

# Street & Performance



**LS-2 / LS-3 / LS-7**

**DBW Wiring Harness**

**58 Tooth Reluctor Ring**

**4L60E - 4L65E - 4L70E**

**6L80E \ 6 Speed Automatic**

**INSTRUCTIONS & SUPPLEMENTAL INFORMATION**



# Street & Performance

#1 Hot Rod Lane ~ Mena, AR 71953

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## LS-2 / LS-3 / LS-7 Harness Installation Instructions

The following instructions are intended as an aid to assist in harness installation. More in depth information can be obtained by ordering the applicable GM service manual (in three volumes). Troubleshooting techniques and diagnosis are beyond the scope of these instructions. Diagnostic flow charts and troubleshooting advice are included in the GM service manual.

The general design of the harness allows enough length for computer mounting in the dash & kick panel or underhood area. Special harness lengths can be provided on a custom order basis.

All harness connections are clearly tagged. If for some reason a tag has been removed, consult the LS-1 Harness layout. **Please identify all tags prior to beginning your installation.**

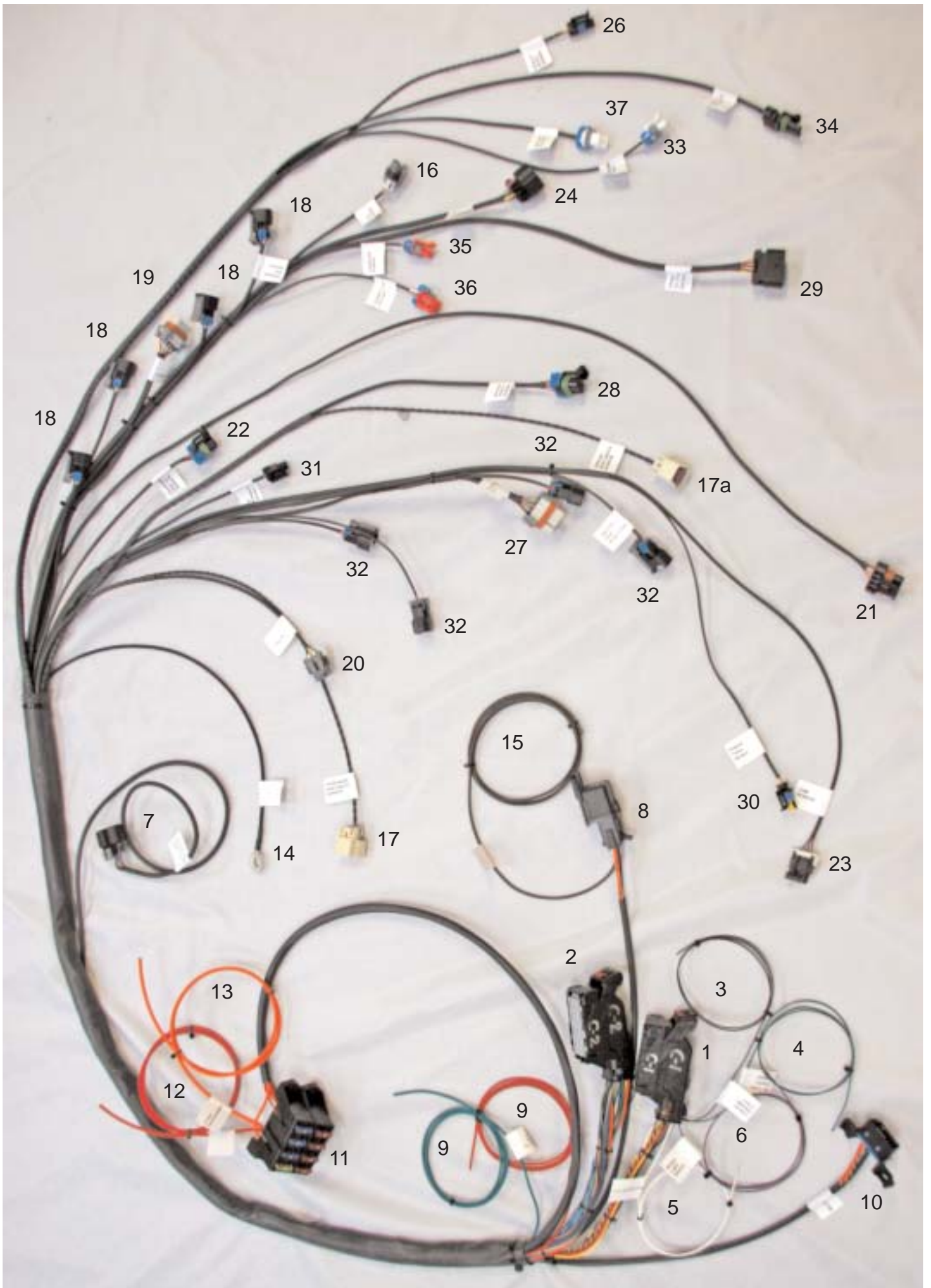
The following information will briefly discuss the individual harness connections:

