



Service Bulletin

Bulletin No.: 13-00-89-008B

Date: August, 2019

INFORMATION

Subject: GM Wiring Repair Strategy Information

Models: 2009-2020 GM Passenger Cars and Trucks — Excluding Chevrolet Low Cab Forward Trucks
2019-2020 Chevrolet Silverado 4500HD, 5500HD, 6500HD
2009-2020 Holden Vehicles

Attention: This Bulletin applies to any of the above models that may be Export from North America vehicles.

This Bulletin has been revised to add Model Years 2016-2020, add MY2009-2020 Holden Vehicles, add an Important statement regarding the phasing out of the service terminals, tray, core and insulation crimps, communicate Wiring, Connector and Terminal repair changes, change CCA Parts to EPC, add a Coaxial Cable Repair section, add the process and graphics to find the part number in SI and the process and graphics to find the part in the Electronic Parts Catalog (EPC). Please discard Corporate Bulletin Number 13-00-89-008A.

Overview

Important: For newer GM Cars and Trucks, the service terminals, tray, core and insulation crimps are being phased out. The process to repair machine crimped terminals cannot be duplicated reliably in the Service environment and is no longer a viable repair option. The use of a terminated lead or a Pigtail (8-way or less connector) is the only approved repair method going forward.

This bulletin provides a resource to find information, processes and parts in order to perform wiring, terminal and connector repairs.

Global Wiring Repair

Wiring Repair Strategy

The following is the global wiring repair strategy:

- Major Harnesses (Body, Engine, Instrument Panel, Forward Lamp, etc.) are to be repaired whenever possible.
- Minor Harnesses (door, seat, steering column, etc.) are serviced as assemblies.

Strategy Consists of Four Different Repairs

The repairs consist of the following:

- Wire to Wire Repair
- Connector Assemblies (Pigtails)
- Connector Kits
- Terminated Lead Repair

This strategy was established to reduce the number of individual part numbers needed to service GM vehicles, as even small harnesses can have many different part numbers for the individual connectors and terminals. When new terminals or connectors are released within the major harnesses they will be serviced through the release of connectors, terminated leads, pigtails, kits, etc., and are available through EPC.

For individual connectors that are 8-way or less, a fully populated pigtail with the correct DuraSeal splice will be available. For connectors that are 9-way or more, the individual parts will be available via connector kits, DuraSeal splices and terminated leads.

Wiring Systems and Power Management — Navigation — Repair Instructions

Navigating to Repair Instructions

To navigate to the Repair Instructions section in Service Information, enter a VIN then click 'Next'. Go to > Power and Signal Distribution > Wiring Systems and Power Management > Repair Instructions

OR

To navigate to the Repair Instructions section in Service Information without a VIN, Go to Year > Make > Model > 'Next' > Service Manual > Power and Signal Distribution > Wiring Systems and Power Management > Repair Instructions.

At the Repair Instructions screen a search can be performed for a specific repair, for example: Flat Wire Repair, Wire to Wire Repair etc.

Repair Instructions

The Repair Instructions contain the following types of wiring repair information:

- Flat Wire Repairs
- Fold Over Wire Repair
- Serial Data Circuit Wiring Repairs
- High Temperature Wiring Repairs
- Heated Oxygen Sensor Wiring Repairs
- Wire to Wire Repair
- Splicing Twisted or Shielded Cable
- SIR/SRS Wiring Repairs
- Terminal Removal
- Serial Data Circuit Wiring Repairs (consists of the following repairs):
 - GMLAN Repairs
 - GMLAN Connector Terminal Repairs
 - GMLAN Wire Repairs
 - Media Oriented Systems Transport (MOST) Wiring Repair
 - Ethernet Wiring Repair

Coaxial Cable Repairs

The coaxial (coax) cable repair strategy uses coaxial cables, connectors and jumpers to repair coaxial cables. The intent is to install the new service cable in the vehicle, with removal of the old cable not being necessary.

The following are several repair scenarios:

- New cables, jumpers, and connector housing are required.
- Only new cables are required while it is possible to reuse the existing connector housing in vehicle. A jumper may or may not be needed.

