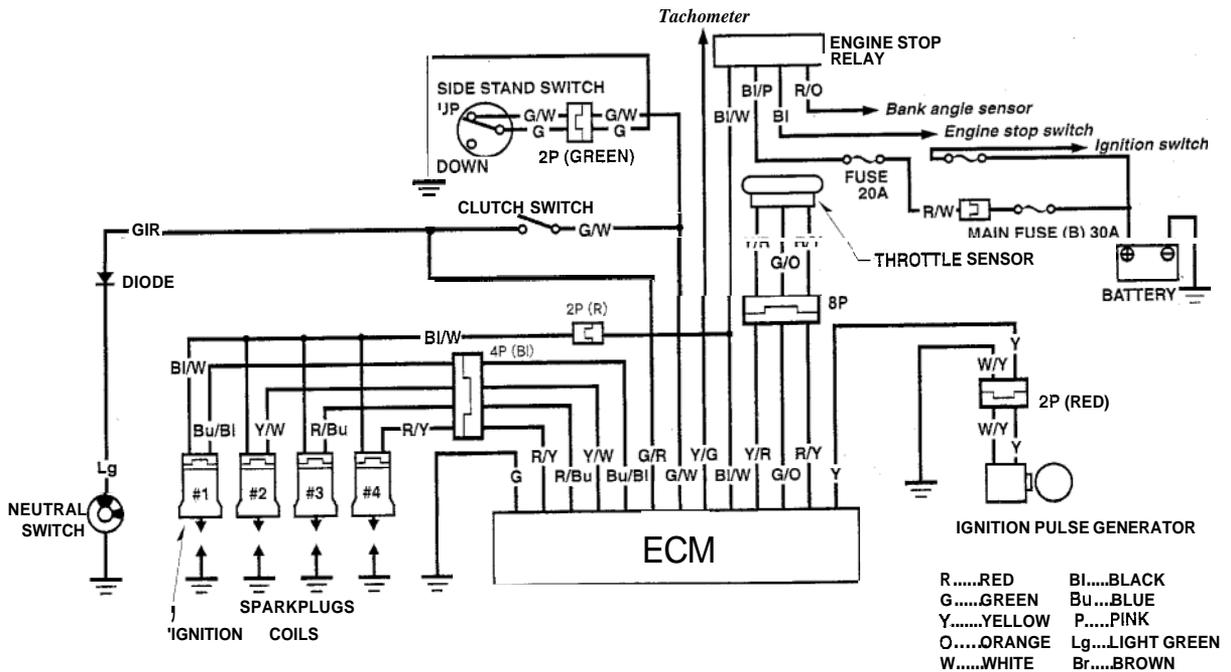
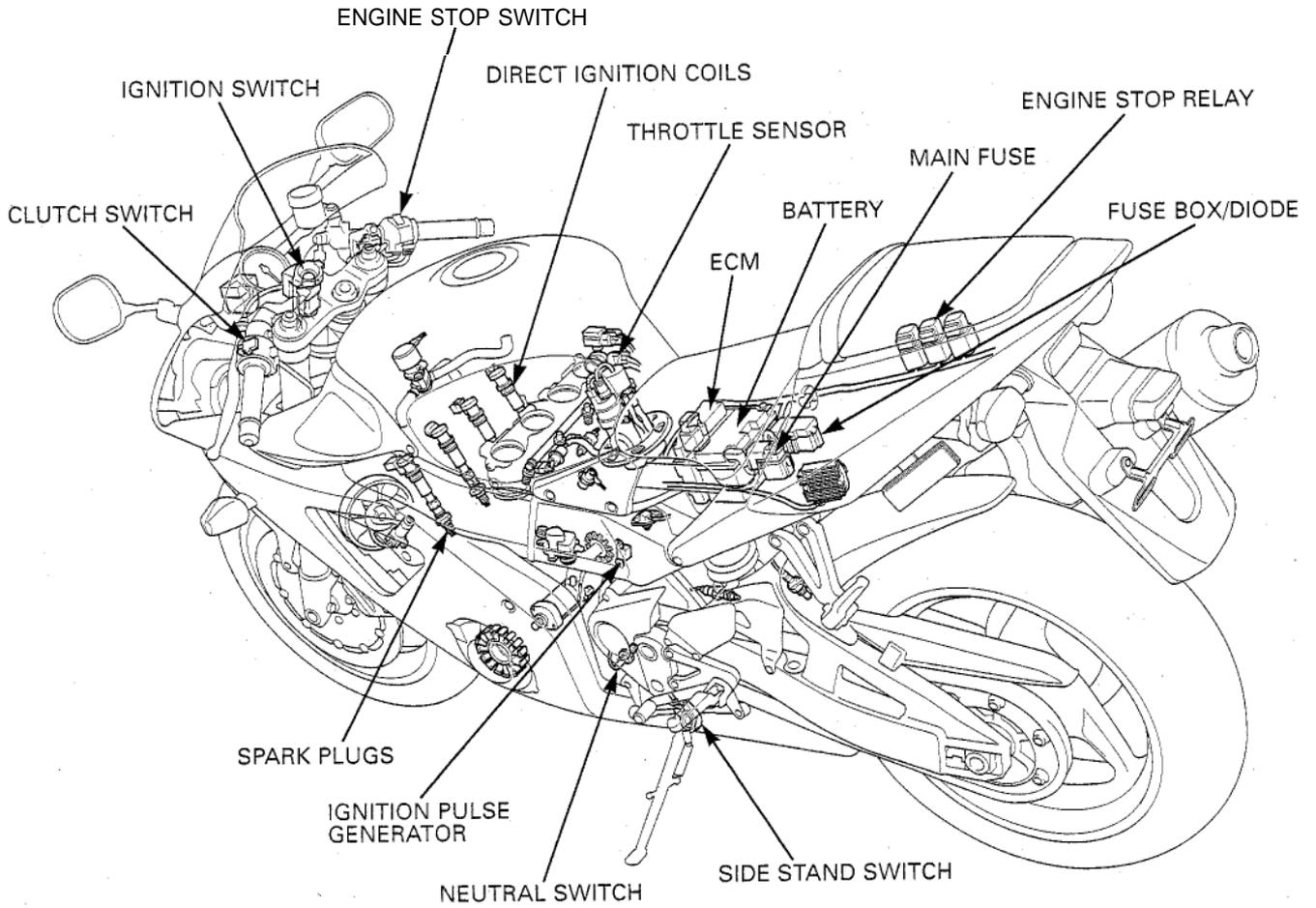