1. **Black Computer Plug(with black cap) C1 on computer**
2. **Gray Computer (with black cap) C2 on computer**
3. **Check Engine Light Wire Ground (dark brown) (from Black C1 plug)-** For the use of a check engine light. Any 12V automotive light will work. It can be mounted as a permanent fixture in the dash, or used as a diagnostic aid only. The wire is completes the connection to your 12 volt hot wire when the key in in start or run. The brown wire is the ground for the cuircuit.
4. **Electric Speedometer Wire (green) (from C1 plug)-** 4000 pulse to cruise or electric speedometer.
5. **Tach Wire (if desired) (white) (from C1 plug)-** Feeds pulse to tachometer. If Tach fails to operate on this pulse, contact Abbott Enterprises, 800-643-5973 for alternate pulse signal simulator.
6. **Brake Light Switch (Purple wire) (from C1 Plug)**
7. **Accelerator Petal Postion (from 2/3 down main body of harness)**
8. **Fuel Pump Relay**
9. **Backup Light (one red, one green wire)**
10. **Diagnostic Link Plug (ALDL) -** Automatic Line Diagnostic Link is used in conjunction with the check engine light and testing or troubleshooting.
11. **Fuse Panel**
12. **Ignition Switch Hot Wire (red)-** The single ignition wire must be connected to provide 12V with the key in START (crank) and RUN position. 12V is then distributed through the fuse block to the computer (ECM), injectors and coil. The fuse block has six (6) 10 amp and one (1) 20 amp fuses. Each injector bank is fused as is the computer, battery and coil.
13. **Battery Wire (orange) -** Connects to main post on positive side of starter. If you're using a battery disconnect, this lead must go to the hot side of the disconnect.
14. **Engine Ground Wire (black wire w/soldered aluminum grommet) -** The ground system is critical for proper operation. A good battery to motor, and motor to harness ground is essential  
**Ground Battery to Motor or Trans (a must)!**  
**Ground Motor to Frame and Motor to Body!**
15. **Hot Feed Electric Fuel Pump Wire (brown) -** Provides 12V to the fuel pump. A fuel pump relay is also provided with the harness and is energized/de-energized by the ECM.
16. **MAP Sensor Plug (grey plug w/white cap and purple waterproof rubber seal) -** The Manifold Absolute Pressure (MAP) measures the change in the intake manifold pressure from engine load and speed changes and sends proportional adjustments to the computer. Connect the MAP sensor electronic connector from the harness to the MAP sensor lead at the rear of the intake manifold. The MAP sensor lead will already be on most new & used engines.
17. **Knock Sensor (Passenger side) Twisted pair shrink wrapped**
- 17a. **Knock Sensor (Driver side) Twisted pair shrink wrapped**
18. **Passenger Side Injectors (4 plugs w/purple, blue, yellow, green & red common wires) -** Lay the harness up over the intake with the passenger side and driver side injector and coil connectors on each side of the engine. Connect the injector plugs into the fuel injection. The longest plug to the farthest point and so forth. This will help hold the harness in place.
19. **Passenger Coil (Gray Plug w/tan waterproof rubber seal ) -** Connect passenger side coils into injector coil packs.
20. **Crank Sensor Plug - (Gray Plug with purple seal and white bracket)** The crankshaft position sensor (CPS) is located in the lower front of the engine.
21. **Alternator**

22. **Passenger Front O2 Plug (black plug w/blue bracket)** - Oxygen Sensor
23. **CAM Sensor Plug (black connector w/white cap and purple waterproof rubber seal)** - The camshaft position sensor (CPS) must be installed prior to installing the intake manifold. The camshaft position sensor is located on the timing cover behind the water pump near the camshaft sprocket. As the camshaft sprocket turns, a magnet activates the Hall effect switch in the camshaft position sensor. The plug for harness installation is at the rear of the intake manifold. The CMP Sensor signal is created as piston #1 is approximately 25 degrees after top dead center (TDC) on the power stroke.
24. **Throttle Position Sensor**
26. **Vehicle Speed Sensor Plug (VSS) (black connector w/lite blue waterproof rubber seal)** - The vehicle speed sensor is a pulse counter type input that informs the PCM how fast the vehicle is being driven. The VSS system uses an inductive sensor mounted in the tail housing of the transmission and a toothed reluctor wheel on the tail shaft. As the reluctor rotates, the teeth alternately interfere with the magnetic field of the sensor creating an induced voltage pulse.
27. **Driver Coil (Gray Plug w/tan waterproof rubber seal )** - Connect driver side coils into injector coil packs.
28. **Driver Side O2 Sensor**
29. **Mass Air Flow Plug (MAF) (Black plug with purple inside and 5 connections)** Take care when handling the MAF. Do not touch the sensing elements or allow anything to come in contact with them. The PCM converts the mass air flow sensor input signal into grams per second, indicating the amount of air flow entering the engine.
30. **Engine Temp Sensor Plug (black connector w/blue waterproof rubber seal and yellow tip)** - Senses engine coolant temperatures during all operating conditions and signals electric fan operations. Located front head exhaust port.
31. **Oil Pressure Sensor**
32. **Driver Side Injectors (4 plugs w/black, red, white, red & red common wires)** Lay the harness up over the intake with the passenger side and driver side injector and coil connectors on each side of the engine. Connect the injector plugs into the fuel injection. The longest plug to the farthest point and so forth. This will help hold the harness in place.
33. **Reverse Inhibit Solenoid** (White plug w/gray seal and blue cap, red & green wires)
34. **Backup lamp feed switch** (black plug, green seal)(green and black wire)
35. **Canister Purge** (Red Plug-red wire w/white stripe and white wire)
36. **Canister Purge Vent Valve** (Red Plug-red wire w/white stripe and green wire)
37. **Skip Shift Solenoid** (White plug w/gray seal and blue cap, red & gray wires)

