

GENERAL

See Figure 4-65. The electronic control module is located under the fairing.

REMOVAL

1. Remove seat. See [2.38 SEAT](#).
2. Disconnect battery. See [1.5 BATTERY MAINTENANCE](#).
3. Remove front fairing. See [2.37 FRONT FAIRING, WINDSHIELD, AND MIRRORS](#).
4. Remove Electronic Control Module (ECM). See [2.25 HEADLIGHT ASSEMBLY AND SUPPORT BRACKET](#) but do not disconnect sensors.
5. Disconnect ECM black connector [10] and gray connector [11].

INSTALLATION

1. Attach ECM connectors [10] and [11].

NOTE

On XB12R models it will be necessary to connect the interactive exhaust connector [164] to the ECM.

2. Locate ECM between fairing and headlight bracket.
3. Install headlight bracket. See [2.25 HEADLIGHT ASSEMBLY AND SUPPORT BRACKET](#).
4. Install front fairing. See [2.37 FRONT FAIRING, WINDSHIELD, AND MIRRORS](#).

⚠ WARNING

Connect positive (+) battery cable first. If positive (+) cable should contact ground with negative (-) cable connected, the resulting sparks can cause a battery explosion, which could result in death or serious injury. (00068a)

5. Thread positive cable (red) fastener into threaded hole first tightening to 72-96 **in-lbs** (8-11 Nm). See [1.5 BATTERY MAINTENANCE](#).
6. Connect negative battery cable.

⚠ WARNING

After installing seat, pull upward on front of seat to be sure it is in locked position. While riding, a loose seat can shift causing loss of control, which could result in death or serious injury. (00070a)

7. Install seat. See [2.38 SEAT](#).

NOTE

If the ECM was replaced with a new component, it will be necessary to recalibrate Throttle Position Sensor. Throttle position sensor can only be calibrated using DIGITAL TECHNICIAN (Part No. HD-44750).

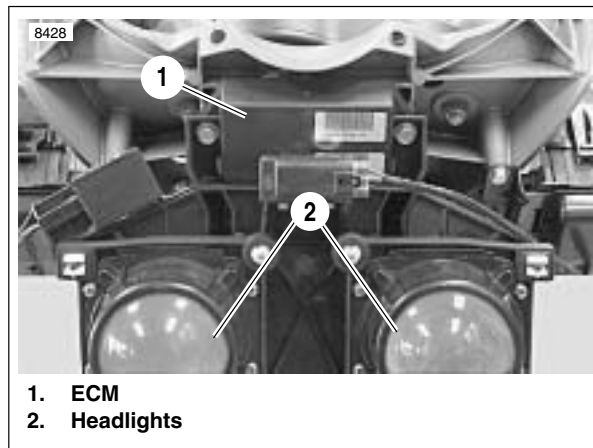


Figure 4-65. ECM

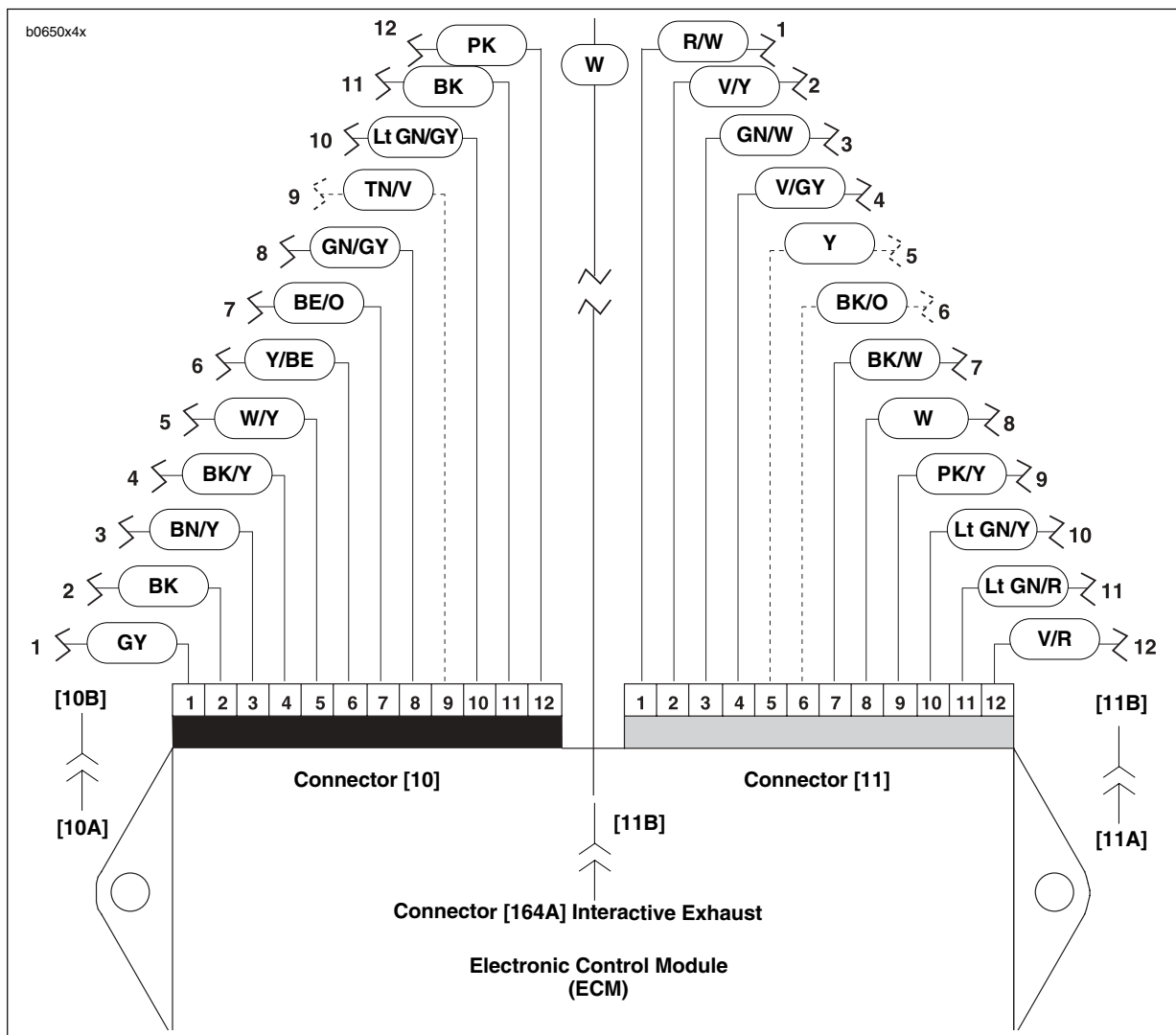


Figure 4-66. ECM Wiring (Interactive Muffler Connector [164] XB12 Models Only)

**Table 4-34. Pin Table for
ECM Connector [10] (Black)**

PIN	FUNCTION
1	Switched ignition
2	System ground A (module)
3	Fuel pump
4	Check engine lamp
5	Injector front
6	Front coil primary
7	Rear coil primary
8	Injector rear
9	Interactive Muffler control feedback
10	Bank angle sensor input
11	System ground B (coil)
12	Tachometer

**Table 4-35. Pin Table for
ECM Connector [11] (Gray)**

PIN	FUNCTION
1	5 volt sensor power
2	Throttle position sensor
3	Camshaft position sensor
4	Oxygen sensor
5	Memory
6	Fan control
7	Sensor ground 1
8	Vehicle speed sensor
9	Engine temperature
10	Intake air temperature
11	Serial data receive
12	Serial data transmit

REMOVAL

⚠ WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

1. Disconnect negative battery cable.
2. Remove sprocket cover. See [2.30 SPROCKET COVER](#).

NOTES

- Make note of cable strap positions and wire routing during disassembly.
- For more information about the wiring located beneath the sprocket cover see [7.25 SPROCKET COVER WIRING](#).

3. Cut cable straps holding cam position sensor wiring.
4. See [Figure 4-67](#). Disconnect cam position sensor wiring at connector [14].
5. Note position of each cam position sensor wiring terminal in plug end of connector.
6. See [Figure 4-66](#). Remove connector terminal pins (7). See [B.2 DEUTSCH ELECTRICAL CONNECTORS](#).
7. See [Figure 4-69](#). Remove timer cover.
 - a. Drill off heads of outer timer cover pop rivets (1) using a 3/8 in. drill bit.
 - b. Tap remaining rivet shafts inboard through holes in timer cover (2) and inner cover (19).
 - c. Remove timer cover. Remove inner cover screws (3) and inner cover (19).
 - d. Carefully remove any remaining pieces of rivets from gearcase cover timer bore.
8. See [Figure 4-68](#). To obtain approximate ignition timing during installation, scribe alignment marks (4) across cam position sensor (3) in two places.
9. See [Figure 4-69](#). Remove timer plate studs (4). Carefully remove cam position sensor. Remove bolt (17) and trigger rotor (16).
10. Carefully remove camshaft oil seal (15) if damaged or if there is any evidence of oil leakage past the seal. [Figure 4-74](#).

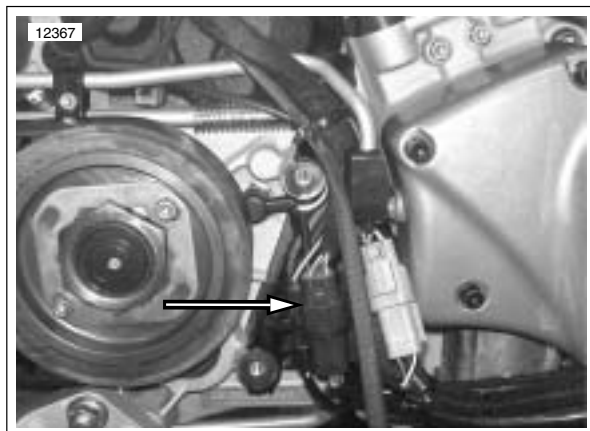


Figure 4-67. Cam Position Sensor Connector [14]

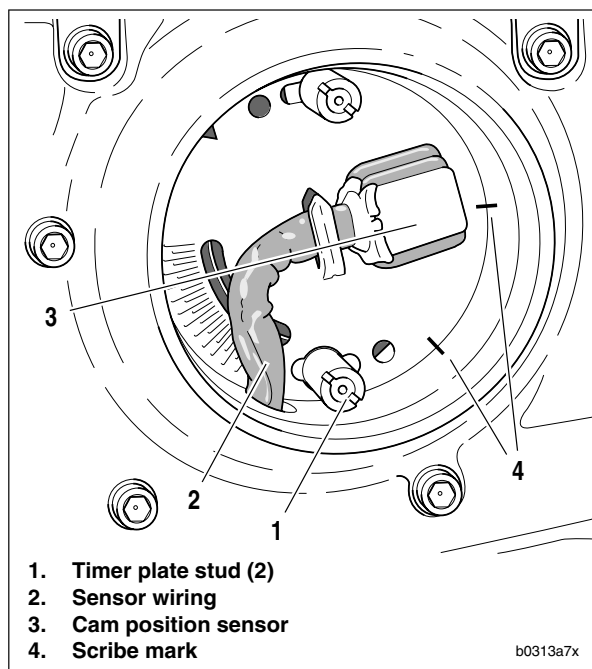
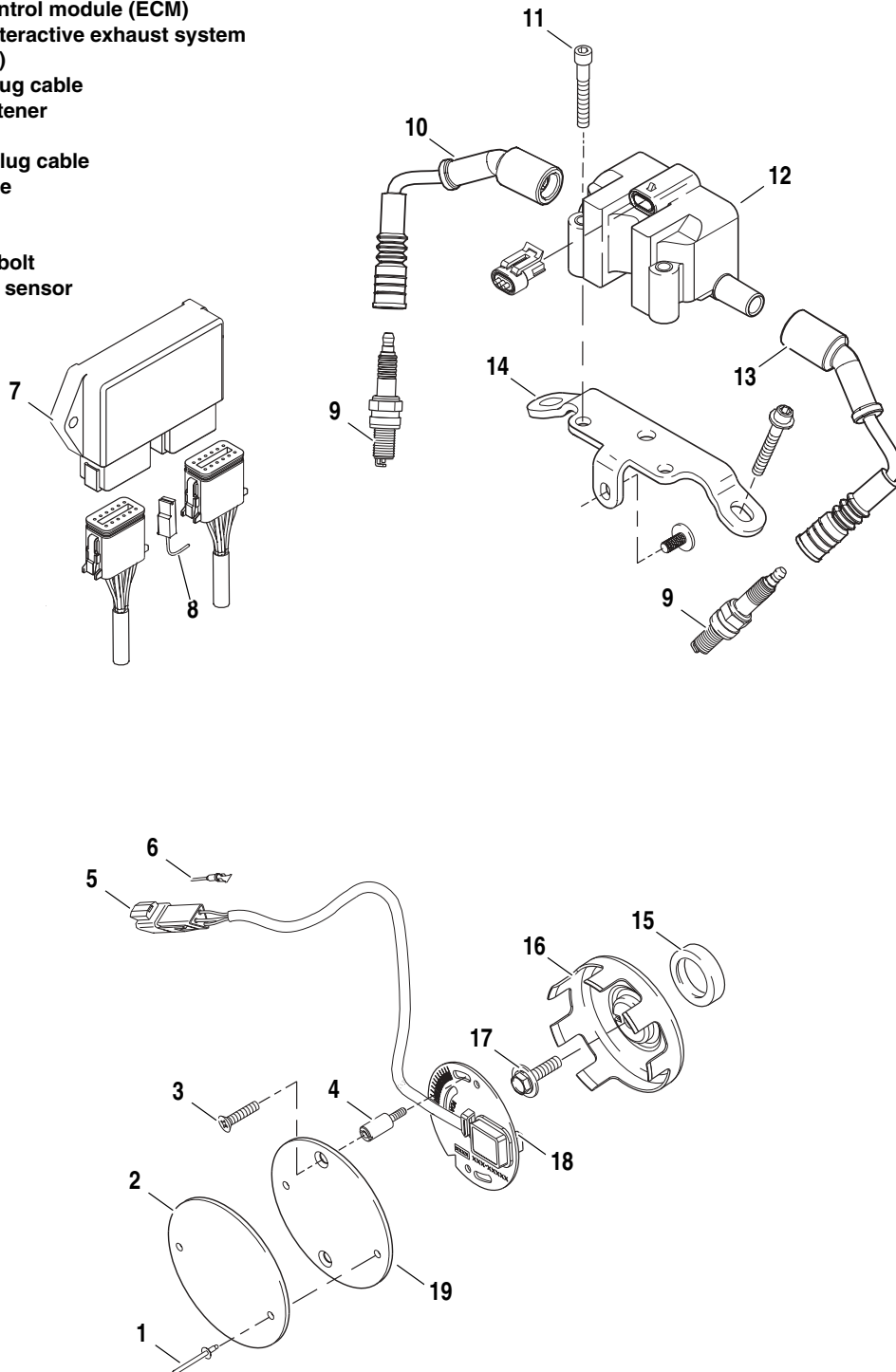


