

Table 7-1. Battery Specifications

BATTERY	
Size	12 VDC/12 AH/200CCA
Type	Sealed, AGM

Table 7-2. Spark Plug Specifications

SPARK PLUGS		
Size	12 mm	
Type	10R12A	
Gap	0.035 in.	0.9 mm
Torque	12-18 ft-lbs	16-24 Nm
Cable resistance (front and rear)	1,350-3,465 ohms	

Table 7-3. Alternator Specifications

ALTERNATOR	
AC voltage output	16-20 VAC per 1000 engine RPM
Stator coil resistance	0.1-0.3 ohms

Table 7-4. Regulator Specifications

REGULATOR	
Voltage output @ 3600 RPM	14.3-14.7 VDC @ 75° F (24° C)
Amperes @ 3600 RPM	34 Amps

Table 7-5. Ignition Coil Specifications

IGNITION COIL RESISTANCE	
Primary winding	0.5-0.7 ohms
Secondary winding	5500-7500 ohms

Table 7-6. Electrical System Specifications

ELECTRICAL SYSTEM	AMPERES
Main fuse	30
Ignition fuse	15
Light fuse	15
Accessory fuse	10
Brake/horn/active muffler fuse (XB12R only)	10
ECM fuse	10
Key switch fuse	15
Cooling fan fuse	10

Table 7-7. Specifications

BULB CHART		BULBS REQUIRED	WATTS	AMPS	PART NUMBER
Headlights	Bulb (H3)	2	55	4.58	68918-98
	Position lamp (European models only)	1	3	0.25	Y0026.02A8
Marker lamps	Tail/Stop Lamp	1	5/21	0.42/1.75	68169-90A
	Turn signal lamp (front and rear 1 bulb each)	4	10.0	0.74	Y0042.K
Instruments	Turn signal indicator	1	1.12	0.08	Y0163.02A8
	Check engine	1	1.12	0.08	Y0163.02A8
	High beam	1	0.7	0.05	Y0162.02A8
	Oil indicator	1	1.12	0.08	Y0163.02A8
	Neutral	1	1.12	0.08	Y0163.02A8
	Backlight	2	1.12	0.08	Y0163.02A8
		1	0.7	0.05	Y0162.02A8
Low fuel		Replace instrument cluster if low fuel warning lamp fails.			

TORQUE VALUES

ITEM	TORQUE		NOTES
Battery (+) to starter fastener	60-85 in-lbs	7-10 Nm	page 7-33
Battery ground cable and actuator ground wire	48-72 in-lbs	5.4- 8.1 Nm	page 7-69
Battery terminal fasteners	72-96 in-lbs	8-10.8 Nm	page 7-34, 7-40, 7-66
clutch switch fasteners	7-10 in-lbs	0.8-1.12 Nm	page 7-15
Exhaust actuator	36-40 in-lbs	4.1-4.5 Nm	page 7-21
Fork clamp, upper	20-22 ft-lbs	27-29.8 Nm	LOCTITE 271 (red), page 7-8
Fuse block mounting fasteners	72-96 in-lbs	8.1-10.8 Nm	page 7-65
Handlebar control housing screws (left side)	25-33 in-lbs	3-4 Nm	page 7-50
Handlebar control housing screws (right side)	25-33 in-lbs	3-4 Nm	longer screw on bottom, page 7-50
Horn fastener	72-96 in-lbs	8.1-10.8 Nm	page 7-59
Ignition switch body fastener	12-36 in-lbs	1.4-4.0 Nm	page 7-7
Ignition switch fasteners	18-20 ft-lbs	(24.4-27.1 Nm)	LOCTITE 271 (red), page 7-8
Instrument module fastener	12-36 in-lbs	1.4-4.0Nm	page 7-53
Main battery ground to frame	48-72 in-lbs	5.4-8.1 Nm	page 7-33
Neutral indicator switch	60-84 in-lbs	6.7-9.5 Nm	LOCTITE 243 (blue), page 7-61
Relay block mounting fasteners	72-96 in-lbs	8.1-10.8 Nm	/Always install with new fasteners, page 7-65
Rotor mounting fasteners	120-140 in-lbs	13.5-15.8 Nm	LOCTITE THREADLOCKER 243 (blue), page 7-31
Spark plugs	12-18 ft-lbs	16-24 Nm	page 7-1
Stator TORX mounting screws	30-40 in-lbs	3-4 Nm	T-27 TORX with retaining compound, replace with new after each removal, page 7-31
Steering head wiring clamp	16-18 ft-lbs	21.7-24.4 Nm	page 7-65
Steering stem cap	38-42 ft-lbs	52-57 Nm	LOCTITE 271 (red), page 7-8
Steering stem pinch fastener	23-25 ft-lbs	31-34 Nm	LOCTITE 271 (red), page 7-8
Tail light lens and tail light	6-7 in-lbs	0.7-0.8 Nm	page 7-44
Turn signal fastener (rear)	25-28 in-lbs	2.8-3.2 Nm	page 7-47
Turn signal fasteners (front)	25-28 in-lbs	2.8-3.2 Nm	page 7-47
Turn signal flasher fastener	36-60 in-lbs	4-6.7 Nm	page 7-48
Voltage regulator mounting fasteners	36-60 in-lbs	6.7-8 Nm	page 7-32

GENERAL

The vehicle uses a breakerless inductive-discharge ignition system. The system has both a primary and secondary circuit. The primary circuit consists of the battery, main fuse, ignition switch, primary coil windings, computerized ignition timer and associated wiring. The secondary circuit consists of the secondary coil, spark plugs and associated wiring. See Figure 7-1.

DIGITAL TECHNICIAN (Part No. HD-44750) can access the information received by and stored in the electronic control module.

The electronic control module (ECM) is located in the fairing. The module has three primary functions. First, it computes the spark advance for proper ignition timing based on sensor input. Second, it controls the independent, primary windings of the spark coil and is thus able to provide sequential and independent firing of the spark plugs (non waste spark). Third, it calculates the correct air/fuel ratio based on input from the sensors.

The electronic control module contains all the solid-state components used in the ignition system. The dwell time for the ignition coil is also calculated by the ECM microprocessor and is dependent upon battery voltage. The programmed dwell is an added feature to keep battery drain to a minimum and to adequately charge the coil at all speeds. The ECM has added protection against transient voltages, continuous reverse voltage protection and damage due to jump starts. The ECM is fully enclosed to protect it from vibration, dust, water and oil. The module is not repairable. Replace the unit if it fails.

The ECM uses six or seven different sensors to monitor rider demands and engine conditions. These sensors are:

- Throttle Position (TP) Sensor
- Cam Position (CMP) Sensor
- Intake Air Temperature (IAT) Sensor
- Engine Temperature (ET) Sensor
- Oxygen (O₂) Sensor
- Bank Angle Sensor (BAS)
- Interactive Muffler Valve Position Sensor (XB12R)
(Built-in to the actuator)

The ECM uses the information provided by the throttle position and cam position sensors to calculate how much air is entering the engine. The throttle position sensor monitors the amount of air entering the engine by how far the throttle is open, whether it is opening or closing and how fast it is opening or closing. The IAT sensor measures the temperature of the air entering the engine, providing the rest of the information necessary to determine the density of the air entering the engine. The ECM also monitors the cam position sensor to determine the exact position of both cylinders in the combustion cycle and the engine speed.

The ET sensor provides the ECM the current engine temperature. Proper fuel and spark delivery are dependent on the temperature of the engine. The ECM will provide a richer fuel mixture on start up and a higher degree of spark advance. As the vehicle warms up to operating temperature the fuel mixture will lean and the spark advance will decrease.

On the XB12R, an interactive exhaust system utilizes an actuator valve in the muffler which is connected to a servo motor via a cable. The valve position automatically adjusts to enhance engine performance.

Cooling fan actuation is controlled by the ECM. With key ON, fan turns on when engine cylinder head temperature reaches 220° C (428° F) and shuts off when temperature reaches 180° C (356° F). With key OFF, fan turns on when engine temperature reaches 170° C (338° F) and shuts off when temperature reaches 150° C (302° F).

The information provided by the O₂ sensor allows the ECM to ensure a proper air/fuel mixture by monitoring the final combustion efficiency in the exhaust system. This ensures optimum engine performance at any altitude or barometric pressure. The O₂ sensor input to the ECM is required to ensure a stoichiometric (14.7:1) air/fuel ratio during closed loop operation.

