

**Instruction 51-1167  
04-21-15**

Copyright © 2003, 2006, 2010  
by S&S® Cycle, Inc.

All rights reserved.  
Printed in the U.S.A.

**S&S® Cycle, Inc.**

**14025 County Highway G  
Viola, WI 54664**

Phone: 608-627-1497 • Fax: 608-627-1488  
Technical Service Phone: 608-627-TECH (8324)  
Technical Service Email: [sstech@sscycle.com](mailto:sstech@sscycle.com)  
Website: [www.sscycle.com](http://www.sscycle.com)



## **Installation Instructions: S&S® IST Ignition System for S&S V-Series Engines with Flywheel Machined for Crank Trigger**

### **DISCLAIMER:**

S&S parts are designed for high performance, closed course, racing applications and are intended for the very experienced rider only. The installation of S&S parts may void or adversely affect your factory warranty. In addition such installation and use may violate certain federal, state, and local laws, rules and ordinances as well as other laws when used on motor vehicles used on public highways, especially in states where pollution laws may apply. Always check federal, state, and local laws before modifying your motorcycle. It is the sole and exclusive responsibility of the user to determine the suitability of the product for his or her use, and the user shall assume all legal, personal injury risk and liability and all other obligations, duties, and risks associated therewith.

The words Harley®, Harley-Davidson®, H-D®, Sportster®, Evolution®, and all H-D part numbers and model designations are used in reference only. S&S Cycle is not associated with Harley-Davidson, Inc.

### **SAFE INSTALLATION AND OPERATION RULES:**

Before installing your new S&S part it is your responsibility to read and follow the installation and maintenance procedures in these instructions and follow the basic rules below for your personal safety.

- Gasoline is extremely flammable and explosive under certain conditions and toxic when breathed. Do not smoke. Perform installation in a well ventilated area away from open flames or sparks.
- If motorcycle has been running, wait until engine and exhaust pipes have cooled down to avoid getting burned before performing any installation steps.
- Before performing any installation steps disconnect battery to eliminate potential sparks and inadvertent engagement of starter while working on electrical components.
- Read instructions thoroughly and carefully so all procedures are completely understood before performing any installation steps. Contact S&S with any questions you may have if any steps are unclear or any abnormalities occur during installation or operation of motorcycle with a S&S part on it.
- Consult an appropriate service manual for your motorcycle for correct disassembly and reassembly procedures for any parts that need to be removed to facilitate installation.
- Use good judgment when performing installation and operating motorcycle. Good judgment begins with a clear head. Don't let alcohol, drugs or fatigue impair your judgment. Start installation when you are fresh.
- Be sure all federal, state and local laws are obeyed with the installation.
- For optimum performance and safety and to minimize potential damage to carb or other components, use all mounting hardware that is provided and follow all installation instructions.
- Motorcycle exhaust fumes are toxic and poisonous and must not be breathed. Run motorcycle in a well ventilated area where fumes can dissipate.

### **IMPORTANT NOTICE:**

Statements in this instruction sheet preceded by the following words are of special significance.



**WARNING**

Means there is the possibility of injury to yourself or others.



**CAUTION**

Means there is the possibility of damage to the part or motorcycle.

**NOTE**

Other information of particular importance has been placed in *italic type*.

S&S recommends you take special notice of these items.

### **WARRANTY:**

All S&S parts are guaranteed to the original purchaser to be free of manufacturing defects in materials and workmanship for a period of twelve (12) months from the date of purchase. Merchandise that fails to conform to these conditions will be repaired or replaced at S&S's option if the parts are returned to us by the purchaser within the 12 month warranty period or within 10 days thereafter.

In the event warranty service is required, the original purchaser must call or write S&S immediately with the problem. Some problems can be rectified by a telephone call and need no further course of action.

A part that is suspect of being defective must not be replaced by a Dealer without prior authorization from S&S. If it is deemed necessary for S&S to make an evaluation to determine whether the part was defective, a return authorization number must be obtained from S&S. The parts must be packaged properly so as to not cause further damage and be returned prepaid to S&S with a copy of the original invoice of purchase and a detailed letter outlining the nature of the problem, how the part was used and the circumstances at the time of failure. If after an evaluation has been made by S&S and the part was found to be defective, repair, replacement or refund will be granted.

### **ADDITIONAL WARRANTY PROVISIONS:**

- (1) S&S shall have no obligation in the event an S&S part is modified by any other person or organization.
- (2) S&S shall have no obligation if an S&S part becomes defective in whole or in part as a result of improper installation, improper maintenance, improper use, abnormal operation, or any other misuse or mistreatment of the S&S part.
- (3) S&S shall not be liable for any consequential or incidental damages resulting from the failure of an S&S part, the breach of any warranties, the failure to deliver, delay in delivery, delivery in non-conforming condition, or for any other breach of contract or duty between S&S and a customer.
- (4) S&S parts are designed exclusively for use in Harley-Davidson® and other American v-twin motorcycles. S&S shall have no warranty or liability obligation if an S&S part is used in any other application.



## CAUTION

**Do not use a dual fire coil with the S&S ignition module.**

**Older modules will NOT work with vehicles equipped with flat slide carbs, open primaries, and dry clutches. If you want to use an older IST with these configurations contact S&S, we can help set it up. Newer modules will have a label indicating that it is already set up for these applications.**

### INTRODUCTION

The Intelligent Spark Technology system uses a sophisticated computerized module that integrates data from sensors that other ignition systems are not designed to use. The S&S® system makes use of crank position sensor, cam position sensor (if present), MAP sensor, cylinder head temperature sensor, and an exclusive knock sensor that actually detects detonation or knock while the engine runs. The knock sensor allows the IST to automatically adjust ignition timing to eliminate knock whenever it occurs.

