



Street & Performance

LS-2 DBW Wiring Harness

4/25/11

6.0

INSTRUCTIONS & SUPPLEMENTAL INFORMATION

4L60E AUTOMATIC Transmission

24 tooth reluctor ring



Street & Performance

#1 Hot Rod Lane ~ Mena, AR 71953

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LS-2 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. **Blue Computer Plug (with black cap) J1 on computer**
2. **Black TCM Plug (with black cap) TCM Transmission Control Module (4L60E/4I65E)**
3. **Gray Computer (with black cap) J3 on computer**
- 3a. **Black Computer Plug (with black cap) J2 on computer**
4. **Check Engine Light Wire Ground (brown) (from Blue J1 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 grounded when the key is in start or run. If light is not used, ensure the brown wire is properly capped.
5. **Electric Speedometer Wire (green) (from Blue J1 plug)**- 4000 pulse to cruise or electric speedometer.
6. **Tach Wire (if desired) (white) (from Blue J1 plug)**- Feeds pulse to tachometer. If Tach fails to operate on this pulse, contact Abbott Enterprises, 800-643-5973 for alternate pulse signal simulator.
- 6a. **Ignition Start Switch (Yellow wire) (from Blue J1 plug)(4L60E ONLY)**
7. **Fuel Pump Relay Plug** - Starts and stops fuel pump. During key-on runs 2 seconds to load injectors.
8. **Brake Light Switch (Purple wire) (from TCM Plug) (4L60E ONLY)**
9. **Knock Sensor (Drivers side)** next to driver side front O2 plug
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. **Accelerator Petal Position.**
18. **Knock Sensor (Passenger side) Twisted pair shrink wrapped next to crank sensor plug and starter solenoid**
19. **Passenger Side Injectors (4 plugs w/green, blue, yellow, & purple uncommon 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.
20. **Passenger Coil (4 plugs w/tan waterproof rubber seal w/orange, yellow, gray, & white uncommon wires)** - Connect passenger side coils into injector coil packs.
21. **Crank Sensor Plug** - The crankshaft position sensor (CPS) is located in the lower front of the engine.
22. **Back Up Lamp Feed (if desired)**