NOTES:

- \*LS-2 58 tooth reluctor ring use a 5-pin mass air flow
- \*LS-3 Has a differant map sensor than the LS-2 & LS-7  
15865791(credit card style) for the 25835421 computer
- \*09 LS-3 use computer 12612384 with the \*\*\*\*\* mass air flow
- \*06-07 LS-7 use the 12597121 computer
- \*08-09 LS-7 use the 12612184 with the 12565791 mass air flow
- \*09 LS-9 use the 12607096 or 12625453 computer





S&P Stainless Steel Fuel Line to passenger side frame rail.

Large vacuum port for power brakes and small port for accessories



Crank sensor behind starter

Passenger side knock sensor

Driver side master coil plug

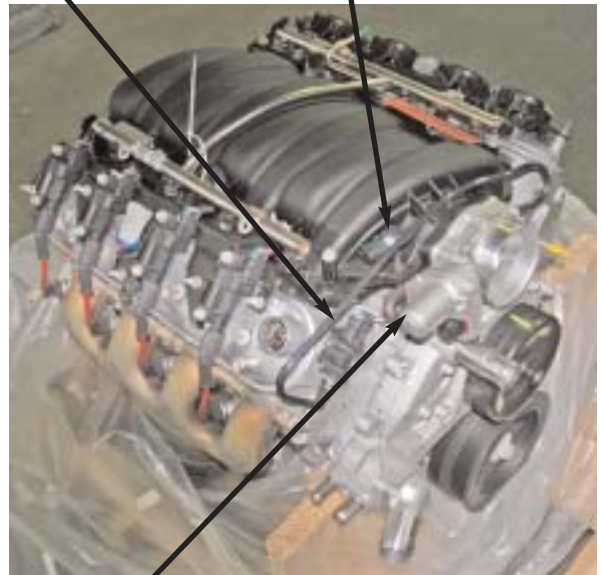
Quick disconnect 3/8 fuel inlet.