If ignition requirements change, if a lower grade of fuel is introduced, for example, the system will automatically make the necessary ignition timing changes to avoid detonation and possible engine damage. This feature is particularly important in touring applications where the rider sometimes has less control over fuel quality. If a different camshaft is installed, or if cylinder head modifications are made, even if major engine modifications are made, such as the installation of a stroker or big bore kit, the system will adjust to eliminate knock.

#### Additional features:

- Simple installation – installation kits plug into stock wiring harness.
- No timing adjustments – the system adjusts timing automatically.
- Factory Pre-set 5950 RPM rev limiter. Adjustable up to 7200 RPM with S&S IST Guardian™ Diagnostic System (p/n 55-5075)
- Single fire operation – requires two coils or dual coil package.
- High output – Automatically maximizes coil output.
- Automatic dwell adjust – will optimize current for any coil 0.5 to 3 ohms.
- Short circuit and reverse polarity protected.
- Diagnostics – Guardian Diagnostic System or harness jumper.

**NOTE:** The electronics used in the S&S Ignition System require operation in single fire mode only. The S&S Ignition System cannot be used in dual fire mode.

### Dual Fire vs. Single Fire Ignition Systems

Two Types of ignition systems have been used on Harley-Davidson® motorcycles, either dual fire, or single fire.

#### Dual Fire

Dual fire ignitions fire the spark plugs in both cylinders on every stroke, each time the pistons reach the tops of the cylinders. One piston is at the top of the compression stroke, while the other piston is near the top of the exhaust stroke. Dual fire is also known as wasted spark because the second spark fires near the top of the exhaust stroke. Dual fire was common for many years because of its simplicity and reliability. Dual

fire has a slightly rougher idle than single fire because the wasted spark occurred just after the top of the exhaust stroke of the rear cylinder, disrupting the incoming intake charge.

#### Single Fire

Single fire ignitions fire the spark plugs on every other stroke of the engine, only at the top of the compression stroke. One cylinder fires, then after one crankshaft revolution, the other cylinder fires. A single fire ignition system allows the ignition to reliably transmit more power to the coil during the compression stroke when it is needed most.

### Ignition Coil Identification

#### Dual Fire Coil

In addition to the spark plug terminals, an aftermarket dual fire coil will have two wiring terminals: positive, negative.

#### Single Fire Coil

In addition to the spark plug terminals, an aftermarket single fire coil will have three wiring terminals: A negative terminal for the front cylinder, a common 12v + terminal, and negative terminal for the rear cylinder, this is the most common type of single fire coil.

All single fire coils are compatible with the S&S ignition if they have a resistance of 0.5 to 3 ohms. The standard rating for an aftermarket single fire coil is 3 ohms. Coils with higher resistance will decrease ignition output.

The S&S Ignition system will also support a variety of different ignition coil combinations as long as they are connected for single fire operation, and yield a final resistance of 0.5 to 3 ohms.

### Spark Plugs and Plug Wires

Spark plugs must be resistor spark plugs (suppression type) of the correct style and heat range for the application. Do not use non-resistor plugs.

Spark plug wires must be suppression type. Do not use solid metal core plug wires.

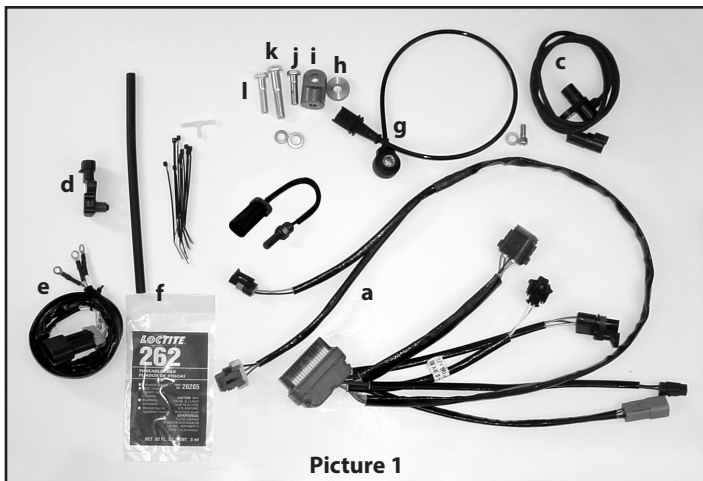
### PARTS LIST

IST ignition sensors are pre installed on S&S® assembled V-Series engines with toothed flywheels.

**NOTE:** Sensor installation instructions in the following section are included here for future reference, should a sensor need replacing.

The IST module is packaged separately (**See Picture 2**) and connected to the system via the wiring Harness Adapter. **See Picture 1.**

- Wiring Harness Adapter (S&S 55-1089), Item a.
- Cylinder Head Temperature Sensor (S&S 55-1039), Item b.
- Crank Position Sensor (S&S 55-1051, H-D® #32798-00) and Hardware, Item c.
- MAP Sensor (S&S 55-1037, H-D® #32316-99) and Hardware, Item d.
- Coil Harness (S&S 55-1038), Item e.
- Loctite® and Wire Ties, Item f.
- Knock Sensor Kit (Includes: Knock Sensor, Knock Sensor Mount and Related Hardware S&S 55-1015), Items g-n.