The Bank Angle Sensor (BAS) provides input to the ECM on whether the vehicle lean is greater than predetermined bank angle limit. As long as lean angle does not exceed limit, fuel supply and ignition operation are unaffected. If the vehicle exceeds the predetermined bank angle limit, the BAS will interrupt the operation of the ignition system and fuel supply. To reset system, return vehicle to the upright position and switch key OFF.

The ECM-controlled ignition coil fires each spark plug independently on the compression stroke of each cylinder (no waste spark). The spark plug in the front cylinder fires at the end of that cylinder's compression stroke, thereby igniting the air/fuel mixture. The same sequence occurs at the end of the rear cylinder's compression stroke (thereby igniting the air/fuel mixture in the rear cylinder).

The rotor and cam position sensor are located in the gear-case cover on the right side of the motorcycle. The Cam position sensor consists of a Hall-effect device, magnet and plate. The plate is mounted over a rotating cup ("rotor cup"). The rotor cup is mounted on the camshaft and operates at one-half crankshaft speed. As the rotor cup turns inside the gear-case, six asymmetrical teeth on the rotor cup sequentially break the magnetic field between the magnet and the Hall-effect device. The edges of these teeth are cut to correspond to specific positions of the camshaft during the engine cycle such as TDC for the front cylinder. The output of the cam position sensor is used by the ECM to not only determine engine position, but also to calculate engine speed. This method of measuring camshaft position provides accurate information on engine position down to zero engine speed.

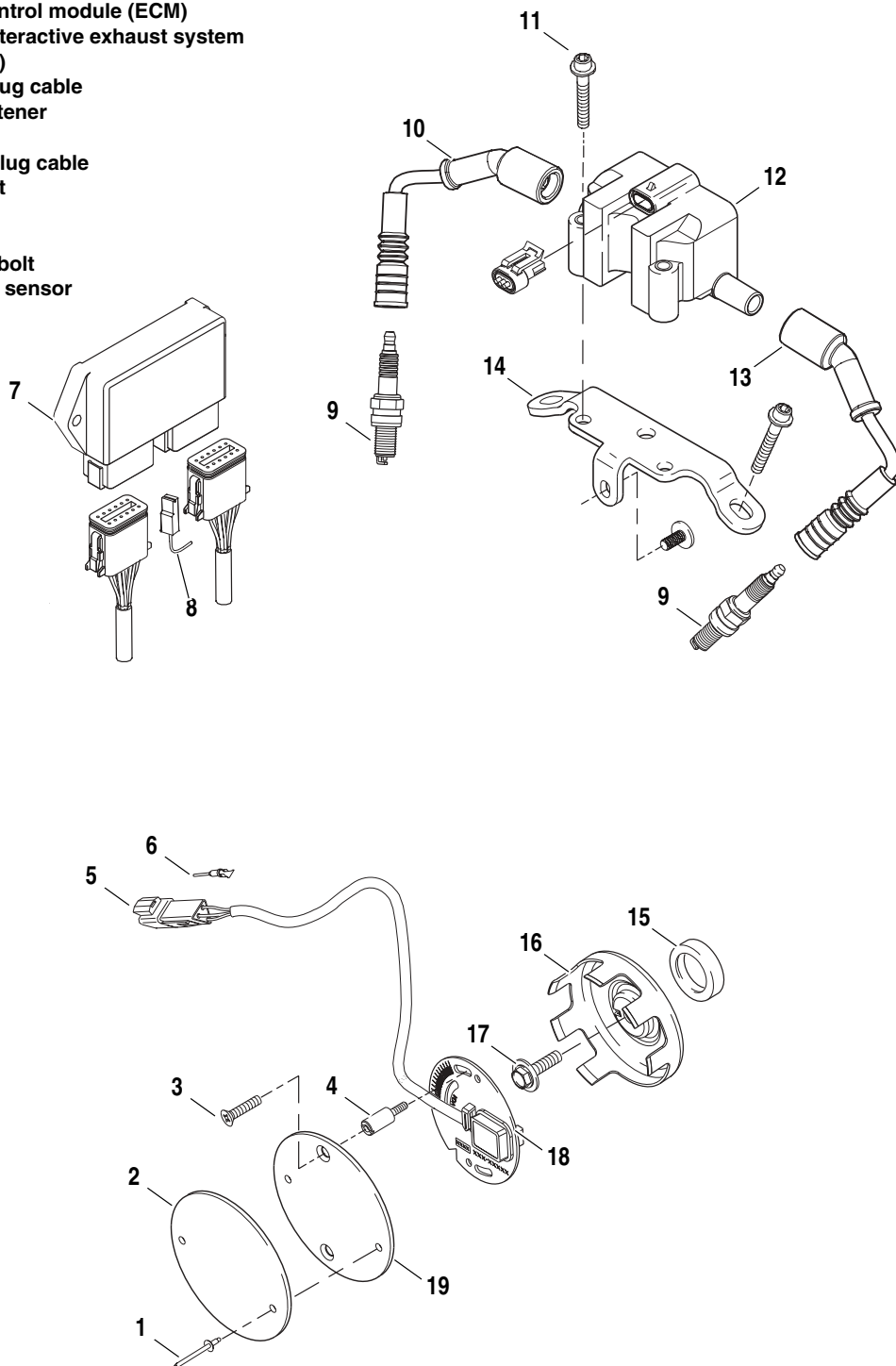
For more information on the sensors used in conjunction with the ECM see Section 4 Fuel System.

See the wiring diagrams in the Appendix for additional information on ignition system circuits.

TROUBLESHOOTING

See Section 4 Fuel System for troubleshooting information.

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. Engine mount
15. Seal
16. Trigger rotor
17. Trigger rotor bolt
18. Cam position sensor
19. Inner cover



b1164b4x

Figure 7-1. Ignition Components

GENERAL

⚠ WARNING

DO NOT modify the ignition/headlight switch wiring to circumvent the automatic-on headlight feature. Visibility is a major concern for motorcyclists. Failure to have proper headlight operation could result in death or serious injury.

Switch positions are explained in [Table 7-8](#).

CAUTION

Turn the ignition switch to the OFF position and remove the key before locking the motorcycle. Leaving the key in the P position will keep the instrument lights on and result in a discharged battery. (00155a)

NOTE

The key locks the ignition system and is removable in both the LOCK and P positions. The P position is located counter-clockwise from the LOCK position and allows the rider to remove the key while leaving the lights on. When the key is placed in the P position, several indicator markers are or can be activated. See [Table 7-9](#).

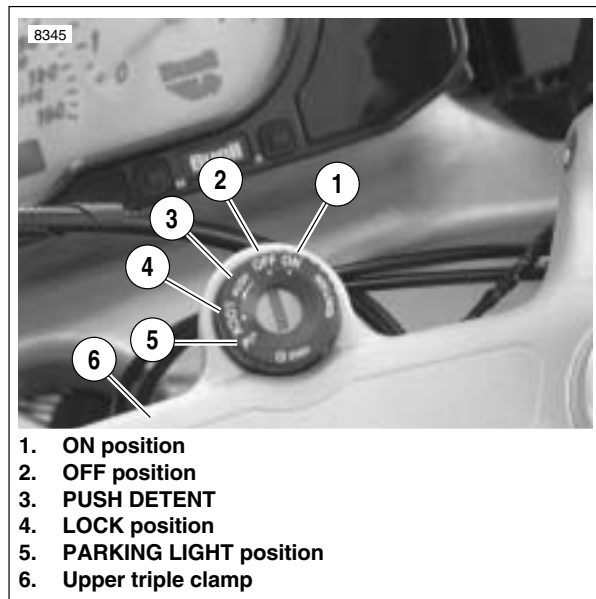


Figure 7-2. Ignition/Headlight Key Switch

Table 7-8. Ignition Key Switch Positions

LABEL	IGN.	LAMPS	REMOVE KEY
OFF	off	off	yes
P	off	See note & Table 7-9 .	yes
ON	on		no
LOCK	off	off	yes

Table 7-9. Indicator Markers

ITEM	P	ON
Headlight position marker lamps (European models only)	on	on
Headlight high beam	off	can be activated
Headlight low beam	off	on
Instrument module illumination lamps	on	on
Stop lamp	can be activated	
Front and rear turn signals	can be activated	
Horn	cannot be activated	can be activated

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. See [Figure 7-6](#). Cut cable strap (2) holding ignition switch, fuse block and right handlebar switch wires.
4. Disconnect ignition switch connector [33] (3).
5. See [Figure 7-3](#). Remove cable straps attached to the upper fork clamp.
6. Remove air cleaner cover. See [2.34 INTAKE COVER ASSEMBLY](#).
7. See [Figure 7-4](#). Remove steering stem pinch fastener (2).
8. Remove upper fork clamp pinch fasteners (1).
9. See [Figure 7-4](#). Hold or brace the lower fork clamp and remove steering stem capnut (3).
10. Remove the upper fork clamp (4) from forks.
11. See [Figure 7-5](#). Use Snap-on Tamper-Resistant T45 Torx driver, Part No FTXR45E to remove ignition switch fasteners (3) securing ignition switch (4) to upper fork clamp. Slide ignition switch out of upper fork clamp.