Driver side knock sensor

Canister purge and canister purge vent valve

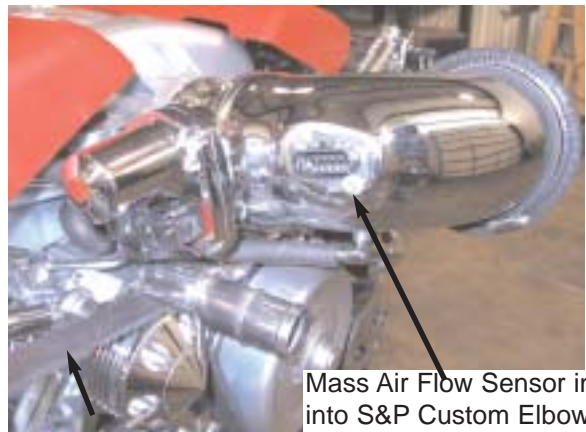
MAP sensor



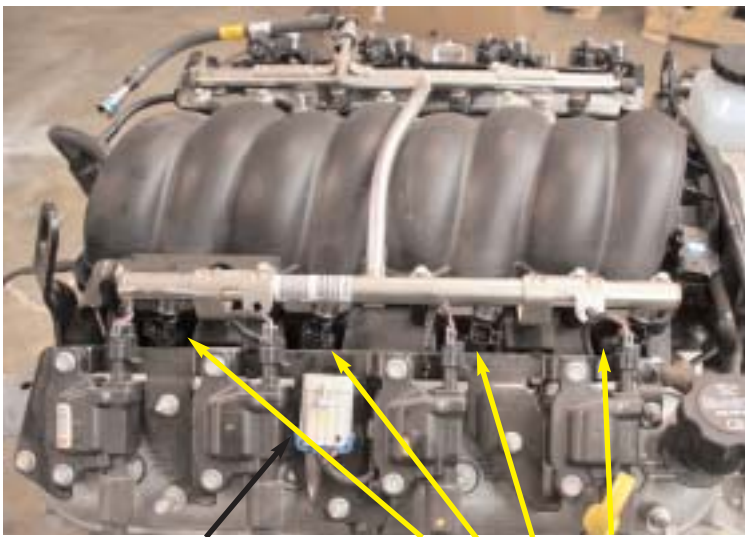
24. Throttle Actuator Control Module



Cam Sensor



Mass Air Flow Sensor installed into S&P Custom Elbow



Passenger side master coil plug  
 Injector plug location both sides



Engine Temp Sensor  
 Driver Side Knock Sensor

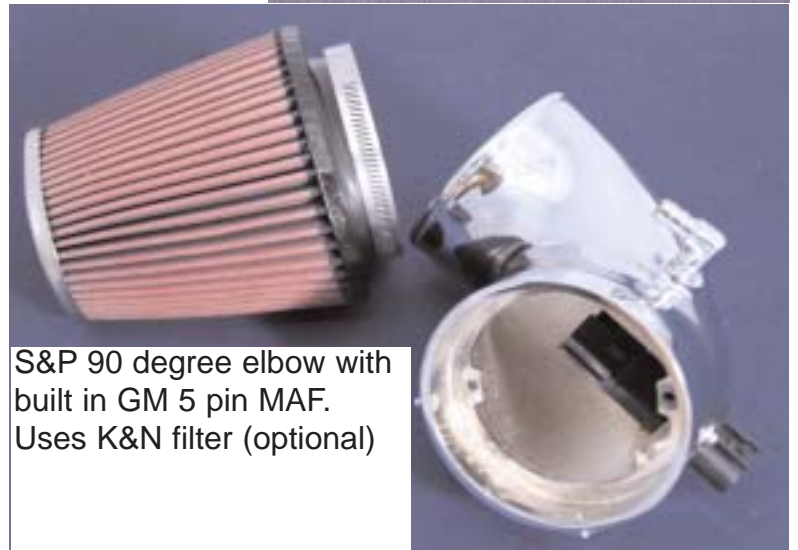


S&P Air Cleaner with built in 5 pin MAF

GM 5 Pin MAF



S&P has several bracket configurations to fit your vehicles needs. Call us for your specific installation.



S&P 90 degree elbow with built in GM 5 pin MAF. Uses K&N filter (optional)



**LS1 single fuel line Filter/Regulator kit**  
 Uses 99-Up Vette fuel filter, allows the use of one line to engine. Filter will return excess fuel to tank.

- Filter Kit.
- Filter
- 3/8 S.S Compression to AN-6 Fitting
- 5/16 S.S Compression to AN-6 Fitting
- S.S Quick Disconnect to Exit Adaptor to AN-6 fitting

**When getting the donor engine and transmission, get the MASS AIR FLOW, COMPUTER, TAC MODULE, GAS PEDAL, OXYGEN SENSORS. S&P keeps a complete line of new and used accessories.**



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479-394-5711 www.hotrodlane.cc

<b>DTC</b>	<b>ALDL Diagnostic Description</b>	<b>Domestic</b>	<b>Illuminate MIL</b>
P0101	Mass Air Flow System Performance	A	Yes
P0102	MAF Sensor Circuit Low Frequency	A	Yes
P0103	MAF Sensor Circuit High Frequency	A	Yes
P0107	MAP Sensor Circuit Low Voltage	B	Yes
P0108	MAP Sensor Circuit High Voltage	B	Yes
P0112	IAT Sensor Circuit Low Voltage	B	Yes
P0113	IAT Sensor Circuit High Voltage	B	Yes
P0117	ECT Sensor Circuit Low Voltage	B	Yes
P0118	ECT Sensor Circuit High Voltage	B	Yes
P0121	TP Sensor Performance	A	Yes
P0122	TP Sensor Circuit Low Voltage	A	Yes
P0123	TP Sensor Circuit High Voltage	A	Yes
P0125	ECT Excessive Time to Closed Loop	A	Yes
P0131	HO2S Circuit Low Voltage Bank 1 Sensor 1	B	Yes
P0132	HO2S Circuit High Voltage Bank 1 Sensor 1	B	Yes
P0133	HO2S Circuit Slow Response Bank 1 Sensor 1	B	Yes
P0134	HO2S CKT Insufficient Activity Bank 1 Sensor 1	B	Yes
P0135	HO2S Heater Circuit Bank 1 Sensor 1	B	Yes
P0143	HO2S Circuit Low Voltage Bank 1 Sensor 3 (post converter)	B	Yes
P0144	HO2S Circuit High Voltage Bank 1 Sensor # (post converter)	B	Yes
P0146	HO2S Circuit Insufficient Activity Bank 1 Sensor 3 (post converter)	B	Yes
P0147	HO2S Heater Circuit Bank 1 Sensor 3 (post converter)	B	Yes
P0151	HO2S Circuit Low Voltage Bank 2 Sensor 1	B	Yes
P0152	HO2S Circuit High Voltage Bank 2 Sensor 1	B	Yes
P0153	HO2S Circuit Slow Response Bank 2 Sensor 1	B	Yes
P0154	HO2S Circuit Insufficient Activity Bank 2 Sensor 1	B	Yes
P0155	HO2S Heater Circuit Bank 2 Sensor 1	B	Yes
P0171	Fuel Trim System Lean Bank 1	B	Yes
P0172	Fuel Trim System Rich Bank 1	B	Yes
P0174	Fuel Trim System Lean Bank 2	B	Yes
P0175	Fuel Trim System Rich Bank 2	B	Yes
P0201	Injector 1 Control Circuit	B	Yes
P0202	Injector 2 Control Circuit	B	Yes
P0203	Injector 3 Control Circuit	B	Yes
P0204	Injector 4 Control Circuit	B	Yes
P0205	Injector 5 Control Circuit	B	Yes
P0206	Injector 6 Control Circuit	B	Yes
P0300	Engine Misfire Detected	B	Yes
P0325	Knock Sensor System	D	Yes
P0327	Knock Sensor Circuit Bank 1	D	No
P0332	Knock Sensor Circuit Bank 2	D	No
P0336	18x Reference Signal Circuit	B	Yes
P0341	CMP Sensor Circuit Performance	B	Yes
P0401	EGR System Flow Insufficient	A	Yes
P0403	EGR Solenoid Control Circuit	B	Yes
P0404	EGR System Performance	B	Yes
P0405	EGR Pintle Position Circuit Low Voltage	B	Yes
P0420	TWC System Low Efficiency	A	Yes
P0440	EVAP System	A	Yes
P0442	EVAP Control System Small Leak Detected	A	Yes
P0446	EVAP Canister Vent Blocked	A	Yes
P0452	Fuel Tank Pressure Sensor Circuit Low Voltage	B	Yes
P0453	Fuel Tank Pressure Sensor Circuit High Voltage	B	Yes
P0500	Vehicle Speed Sensor Circuit	B	Yes
P0506	Idle Control System Low RPM	B	Yes
P0507	Idle Control System High RPM	B	Yes
P0530	A/C Refrigerant Pressure Sensor Circuit	D	No
P0560	System Voltage	D	No
P0601	PCM Memory	B	Yes
P0602	PCM Not Programmed	B	Yes
P0704	Clutch Anticipate Switch Circuit	D	No
P0705	Trans Range Switch Circuit	D	No
P0706	Trans Range Switch Performance	D	No
P0711	Transaxle Fluid Temperature (TFT) Sensor Circuit Performance	D	No
	Refer to 4:60-E Automatic Transmission Diagnosis		
P0712	Transaxle Fluid Temperature (TFT) Sensor Circuit - Low Signal	D	No
	Refer to 4:60-E Automatic Transmission Diagnosis		