Picture 1

### S&S Intelligent Spark Technology Module



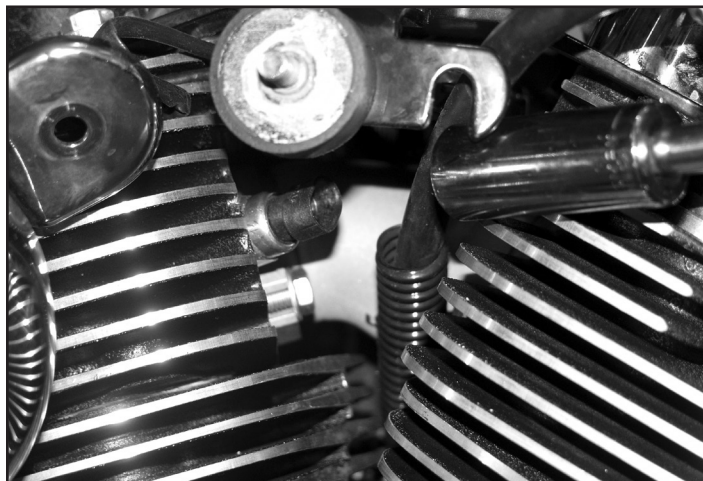
Picture 2

All reference to Harley-Davidson® part numbers is for identification purposes only. We in no way are implying that any of S&S® Cycle's products are original equipment parts or that they are equivalent to the corresponding Harley-Davidson® part number shown.

## A. Removal of Existing Ignition Components

### 1. Ignition Module

- Locate the ignition module installed on your motorcycle. The ignition module can usually be found under the seat, a side cover, or in front of the engine on the frame. **See Picture 3.** Refer to the service manual for your motorcycle if you have trouble locating it.



Picture 3

- Remove the module mounting hardware and unplug the module **See Picture 4**. The plug is disconnected by simultaneously pressing the locking tabs on the connector and pulling it away from the module. Save the mounting hardware for installation of the S&S ignition module.



Picture 4

## 2. Existing Coil, VOES, and Cam Position Sensor

- If so equipped, remove the existing dual fire ignition coil. This is usually located on the left side near the upper motor mount, above the engine front rocker box, or to the left of the engine near the seat. Remove or insulate the "+" and module terminals in the existing harness with heat shrink.
- If so equipped, remove the existing vacuum operated electrical switch (VOES). This is located between the heads. Remove or insulate the terminals and connector in the existing harness with heat shrink.
- Normally, S&S V-Series engines with notched flywheels do not use the stock Cam Position Sensor. If your motorcycle is equipped with one, remove it, the rotor cup, and screw. Be sure to remove or insulate the wiring in the stock harness with heat shrink.

## B. S&S® System Installation



### WARNING

Be careful not to damage the front of the tank when raising or removing it.

Although it may not be necessary in some cases, removal of the gas tank is recommended for ease of installation of the Engine Temperature Sensor, the Knock Sensor Assembly, the Manifold Absolute Pressure (MAP) Sensor and to allow routing of the wiring harness. An alternative to complete tank removal: Loosen (do not remove) the bolt at the front of the tank and remove the mounting bolt(s) at the rear of the tank. The rear of the tank may then be raised slightly to allow enough room to install these components.

**NOTE:** Clearances are limited at the front of the tank. Use care not to damage any painted surfaces while handling tank.



Installing components without removing the fuel tank is a time saving suggestion only. If there is any reservation on the part of the installing mechanic about performing this installation with the fuel tank in place, refer to the appropriate OEM service manual for correct procedure for removing fuel tank and related components.

### 1. Manifold flange Cylinder Head Temperature Sensor Installation.

Some engines use a special intake flange bolt with an integral temperature sensor. **See Picture 5.**

- Remove the bolt from the front intake mounting flange.
- Install the Cylinder Head Temperature Sensor and washer in the front head intake mounting flange.
- Tighten to 6-10 ft.-lbs. (standard intake bolt torque).



Picture 5

### 2. Installation of the Knock Sensor Kit



**Knock Sensor must be mounted to the rear cylinder for correct operation.**

**Mounting the Knock Sensor on the front cylinder will provide an incorrect signal.**

Knock sensor mounting.

Top motor mount location.

- Remove rear motor mount bolt from rear cylinder head.
- Test fit Knock Sensor Mounting block to rear motor mount location using  $\frac{3}{8}$ " x 2" coarse thread bolt (k) and  $\frac{3}{8}$ " lockwasher (n). Test fit Knock Sensor to mounting block (i) using bolt (j) and lockwasher (m). **See Picture 6.**



**Carefully place fuel tank back into position to check Knock Sensor and mounting block clearance. Position the mounting block so that the Knock Sensor or mounting block does not contact the fuel petcock or any other part of the motorcycle. If the wiring harness or outer body of the Knock Sensor (black plastic portion) contacts the engine or any other part of the motorcycle, it could damage the Knock Sensor, or interfere with its ability to detect knock. Special care for rubber mounted motors must be given. View Knock Sensor while motor runs to make sure it has proper clearance.**

- After determining final position for Knock Sensor, remove mounting bolts and lockwashers, then re-install them on mounting block bolt (k), torque to 33 ft. lbs., and Loctite® Red 262 on knock sensor bolt (j), torque to 11 ft lbs.



**Hold knock sensor in position by hand only while torquing. Do NOT use pliers. Damage to knock sensor will occur.**



Picture 6

**NOTE:** Red Loctite® is not recommended for fasteners into aluminum.

### 3. Installation of the MAP Sensor

- Replace the existing VOES vacuum hose with the one provided. Trim the hose to a length that will locate the MAP Sensor so it does not interfere with the engine Temperature or Knock sensors, or motor mount hardware. A hose length in the 1 to 2 inch range is acceptable. If the vacuum fitting in the intake manifold is used for other equipment, the line maybe cut near the manifold, and the supplied tee may be used. The total line length from the manifold to the sensor should be kept less than 9 inches - shorter if practical.
- Remove the orange rubber seal at the end of the MAP Sensor with a pair of needle nose pliers.
- Attach the MAP Sensor to the hose. It is recommended to use wire ties around vacuum hose connections.