Figure 4-68. Marking Ignition Timing

1. Pop rivet (2)
2. Timer cover
3. Screw (2)
4. Timer plate stud (2)
5. Cam position sensor connector [14]
6. Terminal pin
7. Electronic control module (ECM)
8. Connector, interactive exhaust system
9. Spark plug (2)
10. Rear spark plug cable
11. Mounting fastener
12. Ignition coil
13. Front spark plug cable
14. Cylinder brace
15. Seal
16. Trigger rotor
17. Trigger rotor bolt
18. Cam position sensor
19. Inner cover



b1164a4x

Figure 4-69. Ignition Components

bd0022bf

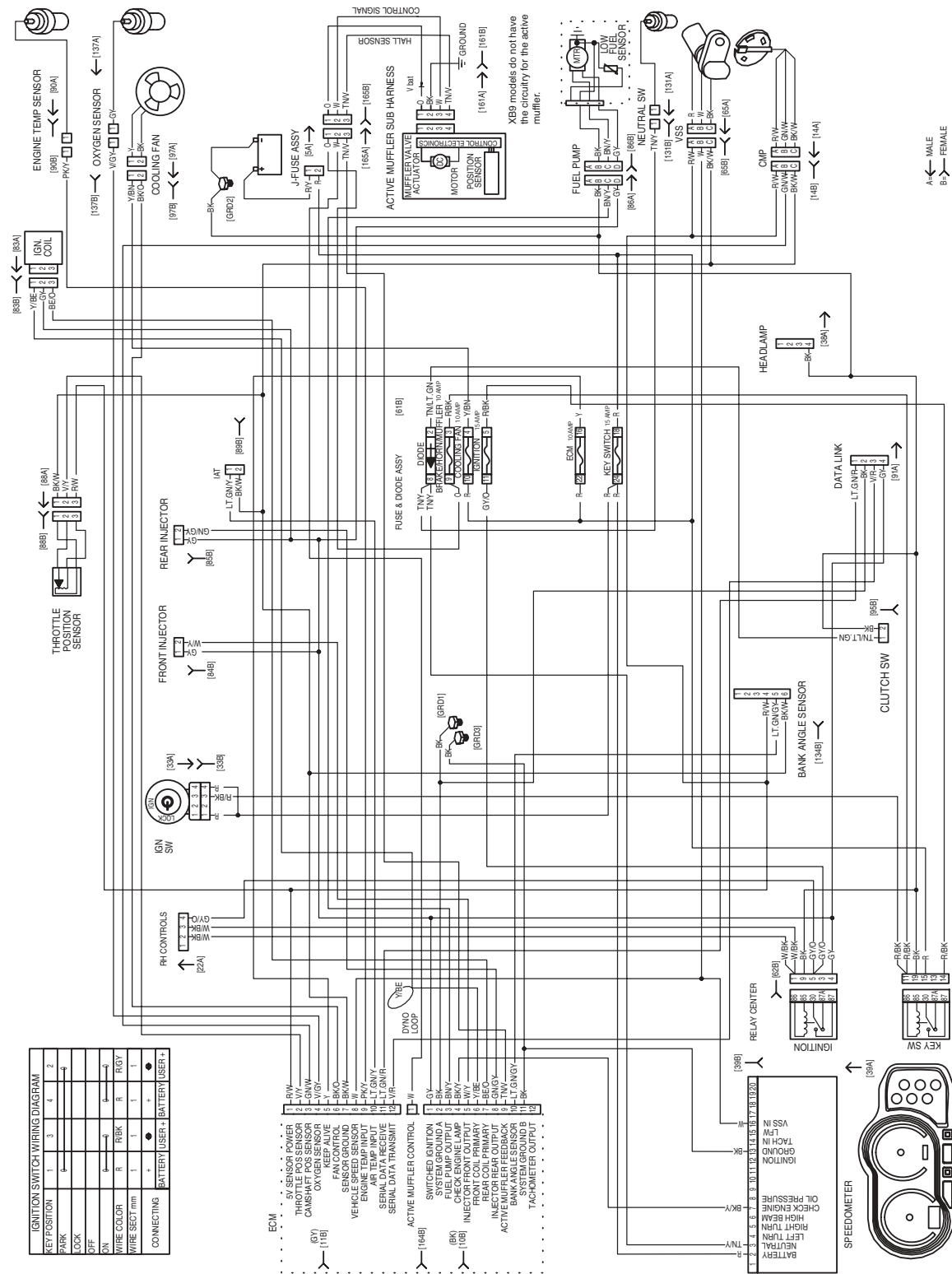


Figure 4-70. Ignition System Circuit

INSTALLATION

1. See [Figure 4-69](#). Coat lip of seal with a thin film of **clean** engine oil. With the lipped side facing inboard, install **new** camshaft oil seal (15) into gearcase cover, if removed. Press seal into position until flush with surface of timer bore.
2. Install trigger rotor (17).
 - a. Apply LOCTITE THREADLOCKER 243 (blue) to threads of bolt (18).
 - b. Position trigger rotor (17) onto end of camshaft aligning notch with camshaft slot.
 - c. Install bolt to secure rotor. Tighten to 43-53 **in-lbs** (5-6 Nm).
3. Install cam position sensor (18) and timer plate studs (4). Rotate cam position sensor to its previously marked position to obtain approximate ignition timing.
4. Route sensor wiring leads and install cable straps. See [7.25 SPROCKET COVER WIRING](#).
5. See [Figure 4-71](#). Install sensor wiring terminals into correct positions in plug end of connector [14]. R/W, GN/W and BK/W wires of plug end (from cam position sensor) must match same color wires in receptacle end of connector (from ignition module wiring harness). Install pin terminals. See [B.2 DEUTSCH ELECTRICAL CONNECTORS](#).
6. See [Figure 4-66](#). Attach connector [3] (2).
7. Check ignition timing. See [1.18 IGNITION TIMING](#).
8. Tighten timer plate studs (4) to 15-30 **in-lbs** (2-3 Nm).
9. Install inner cover (20) using screws (3). Tighten to 12-20 **in-lbs** (1-2 Nm).

NOTE

Use only H-D Part No. 8699 rivets to secure outer timing cover. These rivets are specially designed so that no rivet end falls off into the timing compartment. Use of regular rivets can damage ignition system components and may allow water to enter the timing compartment.

10. Secure timer cover (2) to inner cover using **new** rivets (1).
11. Install sprocket cover. See [2.30 SPROCKET COVER](#).
12. Connect negative battery cable.

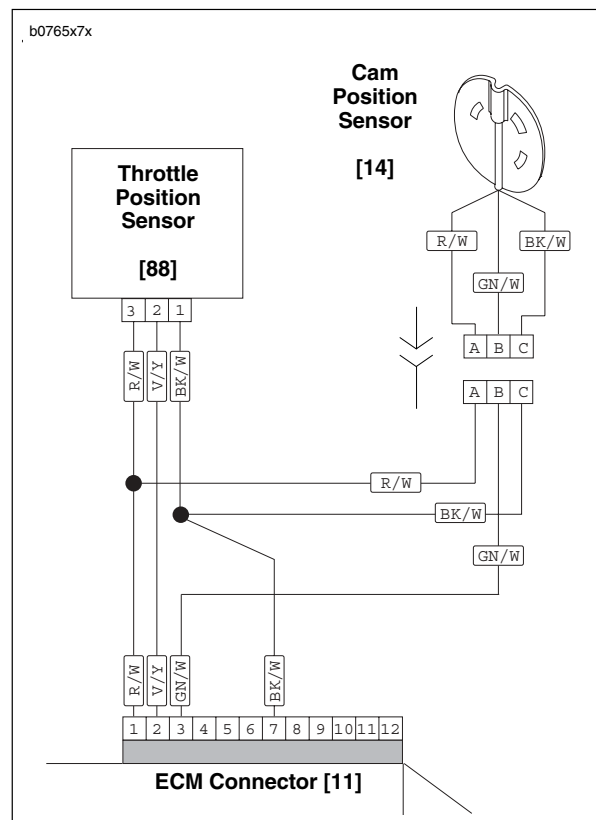


Figure 4-71. Connecting Sensor Wires

REMOVAL

WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

1. Disconnect negative battery cable.
2. Remove intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).
3. Remove air cleaner cover. See [4.44 AIR CLEANER ASSEMBLY](#).
4. See [Figure 4-72](#). Disconnect the spark plug cables from the coil plug posts (1, 5).
5. Detach connector (3) [83].
6. Remove coil fasteners (2).

INSTALLATION

NOTE

To ease installation, install spark plug cables to ignition coil first.

1. Connect spark plug cables to ignition coil.
2. See [Figure 4-72](#). Attach coil to frame with fasteners (2). Tighten to 120-144 **in-lbs** (13.6-16.3 Nm).
3. Attach front and rear spark plug cables to ignition coil posts.
4. Attach connector (3) [83].
5. Install air cleaner cover. See [4.44 AIR CLEANER ASSEMBLY](#).
6. Install intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).
7. Connect negative battery cable.

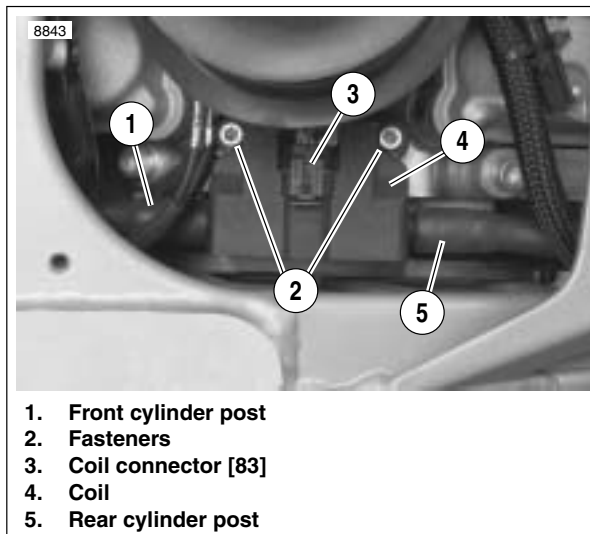


Figure 4-72. Ignition Coil Location

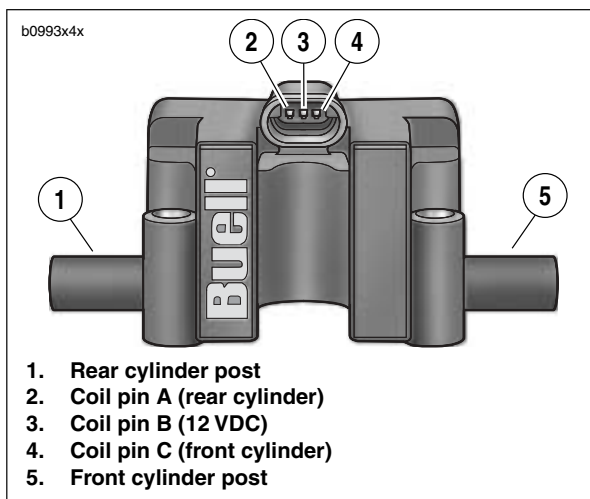


Figure 4-73. Ignition Coil

TROUBLESHOOTING

Follow the troubleshooting procedures listed under **4.8 INITIAL DIAGNOSTIC CHECK** if the engine will not start, is difficult to start or runs roughly. Also check condition of spark plug cables. Insulation on cables may be cracked or damaged allowing high tension current to short to metal parts. This problem is most noticeable when cables are wet.

If poor starting/running condition persists, check resistance of ignition coil primary and secondary windings using an ohmmeter.

NOTE

The ignition coil cannot be repaired. Replace the unit if it fails.

Primary Circuit Test

1. Remove ignition coil.
2. Set ohmmeter scale to RX1.
3. See **Figure 4-74**. Using HARNESS CONNECTOR TEST KIT (Part No. HD-41404) gray socket probes, place multimeter wires on primary coil windings from terminal 1 to 2, and from terminal 2 to 3.
4. Refer to **Table 4-36**. Check primary coil winding resistance.
 - a. Normal resistance range is 0.5-0.7 ohms.
 - b. See **TEST RESULTS** which follows if resistance is not within normal operating range.

Secondary Circuit Test

1. Remove ignition coil.
2. Set ohmmeter scale to RX1K.
3. See **Figure 4-74**. Place multimeter wires on secondary coil windings from terminal 2 to R, and from terminal 2 to F.
4. Refer to **Table 4-36**. Check secondary coil winding resistance.
 - a. Normal resistance range is 5.5-7.5K ohms.
 - b. See **TEST RESULTS** which follows if resistance is not within normal operating range.

Table 4-36. Ignition Coil Winding Resistance

WINDING	OHMMETER SCALE	NORMAL RESISTANCE RANGE (IN OHMS)
Primary	R x 1	0.5-0.7
Secondary	R x 1K	5.5K-7.5K

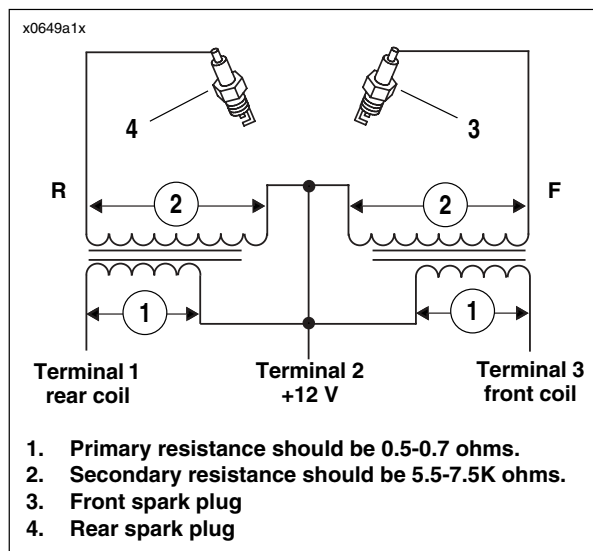


Figure 4-74. Ignition Coil Circuit

Test Results

1. A low resistance value indicates a short in the coil winding. Replace coil.
2. A high resistance value might indicate that there is some corrosion/oxidation of the coil terminals. Clean the terminals and repeat resistance test. If resistance is still high after cleaning terminals, replace coil.
3. An infinite ohms (∞ or OL) resistance value indicates an open circuit (a break in the coil winding). Replace coil.

Ignition Coil Substitution

If a coil tester is not available, use the following test.

NOTE

Coil will function without being attached to frame.

1. Substitute a **new** ignition coil by attaching it to any convenient point near the old coil. Transfer connector [83] to **new** coil.
2. Attach **new** spark plug cables to coil and spark plugs.

Test system. If ignition trouble is eliminated by the temporary installation of a **new** coil, carefully inspect old coil and cables for damage. The insulation on the cables may be cracked or otherwise damaged allowing high tension current to short to metal parts. This is most noticeable in wet weather or after the motorcycle has been washed.

GENERAL

The oxygen sensor, located in the rear header pipe, monitors oxygen content in the exhaust gas and converts it to a voltage reading. This voltage reading is used by the ECM to maintain the proper air/fuel ratio during closed loop operation.

REMOVAL

WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

1. Disconnect negative battery cable.
2. Remove intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).
3. Remove air cleaner cover assembly. See [4.44 AIR CLEANER ASSEMBLY](#).
4. Remove shock absorber. See [2.22 REAR SHOCK ABSORBER](#).
5. Remove cooling fan. See [4.38 COOLING FAN](#).
6. See [Figure 4-76](#). Remove cable straps (2). Unplug 1-place connector [137] (1).
7. Remove oxygen sensor from exhaust header using Snap-on Part No. YA8875.

INSTALLATION

1. Apply LOCTITE ANTI-SEIZE LUBRICANT to threads of sensor.
2. See [Figure 4-75](#). Thread sensor into exhaust header. Tighten sensor to 40-45 ft-lbs (54-61 Nm).
3. Install cooling fan. See [4.38 COOLING FAN](#).
4. Install shock absorber. See [2.22 REAR SHOCK ABSORBER](#).
5. See [Figure 4-76](#). Connect 1-place connector [137] (1) to wiring harness.
6. Install cable straps (2).
7. Install air cleaner cover assembly. See [4.44 AIR CLEANER ASSEMBLY](#).
8. Install intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).
9. Connect negative battery cable.