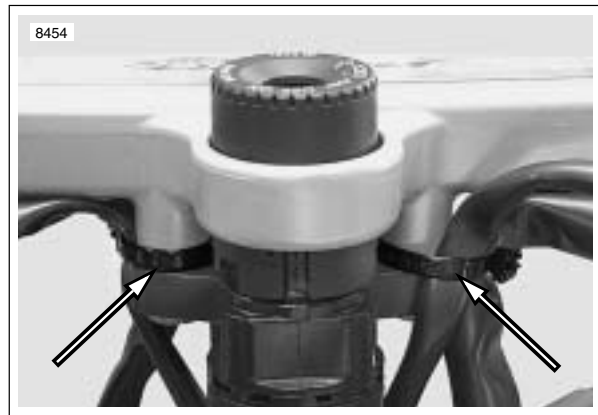


Figure 7-3. Cable Straps On Upper Fork Clamp

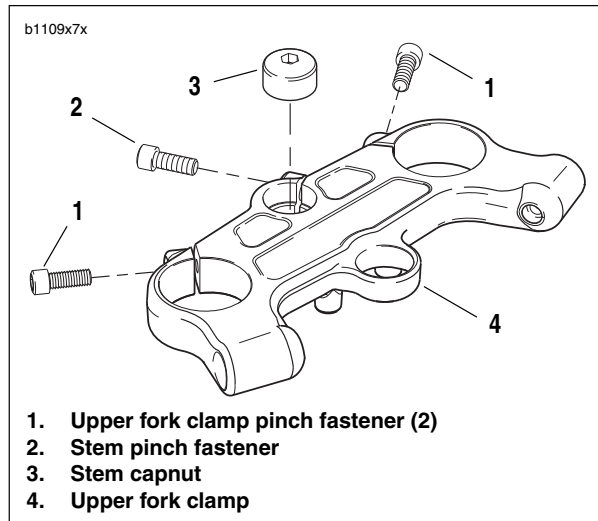


Figure 7-4. Upper Fork Clamp

DISASSEMBLY

1. See [Figure 7-5](#). Remove ignition switch housing (5) from ignition switch (4) by prying tabs on side of housing
2. Remove ignition switch body fasteners (1). Separate ignition switch body (2) from ignition switch (4).

ASSEMBLY

NOTE

See [Figure 7-5](#). In next step, be sure wide slot in ignition switch housing (5) is installed over wide boss on ignition switch (4).

1. Push ignition switch housing (5) on to ignition switch (4).

NOTE

In next step, do not force ignition switch (4) into ignition switch body (2). If ignition switch does not easily slide into ignition switch body, rotate slot in ignition switch body with screwdriver until proper installation can be achieved.

2. Mate ignition switch to ignition switch body.
3. Install ignition switch body fasteners (1). Tighten to 12-36 in-lbs (1.4-4.0 Nm).

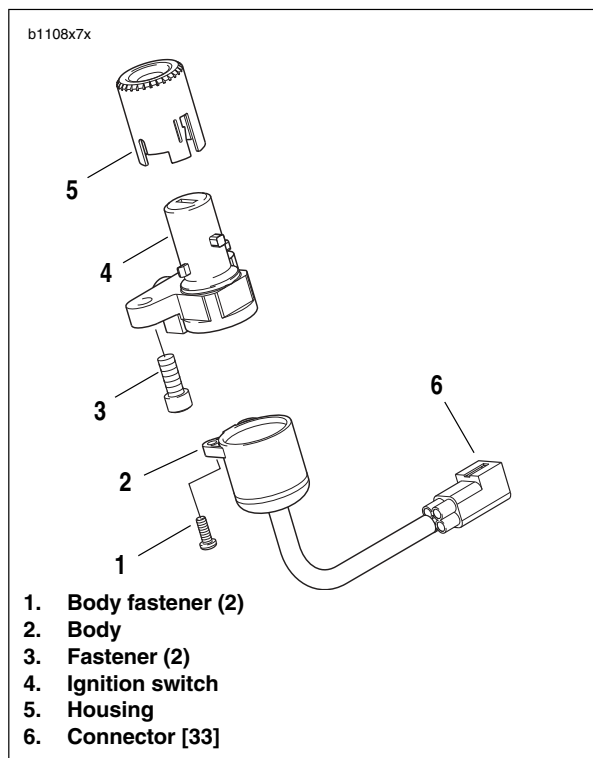


Figure 7-5. Ignition Switch Assembly

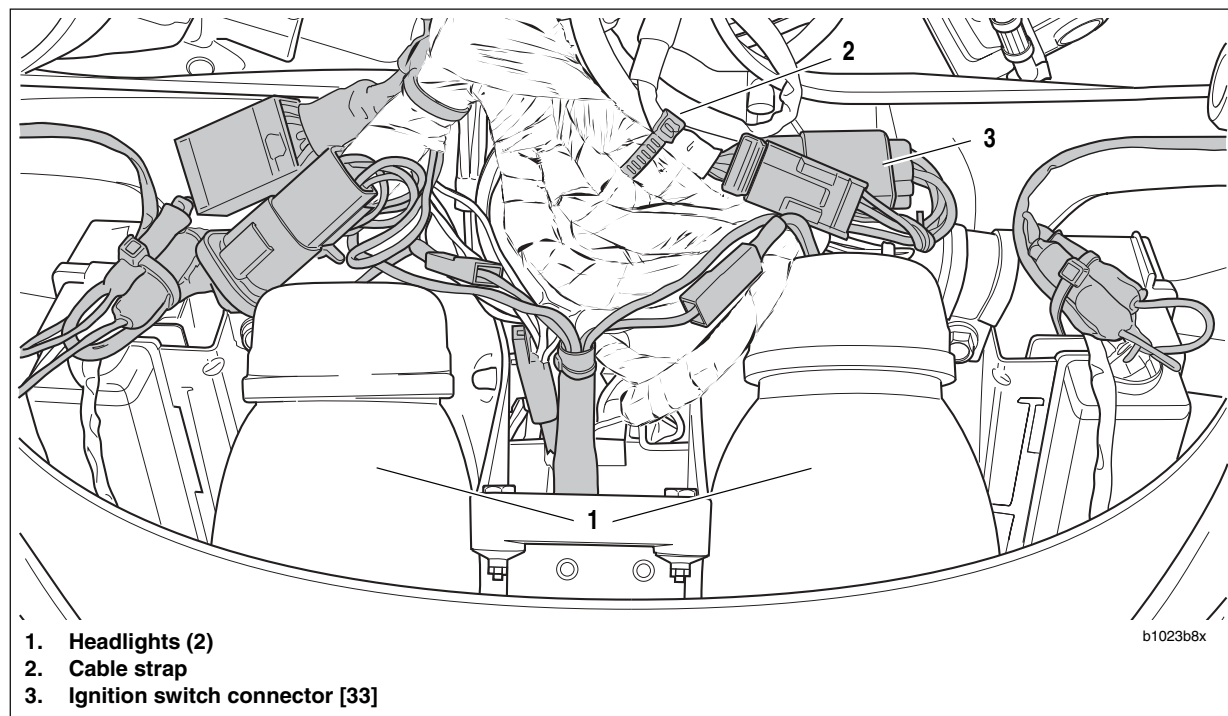


Figure 7-6. Ignition Switch Connector (viewed from beneath fairing)