SYSTEM DIAGRAM



17. IGNITION SYSTEM

SYSTEM DIAGRAM	17-0	IGNITION SYSTEM INSPECTION	17-4
SERVICE INFORMATION	17-1	IGNITION PULSE GENERATOR	17-6
TROUBLESHOOTING	17-3	IGNITION TIMING	17-8

SERVICE INFORMATION

GENERAL

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned to "ON" and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 17-3.
- This motorcycle's Ignition Control Module (ICM) is built into the Engine Control Module (ECM).
- The ignition timing does not normally need to be adjusted since the ECM is factory preset.
- The ECM may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the ignition switch before servicing.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding. Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug.
- Use spark plugs of the correct heat range. Using spark plugs with an incorrect heat range can damage the engine.
- The direct ignition coil that the ignition coil and spark plug cap are integrated, is adopted in this motorcycle.
- Refer to section 5 for Throttle Position (TP) sensor, cam pulse generator and ECM inspection.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	Standard	IMR9C-9H (NGK), VUH27D (DENSO)
	Optional	IMR8C-9H (NGK), VUH24D (DENSO)
Spark plug gap		0.8 - 0.9 mm (0.03 - 0.04 in)
Ignition coil peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		13' BTDC at idle

IGNITION SYSTEM

TORQUE VALUES

Timing hole cap	18 N•m (1.8 kgf•m, 13 lbf•ft)	Apply grease to the threads.
Spark plug	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Ignition pulse generator rotor special bolt	59 N•m (6.0 kgf•m, 43 lbf•ft)	Apply oil to the threads.

TOOLS

IgnitionMate peak voltage tester (U.S.A. only) or Peak voltage adaptor	07HGJ-0020100 (not available in U.S.A.) with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)
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TROUBLESHOOTING

- Inspect the following before diagnosing the system.
 - Faulty spark plug
 - Loose spark plug cap or spark plug wire connection
 - Water got into the direct ignition coil (leaking the ignition coil secondary voltage)
- If there is no spark at either cylinder, temporarily exchange the direct ignition coil with a known-good one and perform the spark test. If there is spark, the exchanged direct ignition coil is faulty.
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch turned to "ON" and engine stop switch at RUN (The engine is not cranked by the starter motor).