- Only new connector housing are required, while it is possible to reuse the existing cable in the vehicle.
- A new cable would need to be installed from source to destination and by-pass the inline connector in some cases when an inline connector is unrepairable. For example: a cracked male end of a 1-way connector.

Antenna Coax Repair Kits

Different kits are available to repair some *antenna* coaxial cables. Refer to Bulletin **17-NA-346 Information on Antenna COAX Repair Kit Availability** in SI for Kit part numbers.

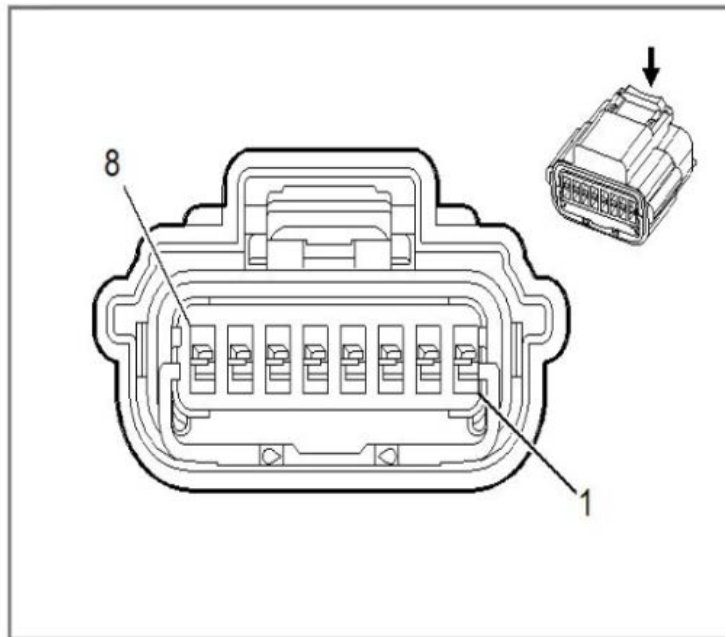
Obtaining Service Parts Using SI and EPC

Navigating to Connector End Views in SI

Go to > Service Manual > Power and Signal Distribution > Wiring Systems and Power Management > Component Locator > Master Electrical Component List > Connector End View (last column on the right)

At the Master Electrical Component List a search can be performed for the electrical component being serviced, for example the: K20 Engine Control Module.

Finding the Correct Service Part Number in SI — 8-Way or Less Connectors



Connector Part Information

- Harness Type: Engine
- OEM Connector: 13774439
- Service Connector: 13583440
- Description: 8-Way F 0.64 Series, Sealed (BK)

5378389

B75C Multifunction Air Intake Sensor — Connector End View 8-Way

The Connector End View provides a view of the connector and the connector part information, which is just below and to the left of the Connector End View drawing.

The Connector End View is presented two ways — the legacy format typically associated with TIFF viewer-supported graphics and the new format typically associated with the new CGM viewer-supported graphics. Connector disassembly videos may be provided to assist with repairs.

The Service Connector part number will be the part number that needs to be ordered, while the OEM Connector part number is what the vehicle should have been built with. If the connector Description indicates it is an 8-way or less, the part number will be a pigtail.

Tables Following Connector End View

The Terminal Part Information Table following the Connector End View provides useful information including the Diagnostic Test Probes, Terminal Removal Tools and Terminated Leads to use.

The second Table (Code and Component Name Table, if Titled) provides the Pin, Size, Color, Circuit, Function, Terminal Type ID and Option.

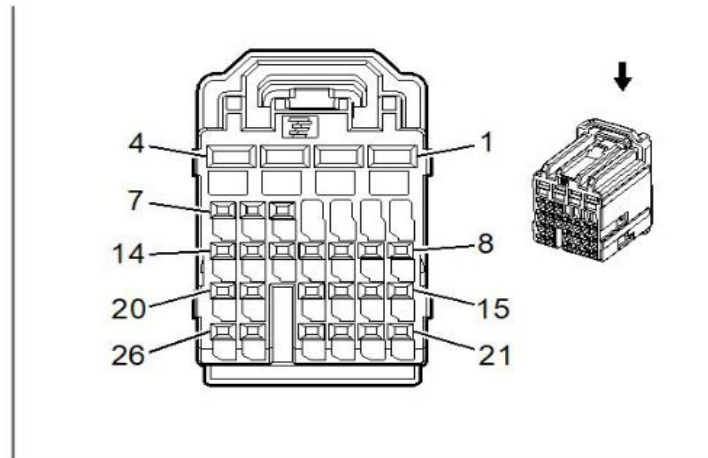
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool	Service Terminal	Tray Name	Core Crimp	Insulation Crimp
I	Not Required	J-35616-64B (LT BU)	No Tool Required	Not Required	Not Required	Not Required	Not Required