### 4. Installation of the Ignition Coil

- A single-fire coil may be installed in the location where the dual-fire coil was. It should have front and rear connections which go to the module and front and rear spark plug wire connections. Other single fire coils may be used by modifying the supplied harness.
- Do not use the motorcycle's existing coil harness - a coil harness is provided.
- Primary coil resistance should be in the range of 0.5 to 3 ohms.

### 5. Installation of the Crank Position Sensor

- Remove the two screws, crank position sensor hole cover plate, and gasket from the front, drive side of the engine crankcase near the oil filter.
- Install the Crank Position Sensor. Install the supplied  $\frac{1}{4}$ " bolt and torque to 8-10 ft.-lb. **See Picture 7**

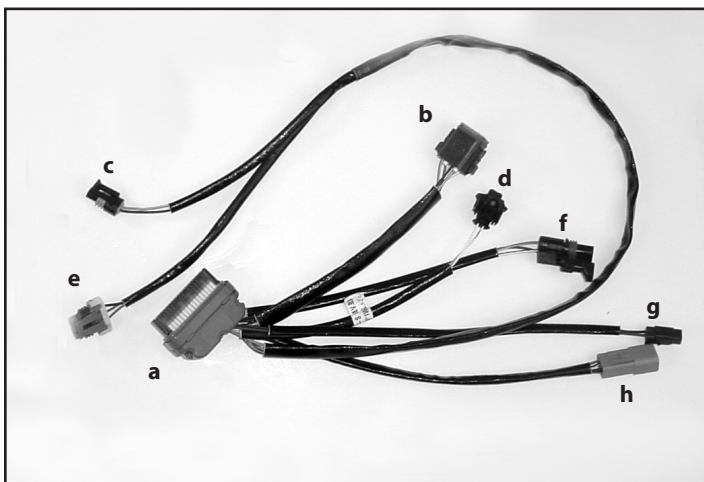


**Picture 7**

## 6. Installation of the IST Ignition Module and Wiring Harness Adapter:

The Wiring Harness Adapter (**See Picture 8**) is a one-piece assembly consisting of the following connectors:

- (a) IST Ignition Module Connector: 32-Socket, Gray (Delphi®/Packard®) - Connects to the S&S® Intelligent Spark Technology Ignition Module.
- (b) Motorcycle Main Harness Connector: 8-Socket Black (Deutsch) – Connects to the stock wiring harness in place of the stock module.
- (c) Head Temperature Sensor Connector: 2-Socket black (Delphi®/Packard®)
- (d) Knock Sensor Connector: 2-Socket black (Bosch)
- (e) MAP Sensor Connector: 3-Socket (Delphi®/Packard®)
- (f) Coil Harness Connector: 3-Socket black (Delphi®/Packard®)
- (g) Crank Position Sensor Connector: 2-Socket black (Deutsch)
- (h) Data Link Connector with Plug: 4-Pin gray (Deutsch)



**Picture 8**

**NOTE:** Locking tabs on each connector listed should produce a light click sound when properly assembled. Check each connection by lightly pulling on each half of the connector to insure that the locking tabs have properly seated.

The IST ignition module includes a hardware packet. The hardware is intended for spacing the module and the connector off of the mounting backplate. Washers are also included for the mounting screws. This hardware is only necessary on some models. The hardware packet includes the following spacers and washers:

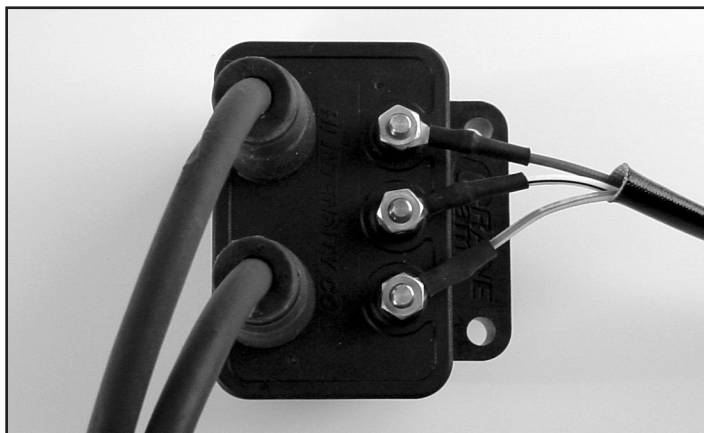
- .200" Spacers (2)
  - .060" Spacers (4)
  - .475" O.D. Washers (2)
  - .250 I.D. Lockwashers (2)
- a. Route the wiring harness along the bike frame to ensure that the Ignition Module Connector (a) (**See Picture 8, above**) reaches the Module mounting location.
  - b. Connect the Ignition Module Connector (a) (**See Picture 8**) to the Module.
  - c. Install the module using the stock mounting hardware and the S&S® hardware (if necessary) included with the module.
  - d. Plug the 8-pin black plug from the stock wiring harness into the black 8-socket Motorcycle Main Harness Connector (b) on the S&S harness. **See Picture 8.** (If the motorcycle plug has only seven pins see step B-7.)
  - e. The portion of the harness that connects to the Head Temperature Sensor, MAP Sensor, and the Knock Sensor should be routed along with the stock wiring under the gas tank.
  - f. Use the provided wire ties to secure this portion of the harness to the motorcycle frame or a portion of the existing harness. Do not allow the harness to touch cylinder or head fins which get very hot.
  - g. Connect the Head Temperature Connector (c) See Picture 8, Knock Sensor Connector (d) (**See Picture 8, previous page**) and MAP Sensor (e) (**See Picture 8**) to the corresponding sensors.