No spark at all plugs

	Unusual condition	Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with ignition and engine stop switches on. (Other electrical components are normal)	1. Faulty engine stop switch and/or engine stop relay. 2. An open circuit in Black/White wire between the direct ignition coil and engine stop relay. 3. Loose or poor connect of the direct ignition coil primary wire terminal, or an open circuit in primary coil (Check at the ECM connector). 4. Faulty ECM (in case when the initial voltage is normal while disconnecting ECM connector)
	Initial voltage is normal, but it drops down to 2 – 4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections. 2. Undercharged battery. 3. No voltage between the Black/White (+) and Body ground (-) at the ECM multi-connector or loosen ECM connection. 4. An open circuit or loose connection in Green wire. 5. An open circuit or loose connection in Blue/Black, Yellow/White, Red/Blue and Red/Yellow wires between the direct ignition coils and ECM. 6. Short circuit in ignition primary coil. 7. Faulty side stand switch or neutral switch. 8. An open circuit or loose connection in No.7 related circuit wires. • Side stand switch line: Green/White wire • Neutral switch line: Light Green and Green/Red wire 9. Faulty ignition pulse generator (measure the peak voltage). 10. Faulty ECM (in case when above No. 1 – 9 are normal).
	Initial voltage is normal, but no peak voltage while cranking the engine.	1. Faulty peak voltage adaptor connections. 2. Faulty peak voltage adaptor. 3. Faulty ECM (in case when above No.1, 2 are normal).
	Initial voltage is normal, but peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (battery under-charged). 3. The sampling timing of the tester and measured pulse were not synchronized (system is normal if measured voltage is over the standard voltage at least once). 4. Faulty ECM (in case when above No. 1 – 3 are normal).
	Initial and peak voltage are normal, but does not spark.	1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil (s).
Ignition pulse generator	Peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (battery under charged). 3. The sampling timing of the tester and measured pulse were not synchronized (system is normal if measured voltage is over the standard voltage at least once). 4. Faulty ECM (in case when above No. 1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.

IGNITION SYSTEM INSPECTION

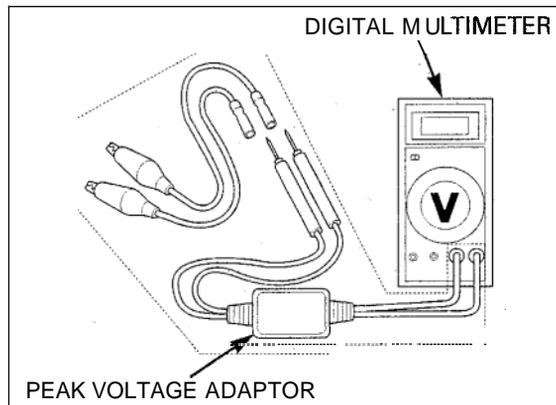
- If there is no spark at any plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use recommended digital multimeter or commercially available digital multimeter with an impedance of 10 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.

Connect the peak voltage tester or peak voltage adaptor to the digital multimeter.

TOOLS:

**IgnitionMate peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ-0020100
(not available in
U.S.A.)**

**with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)**



IGNITION COIL PRIMARY PEAK VOLTAGE

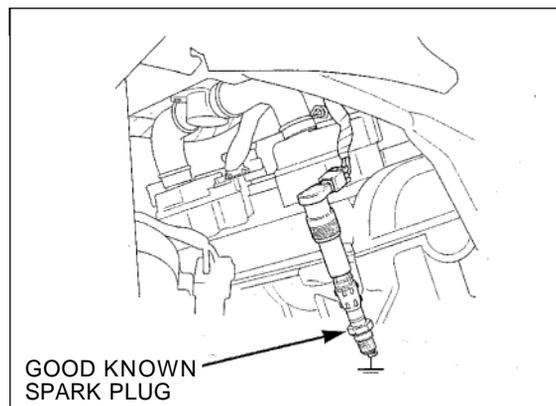
- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

Disconnect the direct ignition coils from the spark plug (page 3-6).

Connect the direct ignition coil 2P connectors to the direct ignition coil.

Shift the transmission into neutral.