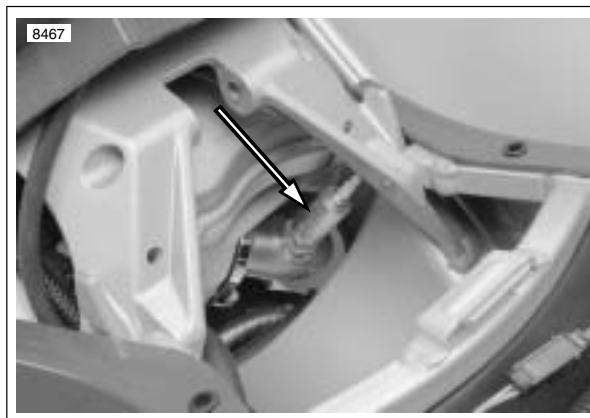
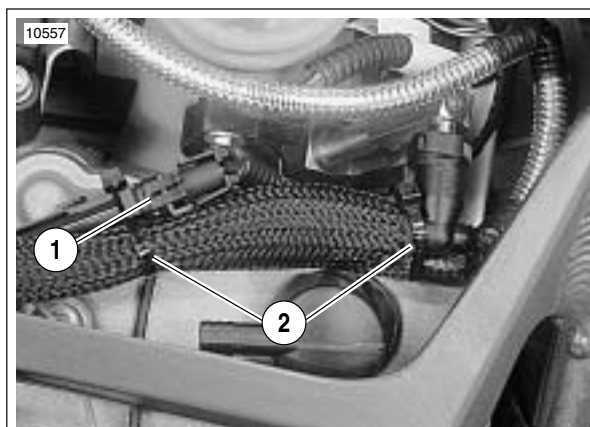


Figure 4-75. Installed Oxygen Sensor (shock absorber removed)



1. Oxygen sensor connector [137]
2. Cable straps

Figure 4-76. Oxygen Sensor Connector [137] (1200 Models)

GENERAL

The Engine Temperature Sensor (ET Sensor), located in the rear cylinder head, monitors the engine temperature close to the combustion chamber. In addition to aiding the ECM in monitoring the operation of the engine, it is also used to warn the operator of potentially damaging temperatures by causing the CHECK ENGINE lamp to blink during operation.

REMOVAL

1. Remove seat. See [2.38 SEAT](#).

⚠ WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

2. Disconnect negative battery cable.
3. Remove intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).
4. Remove air cleaner cover. See [4.44 AIR CLEANER ASSEMBLY](#).
5. See Figure 4-78. Remove right upper tie bar fastener (2). Rotate tie bar to provide access to sensor.

NOTE

Do not pull on engine temperature sensor wiring. Excess strain to sensor wiring will cause sensor damage.

6. Unplug 1-place ET Sensor connector (1) [90] above rear cylinder head.
7. Slide rubber boot up ET sensor wire.
8. Remove sensor from rear cylinder head using Snap-on socket M3503B.

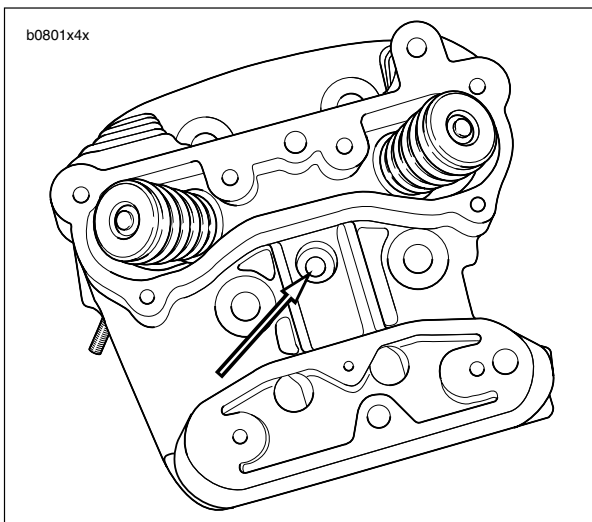


Figure 4-77. Engine Temperature Sensor Location (rear cylinder)



Figure 4-78. Engine Temperature Sensor Connector Approximate Location [90]

INSTALLATION

NOTE

Do not pull on engine temperature sensor wiring. Excess strain to sensor wiring will cause sensor damage.

1. See [Figure 4-77](#). Screw sensor into rear cylinder head.

NOTE

In next step, make sure wire is in cutout portion (slot) of socket to prevent damage.

2. Secure sensor with Snap-on socket M3503B. Tighten ET sensor to 120-168 **in-lbs** (13.6-19 Nm).

NOTE

Orient the rubber boot so the flat on the boot is towards the left side of the motorcycle.

3. Push rubber boot down sensor wire towards cylinder head until it seats in hole on top of ET sensor.
4. See [Figure 4-78](#). Connect ET sensor 1-place connector [90] to wiring harness.
5. Install right upper tie bar fastener (2). Tighten fastener to 25-27 ft-lbs (33.9-36.6 Nm).
6. Install air cleaner cover. See [4.44 AIR CLEANER ASSEMBLY](#).
7. Install intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).
8. Connect negative battery cable.

⚠ WARNING

After installing seat, pull upward on front of seat to be sure it is in locked position. While riding, a loose seat can shift causing loss of control, which could result in death or serious injury. (00070a)

9. Install seat. See [2.38 SEAT](#).

GENERAL

The bank angle sensor (BAS), located inside the fairing on the headlight bracket, provides input to the ECM on vehicle lean angle. If vehicle lean angle exceeds predetermined bank angle limit, the Bank Angle Sensor will shut off power to the ignition and fuel pump.

REMOVAL

1. Remove seat. See [2.38 SEAT](#).

⚠ WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

2. Disconnect negative battery cable.
3. Remove front fairing. See [2.37 FRONT FAIRING, WINDSHIELD, AND MIRRORS](#).
4. See [Figure 4-79](#). Unplug bank angle sensor connector [134].
5. Remove screws and washers to detach sensor from headlight bracket.

INSTALLATION

1. Position bank angle sensor on headlight bracket. Make sure locating post on sensor engages hole in mounting tab.
2. Install bank angle sensor to mounting tab with fasteners and **new** locknuts. Tighten fastener to 12-36 **in-lbs** (1.4-4.1 Nm).
3. See [Figure 4-79](#). Install bank angle sensor connector [134].
4. Install front fairing. See [2.37 FRONT FAIRING, WINDSHIELD, AND MIRRORS](#).
5. Connect negative battery cable.

⚠ WARNING

After installing seat, pull upward on front of seat to be sure it is in locked position. While riding, a loose seat can shift causing loss of control, which could result in death or serious injury. (00070a)

6. Install seat. See [2.38 SEAT](#).

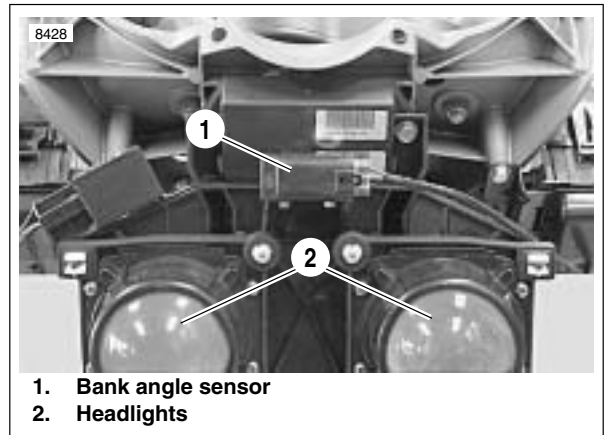


Figure 4-79. Bank Angle Sensor

GENERAL

The intake air temperature sensor (IAT Sensor), located on the air cleaner cover baseplate, measures the air temperature allowing the ECM to calculate the density of the air entering the manifold. The IAT is a thermistor type sensor.

REMOVAL

WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

1. Disconnect negative battery cable.
2. See [Figure 4-80](#). Remove air cleaner cover, filter. Remove fasteners securing base. See [4.44 AIR CLEANER ASSEMBLY](#).
3. Raise base and pull IAT sensor from sensor grommet.
4. Disconnect connector [89] from intake air temperature sensor.
5. Inspect sensor grommet for damage and replace as required.

INSTALLATION

1. Connect IAT sensor connector [89] to wiring harness.
2. Install IAT sensor into grommet on air cleaner base from beneath.
3. Install air cleaner cover. See [4.44 AIR CLEANER ASSEMBLY](#).
4. Install negative battery cable.



Figure 4-80. Intake Air Temperature Sensor Installed

REMOVAL

1. Remove air cleaner cover. See [4.44 AIR CLEANER ASSEMBLY](#).
2. See [Figure 4-81](#). Disconnect throttle position sensor connector [88].
3. See [Figure 4-82](#). Remove two screws and washers to detach TP sensor.

INSTALLATION

1. See [Figure 4-82](#). Apply LOCTITE 222 (purple) to threads of fasteners.
2. Install fastener into lower mounting hole of sensor prior to installation.
3. Attach TP sensor with both fasteners and washers. Tighten to 12-15 **in-lbs** (1.4-1.7 Nm).
4. See [Figure 4-83](#). Attach throttle position sensor connector [88]. Slots on female connector [88B] must fully engage tabs on male connector housing [88A].

NOTE

Throttle position sensor can only be calibrated using DIGITAL TECHNICIAN (Part No. HD-44750).

5. Calibrate throttle position sensor.

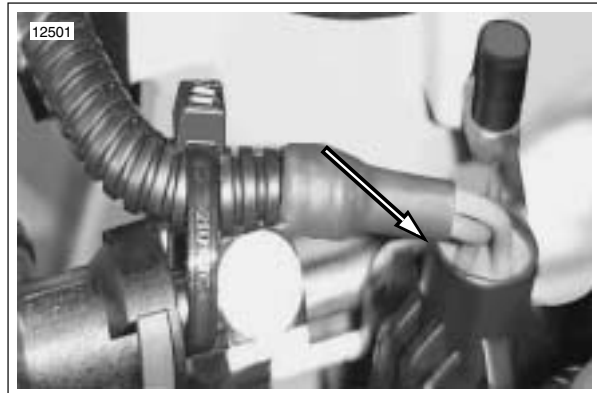


Figure 4-81. Throttle Position Sensor Connector Location



Figure 4-82. Throttle Position Sensor

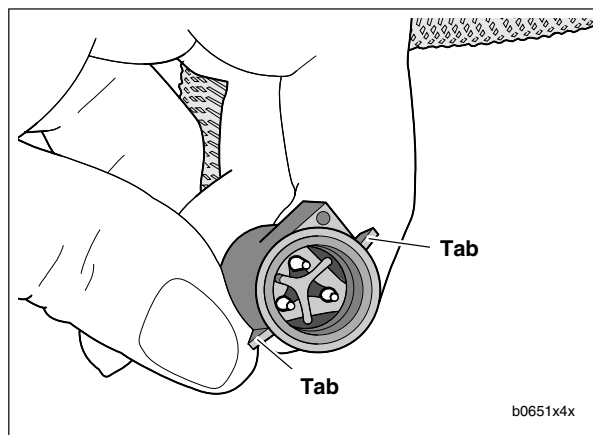


Figure 4-83. Tabs on TP Sensor Connector [88A]

GENERAL

A computer-controlled cooling fan assists engine cooling during operation in high temperatures. Fan actuation is controlled by the ECM. See [Table 4-37. Cooling Fan Specifications](#).

Table 4-37. Cooling Fan Specifications

	FAN ON	FAN OFF
Key ON	220° C (428° F)	180° C (356° F)
Key OFF	170° C (338° F)	150° C (302° F)

REMOVAL

1. Remove seat. See [2.38 SEAT](#).

⚠ WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

2. Disconnect negative battery cable.
3. Remove shock absorber. See [2.22 REAR SHOCK ABSORBER](#).
4. See [Figure 4-84](#). Remove cooling fan fasteners (1).
5. Rotated fan clockwise (looking towards front of vehicle) to remove.
6. See [Figure 4-85](#). Disconnect cooling fan connector [97].

INSTALLATION

1. See [Figure 4-85](#). Connect cooling fan connector [97].

NOTES

- When installing cooling fan (3), be sure wiring, transmission vent hose and fuel line are routed through notch (2) in fan body.
 - On California models, both fuel tank and canister vent hoses are routed through notch in fan body.
2. Install fan and rotate counter-clockwise into position.
 3. Install cooling fan fasteners. Tighten to 12-36 in-lbs (1.4-4.1 Nm).
 4. Install shock absorber. See [2.22 REAR SHOCK ABSORBER](#).
 5. Connect negative battery cable.

⚠ WARNING

After installing seat, pull upward on front of seat to be sure it is in locked position. While riding, a loose seat can shift causing loss of control, which could result in death or serious injury. (00070a)

6. Install seat. See [2.38 SEAT](#).

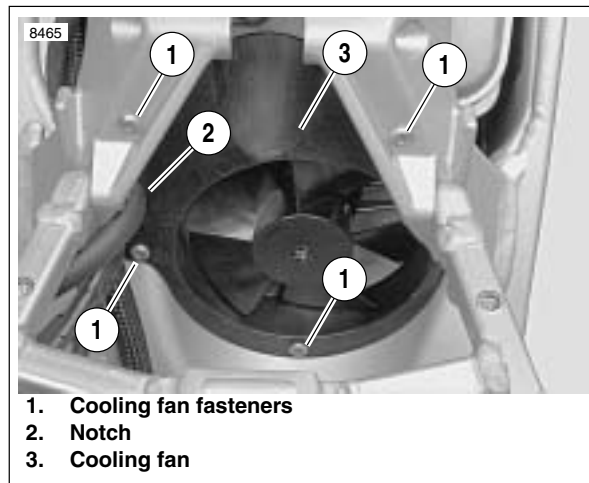


Figure 4-84. Cooling Fan

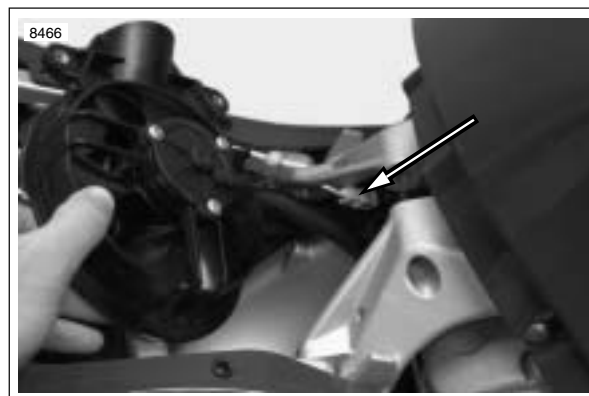


Figure 4-85. Cooling Fan Connector [97]

GENERAL

The fuel pump is located inside the left rear portion of the fuel tank/frame.

DRAINING FUEL TANK

WARNING

To prevent spray of fuel, purge system of high-pressure fuel before supply line is disconnected. Gasoline is extremely flammable and highly explosive, which could result in death or serious injury. (00275a)

1. Purge the fuel supply line of high pressure gasoline.
 - a. See [Figure 4-86](#). Disconnect the 4-place fuel pump connector (1) [86]. Connector is located inside the left rear portion of the fuel tank/frame.
 - b. With the motorcycle in neutral, start the engine and allow vehicle to run.
 - c. When the engine stalls, press the starter button for 3 seconds to remove any remaining fuel from fuel line.

WARNING

Stop the engine when refueling or servicing the fuel system. Do not smoke or allow open flame or sparks near gasoline. Gasoline is extremely flammable and highly explosive, which could result in death or serious injury. (00002a)

2. Remove drain plug (4) and drain fuel into appropriate container. Discard plug.
3. When fuel tank is empty, replace with **new** drain plug. Tighten to 84-108 **in-lbs** (9.5-12.2 Nm).