**NOTE:** If the tank is removed or raised, temporarily replace it to insure clearance for the Engine Temperature, MAP, and Knock Sensor portions of the harness. Reroute any wires that may be damaged by installing the tank.

- h. Route the coil harness segment (f) (**See Picture 8**) on the S&S harness to the coil. The table shows the wire color codes that should be matched to the ignition coil. Install each ring terminal under the corresponding screw. Do not allow the screws or ring terminals to touch each other or any other metal. **See Picture 9.**
- i. Route the crank position sensor harness segment (g) (**See Picture 8**) on the S&S harness to the Crank Position Sensor and attach the connector. Avoid routing this wire segment near coils or spark plug wires.



- j. Locate Data Link harness segment (h) (**See Picture 8**) on the S&S harness so that it may be easily accessed to check any fault codes that may occur. **See Picture 10.**
- k. Permanently reinstall tank, reconnect battery (positive cable first) and any other portions of the motorcycle that have been removed or disconnected.



**Picture 9**



**Picture 10**

#### 7. Motorcycles with a 7-pin ignition connector instead of an 8-pin connector.

Some Harley-Davidson® motorcycles manufactured between the years 1991 and 1994 had a 7-pin connector in place of the 8-pin connector. A 7-to-8-pin adapter is available through aftermarket sources such as Drag Specialties (part #: DS-243068). It is a universal adapter that allows many different ignition systems (including the S&S IST ignition) to work on motorcycles with a 7-pin connector. If the IST installation is on a motorcycle with a 7-pin connector, this adapter can be purchased separately.

**NOTE:** If using an 7-to-8-pin adapter plug, the IST power harness adapter is not used.

#### 8. IST power harness adapter

The IST wiring harness adapter allows installation of the IST ignition on engines in custom, carbureted applications.

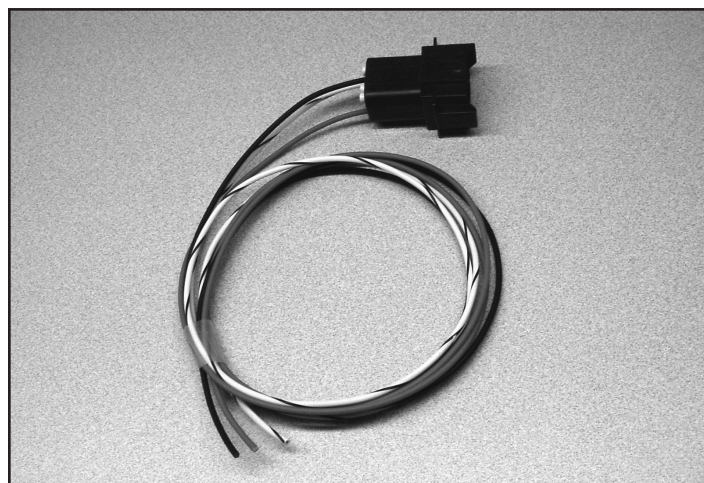
#### NOTES:

- If the IST Ignition will be installed on an engine in a motorcycle with an existing 8-pin ignition connector, the IST main harness connects to it, and the power harness is not used.
- If the motorcycle has an existing connector for an ignition rotor sender, it is not used. V-Series engines with flywheels machined for ignition pick-up use crank position sender instead of nosecone mounted ignition pick-up.

#### 9. IST power harness adapter connections

The power harness adapter (55-1540) is used when installing the IST ignition on an engine used in a custom application. It has an 8-pin connector that plugs into the matching connector of the Main IST harness. The power harness 8-pin connector has three wires coming out of it: chassis ground, switched ignition power (battery +), and tachometer signal. Only two connections to the motorcycle are required for the ignition system to operate: chassis ground, and switched ignition power (battery +). The tachometer trigger wire is optional. **See Picture 11 and Table 1.**

- a. Connect the power harness into IST ignition system, making any corrections in wiring lengths by cutting and splicing using supplied connectors.



**Picture 11**

Wire Color		Coil Terminal Designation
Main	Stripe	
White	Black	Battery "+"
Yellow	Blue	Rear Cylinder
Blue	Orange	Front Cylinder

**Table 1**

#### NOTES:

- Installer to source appropriate wire for any additions. use supplied shrink tube and wire cover to insulate and protect wires and connections.
- Stagger any splices in a wire harness bundle. This reduces the chance of wear between adjacent splices. It also makes it easier to pass splices wire through the harness sleeving.
- Crimp connections are preferred over soldered connections. Soldering causes stress concentrations at the wire to solder joint. Soldered connections are prone to break in high vibration environments.
- In most cases, the switched ignition power connection is made in the wire leading from the ignition switch to the coil.
- If not using a tach, the tach signal wire may be removed from the connector.

### C. Initial Starting Procedure:

Because the S&S® Intelligent Spark Technology Ignition System is designed to learn the specific engine/motorcycle configuration it is being used for, the following initial starting procedure must be followed after installing the system for the first time. This procedure needs to be followed only once. After that, the motorcycle can be started and ridden as usual.

**NOTE: IMPORTANT!** In some applications, a Vehicle Speed Signal (VSS) or Camshaft Position Sensor signal is routed to Pin 21 on the IST module.