INSTALLATION

1. See [Figure 7-4](#). From beneath upper triple clamp (4), insert ignition switch assembly into hole. The word "OFF" stamped on the switch housing should face front of vehicle.
2. See [Figure 7-5](#). Attach ignition switch assembly to upper triple clamp using ignition switch fasteners (3). USE LOCTITE 271 (red) on fasteners. Tighten to 18-20 ft-lbs (24.4-27.1 Nm).
3. See [Figure 7-4](#). Install steering stem cap (3). Tighten but do not tighten.
4. Install upper clamp on fork assembly.
 - a. Apply LOCTITE 271 to upper fork clamp pinch fasteners (1).
 - b. Tighten but do not torque upper fork clamp pinch fasteners.
 - c. Tighten steering stem cap to 38-42 ft-lbs (52-57 Nm).
 - d. Install steering stem pinch fastener (2) applying LOCTITE 271 and tightening to 23-25 ft-lbs (31-34 Nm).
 - e. Tighten upper fork clamp fasteners to 20-22 ft-lbs (27-29.8 Nm).
 - f. Repeat torque sequence in steps d and e.
5. See [Figure 7-6](#). Connect ignition key switch connector (3) to wiring harness. Install cable strap (2) around ignition switch, fuse block and right handlebar switch wires.
6. Install intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).
7. See [Figure 7-3](#). Attach cable straps to upper fork clamp.
 - a. Install cable strap to the right of ignition switch securing right hand switch and brake line wires to upper fork clamp.
 - b. Install cable strap to the left of ignition switch securing left hand switch and clutch cable wires to upper fork clamp.
8. Install negative battery cable.

WARNING

Check for proper headlight operation before riding motorcycle. Visibility is a major concern for motorcyclists. Failure to have proper headlight operation could result in death or serious injury.

9. Check ignition key switch for proper operation. If operation fails, reread procedure and verify that all steps were performed.

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](#).

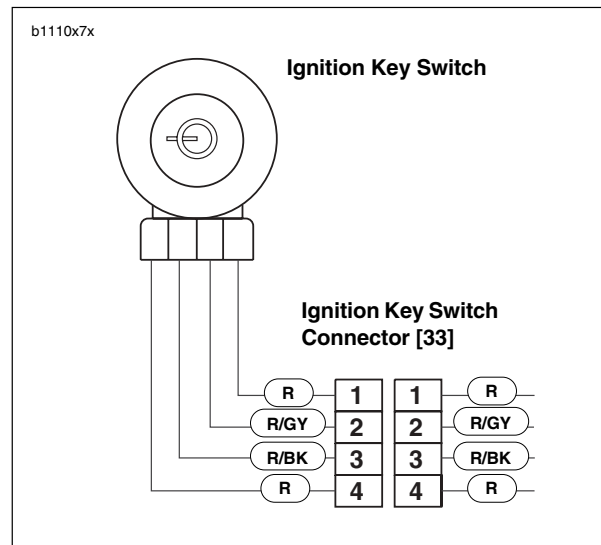


Figure 7-7. Ignition Key Switch Wiring

GENERAL

Resistor-type high-tension spark plug cables have a carbon-impregnated fabric core, instead of solid wire, for radio noise suppression and improved reliability of electronic components. Use the exact replacement cable for best results.

REMOVAL

WARNING

Never disconnect a spark plug cable with the engine running. If you disconnect a spark plug cable with the engine running, you may receive a potentially fatal electric shock from the ignition system which could result in death or serious injury.

NOTE

When disconnecting each spark plug cable from its spark plug terminal, always grasp and pull on the rubber boot at the end of the cable assembly (as close as possible to the spark plug terminal). Do not pull on the cable portion itself. Pulling on the cable will damage the cable's carbon core.

1. Remove air cleaner assembly. See [4.44 AIR CLEANER ASSEMBLY](#).
2. Remove left side air scoop.
3. See [Figure 7-8](#). Disconnect spark plug cables from ignition coil and spark plug terminals. Inspect cables for damage.

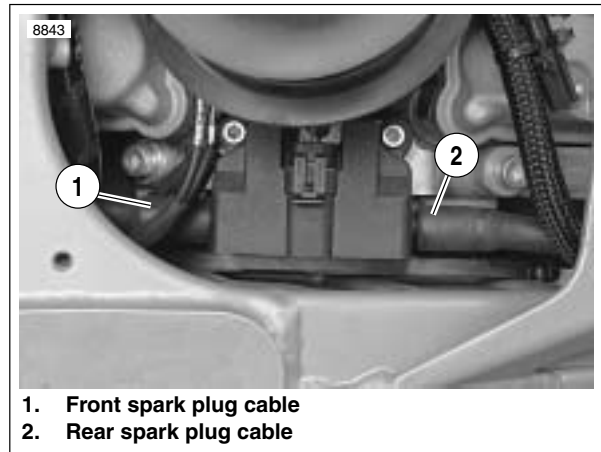


Figure 7-8. Spark Plug Cable Location

INSPECTION

1. Inspect spark plug cables. Replace cables that are worn or damaged.
 - a. Check for cracks or loose terminals.
 - b. Check for loose fit on ignition coil and spark plugs.
2. Check cable boots/caps for cracks or tears. Replace boots/caps that are worn or damaged.

NOTE

Both cables are the same length.

3. See [Figure 7-9](#). Check spark plug cable resistance with an ohmmeter. Replace cables not meeting resistance specifications.

Table 7-10. Spark Plug Cables

SPECIFICATION	FRONT & REAR
Length	5.70 ± 0.25 in. (146 mm)
Resistance	1,350-3,465 ohms

INSTALLATION

NOTES

- To ease installation, install spark plug cables to ignition coil first after applying **ELECTRICAL CONTACT GREASE** (Part No. 99861-90) to the inside of spark plug boot.
 - See [Figure 7-10](#). When assembling the spark plug boots onto the spark plugs, make sure the boot is slid all the way down over the spark plug insulator. The gap should not exceed 1/8 in. (3.2 mm).
 - For spark plug information see [1.14 SPARK PLUGS](#).
1. Connect spark plug cables to ignition coil and spark plugs. Fasten boots/caps securely. Tight connections provide the necessary moisture-proof environment for the ignition coil and spark plug terminals.
 2. Install air cleaner assembly. See [4.44 AIR CLEANER ASSEMBLY](#).

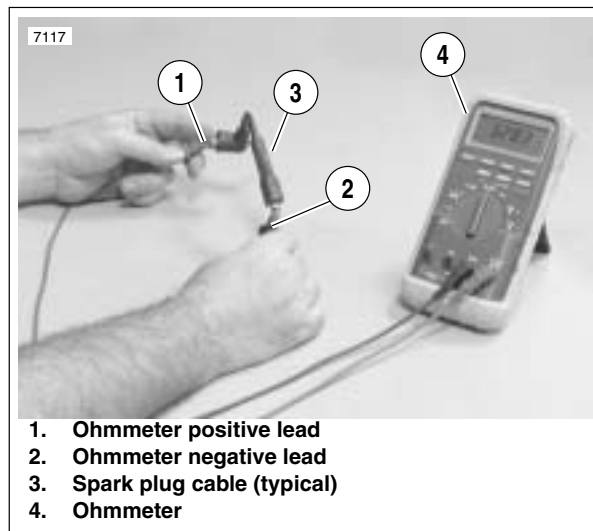


Figure 7-9. Testing Resistance

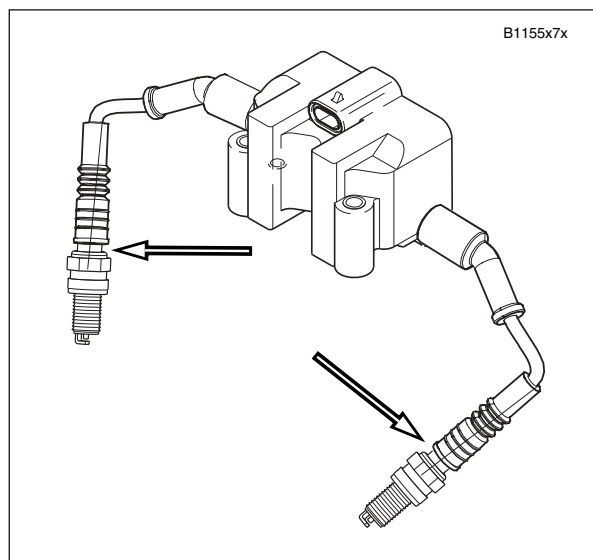


Figure 7-10. Boot Gap Should Not exceed 1/8 in. (3.2 mm)

GENERAL

The starter interlock system is designed to prevent unintended start-up.