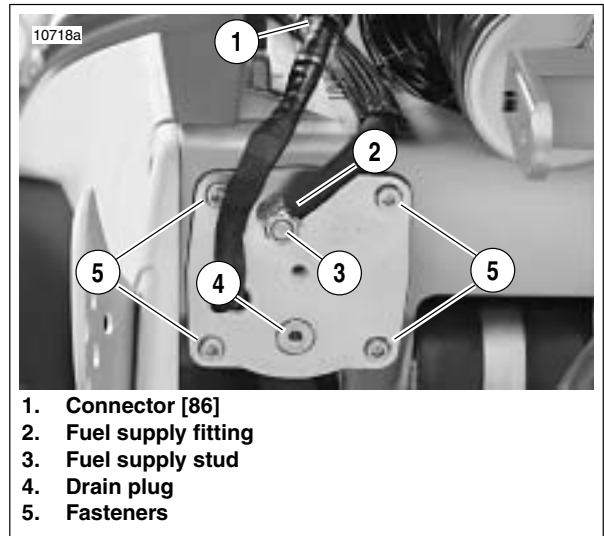


Figure 4-86. Fuel Pump Installation

REMOVAL

PART NO.	SPECIALTY TOOL
B-45657	Fuel pump puller

1. Remove rider footpeg mounts. See [2.29 FOOTPEG, HEEL GUARD AND MOUNT](#).
2. Remove swingarm. See [2.19 SWINGARM AND BRACE](#).
3. Drain fuel tank. See [DRAINING FUEL TANK](#) under [4.39 FUEL PUMP](#).

WARNING

With fuel tank drained, gasoline can spill from bore when supply valve is loosened or removed. Gasoline is extremely flammable and highly explosive, which could result in death or serious injury. Wipe up spilled fuel immediately and dispose of rags in a suitable manner. (00277a)

4. See [Figure 4-86](#). Remove fuel line from fuel supply fitting (2).
5. Remove four fuel pump fasteners (5).
6. See [Figure 4-87](#). Assemble fuel pump puller.
 - a. Thread nut (3) onto bolt (4).
 - b. Slide washer (2) onto bolt.
 - c. Insert bolt assembly into hole in main body (1).
7. See [Figure 4-88](#). Place the main body of the fuel pump puller over the fuel pump assembly.
8. Thread bolt into the threaded hole in the center of the fuel pump assembly until snug.
9. Thread the nut down the shaft of the bolt until it makes contact with the main body of the fuel pump puller.
10. Place wrench onto nut and another wrench onto the bolt. Hold the bolt stationary and turn nut clockwise until fuel pump is pulled free from frame.

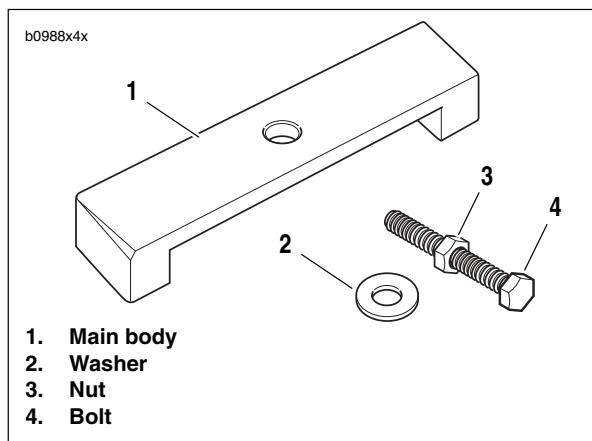


Figure 4-87. Fuel Pump Puller

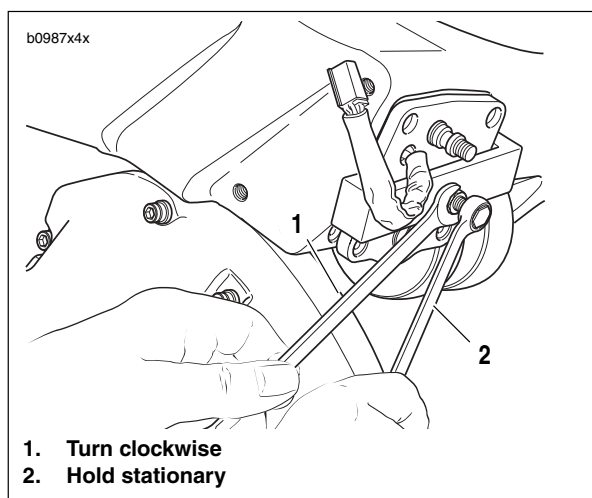


Figure 4-88. Fuel Pump Removal (Typical)

REPAIR

Fuel Pressure Regulator Replacement

1. Remove fuel pump assembly from tank. See REMOVAL in this section.
2. See [Figure 4-89](#). Remove the plastic retaining ring (1) securing the four plastic retainers (2) holding the fuel pressure regulator (3) in place. Spread the four clips and detach regulator (3) from regulator housing(4).
3. Remove and discard o-rings from regulator.
4. Install **new** o-rings on **new** regulator. Press **new** regulator into place.
5. Install plastic retaining ring.
6. Install fuel pump assembly. See INSTALLATION in this section.

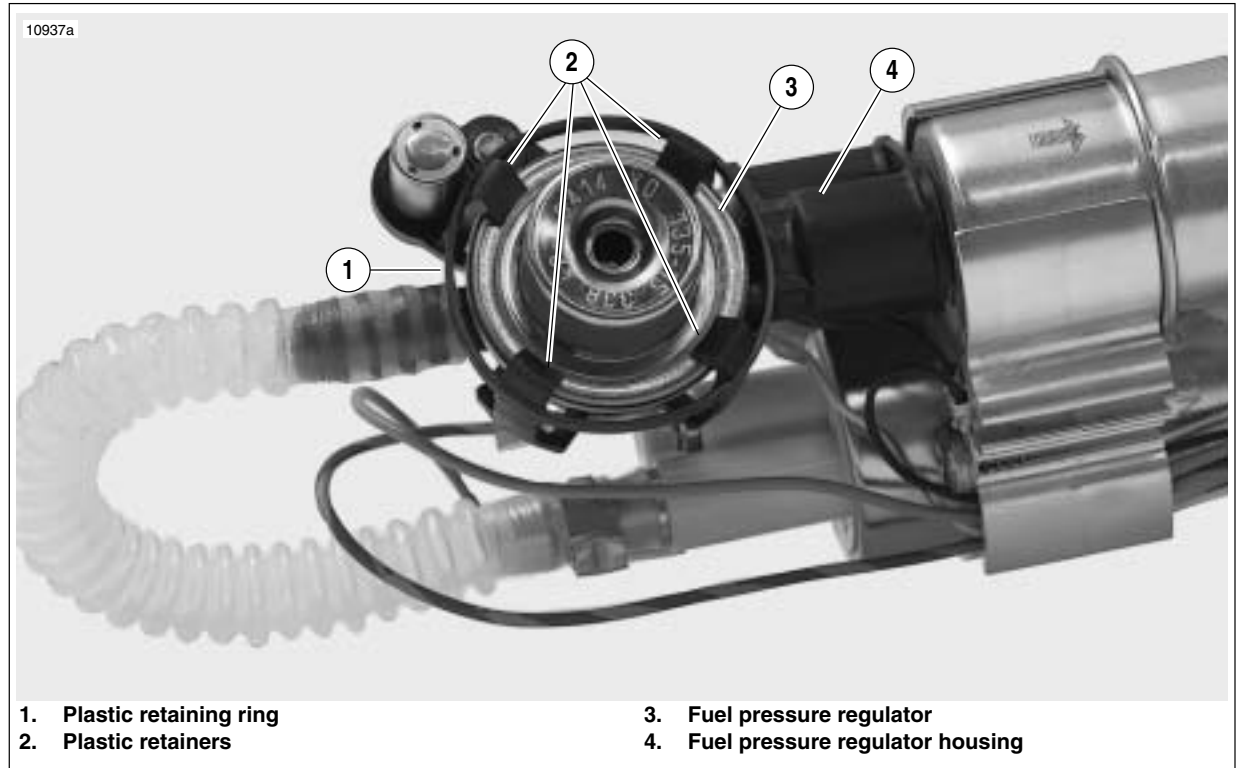


Figure 4-89. Fuel Pressure Regulator

Low Fuel Level Sensor Replacement

1. Remove fuel pump assembly from tank. See REMOVAL in this section.
2. See [Figure 4-90](#). Disconnect low fuel level sensor connector (10).
3. Remove fastener (8) securing low fuel level sensor (7) in place.
4. Install **new** sensor.
5. Install screw (8) securing sensor and tighten to 18-22 **in-lbs** (2.0-2.5 Nm).
6. Attach low fuel level sensor wire connector (10).
7. Install fuel pump assembly. See INSTALLATION in this section.

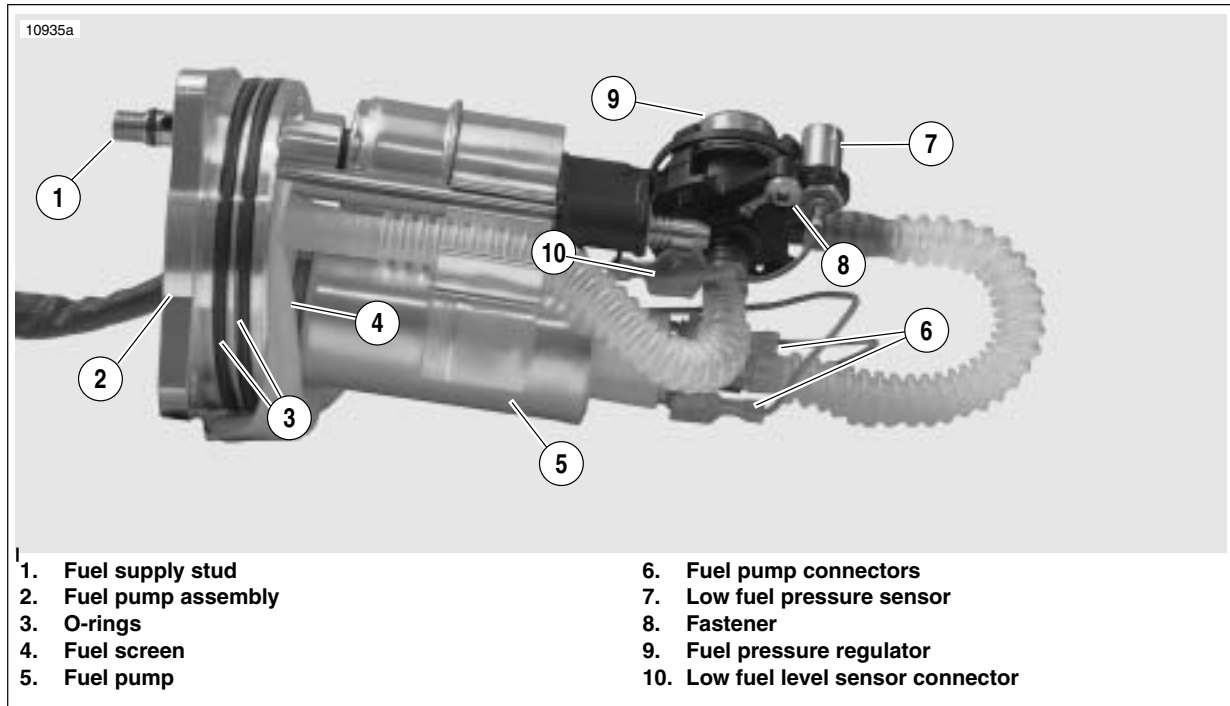


Figure 4-90. Fuel Pump Assembly

Fuel Filter Replacement

1. Remove fuel pump assembly from tank. See REMOVAL in this section.
2. See [Figure 4-91](#). Disconnect electrical connectors (5) & (6).
3. Remove ground fastener (12) from the fuel pump and fuel filter bracket (9).
4. Remove fuel pressure regulator E-clip (7).
5. Pull regulator housing (3) and fuel pump (8) with bracket (9).
6. Remove fuel filter (2).

NOTE

Remove the rubber seals from each end of the original fuel filter to be used on the **new** fuel filter.

7. Install rubber seals on **new** fuel filter and install filter into pump housing (11).
8. See [Figure 4-91](#). Install regulator housing (3) and fuel pump (8) assembly.
9. Install E-clip (7) in bottom groove on shaft.
10. Install ground fastener (12) and connect ground wires to bracket (9) and tighten to 18-22 **in-lbs** (2.0-2.5 Nm).
11. Connect electrical connectors (5) & (6).

NOTE

Fuel pump connectors are two different sizes to prevent incorrect installation.

12. Route overflow hose (10) through guide in bracket (9).
13. Install fuel pump assembly. See INSTALLATION in this section.

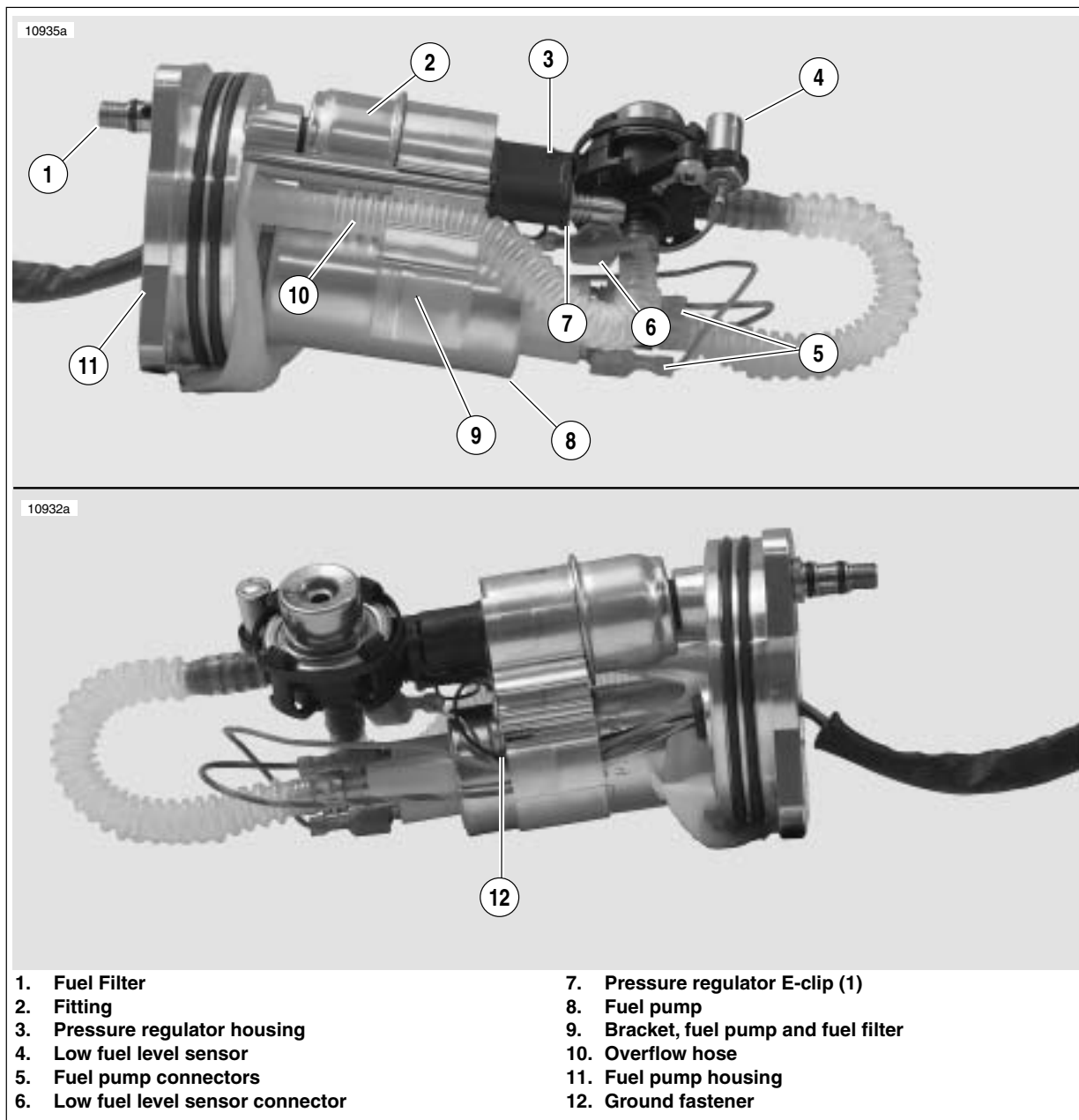


Figure 4-91. Fuel Pump Assembly (Left and Right Sides)

Fuel Screen Replacement

1. Remove fuel pump assembly from tank. See REMOVAL in this section.
2. See [Figure 4-91](#). Disconnect electrical connectors (5) & (6).
3. Remove ground fastener (12) from the fuel pump and fuel filter bracket (9).
4. Remove fuel pressure regulator E-clip (7).
5. Pull regulator housing (3) and fuel pump (8) with bracket (9) as an assembly.
6. See [Figure 4-92](#). Pry fuel screen (1) from fuel pump (2).
7. Install **new** fuel screen on fuel pump.
8. Install regulator housing assembly (4) & (5) and fuel pump (2).
9. Install E-clip (8) in bottom groove on shaft.
10. See [Figure 4-91](#). Install ground fastener (12) and connect ground wires to bracket (9) and tighten to 18-22 **in-lbs** (2.0-2.5 Nm).