TCM (4L60E) →

Computer →

J1 →

J2 →

J3 →



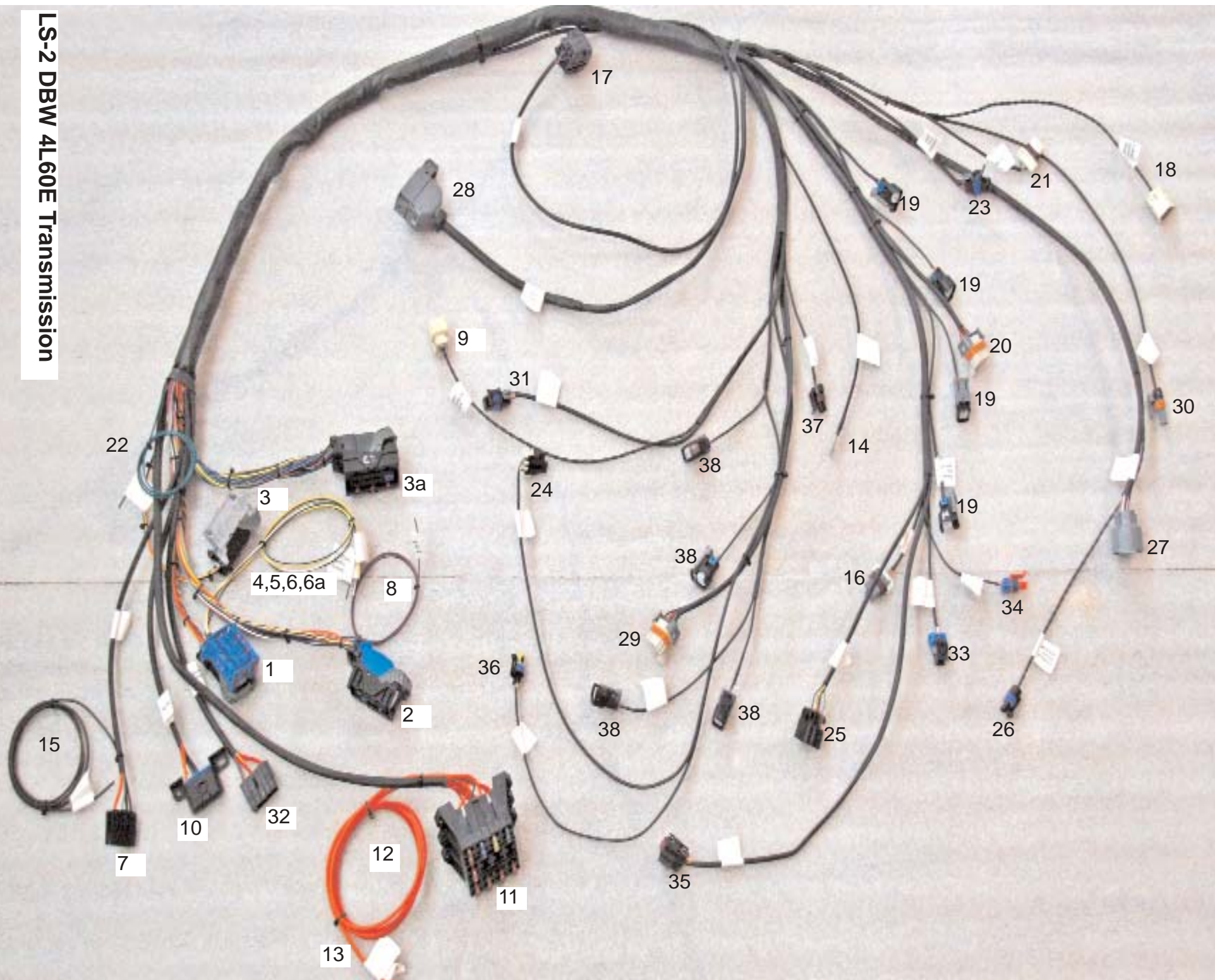
23. **Passenger Front O2 Plug** - Oxygen Sensor see on line **LS TECH**OXYGEN SENSOR PAGE**
24. **CAM Sensor Plug (black connector w/white cap and purple waterproof rubber seal)** - The camshaft position sensor (CPS) must be installed prior to installing the intake manifold. The camshaft position sensor 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.
25. **Throttle Actuator Control Module**
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. **Transmission Plug (4L60E/4I65E)**
28. **Transmission Range Switch Plug (Gray Plug) (4L60E/4L65E)**
29. **Driver Coil (4 Plugs w/tan waterproof rubber seal w/purple, blue, green, red uncommon wires)** - Connect driver side coils into injector coil packs.
30. **Starter Solenoid**
31. **Driver Side Front O2 Plug** - Oxygen Sensor
32. **Starter Relay**
33. **Canister Purge Vent Valve (red connector w/blue cap & grey waterproof rubber seal)** - Use with emission vehicles, connects to the EVAP canister vent solenoid.
34. **Canister Purge** Use with emission vehicles
35. **Mass Air Flow Plug (MAF) (black connector w/white cap and purple waterproof rubber seal)** - Located on the air duct, in the front of the intake manifold. If your using the Street & Performance Air Cleaner w/ZR-1 Air Temp, just plug it into the passenger side back of air cleaner. 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.
36. **Engine Temp Sensor Plug (black connector w/purple waterproof rubber seal)** - Senses engine coolant temperatures during all operating conditions and signals electric fan operations. Located front head exhaust port. Must use IROC/TA Coolant Sensor #12551708, 3 prong plug on Vette motors.
37. **Oil Pressure Sensor**
38. **Driver Side Injectors (4 plugs w/black, red, white & brown uncommon 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.
39. **TO RUN CRUISE-** have to use a TRAILBLAZER ECM & THROTTLE PEDAL with 4L60E/4L65E.

T-56 Six Speed Transmission Only

40. **Skip Shift Solenoid** (white plug black seal blue cap)(red, gray wires)
41. **Reverse Inhibit Solenoid** (White plug, black seal, blue cap)(red and green wire)
42. **Backup lamp feed switch** (black plug, green seal)(green and black wire)