B75C Multifunction Intake Air Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	0.5	WH/BU	6289	Induction Air Temperature Sensor Signal	I	—
2	0.5	BU/RD	460	Engine Control Sensors 5 Volt Reference (1)	I	LFV
	0.5	BK/YE	6014	Barometric Pressure Sensor Low Reference	I	LKN
	0.5	GY/RD	3053	Turbo Intake Pressure Sensor High Reference Bank 1	I	LTG
3	0.5	BK/YE	548	Engine Control Sensors Low Reference (1)	I	LFV
	0.5	BK/VT	2760	Intake Air Temperature Sensor Low Reference	I	LTG/LKN
4	0.5	BU/GY	433	Barometric Pressure Sensor Signal	I	LKN
	0.5	YE	3054	Turbo Intake Pressure Sensor Signal Bank 1	I	LTG/LFV
5	0.5	VT/BU	5294	Powertrain Main Relay Fused Supply 5	I	—
6	0.5	GN/WH	492	Mass Air Flow Sensor Signal	I	—
7	0.75	BK/WH	151	Signal Ground	I	—
8	0.5	BN/GY	4008	Humidity Sensor Signal	I	—

Finding the Correct Service Part Number — 9-Way or More Connectors



Click Image For Video



Connector Part Information

- Harness Type: Instrument Panel
- OEM Connector: 13824335
- Service Connector: 13576031
- Description: 26-Way F 0.64, 2.8 Series (NA)

5379076

K9 Body Control Module X1 — Connector End View 26-Way

The Connector End View provides a view of the connector and the connector part information, which is just below and to the left of the Connector End View drawing. A **Click Image For Video** arrow will be shown under the Connector End View if it is available.

The Connector End View is presented two ways — the legacy format typically associated with TIFF viewer-supported graphics and the new format typically associated with the new CGM viewer-supported graphics.

The Service Connector part number will be the part number that needs to be ordered, while the OEM Connector part number is what the vehicle should have been built with. If the connector Description indicates it is a 9-way or more it will be a connector kit.

Tables Following Connector End View

The Terminal Part Information Table following the Connector End View provides useful information including the Terminated Lead, Diagnostic Test Probe, Terminal Removal Tool, Service Terminal, Tray Name, Core Crimp and Insulation Crimp to use.

The second Table provides the Pin, Size, Color, Circuit, Function, Terminal Type ID and Option.

Terminal Part Information

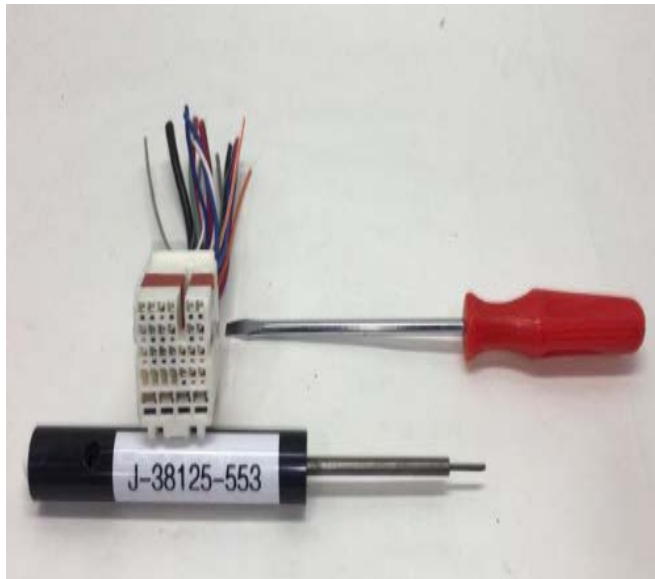
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool	Service Terminal	Tray Name	Core Crimp	Insulation Crimp
I	13582297	J-35616-64B (LT BU)	J-38125-215A	Not Available	Not Available	Not Available	Not Available
II	13582298	J-35616-64B (LT BU)	J-38125-215A	Not Available	Not Available	Not Available	Not Available
III	13582326	J-35616-35 (VT)	J-38125-553	8100-4444	Sumitomo 22	2	A