Two circuits make up the starter interlock system.

Starter Circuit

The starter circuit prevents the motorcycle from being started unless a ground has been established at the starter relay. This ground may come from one of two sources.

- By placing the motorcycle in neutral and grounding through the neutral switch.
- By disengaging the clutch and grounding through the clutch lever switch.

Once the starter circuit is grounded and the starter button pushed, the starter relay can be energized. The energized relay then permits the starter motor to crank the engine.

Table 7-11. Starter Interlock Troubleshooting

PROBLEM	CHECK FOR	CORRECTION
Electric starter will not crank.	Battery problems.	See 7.11 BATTERY .
	Inappropriate gear selected.	Place vehicle in neutral.
	Clutch lever not disengaged.	Pull in clutch lever.
	Starter relay problems.	Listen for starter relay “click”. If click is not heard, perform starter relay tests.
		Follow starter troubleshooting in Section 5.

DIAGNOSTICS

The reference numbers below correlate with the circled numbers in the [7.5 STARTER INTERLOCK](#) flow charts.

1. Check diode with an ohmmeter as shown in [Figure 7-12](#).
2. Check diode polarity as shown in [Figure 7-11](#).

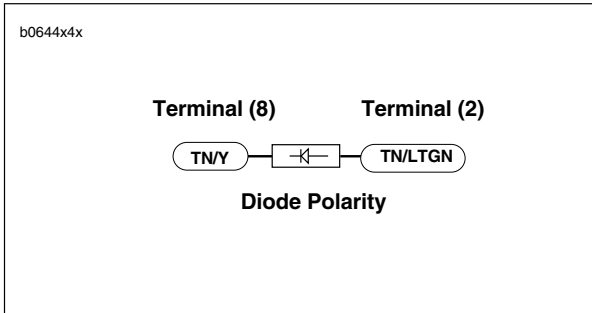


Figure 7-11. Diode Polarity

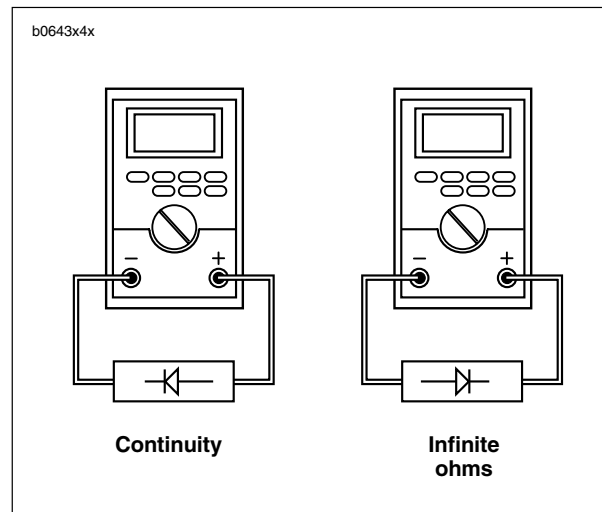


Figure 7-12. Ohmmeter Diode Test

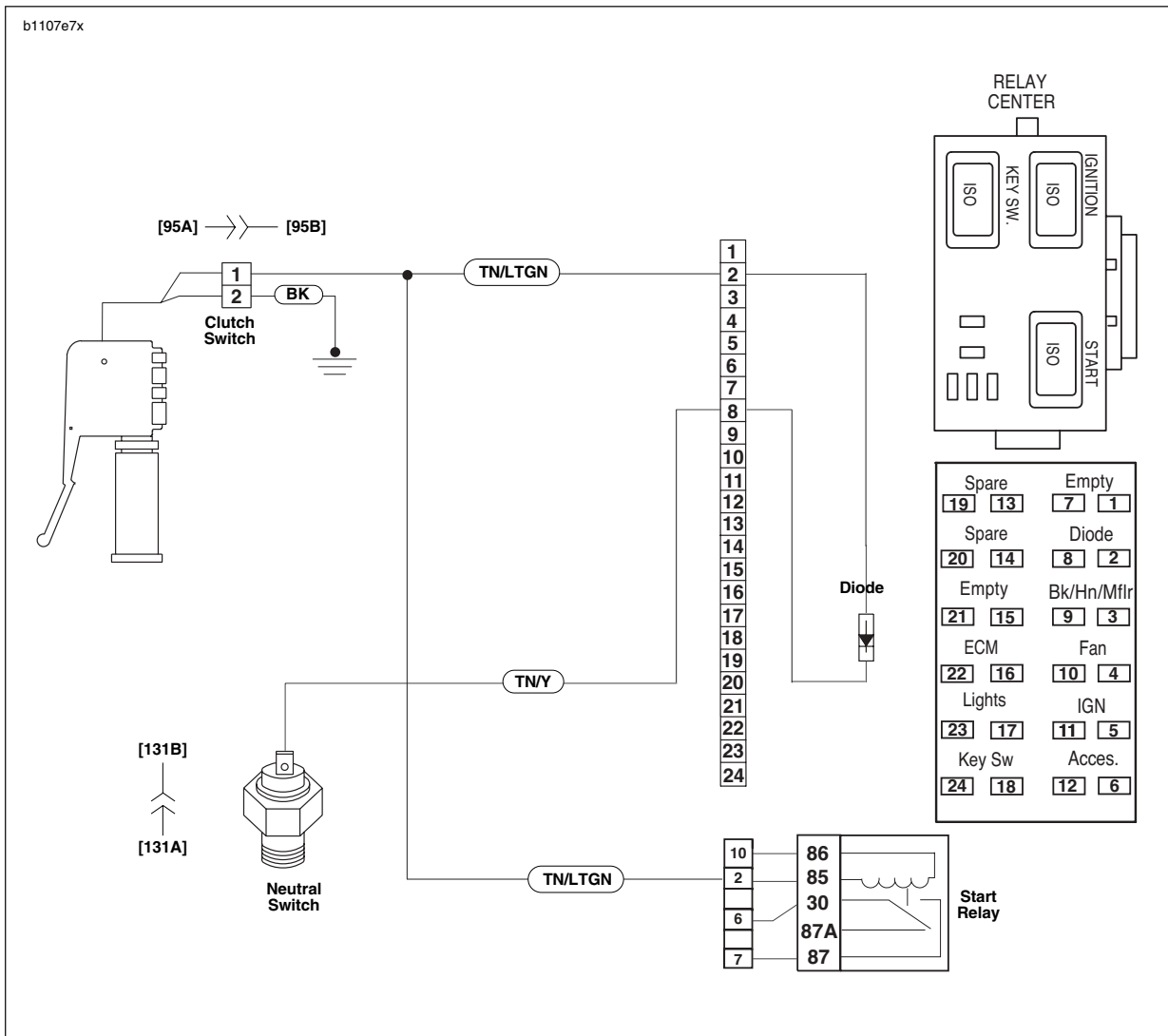
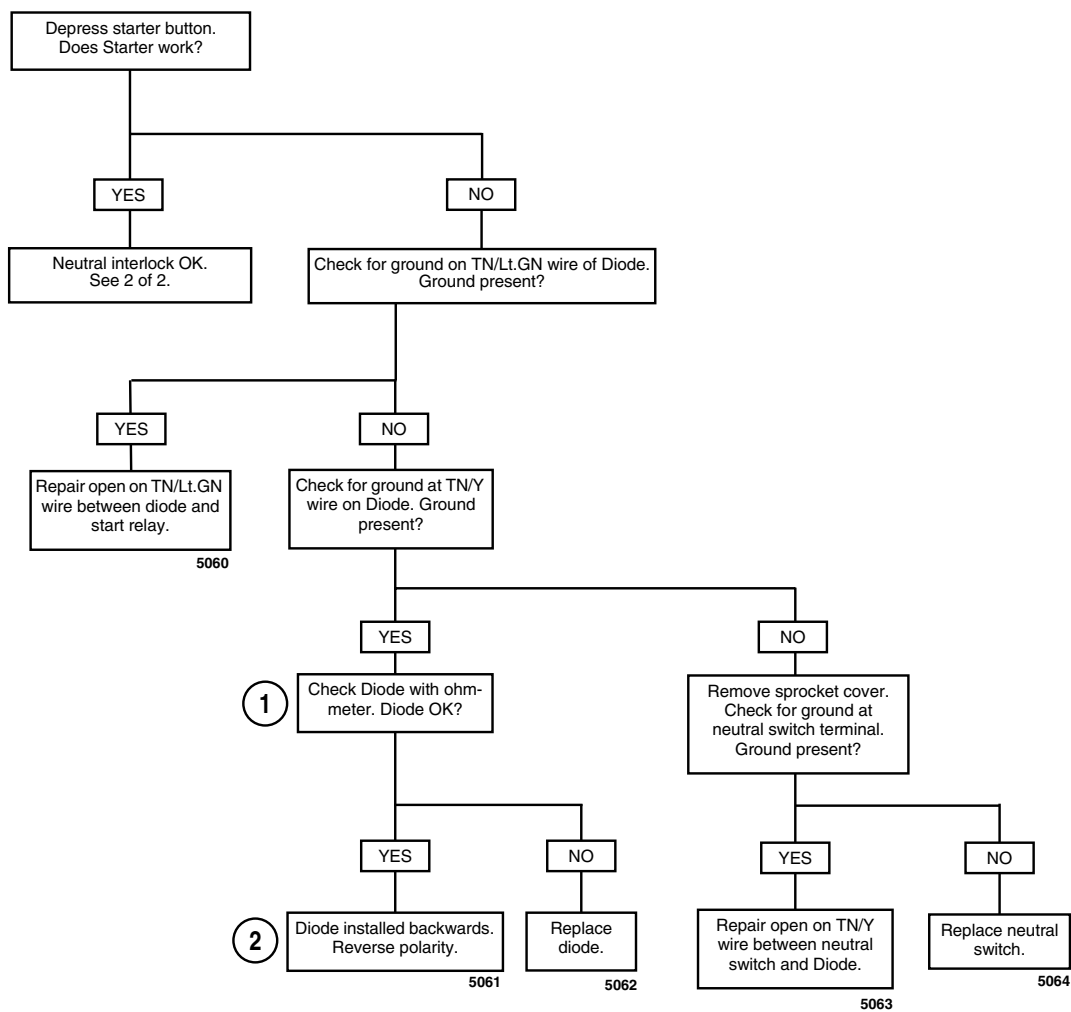