****CRUISE AVAILABLE FOR MANUAL TRANSMISSION, MUST USE CST-V THROTTLE PEDAL & PROGRAM.

LS-2 DBW 4L60E Transmission



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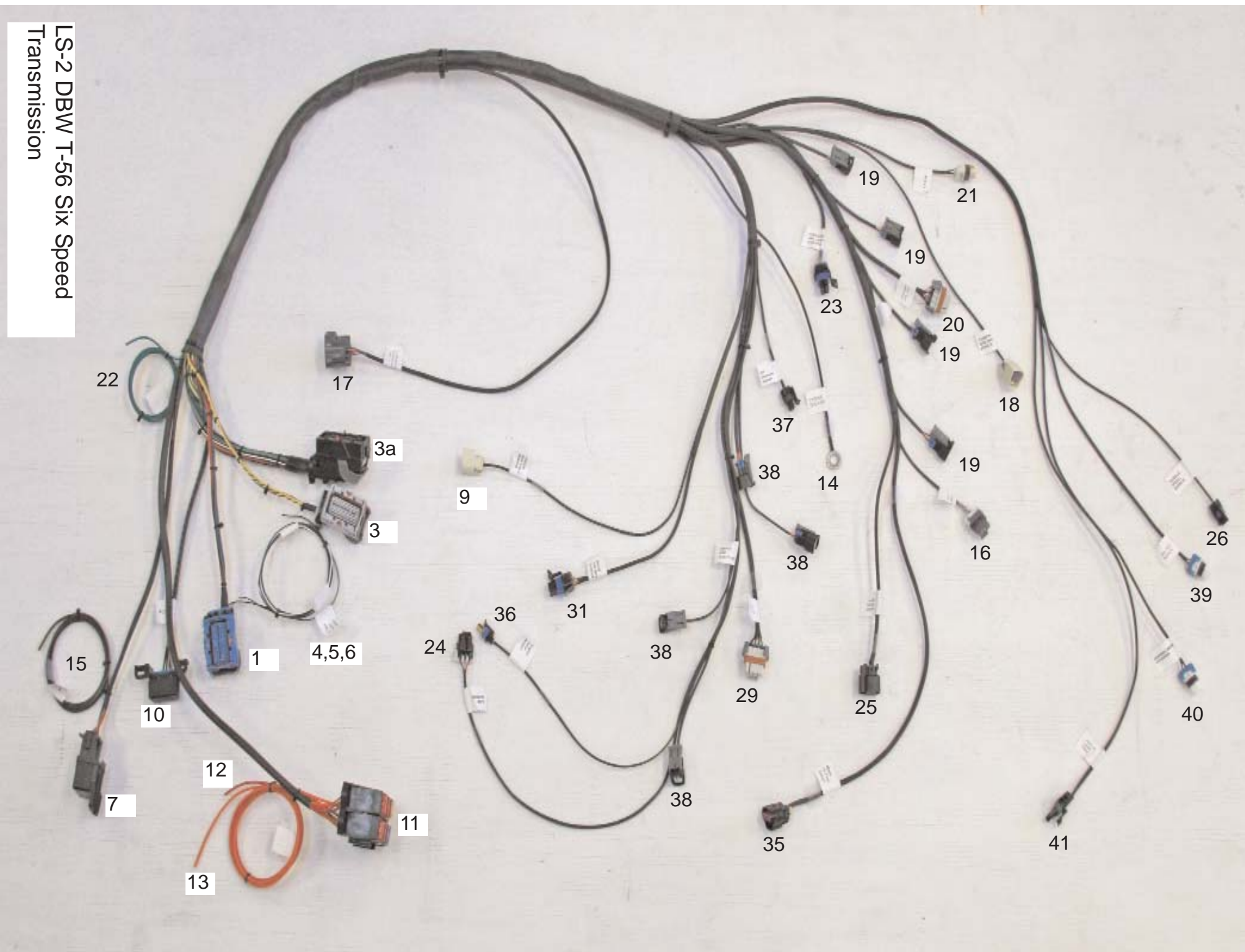
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LS-2 DBW T-56 Six Speed
Transmission



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Stock oil pressure sensor Large vacuum port for power brakes and small port for accessories



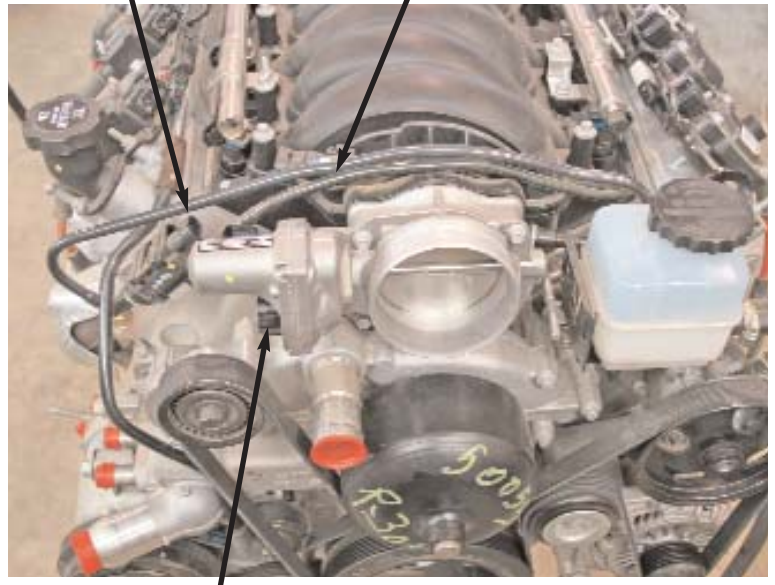
Crank sensor behind starter Passenger side knock sensor

Driver side master coil plug Quick disconnect 3/8 fuel inlet.