Terminal Part Information

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	1	BK	1850	Ground	III	—
2	1	RD/BU	4540	Battery Positive Voltage	III	—
3	1	RD/GN	4440	Battery Positive Voltage	III	—

Note: This Table is a representative view and does not include all 26 Connector Pins.

Video



5380982

Connector Repair Video Opening Screen

The video (if available) will illustrate how to use the tools for probing and releasing the terminals with a demonstration on the exact connector.

Electronic Parts Catalog

Overview

Continual updates to the EPC will allow better searchability for wiring repair components. In addition, pictures will be added when available to the EPC for

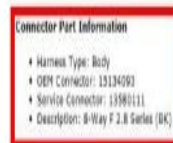
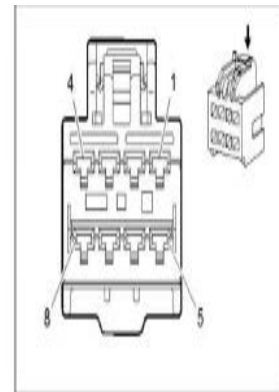
these parts to help in confirming the correct parts are ordered. Battery cables, infotainment cables and hoses are also listed in the EPC.

Tip: GM is now releasing washer hoses as a subassembly to the main harness when a hose is imbedded in the harness. For example: The chassis harness has a hose going to the rear wiper.

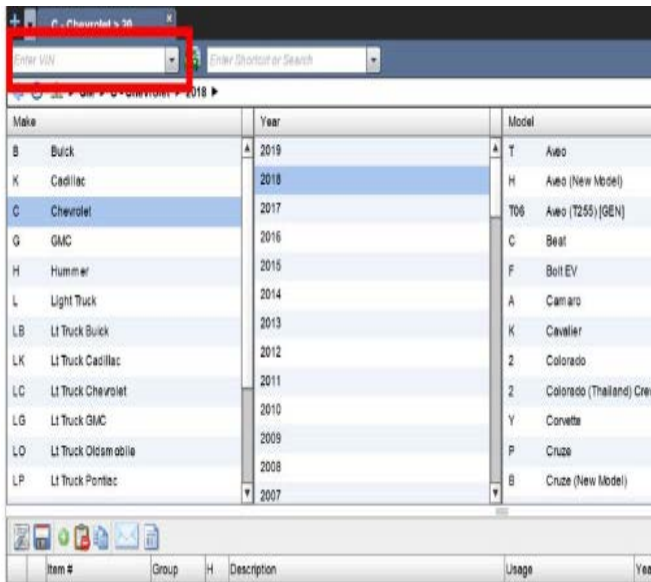
Ordering Parts

Process for ordering part(s) in the EPC:

1. Go to > Service Manual > Power and Signal Distribution > Wiring Systems and Power Management > Component Locator > Master Electrical Component List > Connector End View (last column on the right) in SI.
2. Select the Connector End View being serviced.

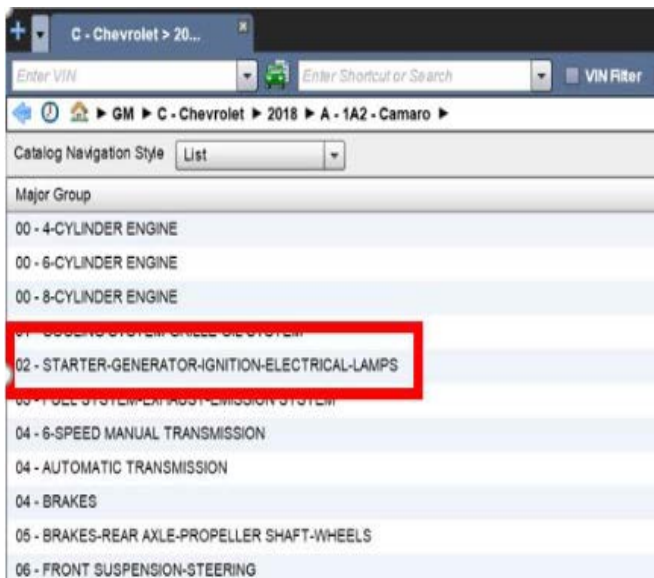


- 3. Locate the Service Connector Number which is just below and to the left of the Connector End View drawing.