Figure 7-13. Diode Wiring

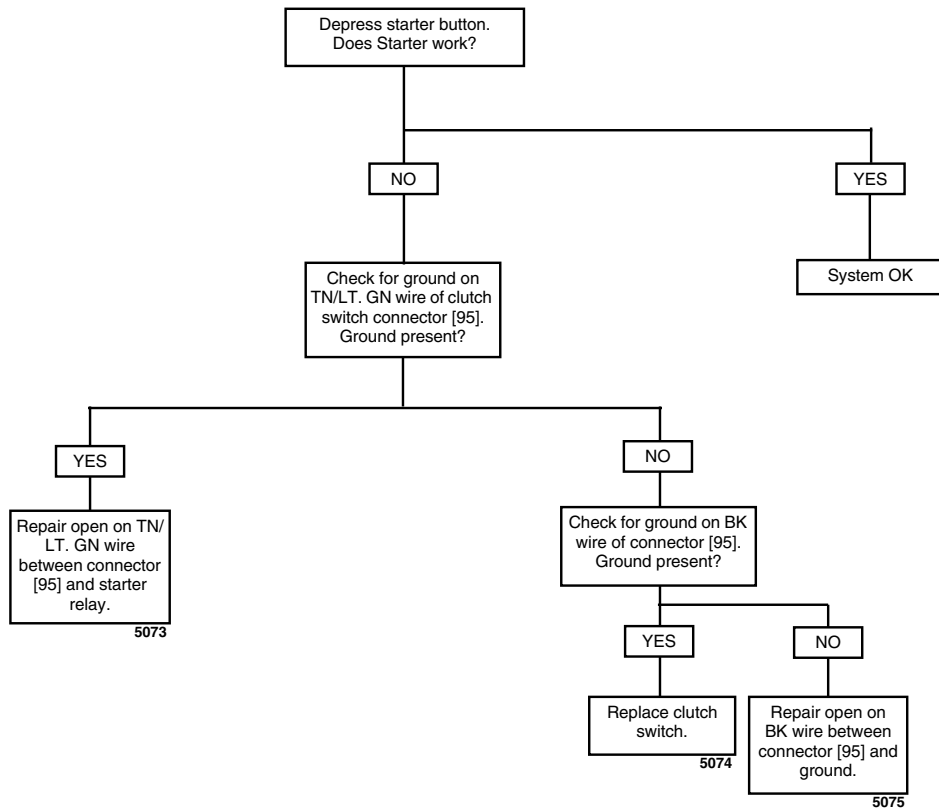
Starter Test (Part 1 of 2)

CONDITION: Key ON, transmission in neutral and clutch engaged



Starter Test (Part 2 of 2)

CONDITION: Key ON, transmission in gear and clutch disengaged



TESTING/REPLACEMENT

Clutch Switch

See [Figure 7-14](#). The clutch switch attaches to the clutch control lever bracket. The switch completes a path to ground for the ignition relay and the starter relay when the clutch is disengaged. Test the switch as follows:

1. Unplug the 2-place clutch switch connector [95].
2. Test the switch using an ohmmeter.
 - a. With clutch engaged (1) (switch open), the switch should show ∞ ohms (infinite ohms).
 - b. With clutch disengaged (2) (switch closed), the switch should show 0 ohms or little resistance.
3. Replace the assembly with a **new** switch if necessary and tighten switch fasteners to 7-10 **in-lbs** (0.8-1.12 Nm). See [2.24 CLUTCH CONTROL](#).

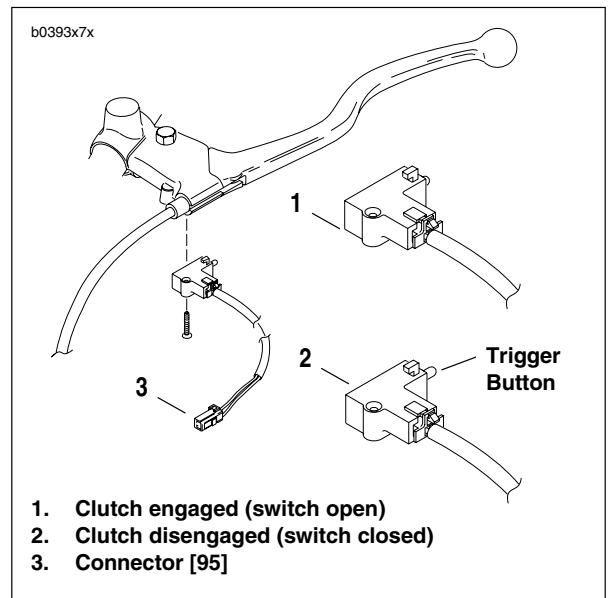


Figure 7-14. Clutch Switch

Ignition Relay

The ignition relay is located on the left side of the vehicle behind the fairing. Test the relay as follows:

1. See [Figure 7-15](#). Locate ignition relay (2) within relay block.
2. To test relay, proceed to Step 3. If installing a **new** starter relay, remove old relay. Install **new** relay into relay block.
3. See [Figure 7-16](#). Obtain a 12 volt battery and a continuity tester or ohmmeter.
 - a. Pull relay from relay block.
 - b. Connect positive battery lead to the 86 terminal.
 - c. Connect negative battery lead to the 85 terminal to energize relay.
 - d. Check for continuity between the 30 and 87 terminals. A good relay shows continuity (continuity tester lamp "on" or a zero ohm reading on the ohmmeter). A malfunctioning relay will not show continuity and must be replaced.
4. Replace the relay with a **new** relay if necessary.

Key Switch Relay

See [Figure 7-15](#). The key switch relay (1) is located on the left side of the vehicle behind the fairing. See [Ignition Relay](#) under [7.5 STARTER INTERLOCK](#) for testing procedure.