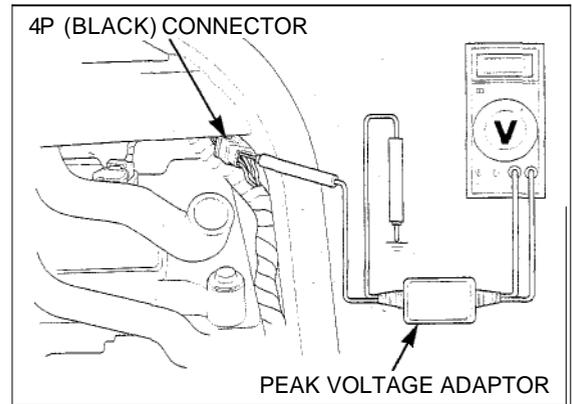
Connect a known good spark plugs to the direct ignition coils and ground the spark plugs to the cylinder head as done in a spark test.



With the ignition coil sub-harness 4P (Black) connector connected, connect the peak voltage adaptor or Imrie tester to the 4P (Black) connector primary wire terminal and ground.

CONNECTION:

- No.1 coil:**
Blue/Black terminal (+) - Body ground (-)
- No.2 coil:**
Yellow/White terminal (+) - Body ground (-)
- No.3 coil:**
Red/Blue terminal (+) - Body ground (-)
- No.4 coil:**
Red/Yellow terminal (+) - Body ground (-)



Avoid touching the sparkplugs and tester probes to prevent electric shock

Turn the ignition switch to "ON" and engine stop switch to "RUN".
Check for initial voltage at this time.
The battery voltage should be measured.
If the initial voltage cannot be measured, check the power supply circuit (refer to the troubleshooting, page 17-3).

Crank the engine with the starter motor and read the ignition coil primary peak voltage.

PEAK VOLTAGE: 100V minimum

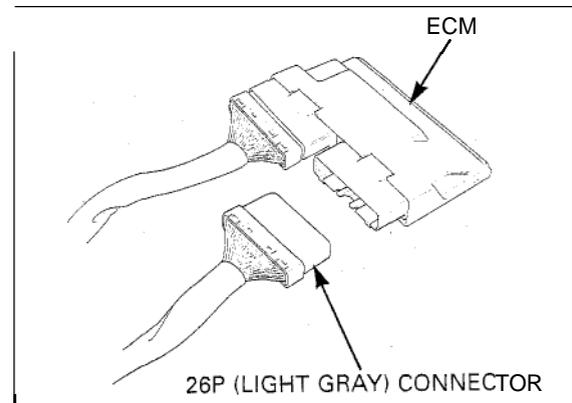
If the peak voltage is abnormal, check for an open circuit or poor connection in Blue/Black, Yellow/White, Red/Blue and Red/Yellow wires.
If no defects are found in the harness, refer to the troubleshooting chart on page 17-3.

IGNITION PULSE GENERATOR PEAK VOLTAGE

- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

Remove the ECM cover (page 5-87).

Disconnect the 26P (Light gray) connector from the ECM.



IGNITION SYSTEM

Connect the peak voltage tester or peak voltage adaptor probes to the connector terminal of the wire harness side and ground.

TOOLS:

IgnitionMate peak voltage tester (U.S.A. only) or Peak voltage adaptor 07HGJ-0020100 (not available in U.S.A.)

with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)

CONNECTION:

Yellow terminal (+) - Ground (-)

Avoid touching the spark plugs and tester probes to prevent electric shock.

Crank the engine with the starter motor and read the peak voltage.

PEAK VOLTAGE: 0.7 V minimum

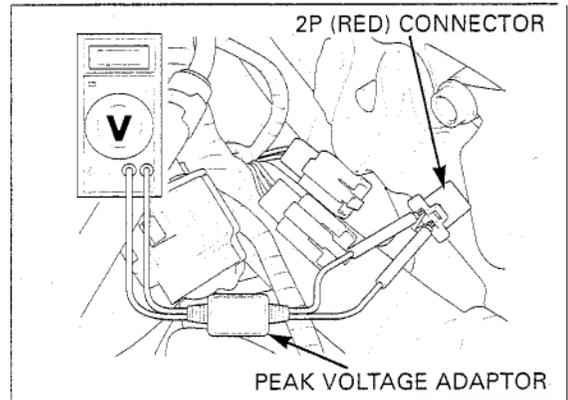
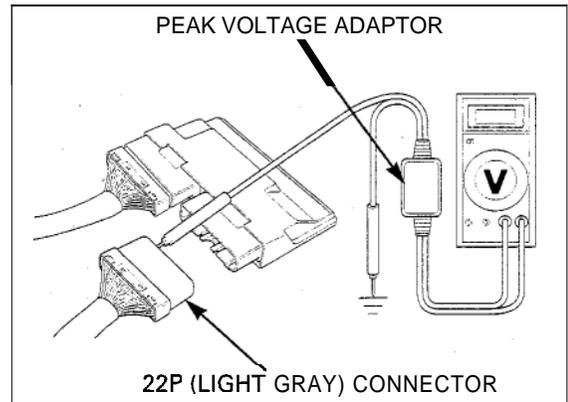
If the peak voltage measured at the ECM multi-connector is abnormal, measure the peak voltage at the ignition pulse generator connector.