11. See [Figure 4-91](#). Disconnect fuel pump connector (5) and low fuel level sensor connector (6).

NOTE

Fuel pump connectors are two different sizes to prevent incorrect installation.

12. Route overflow hose (10) through guide in bracket (9).
13. Install fuel pump assembly. See INSTALLATION in this section.

Table 4-38. Fuel Pump Specifications

SPECIFICATION	DATA
Pressure Setting	49 PSI
Operating Voltage	13.2 volts
Fuel Delivery	60 LPH @ 45 PSI [310 kPa]
Current Draw	6.0 amps

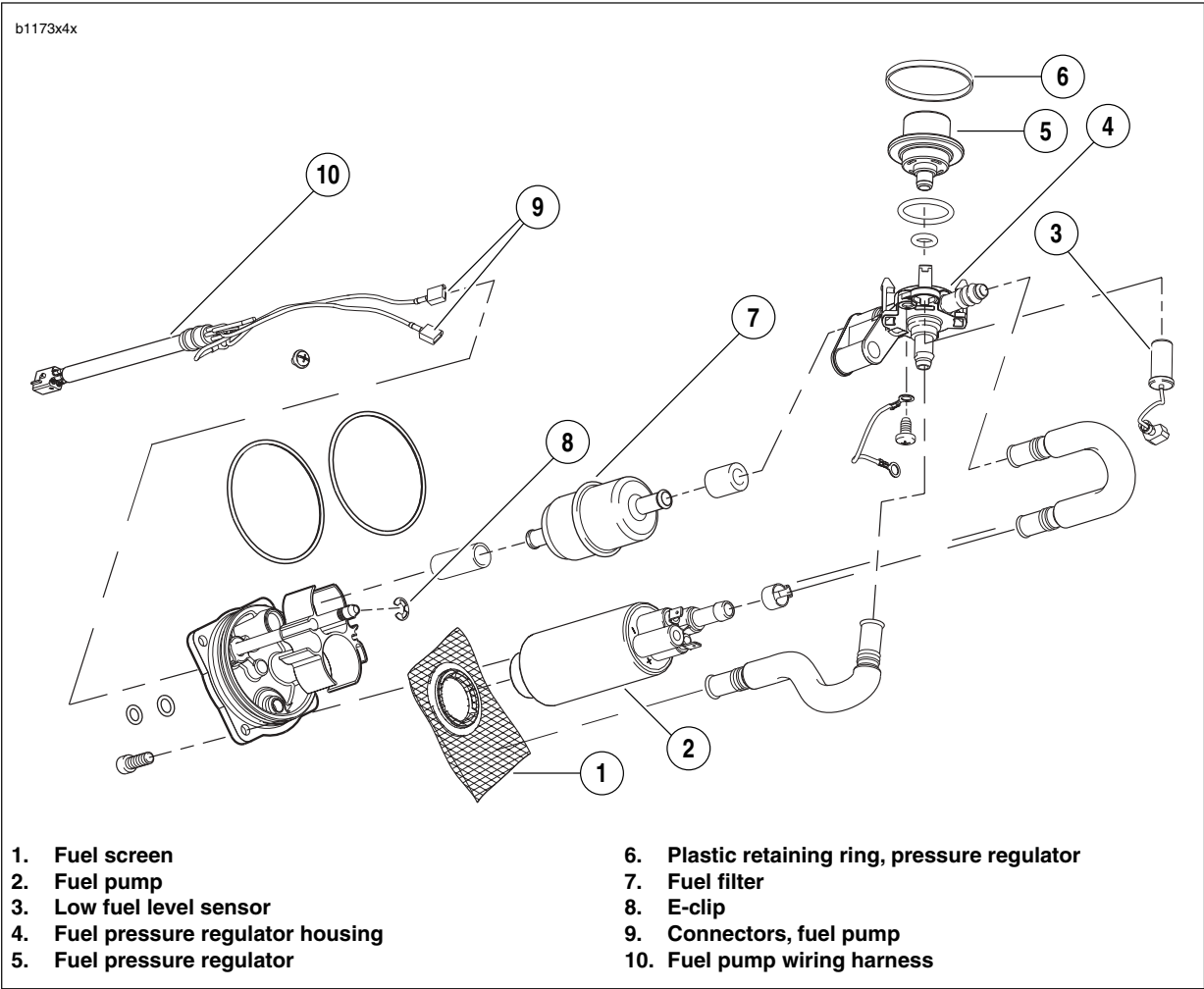


Figure 4-92. Fuel Pump Assembly

Fuel Pump Wire Harness Replacement

1. Remove fuel pump assembly from tank. See REMOVAL in this section.
2. See [Figure 4-91](#). Disconnect fuel pump connector (5) and low fuel level sensor connector (6).
3. See [Figure 4-93](#). Remove terminals from fuel pump connector [86].
4. See [Figure 4-91](#). Remove ground screw (12).

NOTE

Note positions of wires in connector for correct assembly.

5. Disassemble fuel pump connector [86].
 - a. See [Figure 4-94](#). Remove connector clips (3).
 - b. Insert push pin/safety pin (1), into connector as shown.
 - c. Bend terminal tab towards connector pin and pull wire from opposite side of connector.
 - d. Repeat for all wires.
6. See [Figure 4-95](#). From outer side of fuel pump assembly, push wire harness through assembly.
7. Lubricate **new** o-rings with **clean** engine oil. From inner side of fuel pump assembly, push new wire harness into assembly.
8. See [Figure 4-91](#). Insert **new** fastener (12), through ground wire terminal and secure to bracket (9).

NOTE

After installing terminals, pull slightly on wire to make sure it is seated. If necessary, bend tab on terminal to aid in seating wire.

9. Install terminals into proper locations of fuel pump connector [86]. Install connector clips.
10. See [Figure 4-91](#). Connect low fuel level sensor connector (6).
11. Connect fuel pump connectors (8). Connectors are two different sizes.
12. Install fuel pump assembly. See INSTALLATION in this section.

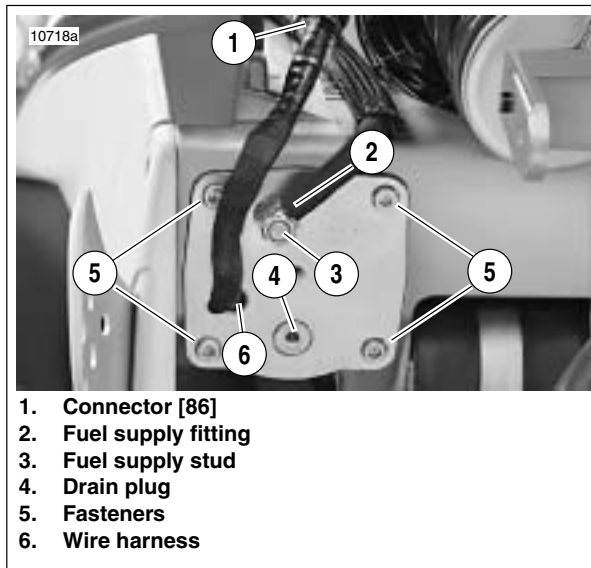


Figure 4-93. Fuel Pump Wire Harness Location

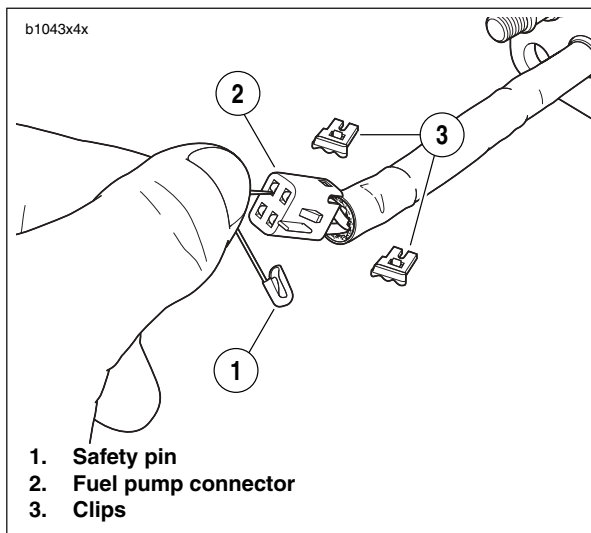


Figure 4-94. Fuel Pump Connector Disassembly

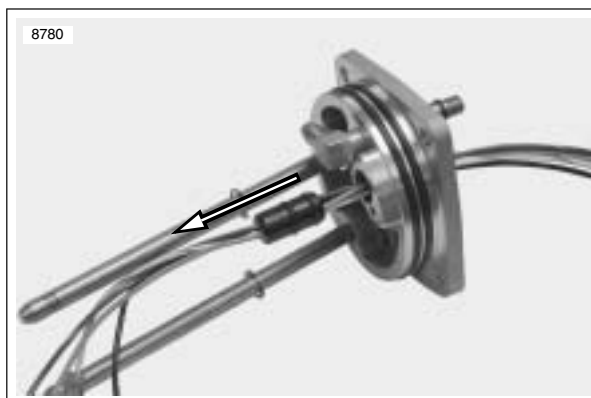


Figure 4-95. Wire Harness Removal Direction

INSTALLATION

1. See [Figure 4-90](#). Replace o-rings (3). Lubricate **new** o-rings with **clean** engine oil.
2. Install **new** o-rings on fuel supply stud (2). Larger o-ring is located in groove closer to fuel pump.
3. See [Figure 4-96](#). Insert fuel pump into frame until resistance is felt.
4. Insert four screws (5) through fuel pump and into frame.

NOTE

Use all four screws to draw fuel pump into frame. Using less than four screws will damage fuel pump o-rings.

5. Using crosswise pattern, draw fuel pump into frame by tightening screws. Final tighten screws to 48-51 **in-lbs** (5.4-5.8 Nm).

WARNING

Do **NOT** overtighten fuel fitting nuts. Overtightening fasteners may result in excessive compression of sealing components and fuel leakage which could result in death or serious injury.

NOTE

Install fuel line onto fitting on fuel pump so that the fuel line is at approximately the one o'clock position. Ensure that the sheathing on the fuel line comes down to the bend as shown.

6. Install fuel supply line banjo fitting (2) over fuel supply stud (3). Install **new** fastener. Tighten to 84-108 **in-lbs** (9.5-12.2 Nm).
7. Fill tank with a small amount of fuel. Check for leaks.
8. Connect fuel pump connector [86] (1) and push cable strap tab into hole in frame.
9. Install swingarm. See [2.19 SWINGARM AND BRACE](#).
10. Install rider footpeg mounts. See [2.29 FOOTPEG, HEEL GUARD AND MOUNT](#).

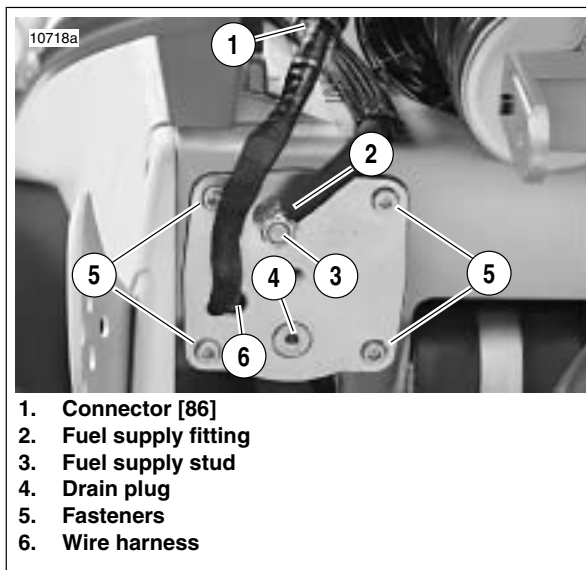


Figure 4-96. Fuel Pump Location

GENERAL

The vent valve opens to allow gas vapor to escape the fuel tank and either vent to the atmosphere or to the charcoal canister on California Models (EVAP-equipped) and closes to prevent gasoline from leaking out of the fuel tank if the vehicle is tipped at an extreme angle.

NOTE

The fuel tank must be drained to perform this service.

REMOVAL

1. Remove seat. See [2.38 SEAT](#).

⚠ WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

2. Disconnect negative battery cable.
3. Remove intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).
4. Remove air cleaner cover. See [4.44 AIR CLEANER ASSEMBLY](#).
5. Drain fuel tank. See [DRAINING FUEL TANK](#) under [4.39 FUEL PUMP](#).
6. Remove fuel tank vent line from vent valve.
7. See [Figure 4-97](#). Remove vent valve fasteners (5).
8. Remove bracket (4), vent valve (3) and o-ring (2) from fuel tank/frame (1).

INSTALLATION

1. See [Figure 4-97](#). Install **new** vent valve o-ring (2).
2. Install vent valve (3) into fuel tank/frame. Vent valve nozzle should be at approximately the 7:00 position.
3. Install bracket over vent valve. Slot in bracket should line up with notch in valve.
4. Loosely install vent valve fasteners (5).
5. Tighten fasteners to 39-41 **in-lbs** (4.4-4.6 Nm).
6. Connect fuel tank vent line to vent valve.
7. Install air cleaner cover. See [4.44 AIR CLEANER ASSEMBLY](#).
8. Install intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).
9. Connect negative battery cable. Tighten battery terminal hardware to 72-96 **in-lbs** (8-11 Nm).

⚠ WARNING

After installing seat, pull upward on front of seat to be sure it is in locked position. While riding, a loose seat can shift causing loss of control, which could result in death or serious injury. (00070a)

10. Install seat. See [2.38 SEAT](#).

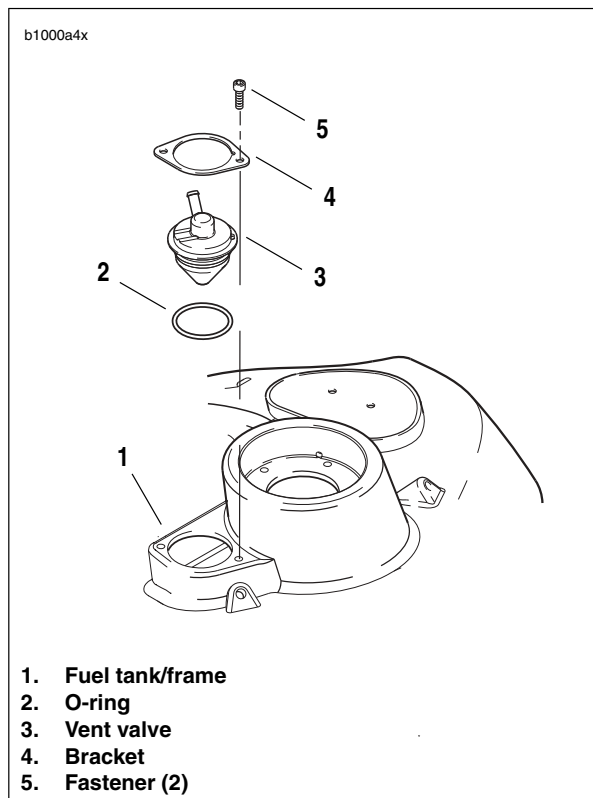


Figure 4-97. Fuel Tank Vent Valve

REMOVAL

NOTE

The fuel tank must be drained to perform this service.

