (1.4102 in)



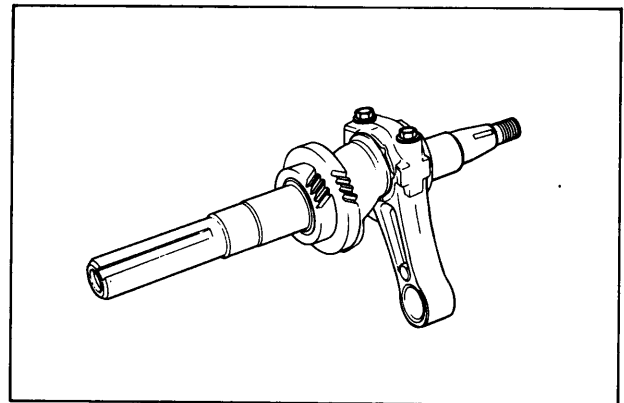
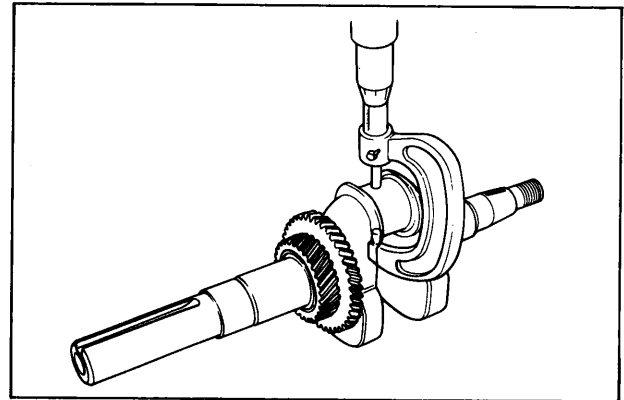
● CRANKPIN OD

ORIGINAL SIZE

	Standard	Service limit
GXV270	32.975–32.985 mm (1.2982–1.2986 in)	32.920 mm (1.2961 in)
GXV340	35.975–35.985 mm (1.4163–1.4167 in)	35.930 mm (1.4146 in)

0.25 mm UNDERSIZE

	Standard	Service limit
GXV270	32.725–32.735 mm (1.2884–1.2888 in)	32.670 mm (1.2862 in)
GXV340	35.725–35.735 mm (1.4065–1.4069 in)	35.680 mm (1.4047 in)



● CONNECTING ROD BIG END OIL CLEARANCE

- 1) Clean all oil from the crankpin and connecting rod bearing surfaces.
- 2) Place a piece of plastigauge on the crankpin, install the connecting rod and cap, and tighten the bolts.

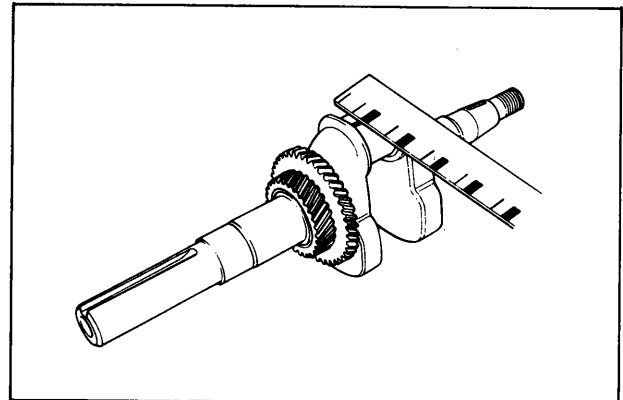
Torque	12–16 N·m (120–160 kg-cm, 8.7–11.6 ft-lb)
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NOTE: Do not rotate the crankshaft while the plastigauge is in place.

- 3) Remove the connecting rod and measure the plastigauge.