Open and support the front end of the fuel tank (page 3-4).

Disconnect the ignition pulse generator 2P (Red) connector and connect the tester probes to the terminal (Yellow and White/Yellow).

In the same manner as at the ECM connector, measure the peak voltage and compare it to the voltage measured at the ECM connector.

- If the peak voltage measured at the ECM is abnormal and the one measured at the ignition pulse generator is normal, the wire harness has an open circuit or loose connection.
- If both peak voltages are abnormal, check each item in the troubleshooting chart. If all items are normal, the ignition pulse generator is faulty. See following steps for ignition pulse generator replacement.

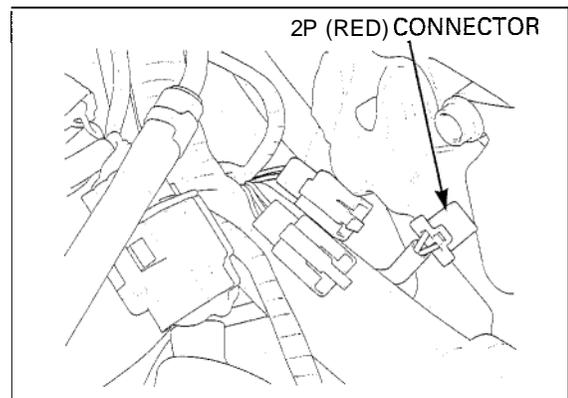


IGNITION PULSE GENERATOR

REMOVAL

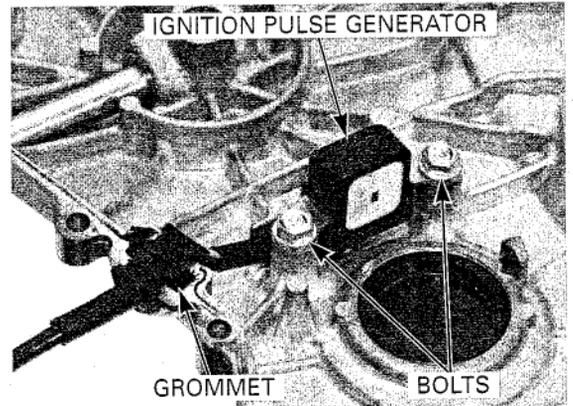
Open and support the front end of the fuel tank (page 3-4).

Disconnect the ignition pulse generator 2P (Red) connector.



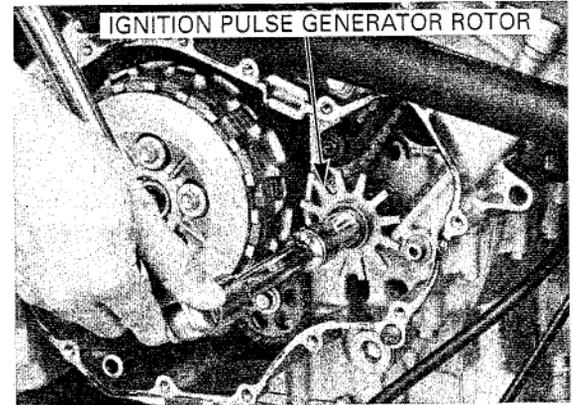
Remove the right crankcase cover (page 9-3).

Remove the wire grommet from the cover.
Remove the bolts and ignition pulse generator.