1. Drain fuel tank. See [DRAINING FUEL TANK](#) under [4.39 FUEL PUMP](#).
2. Remove fuel filler cap.
3. See [Figure 4-98](#). Remove fasteners (4) securing fuel cap retaining ring (3) to fuel filler neck (1).
4. Remove fuel cap retaining ring and o-ring (2). Discard o-ring.

INSTALLATION

1. Coat **new** o-ring (2) with thin film of clean engine oil.
2. Place o-ring into groove in underside of fuel cap retaining ring (3).

NOTE

Be sure o-ring remains in groove of fuel cap retaining ring during installation.

3. Insert fuel cap retaining ring into fuel filler neck.
4. Install fasteners (4). Tighten to 62-71 **in-lbs** (7-8 Nm).
5. Install fuel filler cap.

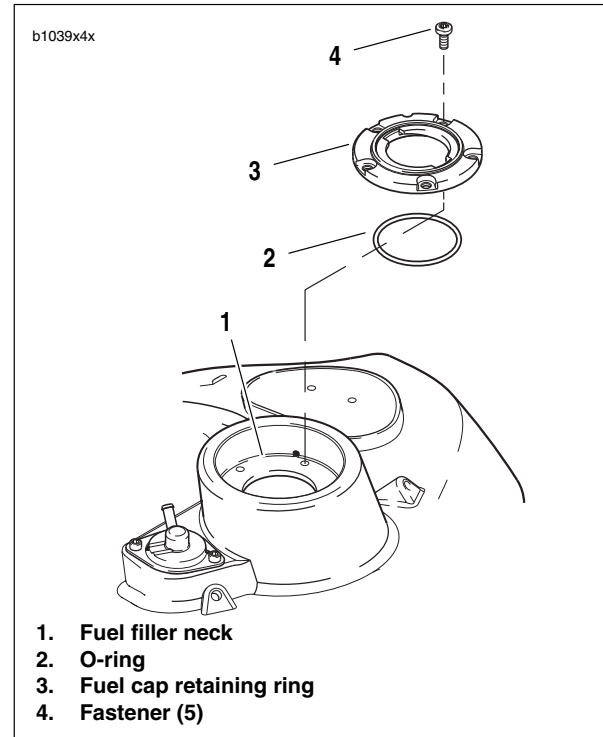


Figure 4-98. Fuel Cap Retaining Ring

GENERAL

See [Figure 4-101](#). The throttle body consists of the following components:

- Fuel supply fitting.
- Idle speed adjustment screw.
- Cable bracket.
- Throttle position sensor.
- Throttle lever.

REMOVAL

⚠ WARNING

To prevent spray of fuel, purge system of high-pressure fuel before supply line is disconnected. Gasoline is extremely flammable and highly explosive, which could result in death or serious injury. (00275a)

1. Purge the fuel supply line of high pressure gasoline.
 - a. See [Figure 4-99](#). Disconnect the 4-place fuel pump connector [86]. Connector is located on the left side, above the fuel pump.
 - b. With the motorcycle in neutral, start the engine and allow vehicle to run.
 - c. When the engine stalls, press the starter button for 3 seconds to remove any remaining fuel from fuel line.
 - d. Reconnect fuel pump connector.
2. Remove air cleaner assembly. See [4.44 AIR CLEANER ASSEMBLY](#).
3. Label and detach throttle cables. See [2.23 THROTTLE CONTROL](#).
4. See [Figure 4-103](#). On California models, pull EVAP hose from fitting (1).
5. Remove left and right air scoops. See [2.35 AIR SCOOPS](#).
6. Remove ignition coil. See [4.32 IGNITION COIL](#).
7. Remove cable strap securing the idle adjuster cable to "V" bracket.
8. Remove fuel line from fuel rail.
9. Remove fuel rail fastener (1) that holds the fuel rail to the throttle body and manifold.
10. Remove fastener connecting throttle body to cylinder brace
11. Disconnect TPS connector [88] and injector connectors [84] and [85].



Figure 4-99. Fuel Pump Connector [86] (swingarm removed for illustration)

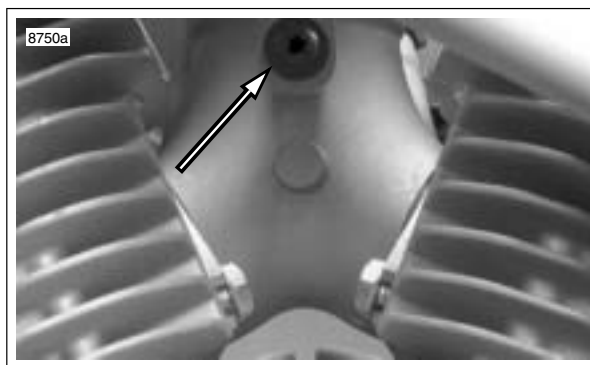
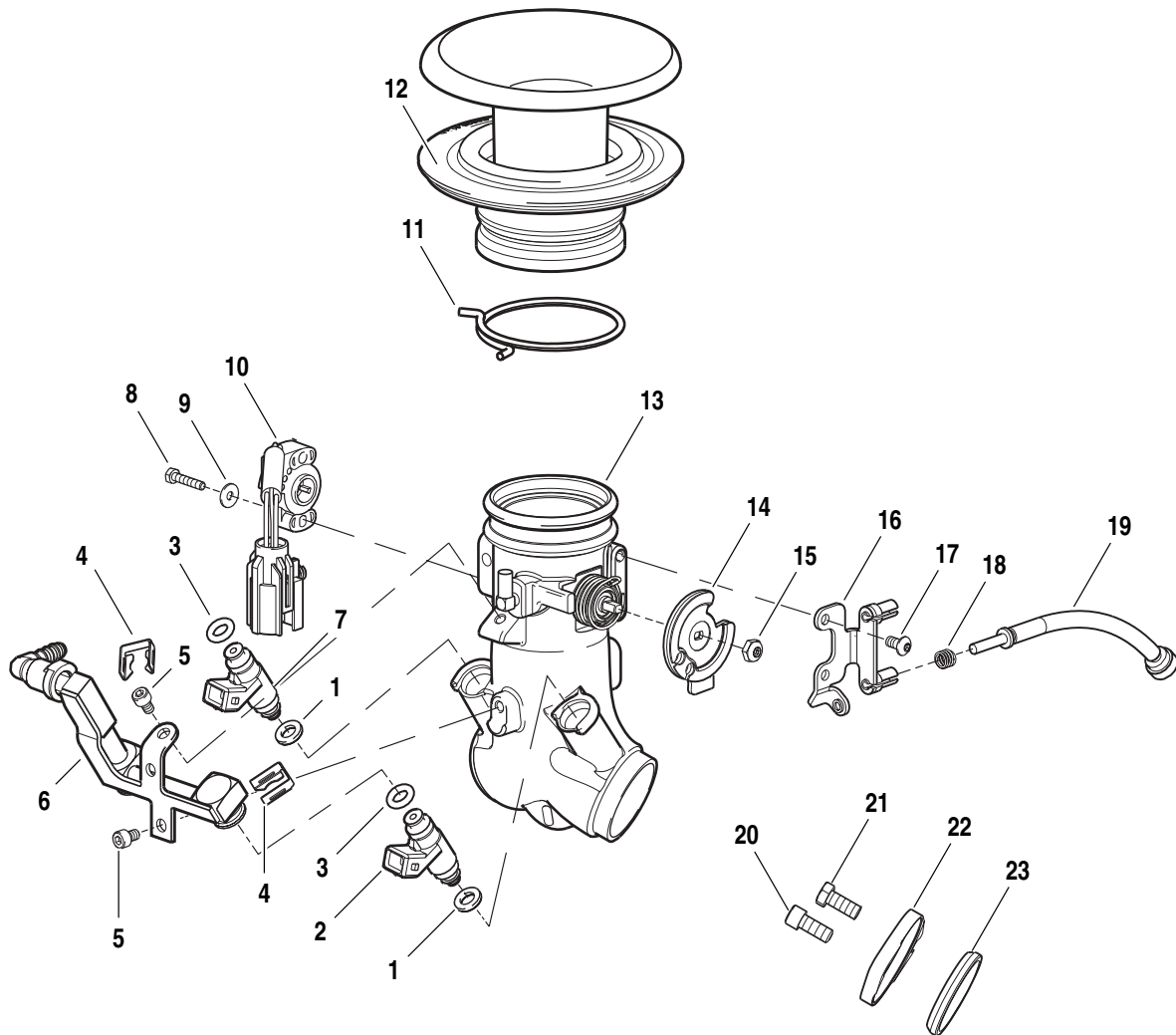


Figure 4-100. Fastener Connecting Throttle Body to Cylinder Brace

b0063



1. O-ring, fuel injector, outlet
2. Fuel Injector, front
3. O-ring, fuel injector, inlet
4. Clip, injector (2)
5. Screw (2)
6. Fuel Rail
7. Fuel injector, rear
8. Screw (2)
9. Washer, flat (2)
10. Throttle position sensor
11. Clamp, wire spring
12. Velocity stack

13. Throttle body manifold assembly
(45mm-984) (49mm-1203)
14. Throttle lever assembly
15. Nylock
16. Cable Bracket
17. Screw (2)
18. Spring, idle adjuster
19. Idle adjuster
20. Bolt (2)
21. Bolt (2)
22. Mounting flange, intake (1 front, 1 rear)
23. Seal, intake manifold (2)

Figure 4-101. One Piece Throttle Body/Intake Manifold Assembly (XB9/12 Models)

12. Remove assembly from motorcycle.
 - a. See [Figure 4-108](#). On primary side, loosen but do not remove the two front and rear intake flange fasteners (2).
 - b. See [Figure 4-102](#). Remove fastener (1) holding manifold to cylinder brace.
 - c. See [Figure 4-105](#). On gearcase cover side, remove both intake flange fasteners from cylinder heads.
 - d. Slide the throttle body assembly through top of bike frame.
13. See [Figure 4-101](#). Remove intake flanges (22) from manifold. Remove and discard seals (23).

REPAIR

Throttle Position Sensor

See [4.37 THROTTLE POSITION SENSOR](#) for removal, installation and calibration information.

Fuel Injectors

1. Remove throttle body. See [REMOVAL](#) in this section.
2. Separate fuel rail assembly from throttle body.
 - a. See [Figure 4-106](#). Remove both injector clips (4).
 - b. See [Figure 4-104](#). Remove fuel rail fastener (1) that holds the fuel rail to the throttle body and manifold.
 - c. Separate fuel rail from injectors (2, 5) by gently rocking the fuel rail and pulling it away from the injectors.
3. Remove fuel injectors (2, 5) from manifold by gently rocking and pulling it away from the manifold.

NOTE

Front and rear fuel injectors are not interchangeable.

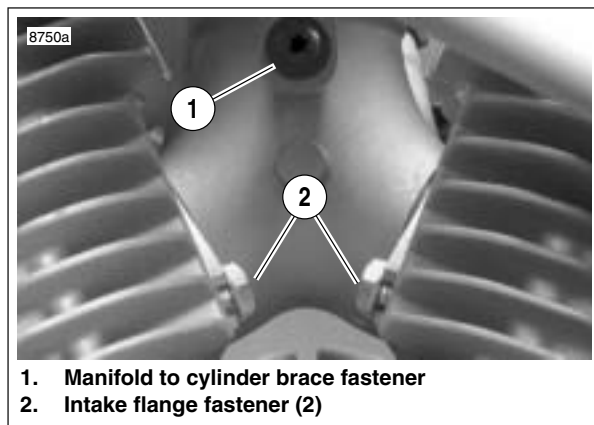


Figure 4-102. Intake Manifold (Primary Side)

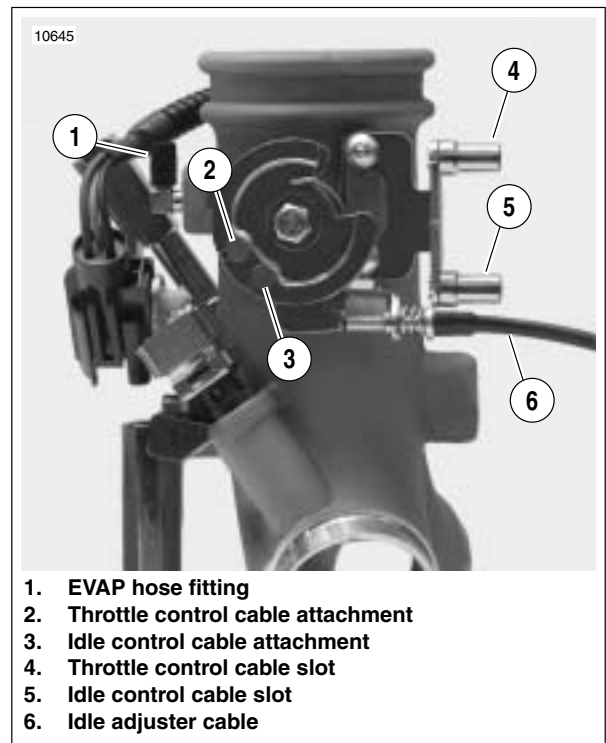


Figure 4-103. Throttle Cable Bracket (typical)

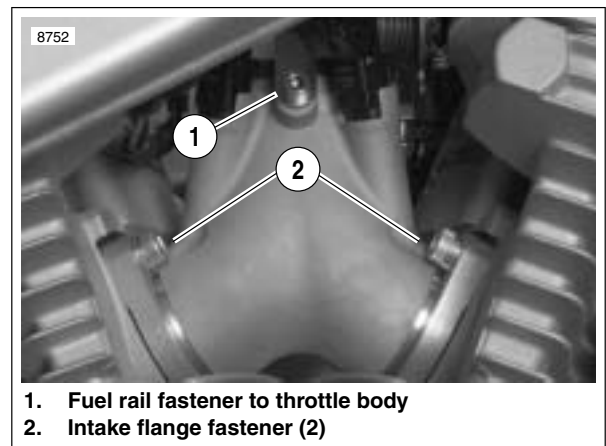


Figure 4-104. Intake Manifold Fasteners (gearcase cover side)

⚠ WARNING

Do not use any injector that has damaged or deformed o-rings. Damaged o-rings may leak gasoline. Gasoline is extremely flammable and highly explosive. Use of damaged o-rings could result in death or serious injury.

4. Inspect all injector o-rings for cuts, tears or general deterioration. Replace injector o-rings if they have been damaged or have taken a definite set.
5. Apply a thin coat of clean engine oil to top and bottom injector o-rings.

NOTE

Front and rear fuel injectors are not interchangeable.

6. See [Figure 4-106](#). Install fuel injectors.
 - a. Install both injectors (2, 5) into throttle body.
 - b. Press the fuel rail assembly (3) onto the top of the injectors.
 - c. Apply a drop of LOCTITE 271 (red) to threads of fuel rail fastener (1).
 - d. Secure the fuel rail to the throttle body with fastener. Tighten to 20-25 **in-lbs** (2.3-2.8 Nm).
7. Snap the injector clips (4) over the flange on the fuel rail outlet and into the top groove in the injector.