In these instances, it is important that the ignition has learned what type of signal is connected. It is important that the wheels remain motionless while the key is on prior to completing this procedure.

Until the ignition has learned what type of signal is present, it could fire the plugs based on wheel movement if installed on a motorcycle with the VSS routed to the IST.

In the application described in this instruction sheet, neither signal is used on this input. So, this step is not relevant. If you are installing the IST module only and not completely familiar with the rest of the wiring, it is recommended that you perform this procedure:

To insure proper learning of the type of signal used in your application:

- a. Be sure to start the motorcycle in neutral and on a flat/level surface.
- b. Allow the engine to run for a minimum of 10 seconds before turning the key off.

This procedure only needs to be performed once, but it should be repeated if the IST module is installed in another motorcycle.

### D. Troubleshooting:

#### Basic Troubleshooting

Below are some suggestions if any problems are encountered with the IST Ignition Module.

#### 1. Problem: Engine cranks but will not start.

Possible solutions:

- a. Check that the gas tank is full and that the fuel petcock is turned on.
- b. Check that coil wires (plug and harness) have been reinstalled properly.
- c. Check that all connections are complete on the Wiring Harness Adapter.

#### 2. Problem: Key power-on switch does not seem to work.

Possible solutions:

- a. Check for blown fuses and/or tripped circuit breakers.
- b. Check that the battery has been properly reconnected.
- c. Check that the connectors are connected correctly.

### Advanced Troubleshooting

The S&S® ignition system features advanced self-diagnostic capabilities. The unit detects operational faults, and stores them as codes in memory. There are two methods of retrieving trouble codes stored in memory. First, by counting Flash Codes generated by the Check Engine light (see note) and second, by using the S&S IST Guardian™ Diagnostic System (P/N 55-5075) connected to the data link connector of the S&S Ignition Wiring Harness. Flash codes allow the mechanic to access the trouble code information without the use of the Guardian system, but are less detailed and cannot be cleared immediately after correcting the issue that caused the code.

#### NOTES:

- Motorcycles that have an existing check engine light will use it to read stored codes. For motorcycles without an OEM check engine light, there is an LED on the face of the ignition module that functions as a check engine light, and is used to read stored codes.
- Trouble codes are stored in memory for as long as the fault exists, and for 50 on/off cycles of the key after a fault is corrected. The S&S IST Guardian™ Diagnostic System (P/N 55-5075) has code clearing capability, and is the only way to clear trouble codes immediately after a fault has been corrected. If a fault still exists, a new trouble code will be generated.
- Before purchasing the S&S IST Guardian™ Diagnostic System (P/N 55-5075) note that the software is only compatible with Windows® 2000/XP/Vista/7 32-bit systems. It will not work on 64-bit operating systems.
- Also, be aware that the Guardian system is only compatible with the S&S IST ignition module. It will not work with stock Harley-Davidson® or other aftermarket modules.

#### Overview of check engine light operation.

Initial start sequence.

The check engine light will flash in one of the three ways listed below each time the key is turned on, and the off/run switch is set to run.

- If no faults are detected, the IST ignition will turn the check engine light on for 4 seconds, then off.
- If a fault is present at that time, the check engine light will turn on for four seconds, then turn off for four seconds, then turn on continuously.
- If a fault has occurred and been corrected within the past 50 key on/off cycles, the check engine light will turn on for four seconds, then off for four seconds, then on for eight seconds, then off.

Retrieving and displaying codes using the Check Engine light.

- a. Turn key and off/run switch to off.
- b. Remove seat or side cover to expose the datalink connector, located near the ignition module.
- c. Remove rubber plug from datalink connector.
- d. Connect pins 1 and 2 of the datalink connector with a jumper wire. Pins have to remain jumpered together during the code retrieval process.



## CAUTION

See Picture 12 for pin locations. Do not cross any other pins except pins 1 & 2.

- e. Turn key to on Set off/run switch to run, but do not start engine.
- f. The check engine light will flash through its initial start sequence, as described above.
- g. After the initial sequence of flashes, stored trouble codes will then be sent out as a series of flashes. Trouble codes are stored as two digit numbers. The first digit of the trouble code is equal to the number of times the light flashes. There is then a 1.2 second pause, then the second digit of the trouble code is flashed, the second digit being equal to the number of times the light flashes. After three seconds, if additional codes are stored, they will flash in the same manner as the first, until all codes have been displayed, then the sequence will repeat continuously. If only one code is stored, it will repeat continuously.

**EXAMPLE:** After flashing the initial start sequence (as described above) there will be a pause, then flash, flash, flash, flash, (1.2 second pause) flash. (3 second pause) sequence repeats. This indicates code 41, meaning there is a problem with the crank position sensor.

**NOTE:** See chart for definitions of fault codes supported by the S&S® ignition module.

- h. After retrieving codes, turn ignition key and run switch to off.
- i. Remove jumper wire and replace datalink connector plug.

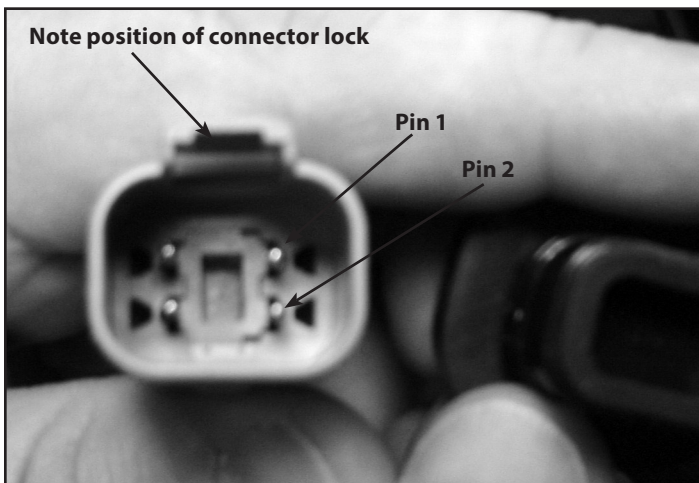
### Retrieving codes using the S&S IST Guardian™ Diagnostic System (P/N 55-5075)

The Guardian system offers a more detailed description of the trouble codes than the Flash Code method. It also offers a way for trouble codes to be cleared immediately after a fault has been corrected rather than the 50 on/off cycles of the key that are normally required.