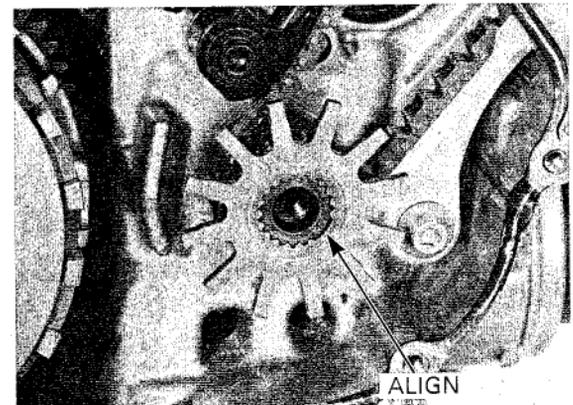
if the engine is out of the frame, remove the alternator cover (page 10-2) and hold the flywheel with the flywheel holder (07725-0040000), then remove the bolt.

Shift the transmission into 6th gear and apply the rear brake.
Remove the ignition pulse generator rotor special bolt.

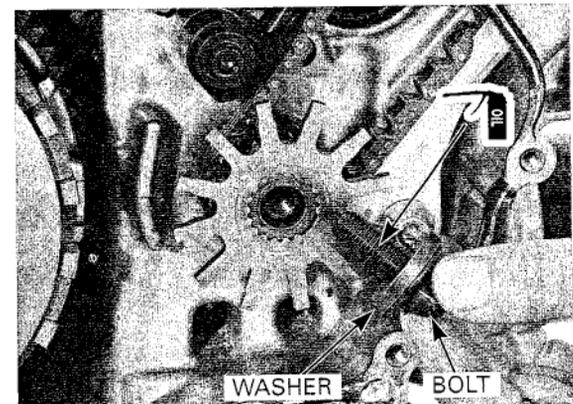


INSTALLATION

Install the ignition pulse generator rotor by aligning the wide groove with the wide teeth of the crankshaft.



Apply oil to the ignition pulse generator rotor bolt threads, then install the washer and rotor bolt.



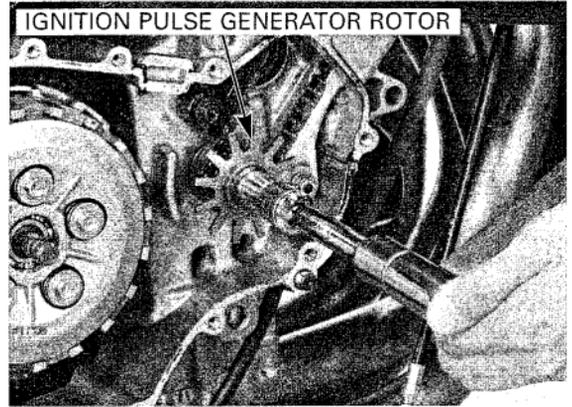
IGNITION SYSTEM

*if the engines
out of the frame,
hold the flywheel
with the
flywheel holder
(07725-0040000),
then tighten the
bolt*

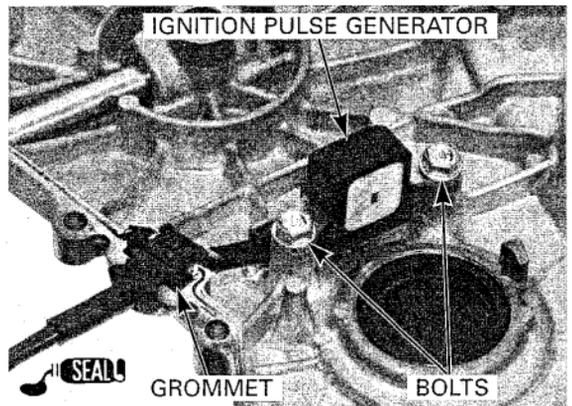
Shift the transmission into 6th gear and apply rear brake.

Tighten the ignition pulse generator rotor special bolt to the specified torque.

TORQUE: 59 N·m (6.0kgf·m, 43 lbf·ft)



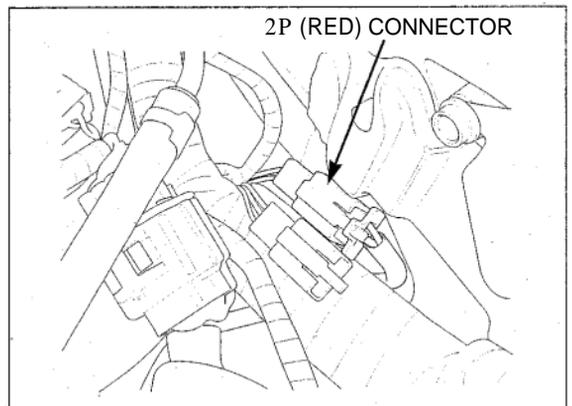
Install the ignition pulse generator into the cover. Apply sealant to the wire grommet, then install it into the groove of the cover. Install and tighten the ignition pulse generator bolts.