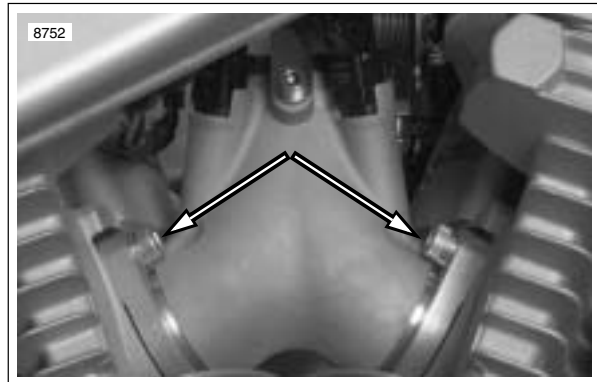


Figure 4-105. Intake Manifold Fasteners (gearcase cover side)

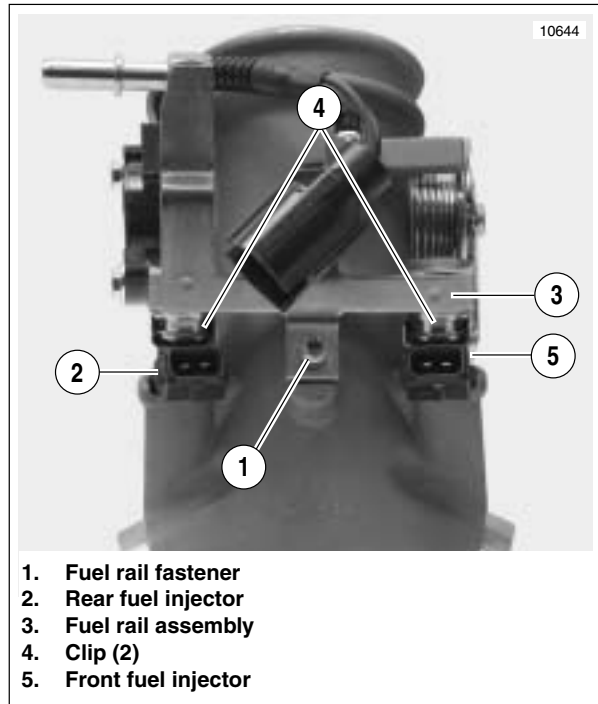


Figure 4-106. Fuel Injectors

INSTALLATION

1. See [Figure 4-107](#). Install front and rear intake flanges onto throttle body with the counterbore facing out. Each intake flange is labeled and the pieces are not interchangeable.
2. Place a **new** seal in each intake flange with the beveled side against the counterbore.
3. Install throttle body/intake manifold assembly.
 - a. See [Figure 4-108](#). Slide the assembly toward installed position. Manifold should slide over fasteners (2) on primary cover side of engine.
 - b. Align holes in intake flanges with those in cylinder heads and start screws.
 - c. Make sure throttle body is centered between cylinders and tighten all intake flange screws to 96-120 **in-lbs** (10.8-13.6 Nm).
4. See [Figure 4-108](#). Install fastener holding manifold to cylinder brace and tighten to 90-120 in-lbs (10-13.6 Nm).
5. Attach throttle cables. See [2.23 THROTTLE CONTROL](#).
6. Attach wiring.
 - a. Injector cables are tagged F(ront) and R(ear) for ease of assembly. Push connector halves together until latches "click." Grooves in female connector must align with the tabs in male housing.
 - b. Connect throttle position sensor by pushing the connector halves together. Slots on female connector must fully engage tabs on male connector housing.
7. Connect fuel line and EVAP hose to port at bottom of throttle body (California models only).
8. Secure idle adjuster cable to "V" bracket with a cable strap.
9. Calibrate throttle position sensor if removed or replaced. See [1.20 THROTTLE POSITION SENSOR \(TPS\)](#).
10. Install coil. [4.32 IGNITION COIL](#).
11. Install air cleaner cover. See [4.44 AIR CLEANER ASSEMBLY](#).
12. Check throttle cable adjustment. See [2.23 THROTTLE CONTROL](#).
13. Install air scoops. See [2.35 AIR SCOOPS](#).
14. Verify engine speed. See [1.20 THROTTLE POSITION SENSOR \(TPS\)](#).

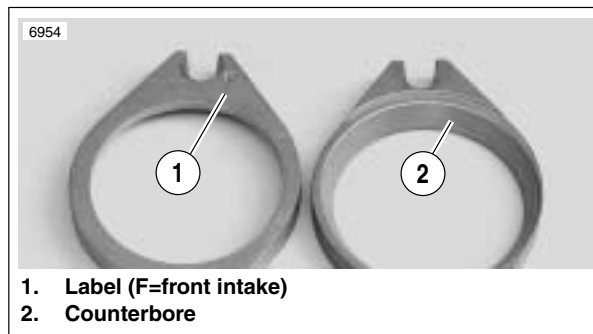


Figure 4-107. Intake Flanges

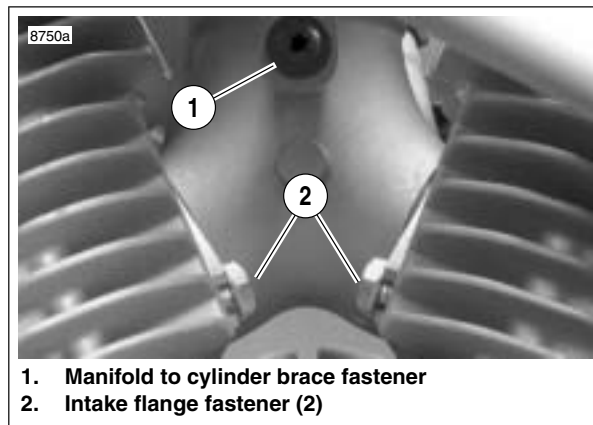


Figure 4-108. Intake Manifold (Primary Side)

Testing

1. Remove intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).
2. Remove air cleaner cover. See [4.44 AIR CLEANER ASSEMBLY](#).
3. Conduct test.
 - a. Turn key ON for two seconds.
 - b. Turn key OFF for two seconds.
 - c. Repeat Steps A and B five consecutive times.
 - d. Open throttle, replace fuel injectors if there is any evidence of raw fuel in throttle body manifold.
4. Install air cleaner cover. See [4.44 AIR CLEANER ASSEMBLY](#).
5. Install intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).

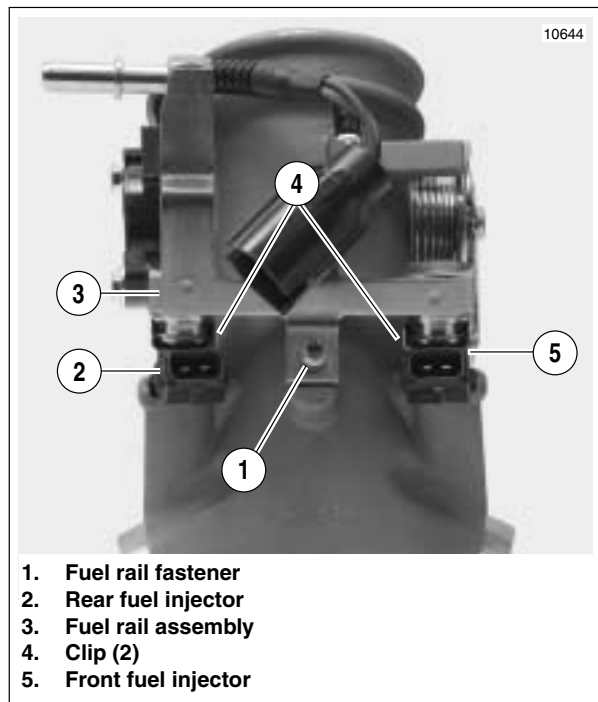


Figure 4-109. Fuel Injectors

GENERAL

DANGER

Be sure to follow manufacturer's instructions when using the UltraTorch UT-100 or any other radiant heating device. Failure to follow manufacturer's instructions can cause a fire, which could result in death or serious injury. (00335a)

- Avoid directing heat toward any fuel system component. Extreme heat can cause fuel ignition/explosion resulting in death or serious injury.
- Avoid directing heat toward any electrical system component other than the connectors on which heat shrink work is being performed.
- Always keep hands away from tool tip area and heat shrink attachment.
- To prevent false readings, keep air cleaner cover installed when performing test.
- Do not direct propane into air scoop, false readings will result.

LEAK TESTER

Parts List

- Standard 14oz. propane cylinder.
- HD-41417 Propane Enrichment Kit.
- 12 in. (304 mm) long-1/4 in. (6mm) diameter copper tubing.

Tester Assembly

1. Cut rubber hose from kit to 18 in. (457 mm) in length.
2. See [Figure 4-110](#). Flatten one end of copper tube to form a nozzle.
3. Insert round side of copper tube into end of tubing.

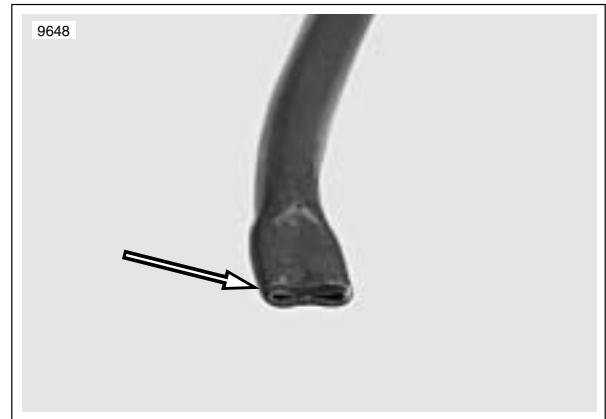


Figure 4-110. Nozzle

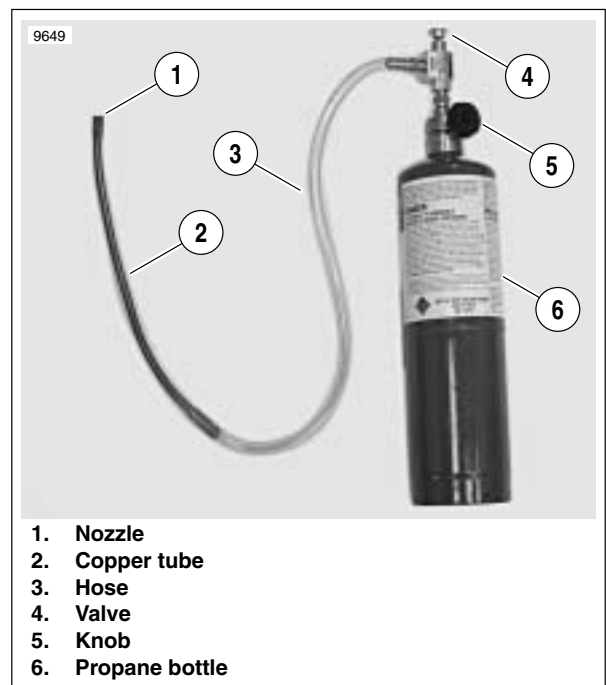


Figure 4-111. Leak Tester

INTAKE LEAK TEST

DANGER

Propane is an extremely flammable liquid and vapor. Vapor may cause flash fire. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Failure to follow this alert can result in death or serious injury.

DANGER

Be sure to follow manufacturer's instructions when using the UltraTorch UT-100 or any other radiant heating device. Failure to follow manufacturer's instructions can cause a fire, which could result in death or serious injury. (00335a)

- Avoid directing heat toward any fuel system component. Extreme heat can cause fuel ignition/explosion resulting in death or serious injury.
 - Avoid directing heat toward any electrical system component other than the connectors on which heat shrink work is being performed.
 - Always keep hands away from tool tip area and heat shrink attachment.
1. Start engine.
 2. Warm engine to operating temperature.
 3. See [Figure 4-111](#). Turn knob (5) counterclockwise to open propane bottle (6).

NOTE

Do not direct propane stream toward front of engine. If propane enters intake screen, a false reading will be obtained.

4. Aim nozzle toward possible sources of leak such as fuel injectors and intake tract.
5. Push valve (4) to release propane. Tone of engine will change when propane enters source of leak.



Figure 4-112. Checking for Intake Leak

REMOVAL

1. Remove intake cover assembly. [2.34 INTAKE COVER ASSEMBLY](#).
2. See [Figure 4-113](#). Remove fuel vent tube (4) from fuel vapor valve (2) and groove on top of air cleaner cover (1).
3. If removing the interactive exhaust from an XB12R model, see [1.17 INTERACTIVE EXHAUST CABLE](#).
4. Unlatch six lock tabs (3) and remove air cleaner cover from baseplate.
5. Remove the filter element from baseplate. Inspect and replace if necessary.
6. See [Figure 4-115](#). Remove air cleaner baseplate.
 - a. Remove four fasteners (1) and raise baseplate (4).
 - b. Disconnect longer breather hose from baseplate (pull out from bottom).
 - c. Disconnect shorter breather hose from PVC valve located on top of rear cylinder.
 - d. Remove IAT sensor (2) from grommet on bottom of baseplate.
 - e. Lift baseplate off of frame, carefully disengaging baseplate from rubber sealing ring (8) on velocity stack (7).
 - f. Remove baseplate from motorcycle.

INSPECTION

1. Inspect air cleaner cover. Check for dirt, torn filter material and general condition. Replace if necessary.
2. Inspect inside of backing plate and cover. Remove any dirt or debris.
3. Inspect condition of velocity stack and velocity stack sealing ring. If torn or damaged, replace.
4. Inspect IAT sensor and replace if faulty. See [4.36 INTAKE AIR TEMPERATURE SENSOR](#)
5. Inspect breather hoses, intake air temperature sensor grommet and baseplate gasket. Replace as necessary.

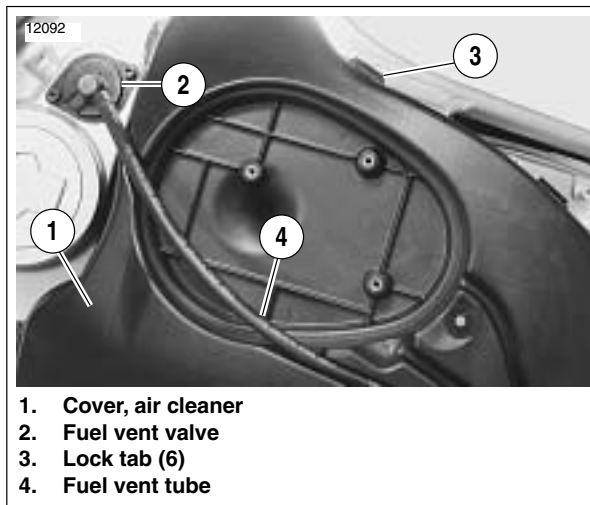


Figure 4-113. Air Cleaner Cover (XB9R)

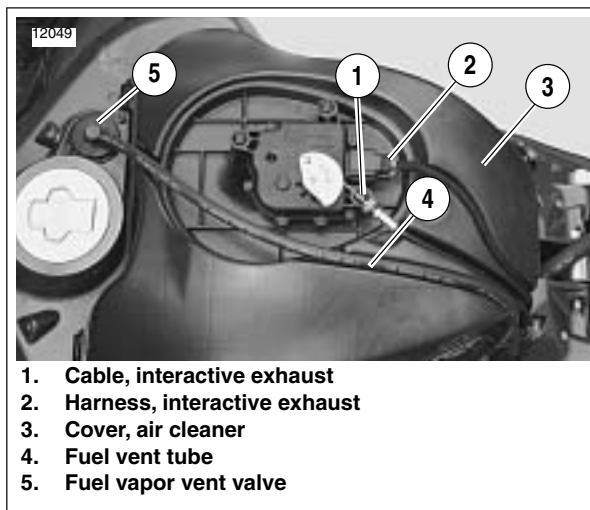


Figure 4-114. Air Cleaner Cover, Fuel Vent Tube and Fuel Tank Vent (XB12R)

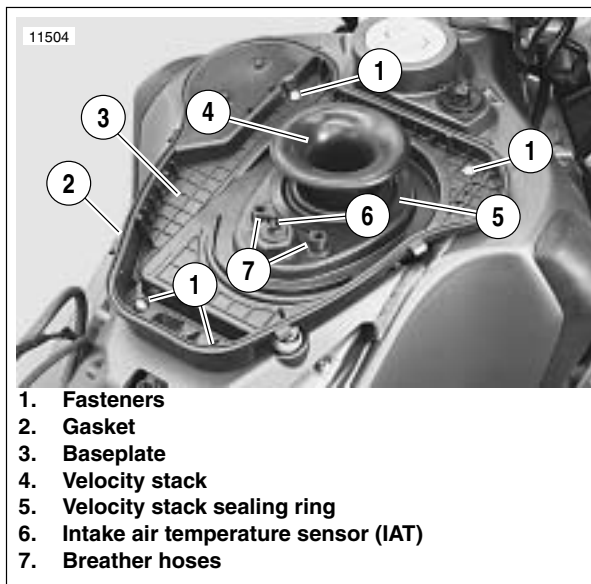


Figure 4-115. Baseplate

INSTALLATION

1. See [Figure 4-115](#). Hold baseplate above mounting position.
2. Insert IAT sensor into grommet on baseplate from underside.