Driver side knock sensor

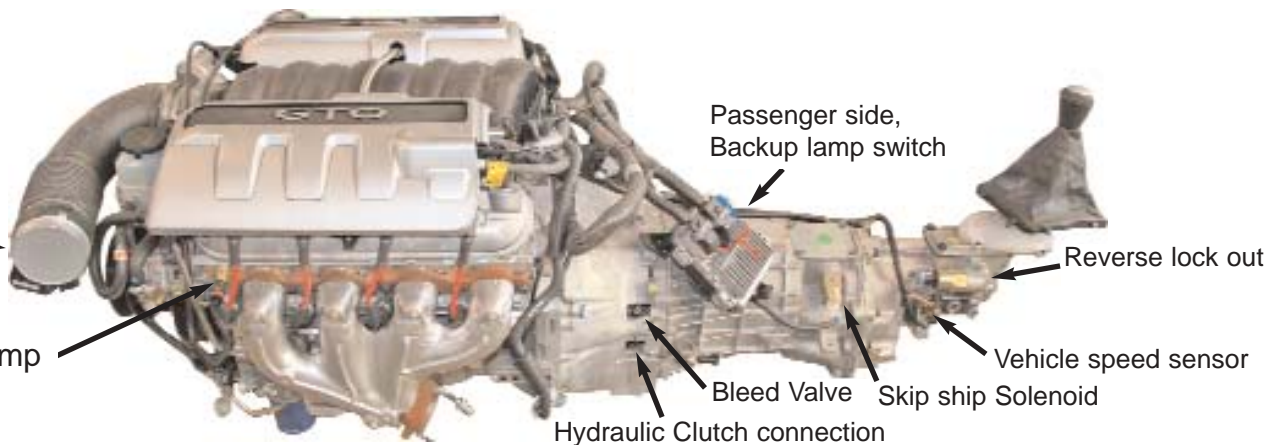
Canister purge and canister purge vent valve MAP sensor



Throttle Actuator Control Module

Five pin Mass Air Flow (MAF)

Coolant Temp Sensor



Passenger side, Backup lamp switch

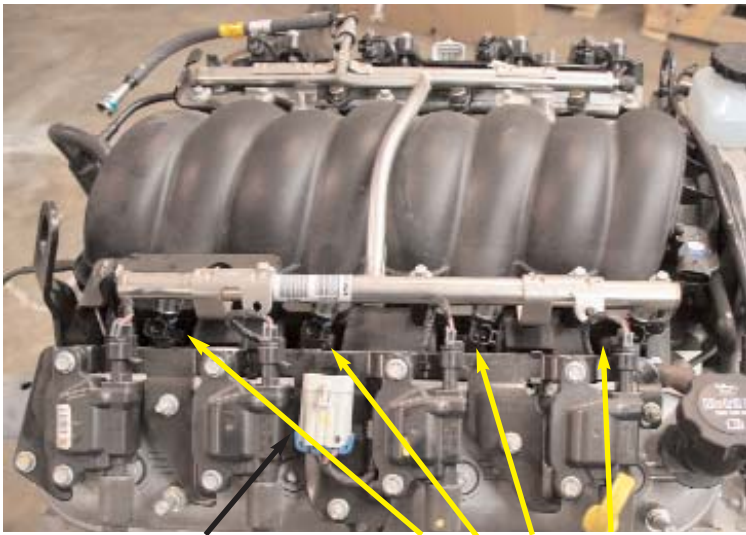
Reverse lock out

Hydraulic Clutch connection

Bleed Valve

Vehicle speed sensor

Skip ship Solenoid



Passenger side master coil plug
Injector plug location both sides



Stock GTO front bracket accessories



A. 05 LS2 Computer 12597883
B. Transmission Controller
C. GTO DBW Throttle Pedal Assembly

SERV NO.	ENGINE/VEHICLE
9254896- 99-00	4.8, 5.3 & 6.0
12200411- 01-02	4.8, 5.3, 6.0 & 8.1
12200411- 01-03	IROC/TA Vette LS1/LS6
12586242- 04	Vette LS1/LS6
12576106- 03	4.8, 5.3 & 6.0
12586243- 04	4.8, 5.3 & 6.0
12589463- 05-06	4.8, 5.3 & 6.0
12597191- 05	Vette LS2
12597883- 05	Vette LS2
12598343- 04	GTO / SSR
12597883- 05	GTO / SSR
12603892- 06	LS-2/LS-7
12583560- 06	5.3 Truck
12583561- 06	5.3 Truck
12596679- 06	5.3 SSR



2005 SSR. Truck
2005 Corvette

LS-2 using 04 computer Manual Transmission
1G1YY12SX45101998
LS-2 using 04 computer Auto Transmission
2GCEK19N041175573
Drive by Wire
LS-2 using 05 computer (12597883) Manual
6G2VX12U15L386125
LS-2 using 05 computer 4L65E
6G2VX12U55L398245



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 Adapter to AN-6 fitting

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.