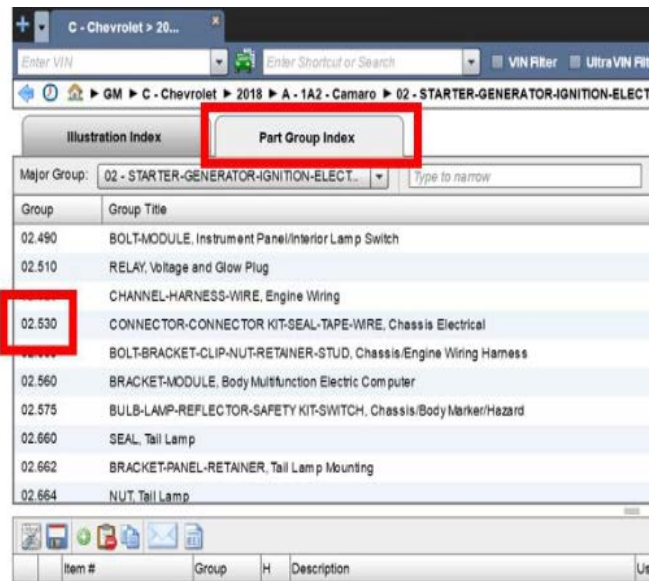
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- 4. In the Electronic Parts Catalog (EPC) enter the VIN for the vehicle OR select the Make, Year and Model.



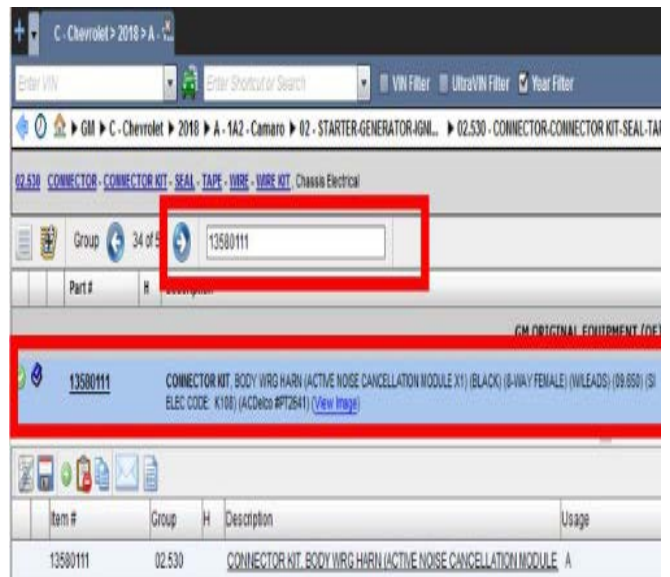
5381500

- 5. At the Major Group screen, select: 02 – STARTER - GENERATOR - IGNITION_ELECTRICAL - LAMPS



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- 6. Select the Part Group Index.
Select 02.530 CONNECTOR-CONNECTOR KIT-SEAL-TAPE-WIRE, Chassis Electrical



5385406

- 7. Copy and paste the Service Connector Number into the Type To Narrow search box.



5386219

8. **Typical view of 19352910 CONNECTOR KIT, BODY WRG HARN (14V POWER MODULE X1) (BLACK) (.75MM2) (8-WAY FEMALE) (W/LEADS)**

Click View Image to see the connector image to verify the correct part is being purchased. If an image is not available, there will be a generic image in its place. Review the Description field to determine if it matches application required for repair.