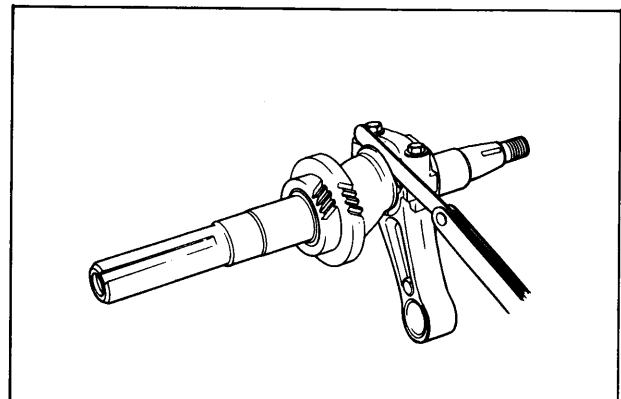
Standard	Service limit
0.040–0.066 mm (0.0016–0.0026 in)	0.12 mm (0.0047 in)

- 4) If the clearance exceeds the service limit, replace the connecting rod and recheck the clearance.



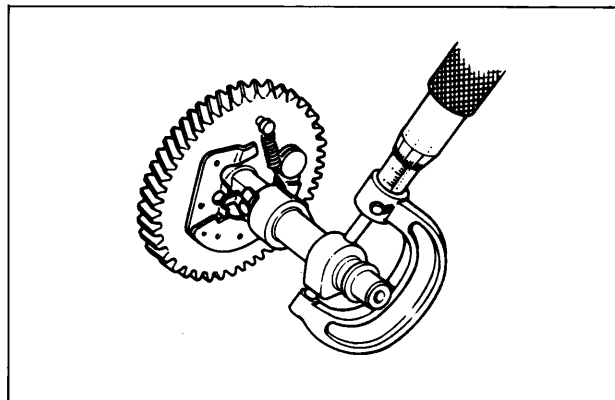
● CONNECTING ROD BIG END SIDE CLEARANCE

Standard	Service limit
0.1–0.7 mm (0.004–0.028 in)	1.1 mm (0.043 in)



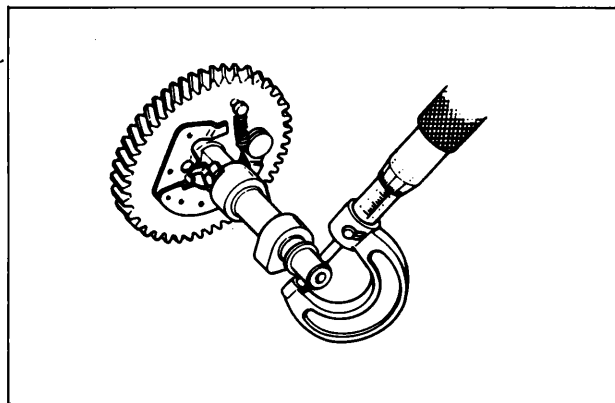
● CAMSHAFT CAM HEIGHT

	Standard	Service limit
IN	33.00 mm (1.299 in)	32.75 mm (1.289 in)
EX	32.60 mm (1.283 in)	32.35 mm (1.274 in)



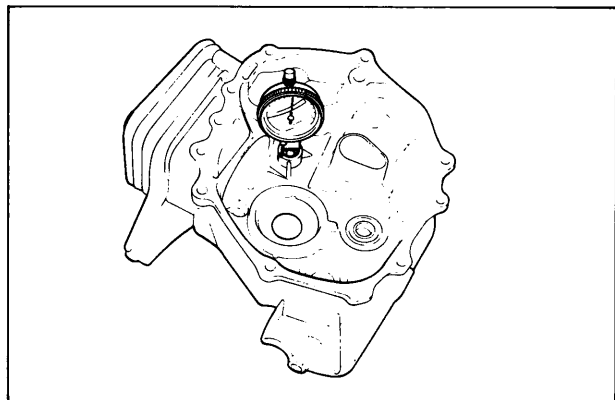
● CAMSHAFT OD

Standard	Service limit
15.984 mm (0.6293 in)	15.916 mm (0.6266 in)



● CAMSHAFT HOLDER ID

Standard	Service limit
16.000 mm (0.6299 in)	16.05 mm (0.632 in)



NOTE