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.

DTC	ALDL Diagnostic Description	Domestic	Illuminate MIL
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	TPSensor 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 Inut (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 Malfunct 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 system is protected by fuses in the fuse block. You must find the short before proceeding. Never jumper or bypass around the fuses. 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

Street & Performance

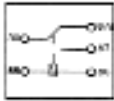
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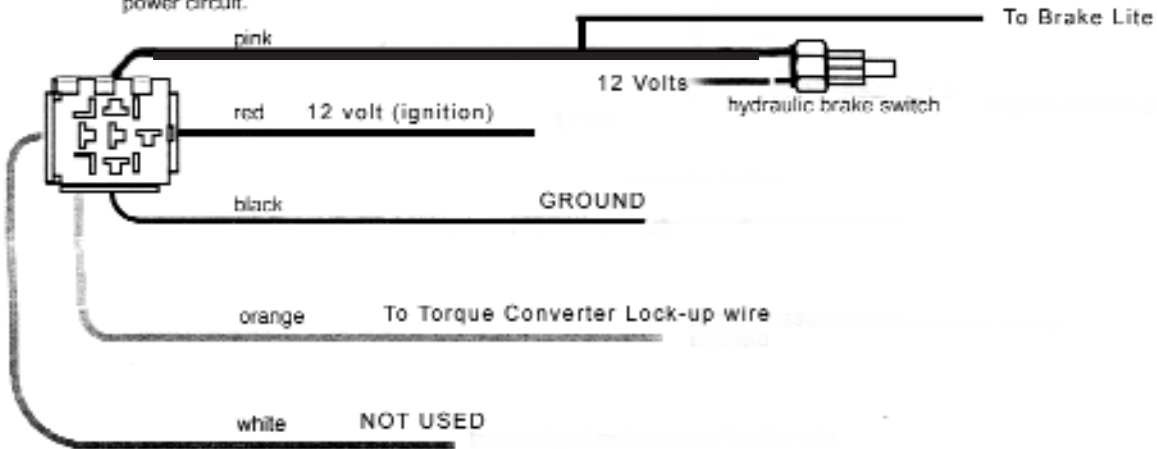
relay logic



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.

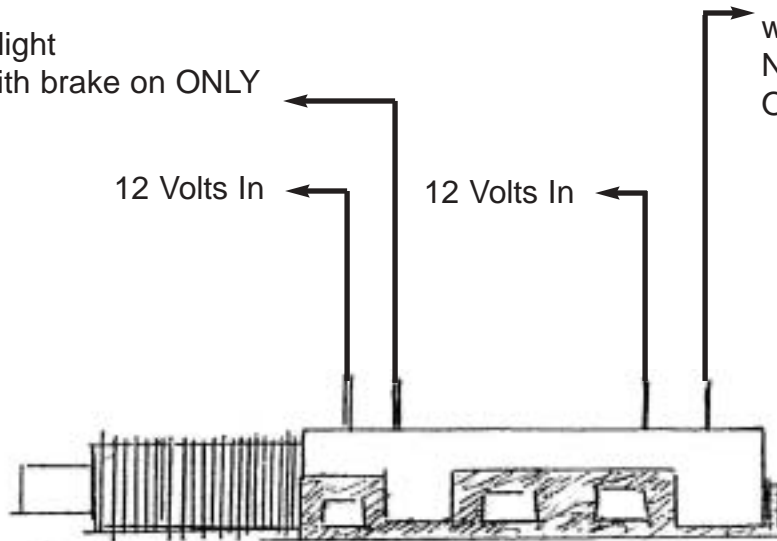


For brake light
12 Volts with brake on ONLY

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



A. '98- '02 LS1 IROC/TA Engines **GM# 25312197 AC DELCO# AFS98**

B. '05 LS2 with Square Plug **GM#12587785 AC DELCO# 213-1702**

37 DEGREE FITTINGS AVAILABLE FOR CONVERTING TO STAINLESS STEEL TRANSMISSION LINES. SEE WEB FOR CUSTOM SET OF STAINLESS STEEL TRANSMISSION COOLER LINES.

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