P0713	Transaxle Fluid Temperature (TFT) Sensor Circuit - High Signal Refer to <i>4L60E Automatic Transmission Diagnosis</i>	D	No
P0716	Automatic Transmission Input (Shaft) Speed Sensor Circuit Performance Refer to <i>4L60E Automatic Transmission Diagnosis</i>	B	Yes
P7017	Automatic Transmission Input (Shaft) Speed Sensor No Input Refer to <i>4L60E Automatic Transmission Diagnosis</i>	B	Yes
P0719	Brake Switch Circuit Low Refer to <i>4L60E Automatic Transmission Diagnosis</i>	D	No
P0724	Brake Switch Circuit High Refer to <i>4L60E Automatic Transmission Diagnosis</i>	D	No
P0730	Incorrect Gear Ratio - Refer to <i>4L60E Automatic Transmission Diagnosis</i>	D	No
P0741	Torque Converter Clutch System Stuck Off Refer to <i>4L60E Automatic Transmission Diagnosis</i>	B	Yes
P0742	Torque Converter Clutch System Stuck On Refer to <i>4L60E Automatic Transmission Diagnosis</i>	A	Yes
P0748	Pressure Control Solenoid Valve Circuit Malfunction Refer to <i>4L60E Automatic Transmission Diagnosis</i>	D	Yes
P0751	Shift Solenoid 1 - Performance/Stuck Off Refer to <i>4L60E Automatic Transmission Diagnosis</i>	B	Yes
P0753	Shift Solenoid 1 - Electrical Refer to <i>4L60E Automatic Transmission Diagnosis</i>	A	Yes
P0756	Shift Solenoid 2 - Performance/Stuck On Refer to <i>4L60E Automatic Transmission Diagnosis</i>	A	Yes
P0758	Shift Solenoid 2 - Electrical Refer to <i>4L60E Automatic Transmission Diagnosis</i>	A	Yes
P1106	MAP Sensor CKT Intermittent High Voltage	D	No
P1107	MAP Sensor CKT Intermittent Low Voltage	D	No
P1111	IAT Sensor CKT Intermittent High Voltage	D	No
P1112	IAT Sensor KCKT Intermittent Low Voltage	D	No
P1114	ECT Sensor CKT Intermittent Low Voltage	D	No
P1115	ECT Sensor CKT Intermittent High Voltage	D	No
P1121	TP Sensor CKT Intermittent High Voltage	D	No
P1122	TP Sensor CKT Intermittent Low Voltage	D	No
P1133	HO2S Insufficient Switching Bank 1 Sensor 1	B	Yes
P1134	HO2S Transition Time Ratio Bank 1 Sensor 1	B	Yes
P1153	HO2S Insufficient Switching Bank 2 Sensor 1	B	Yes
P1154	HO2S Transition Time Ratio Bank 2 Sensor 1	B	Yes
P1336	CKP System Variation Not Learned	A	Yes
P1351	IC Circuit Open	B	Yes
P1352	Bypass Circuit Open	B	Yes
P1361	IC Circuit Not Toggling	B	Yes
P1362	Bypass Circuit Shorted	B	Yes
P1374	3X Reference Circuit	B	Yes
P1380	EBCM DTC Rough Data Unstable	D	No
P1381	Misfire Detected No EBCM/PCM Serial Data	D	No
P1404	EGR Valve Closed Pintle Position	B	Yes
P1441	EVAP System Flow During Non-Purge	B	Yes
P1554	Cruise Control Status Circuit	D	No
P1626	Theft Deterrent System Fuel Enable CKT	D	No
P1629	Theft Deterrent Crank Signal Malfunction	D	No
P1635	5 Volt Reference (A) Circuit	B	Yes
P1639	5 Volt Reference (B) Circuit	B	yes
P1641	A/C Relay Control Circuit	D	No
P1651	Fan 1 Relay Control Circuit	B	Yes
P1652	Fan 2 & 3 Relay Control Circuit	B	Yes
P1653	Fuel Level Output Control Circuit	D	No
P1662	Cruise Control Inhibit Control Circuit	D	No
P1663	Generator Lamp Control Circuit	D	No
P1665	EVAP Vent Solenoid Control Circuit	B	Yes
P1671	MIL Control Circuit	D	No
P1672	Low Engine Oil Level Lamp Control Circuit	D	No
P1676	EVAP Canister Purge Solenoid Control CKT	B	Yes
P1810	Auto Transmission Fluid Pressure Manual Valve Position Switch Malfunction Refer to <i>4L60E Automatic Transmission Diagnosis</i>	B	Yes
P1811	Maximum Adapt and Long Shift Refer to <i>4L60E Automatic Transmission Diagnosis</i>	D	No
P1860	Torque Converter Clutch PWM Solenoid Circuit Refer to <i>4L60E Automatic Transmission Diagnosis</i>	A	Yes
P1887	TCC Release Switch Malfunction Refer to <i>4L60E Automatic Transmission Diagnosis</i>	B	Yes