For more details, visit [www.sscycle.com/tech-info/software/guardian/](http://www.sscycle.com/tech-info/software/guardian/)

### NOTES:

- Before purchasing the S&S IST Guardian™ Diagnostic System (P/N 55-5075) note that the software is only compatible with Windows® 2000/XP/Vista/7 32-bit systems. It will not work on 64-bit operating systems.
- Also, be aware that the Guardian system is only compatible with the S&S IST ignition module. It will not work with stock Harley-Davidson® or other aftermarket modules.



Picture 12



Check Engine Lamp Code	Diagnostic Test Condition (Guardian Only)	Fault Condition
12	P0107	MAP sensor open
12	P0108	MAP sensor high
12	P0109	MAP sensor intermittent
14	P0117	Engine Temp sensor voltage low
14	P0118	Engine Temp sensor voltage open
14	P0119	Engine Temp sensor voltage intermittent
71	P0324	Knock sensor low input
72	P0327	Knock sensor high input
41	P0335	Crank Position sensor intermittent
41	P0336	Crank Position sensor synch error
42	P0340	Cam sensor failure
16	P0562	Battery voltage low
16	P0563	Battery voltage high
54	P0603	ECM EEPROM error
24	P1351	Front ignition coil open
24	P1352	Front ignition coil high
25	P1354	Rear ignition coil open
25	P1355	Rear ignition coil high
58	P1607	Ignition Module Board temp low
58	P1608	Ignition Module Board temp high