9. Add the Service Connector to the Shopping List.

Terminal Tools and Kits

Overview

The metal piece soldered or crimped to the end of a wire is called a terminal. It provides the electrical connection between wires and components. Any damage to the terminals could cause inaccurate test results, difficult diagnosis and failures after the vehicle has been returned to the customer.

When servicing a suspected wire/terminal issue, It is important to inspect for the following conditions:

- Any signs of connector damage.
- Excessive wear to the terminal locking mechanism.
- Loose or backed out terminals.
- Damaged terminated lead due to improper probing tool use.

Terminal Tools

The following Special Tools can be used for the diagnosis, testing and removal of terminals. These items can be ordered through Bosch or Kent-Moore. Be advised that the kit and tool numbers are always subject to change when they are updated by the supplier.

Terminal Test Probe Kit J-35616-F (EL-35616 Global Tool Number)



5386340

When probing a terminal for testing procedures, it is critical to use the appropriate size probe from the J-35616-F Terminal Test Probe Kit. The probes in the kit are sized to fit various terminal sizes and their shapes properly.

Terminals are becoming increasingly smaller and more complex in design. Using an improper test kit probe may cause damage to the terminals being probed and false readings during a diagnostic procedure. Using an instrument other than the correct probe will, in most cases, cause irreversible damage to the terminal by enlarging or deforming it to the point that it will no longer mate correctly.

Refer to **Power and Signal Distribution > Wiring Systems and Power Management > Diagnostic Information and Procedures > Probing Electrical Connectors** in SI. Refer to the Test Adapter and Description Table as a guide in selecting the correct test adapter for front probing connectors.

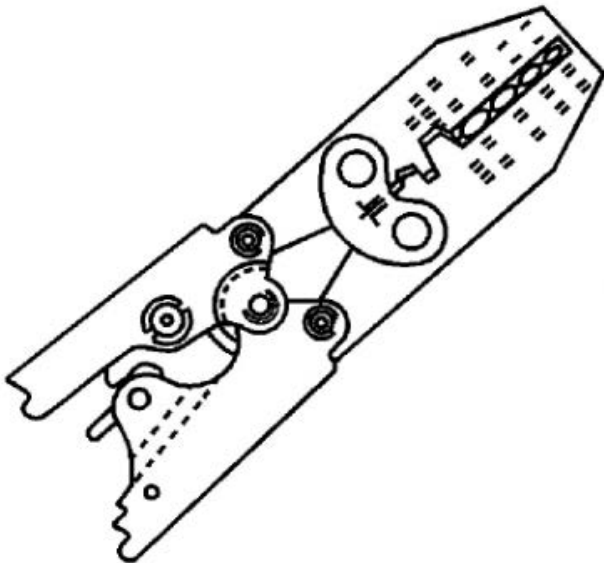
Terminal Release Tool Kit: J-38125-550 (EL-38125-550 North America Only)



5386378

This Terminal Release Tool Kit contains various tools designed to release the terminals from the connector. The terminals have a metal arm or tang that locks into the connector body. When the release tool is inserted into the canal, it moves the tang against the terminal. This movement allows the connector body to be released and moved outward. Tangless terminals are released in a similar fashion with the only difference being that the tool pushes the arm of the connector body to release the terminal.

Splice Sleeve Crimp Tool



5389158

J-38125-8 Splice Sleeve Crimping Tool (GMNA)

The splice sleeve crimp tools are part of the process necessary for repairing terminals and connectors. It is very important to use these tools in conjunction with the information contained in the Service Manual. The Service Manual contains information for crimp nest

selection. Crimp nest selection is determined based on wire size. Crimp nest selection is critical to splice crimp quality.

Use the J-38125-580 Terminal Repair Kit with the following tools:

- J-38125-6 Crimp Tool
- J-38125-7 Crimp Tool
- J-38125-8 Crimp Tool
- J-38125-64 Crimp Tool
- J-38125-101 Crimp Tool
- J-38125-641 Crimp Tool
- J-38125-642 Crimp Tool
- J-38125-643 Crimp Tool

Splice Sleeve Crimp Tool — Special Tool Numbers

- J-38125-8 (North America Only)
- EL-38125-EU (Europe)
- EL-38125-10 (Non-North America/Non Europe)

Best Practices

Some steps that should be considered as best practices are:

1. Compress handles until the ratchet automatically opens.
2. Determine the correct holder per the crimp matrix section.
3. Crimp the core wings first. Lay the back of the terminal core wings on the appropriate anvil. Be sure the core wings are pointing toward the forming jaws.
4. Gently apply pressure to the handles until the crimpers slightly secure the terminal core wings.
5. Insert stripped cable through as needed.