Install the right crankcase cover (page 9-17)

Route the ignition pulse generator wire properly, connect the 2P (Red) connector.

Install the removed parts in the reverse order of removal.

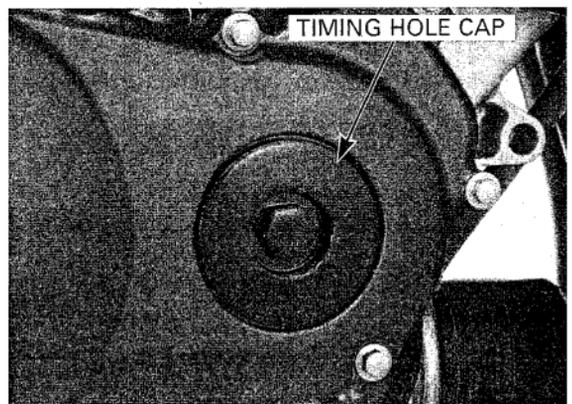


IGNITION TIMING

Remove the lower cowl (page 2-7).

Warm up the engine.

Stop the engine and remove the timing hole cap.

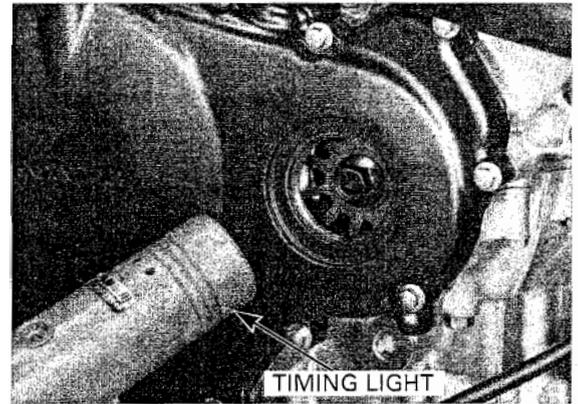


Read the instructions for timing light operation

Connect the timing light to the No.1 direct ignition coil wire.

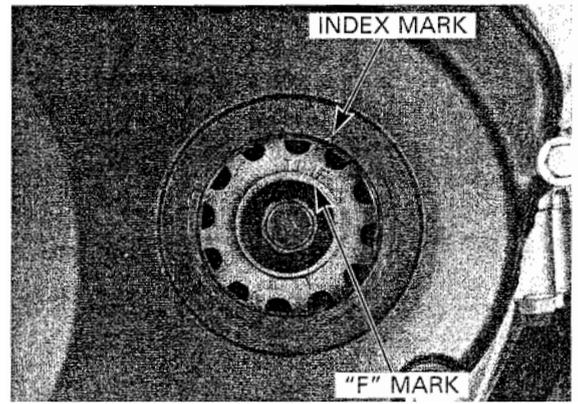
Start the engine and let it idle.

IDLE SPEED: 1,200 ± 100 rpm



The ignition timing is correct if the "F" mark aligns with the index mark on the ignition pulse generator rotor cover.

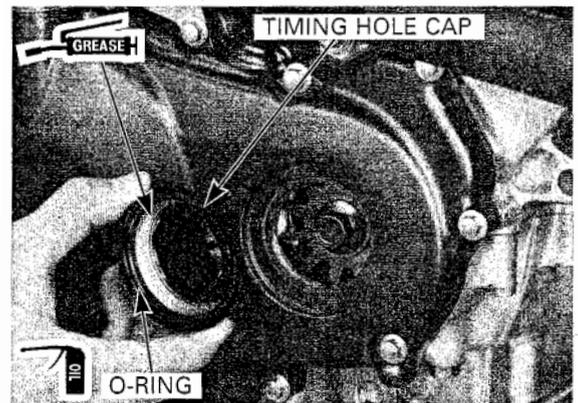
Increase the engine speed by turning the throttle stop screw and make sure the "F" mark begins to move counterclockwise when the engine speed at approximately 1,500 rpm.



Check that the O-ring is in good condition, replace if necessary.

Apply oil to the O-ring.

Apply grease to the timing hole cap threads and install the O-ring and timing hole cap.



Tighten the timing hole cap to the specified torque.

TORQUE: 18 N·m (1.8kgf·m, 13 lbf·ft)

Install the lower cowl (page 2-7).