# Common Installation Questions;

**Q. Is it important to follow any particular order when installing the harness?**

A. Yes, Starting at the engine intake manifold, installing the injectors and coils helps hold the harness in place while completing your installation. The order of installation of the non-engine connectors depends upon your application. (Refer to page 3)

**Q. What happens if I have a short?**

A. The quick burn fuseable 30 amp link should protect the system in the event of a short. You must find the short before proceeding. Never jumper or bypass around the fuseable link. This could damage your harness. Use proper diagnosis and repair techniques.

**Q. Where can I purchase the G.M. Service Manual.**

A. Call Helm's at 800-782-4356. Most local auto parts stores have many Helm's books. The Street & Performance Video Series is packed with useful information. Contact your Street & Performance dealer.

**Q. Where can I find professional help with my harness installation?**

A. Your local Street & Performance dealer can normally assist you in the installation. In addition, Street & Performance conducts a fuel injection school dealing with the latest in Fuel Injection Technology. Periodically, information is also available on our web site to help in your installation.

**Q. Do you have technical assistance available?**

A. For technical assistance, call Street & Performance or your local dealer.

**Q. What should I do if I accidentally split or chaf a wire?**

A. The G.M. 1998 Service Manual, Second Edition, Volume 3 of 3, provides detailed instructions on repairing damaged flat wires and HO2S wiring. Sections 8-307 and 8-309.

**Q. If I break a plug or connector, what should I do?**

A. The G.M. 1998 Service Manual, Second Edition, Volume 3 of 3, provides detailed instructions on repairing damaged flat wires and HO2S wiring. Section 8-310.

**Q. Can you explain voltage?**

A. You must use a 90 amp or larger alternator with fuel injection. **YOU MUST HAVE GOOD GROUNDS.** Battery to motor or trans, engine to frame and engine to body.

**Q. Do I need to save my old harness?**

A. No, although its helpful to save the old ends in case of damage to your new harness.

**Q. Where can I find the trouble code references?**

A. Included with your harness.



LS-2 in S&P '57 Chevy



LS-2 in S&P '57 Chevy



LS-2 in S&P '57 Chevy

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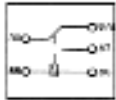
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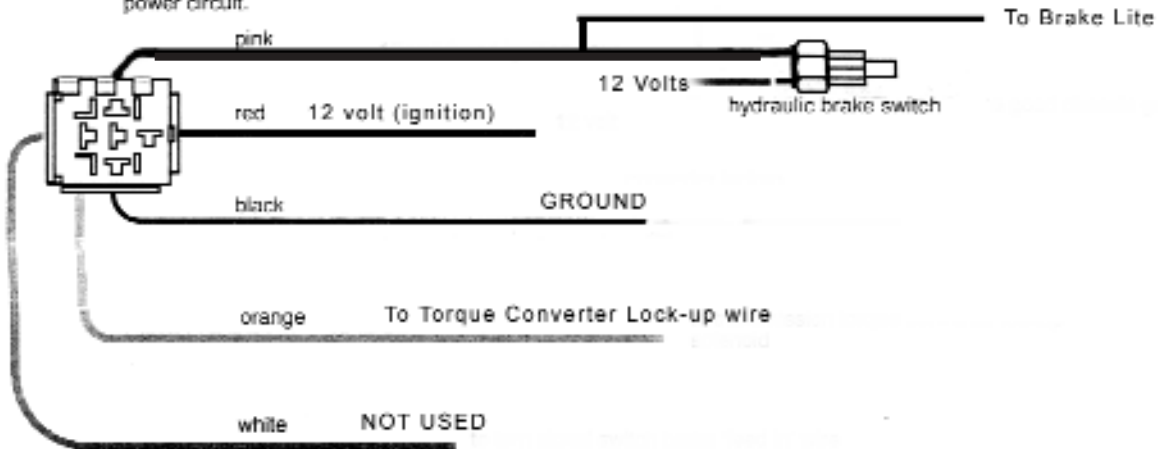
relay logic



If you have a 2 prong pressure brake switch, you will need this brake switch relay kit.