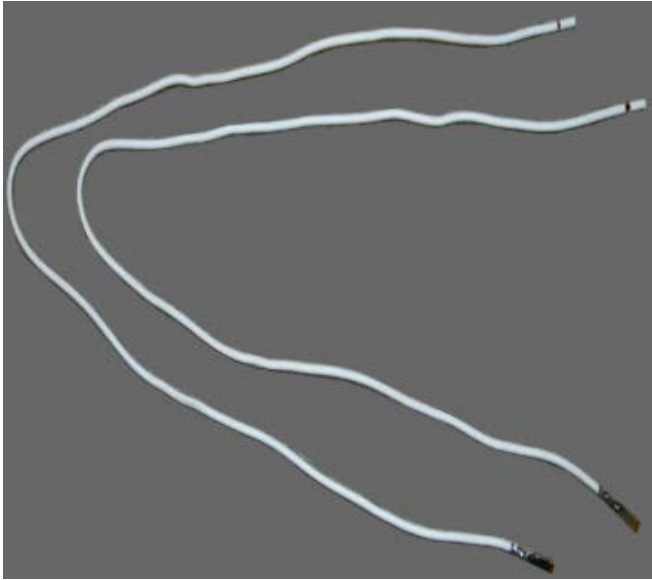
Wire Repair Components

Overview

Note: GM DOES NOT recommend soldering of terminals or connections unless specifically called out in a repair procedure.

The following components are used to repair damaged circuits. Each piece is used for a specific application depending on which parts are damaged and how they are damaged. Some pieces may also be used together depending on the repair procedures.

Terminated Lead



5389168

Machine Crimped Terminated Lead

Replacement may be needed due to a spread terminal condition, corrosion, or it will not stay retained in the connector body.

Pigtail



5389320

8-Way or Less Pigtail

Used when replacing a damaged connector that has 8-circuits or less. This connector assembly has terminated leads installed. The most common cause of replacement could be terminal corrosion or body damage.

Connector Kit



5389332

9-Way and More Connector Kits

Used when replacing a plastic connector body that has nine or greater circuits. These kits include the plastic connector body, CPA, and TPA, but do not have terminals or terminated leads included. The most likely cause requiring replacement is a damaged retainer or corrosion.

DuraSeal Splices

Important: Use only DuraSeal splice sleeves to form a one-to-one splice on all types of insulation except high voltage and specialty cables. Use DuraSeal splice sleeves where there are special requirements such as moisture sealing.

The use of DuraSeal splice sleeves is required to form a one-to-one splice on all types of insulation, except Tefzel® and coaxial. The current procedure helps to install the DuraSeal splice sleeves once the wire or circuit has been identified.

DuraSeal splice sleeves have the following 2 critical features:

- A special heat shrink sleeve environmentally seals the splice. The heat shrink sleeve contains a sealing adhesive inside.
- A cross hatched (knurled) core crimp provides the necessary low resistance contact integrity for these sensitive, low energy circuits.

DuraSeal Splice Colors and Sizes



5389895

Use the instructions in the Table below to splice copper wire using DuraSeal splice sleeves.

Splice Sleeve Selection

Splice Sleeve Color	Crimp Tool Nest Color		Wire Gauge mm ² / (AWG)
	3 Crimp Nests	4 Crimp Nests	
Salmon (Yellow-Pink) 19300089	Red (1) or Red/Green (1)	Red (2)	0.22–0.8/(18–26)
Blue 19168447	Blue (2)	Blue (3)	1.0–2.0/(14–16)
Yellow 19168448	Yellow (3)	Yellow (4)	3.0–5.0/(10–12)

Wire and Fuse Parts

GXL and TXL Wire Overview

There are overlapping qualities between GXL and TXL wire and there are also some distinct differences. GXL and TXL wire both consist of multi-stranded bare copper core conductors, a temperature rating of -59°F (-51°C) to 257°F (125°C), cross linked polyethylene (XLPE) along with meeting the SAE specification ratings. The two main distinct differences between the two wires is their differences in weight and wall thickness. GXL is a slightly heavier option due to its slightly thicker outer wall. TXL on the other hand, is lighter due to its more lightweight and extra-thin outer wall.