Main Fuse

A 30 Amp main fuse links the ignition key switch and the battery. The 30 Amp main fuse is located under the rider's seat. See [7.22 MAIN FUSE AND FUSES](#) for more information.

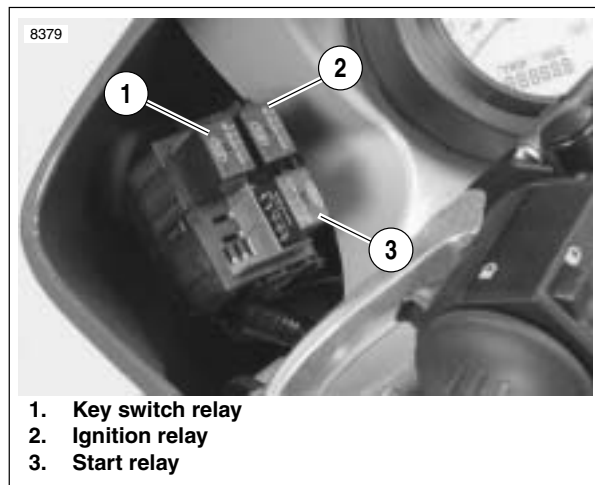


Figure 7-15. Relay Block

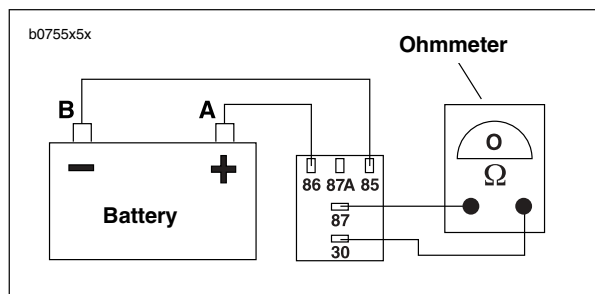


Figure 7-16. Starter Relay Test

Diodes

See [Figure 7-17](#). The diode is located on the right side of the vehicle behind the fairing.

1. See [Figure 7-18](#). Locate diode within fuse block.
2. Test diode using Starter Test flow charts under [DIAG-NOSTICS](#).
3. Replace the diode by pulling it straight out. Ensure it is installed in the correct direction.

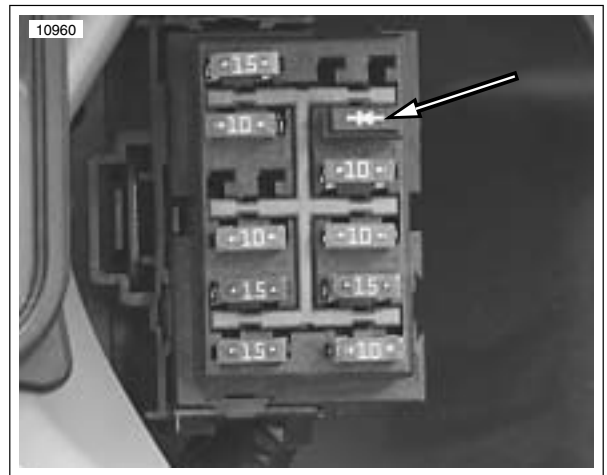


Figure 7-17. Fuse Block (contains diode)

b1165x4x

Spare	Empty
19 13	7 1
Spare	Diode
20 14	8 2
Empty	Bk/Hn/Mflr
21 15	9 3
ECM	Fan
22 16	10 4
Lights	IGN
23 17	11 5
Key Sw	Acces.
24 18	12 6

Figure 7-18. Fuse Block

GENERAL

NOTE

The interactive exhaust system is standard equipment on the XB12 only.

See [Figure 7-19](#). An electronically controlled actuator opens or closes a butterfly valve (1) that controls exhaust flow in a multi-chamber muffler.

The ECM monitors engine speed and throttle position while alternating flow paths between the chambers to adjust back-pressure optimizing torque and horsepower for the riding condition.

For example:

1. At low RPM with a wide-open throttle, the valve (1) is opened to reduce back-pressure so the engine can gain RPM quickly. The exhaust enters (2) the muffler and flows (3) through the open valve (1) into chamber C (7) and then exits (8).
2. In the mid-range, the valve is closed to increase acceleration torque. The exhaust flows (4) through chamber A, around to chamber B and then through chamber C and exits.
3. At high RPM, the valve opens again to maximize horsepower. The exhaust enters (2) the muffler and flows (3) through the open valve (1) into chamber C (7) and then exits (8).