## BRAKE SWITCH RELAY WIRING - TCC

This set up removes the overload strain of hi-load brake lamps from the hydraulic brake switch. It is also necessary to interrupt current to the transmission torque converter lockup solenoid circuit when the brakes are applied. When the brakes are released, power is restored to the lockup solenoid power circuit.

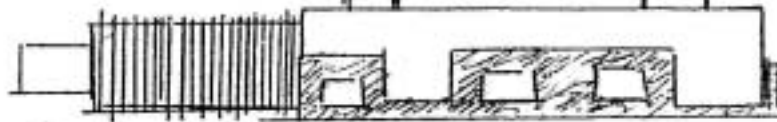


For brake light  
12 Volts with brake on ONLY

12 Volts In

12 Volts In

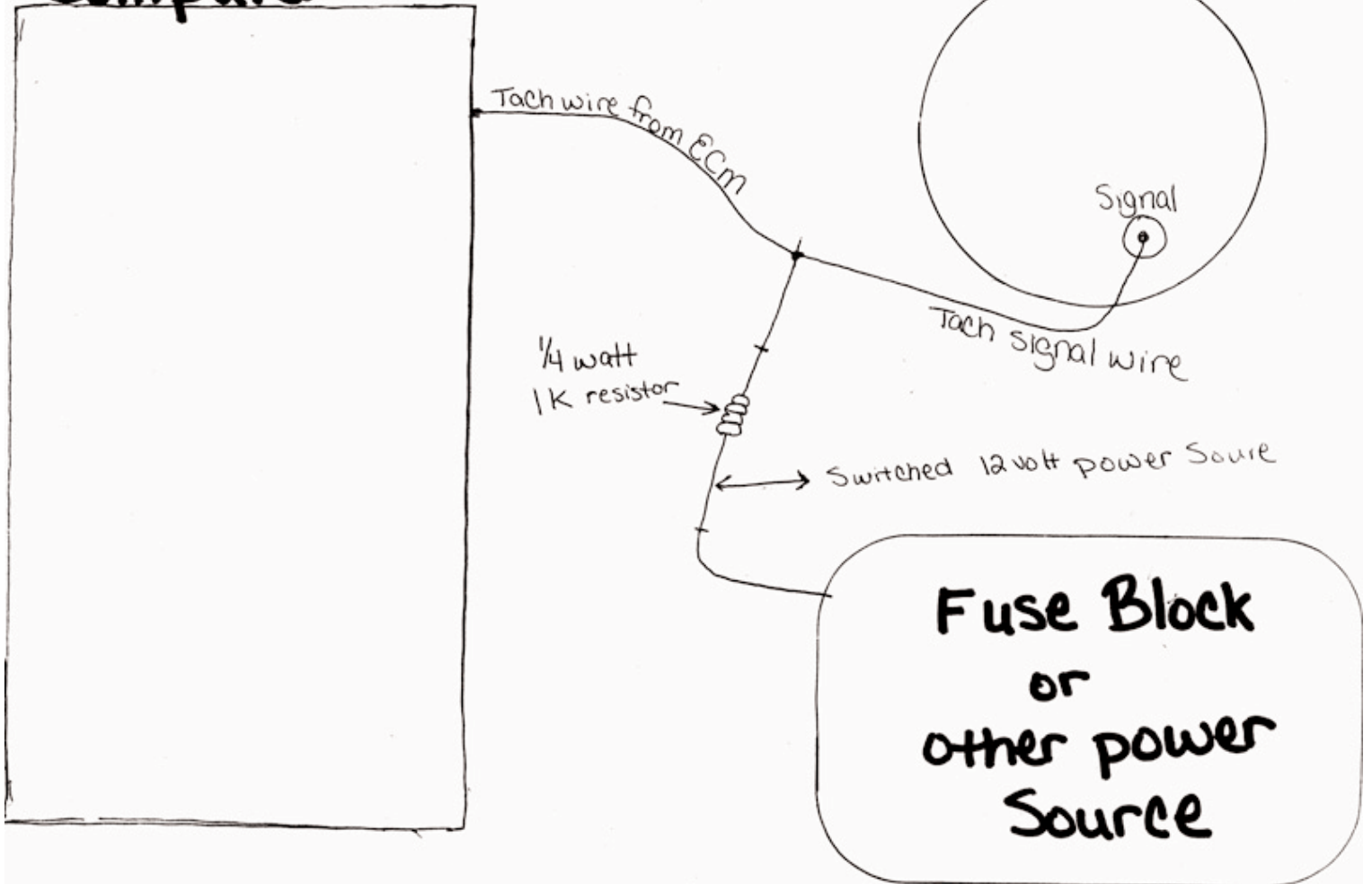
Hook to red brake wire  
12 Volts ALL THE TIME  
with brake OFF.  
NO VOLTAGE WITH  
BRAKE ON!