NOTE

A small amount of soapy water applied to the inside diameter of grommet will make breather hose installation easier.

NOTE

In next step, be sure breather hoses do not extend past Intake air temperature sensor tower. If hoses extend past tower, damage to sensor may occur.

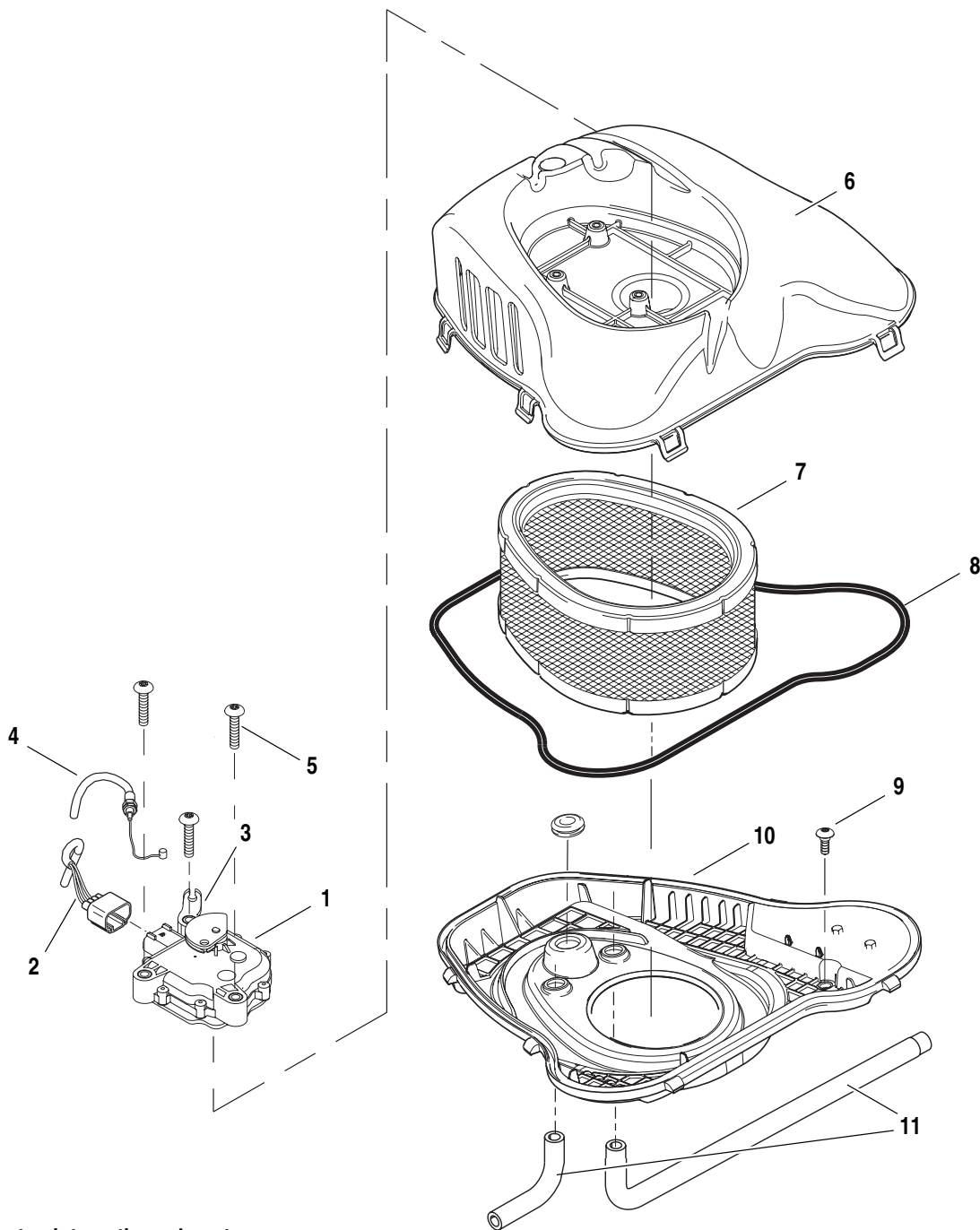
3. Insert longer breather hose into right baseplate grommet from underside.
4. Attach shorter breather hose onto crankcase breather located on top of rear cylinder.
5. Carefully lower baseplate into mounting position. Ensure rubber sealing ring on velocity stack completely engages baseplate. Baseplate should be sandwiched between upper and lower rubber sealing rings.
6. Install baseplate to frame with four fasteners and washers (5). Tighten fasteners to 84-120 **in-lbs** (9.5-13.6 Nm).
7. Position air cleaner filter on baseplate.
8. Install air cleaner to baseplate and latch six latches to secure.
9. If interactive exhaust actuator (XB12R) was removed, install at this time and tighten fasteners to 36-40 **in-lbs** (4-4.5 Nm). See [1.17 INTERACTIVE EXHAUST CABLE](#).
10. Route vent hose through groove on air cleaner to vent valve.
11. Install intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).

WARNING

After installing seat, pull upward on front of seat to be sure it is in locked position. While riding, a loose seat can shift causing loss of control, which could result in death or serious injury. (00070a)

12. Install seat. See [2.38 SEAT](#).

b1246x1x



1. Actuator, interactive exhaust
2. Harness, interactive exhaust
3. Cable bracket
4. Interactive exhaust cable
5. Mounting fasteners, actuator
6. Cover, air cleaner
7. Filter element
8. Air cleaner seal
9. Shoulder screw (4)
10. Base plate assembly
11. Breather hoses, front and rear

Figure 4-116. Air Cleaner Assembly with Interactive Exhaust (XB12R)

GENERAL

Buell motorcycles sold in the state of California are equipped with an evaporative (EVAP) emissions control system. The EVAP system prevents fuel hydrocarbon vapors from escaping into the atmosphere and is designed to meet the California Air Resource Board (CARB) regulations in effect at the time of manufacture.

The EVAP functions in the following manner:

- Hydrocarbon vapors in the fuel tank are directed through the vent valve and stored in the carbon canister. If the vehicle is tipped at an abnormal angle, the vent valve closes to prevent liquid gasoline from leaking out of the fuel tank through the fuel tank vent hose.
- When the engine is running, manifold venturi negative pressure (vacuum) slowly draws off the hydrocarbon vapors from the carbon canister through the canister vent hose. These vapors pass through the throttle body manifold and are burned as part of normal combustion in the engine.

TROUBLESHOOTING

WARNING

Keep evaporative emissions vent lines away from exhaust and engine. Gasoline is extremely flammable and highly explosive, which could result in death or serious injury. (00266a)

The system has been designed to operate with a minimum of maintenance. Check that all hoses are properly routed and connected and are not pinched or kinked.

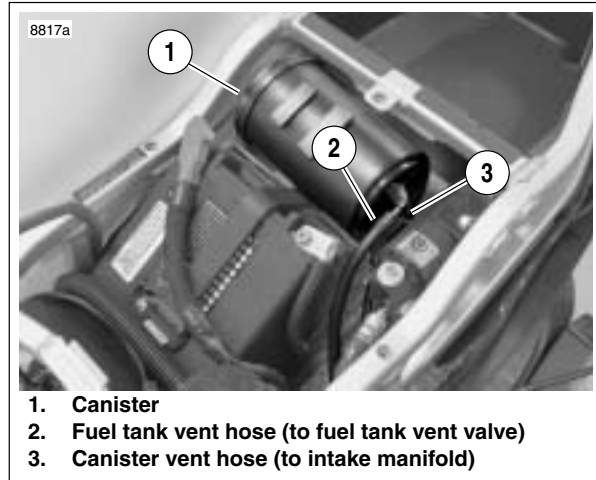


Figure 4-117. Carbon Canister Installation.

REMOVAL

Vent Valve

1. Remove vent valve. See [4.40 FUEL TANK VENT VALVE](#).
2. If necessary, label fuel tank vent hose at canister fitting and remove.

Canister

1. Remove upper tail body work. See [2.36 SUBFRAME TAIL ASSEMBLY AND BODY WORK](#).
2. See [Figure 4-117](#). The canister assembly mounts behind the battery in the tail section.
3. Label and disconnect the fuel tank vent hose (2) and canister vent hose (3) from the canister.
4. See [Figure 4-119](#). Remove rear shock absorber reservoir fasteners (2). Move reservoir assembly away from canister.
5. Slide canister towards left side of vehicle to disengage from mounting plate (1).

INSTALLATION

Vent Valve

WARNING

Verify that the fuel tank vent hose does not contact hot exhaust or engine parts. The hose contains flammable vapors that can be ignited if damaged, which could result in death or serious injury.

1. Install vent valve. See [4.40 FUEL TANK VENT VALVE](#).
2. See [Figure 4-117](#). Attach fuel tank vent hose (2) to canister if disconnected.

Canister

NOTE

In next step, be sure canister hose barbs are facing left side of vehicle and barb holes are facing toward front of vehicle.

1. See [Figure 4-119](#). Slide canister into position on canister mounting plate (1).
2. Place rear shock reservoir assembly (3) into position.

NOTE

See [Figure 4-120](#). To ensure proper reservoir mounting, temporarily place upper body work onto tail section and adjust reservoir placement so adjuster screw (1) aligns with alignment hole (2).

3. See [Figure 4-119](#). Install reservoir mounting fasteners (2). Tighten fasteners to 120-144 **in-lbs** (13.6-16.3 Nm).

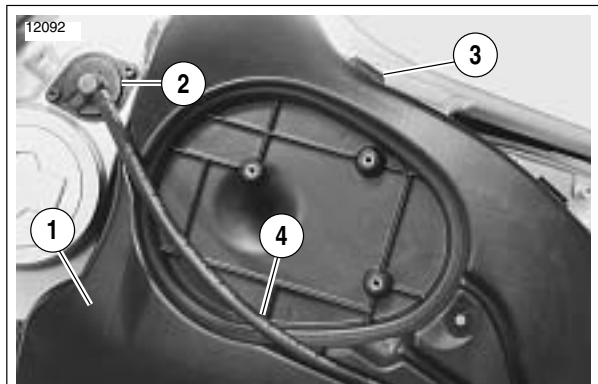
WARNING

Always make sure fuel hoses are seated against the component they connect to and that hose clamps are properly tightened and positioned on straight section of fitting and not on the fitting barb. Failure to comply may result in fuel leakage which could result in death or serious injury.

NOTE

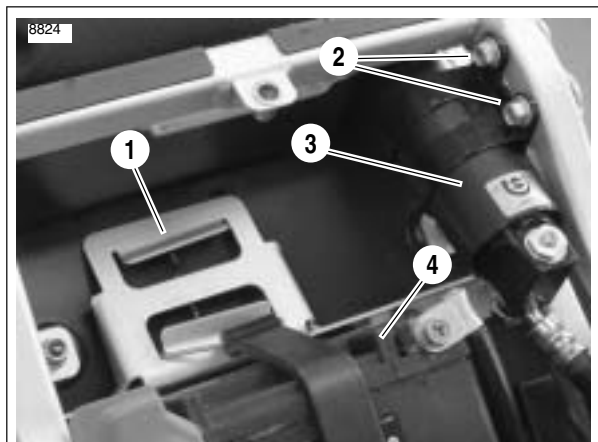
The barb is the larger outside diameter portion (bump) on the fuel fitting.

4. See [Figure 4-117](#). Connect two hoses to the canister. Make sure to push hoses all the way on to carbon canister fittings.
5. Install upper tail body work. See [2.36 SUBFRAME TAIL ASSEMBLY AND BODY WORK](#).



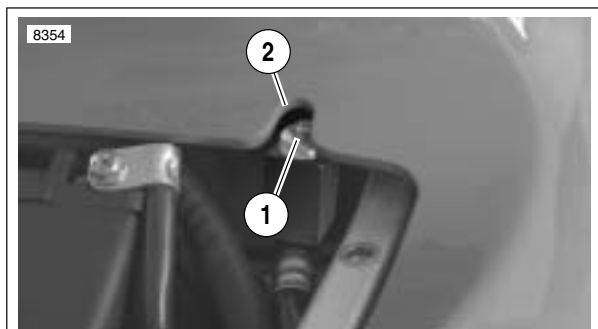
1. Cover, air cleaner
2. Fuel vent valve
3. Lock tab (6)
4. Fuel vent tube

Figure 4-118. Air Cleaner Cover (XB9R Model)



1. Mounting plate
2. Rear shock reservoir fasteners (2)
3. Rear shock reservoir
4. Battery

Figure 4-119. Carbon Canister Mounting



1. Adjuster screw
2. Adjuster screw alignment hole

Figure 4-120. Adjuster Screw Alignment

HOSE ROUTING

Both fuel tank and canister vent hoses are routed through notch in fan body.

NOTE

For information on vent hose routing, see [D.1 HOSE AND WIRE ROUTING](#).

⚠ WARNING

Always make sure fuel hoses are seated against the component they connect to and that hose clamps are properly tightened and positioned on straight section of fitting and not on the fitting barb. Failure to comply may result in fuel leakage which could result in death or serious injury.

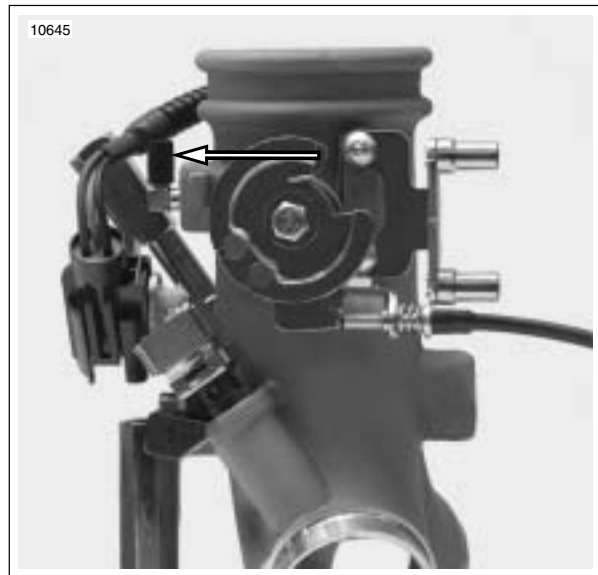


Figure 4-121. Emissions Hose Attachment, California Models Only