# WITH FLYWHEEL MACHINED FOR CRANKTRIGGER INSTALLATION KIT

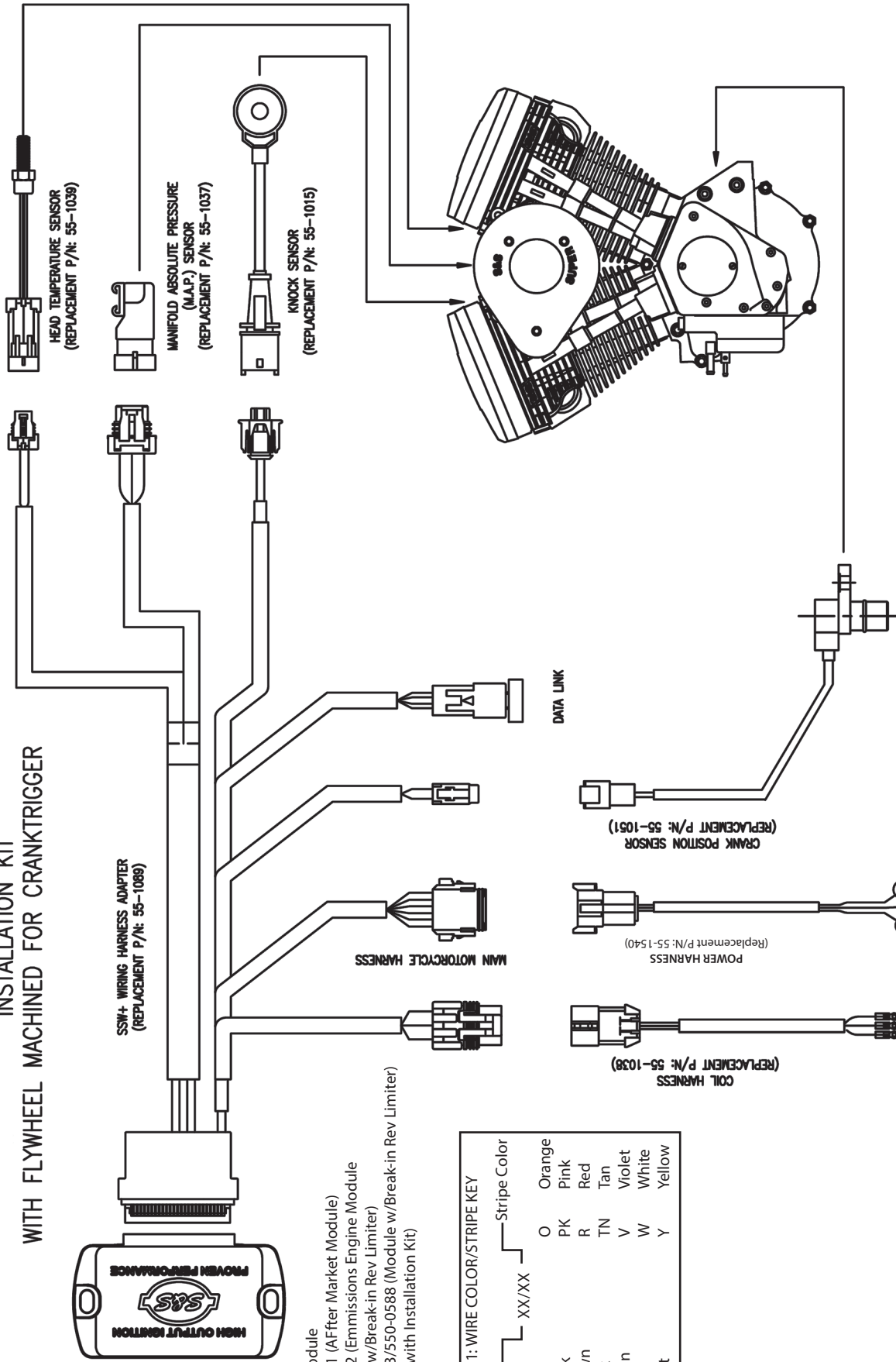


TABLE 1: WIRE COLOR/STRIPE KEY

Wire Color	XX/XX	Stripe Color
BE	Blue	O
BK	Black	PK
BN	Brown	R
DK	Dark	TN
GN	Green	V
GY	Gray	W
LT	Light	Y
		Orange
		Pink
		Red
		Tan
		Violet
		White
		Yellow

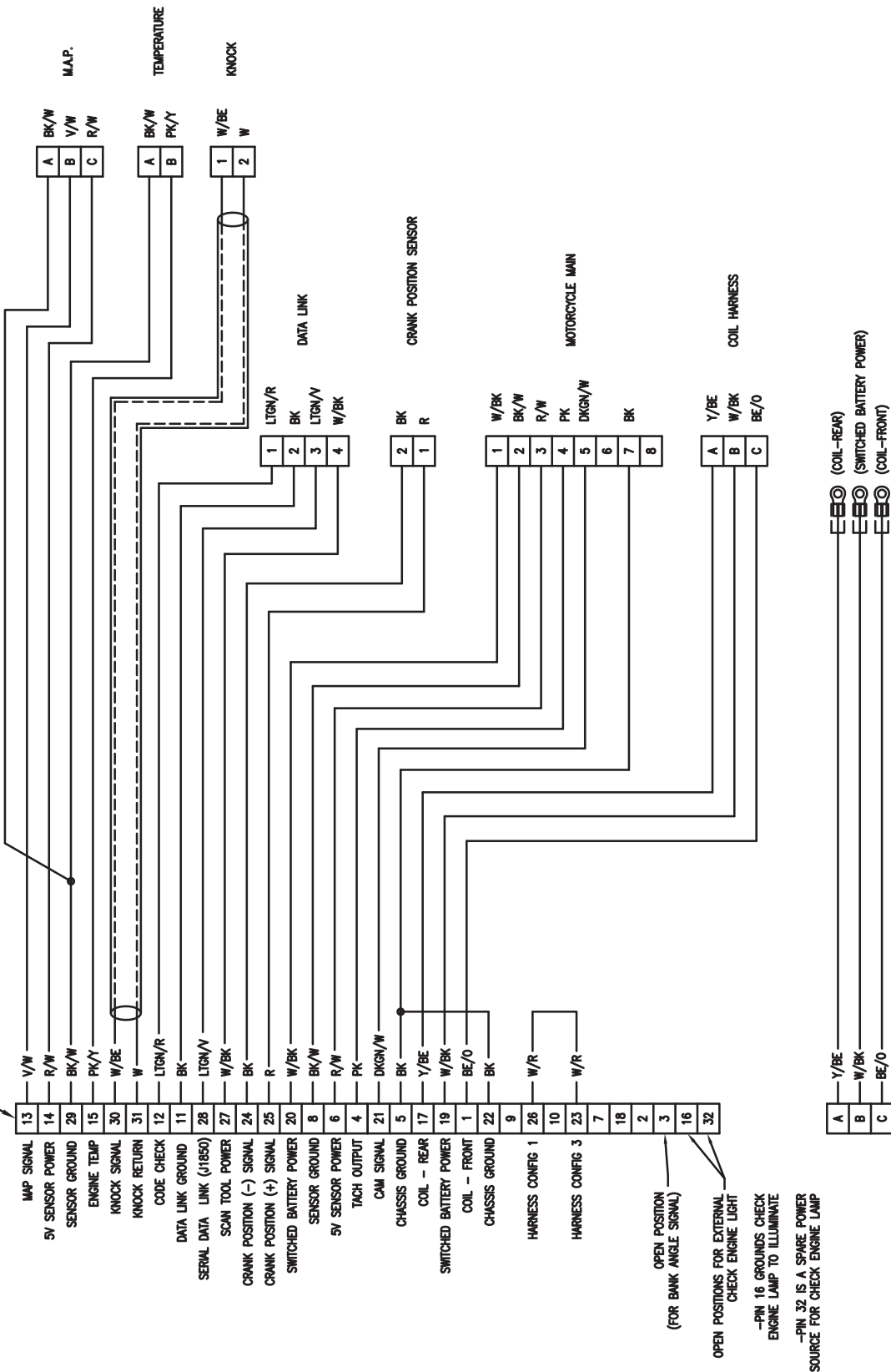
1. BE/O = COIL (-) FRONT  
2. W/BK = SWITCHED BATTERY POWER  
3. Y/BE = COIL (-) REAR
4. W/BK = SWITCHED BATTERY POWER  
5. PK = TACH  
6. BK = CHASSIS GROUND

# IGNITION HARNESS

P/N 55-1089

S&S 4" & 3-5/8" BORE ENGINES  
W/NOTCHED FLYWHEELS

1ST PINOUTS



INST-51-1167

COIL HARNESS  
P/N 55-1038

Wire Color	XX/	XX	Stripe Color
BE	Blue	O	Orange
BK	Black	PK	Pink
BN	Brown	R	Red
DK	Dark	TN	Tan
GN	Green	V	Violet
GY	Gray	W	White
LT	Light	Y	Yellow