GM Brake Switch #25524845  
AC Delco #D850A

**Engine  
Computer**

**Tachometer**

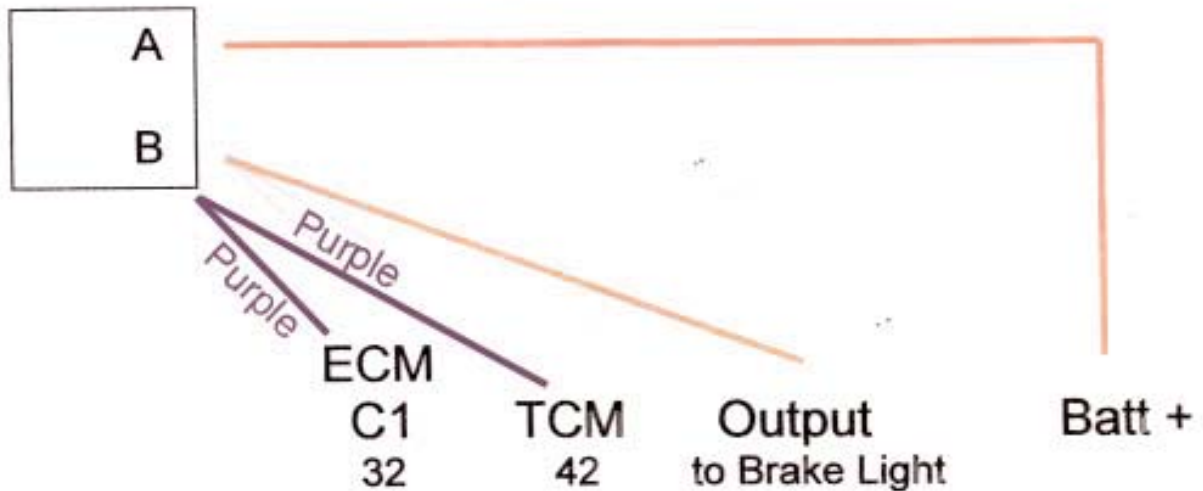


# 2005 GTO LS-2 SUPPLIMENTAL

## BRAKE LIGHT SWITCH

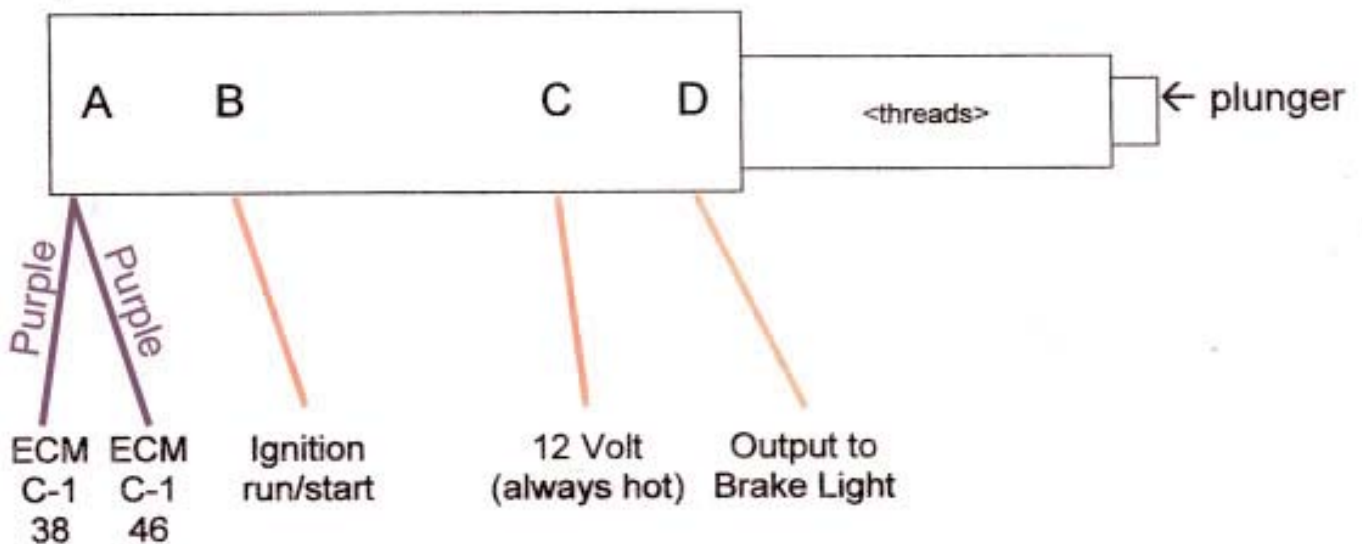
### 2 WIRE SWITCH (NORMALLY OPEN)

(ECM C1-38 and C1-46 not used)



### 4 WIRE SWITCH (NORMALLY CLOSED TO ECM) Part # 25524845

(ECM C1-32 and TCM 42 not used)



**\* Must be mounted so that plunger is depressed with foot off brake and plunger is released when brake applied.**

# 97~04 Vette DBW

## 02~07 Truck DBW

### Cruise Control Schematic (TAC Module)

- C2-4 Dark Blue  
Set/Coast (momentary switch)
- C2-5 Grey/Black Stripe  
Resume/Accel
- C2-6 Light Blue  
Stop Lamp Signal (brake light switch)  
Bulb side must see resistance of  
brake light bulbs
- C2-14 Grey  
On/Off signal - on switch