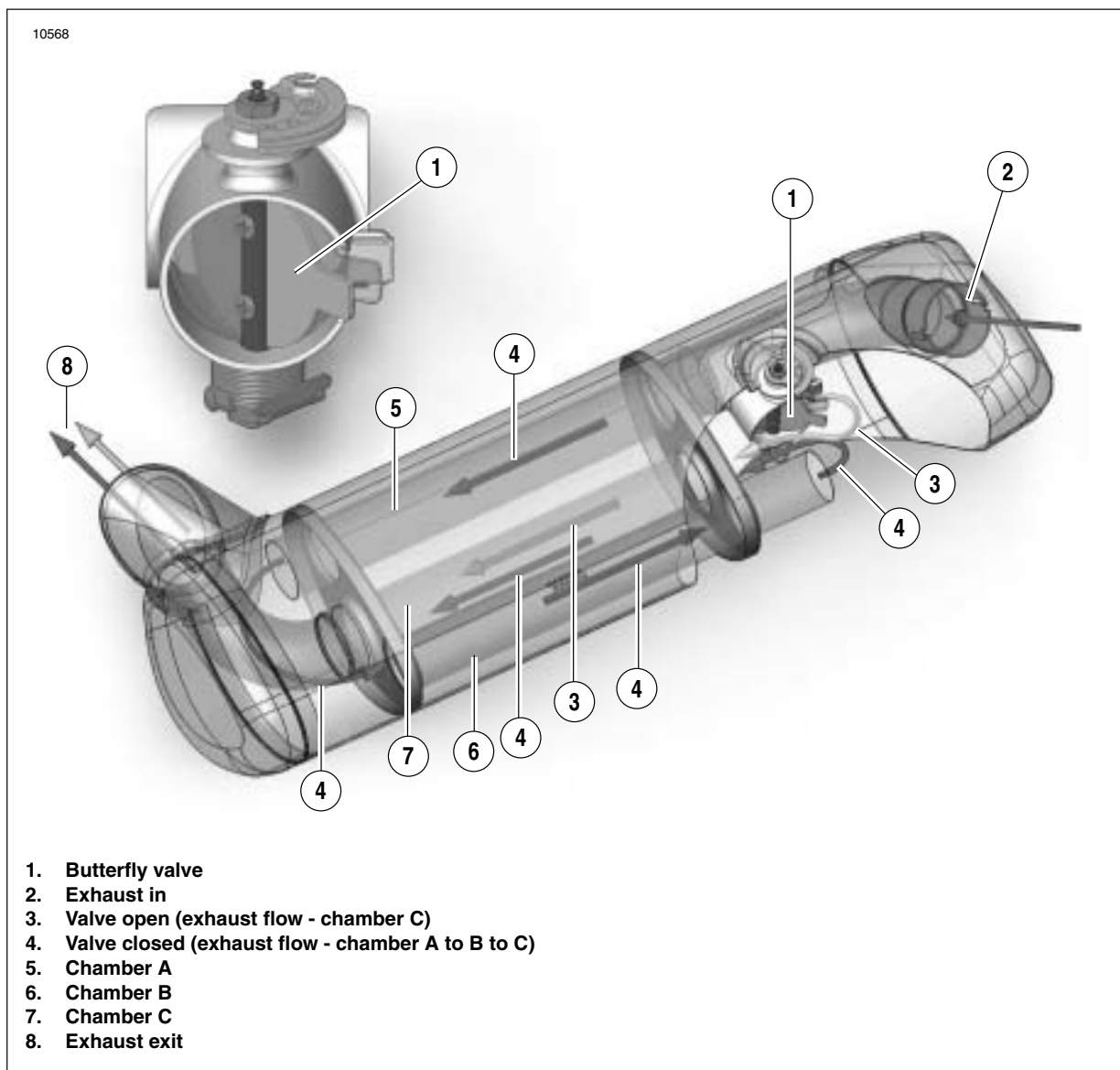
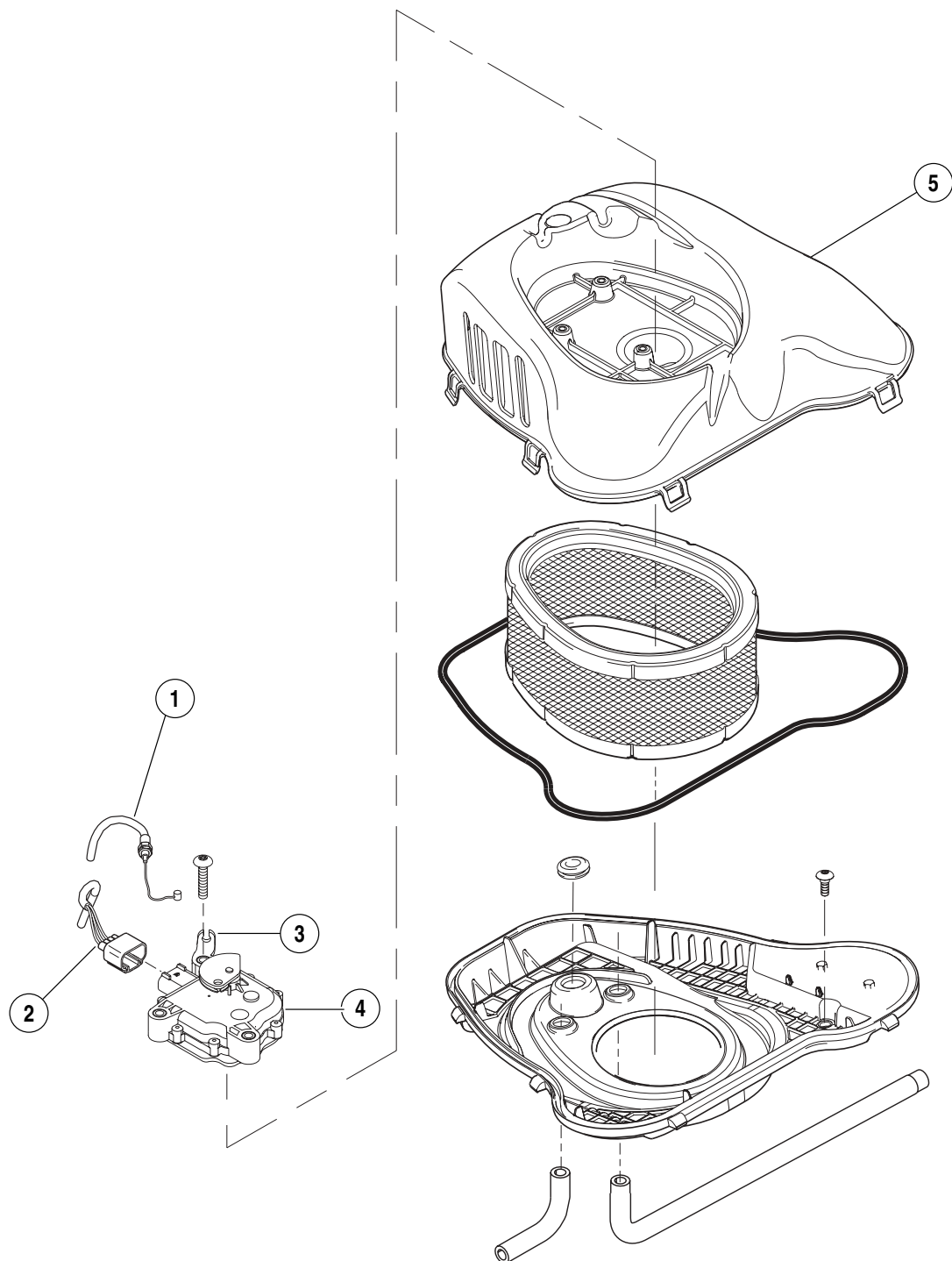


Figure 7-19. Interactive Exhaust System Muffler

b0064b



1. Interactive exhaust cable
2. Harness with connector [161B]
3. Interactive exhaust cable bracket
4. Actuator
5. Air cleaner cover

Figure 7-20. Interactive Control System (XB12R)

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 chin fairing. See [2.33 CHIN FAIRING](#).
4. Remove front sprocket cover. See [2.30 SPROCKET COVER](#).
5. Remove intake cover assembly. See [2.34 INTAKE COVER ASSEMBLY](#).
6. See [Figure 7-21](#). Disconnect harness connector [161B] from actuator (4).
7. Add free play to interactive exhaust cable (5), loosen jam nut and remove cable from bracket on actuator.
8. Remove interactive exhaust cable from cable wheel on actuator.
9. Remove actuator.
10. Remove tree fastener securing interactive exhaust cable to inside of muffler bracket on right side.

NOTE

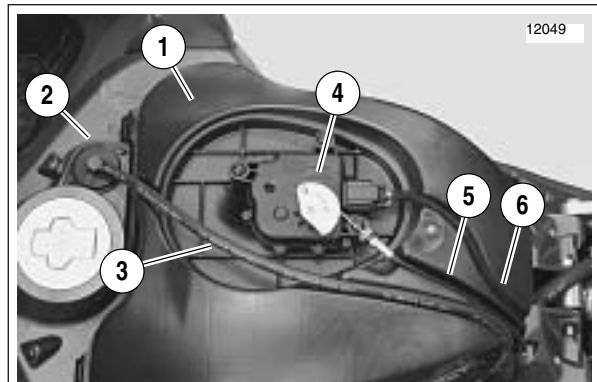
To remove interactive exhaust cable from muffler, partially remove and support muffler until interactive exhaust cable is removed

11. Remove cable strap above starter securing actuator cable, vent line, main harness and positive battery cable.
12. Remove cable strap securing actuator cable and main harness to oil return line.
13. Remove muffler. See [2.28 EXHAUST SYSTEM](#).
14. Loosen jam nut and remove interactive exhaust cable from bracket on muffler.
15. Remove interactive exhaust cable from cable wheel on muffler.

NOTE

To replace interactive cable on vehicle it will be necessary to use hose assembly (Part No. HS0020.02A8A) to aid in removal and installation.

16. Remove interactive cable from vehicle.
 - a. Slip end of hose over upper end of cable and attach with tape.
 - b. Gently pull cable assembly down and out.
 - c. Remove hose from interactive exhaust cable assembly.



1. Air cleaner cover
2. Fuel vent valve
3. Fuel vent tube
4. Actuator, interactive exhaust
5. Cable, interactive exhaust
6. Harness, interactive exhaust

Figure 7-21. Air Cleaner Cover (XB12R)

INSTALLATION

NOTE

- *Never reuse front muffler strap. Always replace front muffler strap with a new strap when removed from system.*
- *It is necessary to install interactive exhaust cable to muffler with muffler only partially installed.*

1. Install muffler. See [2.28 EXHAUST SYSTEM](#).
2. Install interactive cable onto vehicle.
 - a. Slip end of hose over upper end of cable and attach with tape.
 - b. See [Figure 7-22](#). Gently pull cable assembly up through the wire harness strap and guide at the left rear corner of the frame/fuel tank assembly. See [1.17 INTERACTIVE EXHAUST CABLE](#).



Figure 7-22. Interactive Exhaust Cable Behind Wire Harness Strap and Guide

3. Install actuator. Tighten fasteners to 36-40 **in-lbs** (4.1-4.5 Nm).
4. Attach interactive exhaust cable to cable wheel on actuator.
5. Connect interactive exhaust harness to actuator [161B].

6. Attach interactive exhaust cable to bracket and cable wheel on actuator and adjust. See [1.17 INTERACTIVE EXHAUST CABLE](#).
7. Install cable strap above starter securing actuator cable, vent line, main harness and positive battery cable.
8. Install cable strap securing actuator cable and main harness to oil return line.
9. Install front sprocket cover. See [2.30 SPROCKET COVER](#).
10. Install chin fairing. See [2.33 CHIN FAIRING](#).
11. Install intake cover. See [2.34 INTAKE COVER ASSEMBLY](#).

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)

12. Install negative battery cable to battery terminal. Tighten fastener 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)

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

NOTES