It is important to use TXL wire to maintain GM factory specifications for wire harness integrity. TXL wire is available through the EPC within the Chemical Catalog section.

Locating TXL Wire and Fuses in EPC

In the EPC the TXL wire and fuses are located in the Chemicals – Fuses - Wire - book section. To locate this section, select Make, Year, then under Model select

Chemicals – Fuses – Wire catalog. The TXL Wire will be called out under Group 8.966 Wire, Primary wire. Fuses are located under Group 8.965 Fuse.

In the EPC Next Generation the TXL wire and fuses are in the Q – CHEMICALS – FUSES – WIRES – BULBS section. To locate this section, select Make, Year, then under Model select Q – CHEMICALS – FUSES – WIRES – BULBS and then select 08 – Vehicles Maintenance. The TXL Wire will be called out under Group 08.966 WIRE, Primary Wire. Fuses are located under Group 08.965 FUSE, Fuse.

Part Resource Matrix

Part Resource Matrix

Part Name	Part Number Resource	Order Through
Terminal	SI	Bosch Automotive Service Solutions
Crimp Tools	SI	Bosch Automotive Service Solutions

Part Resource Matrix (cont'd)

Part Name	Part Number Resource	Order Through
Terminated Leads	SI	EPC
Connector w/Leads	SI	EPC
Connector	SI	EPC
Splice Sleeves	SI and EPC	EPC
Harness Assembly	EPC	EPC
Wire, Fuse and Heat Shrink	EPC	EPC

Electrical Service Information Reference**Circuit Testing**

The Circuit Testing section contains the following diagnostic testing information. Using this information along with the diagnostic procedures will identify the cause of the electrical malfunction.

To navigate to the Circuit Testing section in the Service Manual, enter a VIN then click Next. Go to > Power and Signal Distribution > Wiring Systems and Power Management > Diagnostic Information and Procedures > Circuit Testing

OR

Go to > Year > Make > Model > Next > Service Manual > Power and Signal Distribution > Wiring Systems and Power Management > Diagnostic Information and Procedures > Circuit Testing

- Using Connector Test Adapters
- Probing Electrical Connectors
- Troubleshooting with a Digital Multimeter
- Troubleshooting with a Test Lamp
- Using Fused Jumper Wires
- Measuring Voltage
- Measuring Voltage Drop
- Measuring Frequency
- Testing Ground and Low Reference Circuits
- Testing for Continuity
- Testing for Short to Ground

- Testing for a Short to Voltage
- Testing for Intermittent Conditions and Poor Connections
- Inducing Intermittent Fault Conditions
- Testing for Electrical Intermittents
- Scan Tool Snapshot Procedure
- Circuit Protection - Fuses
- Circuit Protection - Circuit Breakers
- Circuit Protection - Fusible Links

Supplier Connector Repair Reference List

In addition to connector disassembly videos, some supplier connector disassembly instructions are found in SI. The connector repairs are listed by the connector manufacturer and then by connector type. Knowing the connector manufacturer will assist in finding the correct connector repair. If the technician cannot identify the manufacturer of the connector, refer to Identifying Connectors below.

To navigate to the Connector Repair Reference section in the Service Manual, enter a VIN then click Next. Go to > Power and Signal Distribution > Wiring Systems and Power Management > Diagnostic Information and Procedures > Connector Repairs

OR

Go to > Year > Make > Model > Next > Service Manual > Power and Signal Distribution > Wiring Systems and Power Management > Diagnostic Information and Procedures > Connector Repairs

- Connector Position Assurance Locks
- Terminal Position Assurance Locks
- AFL/EPC Connectors
- Bosch Connectors
- Delphi Connectors
- FCI Connectors
- FEP Connectors
- JST Connectors
- Kostal Connectors
- Molex Connectors
- Sumitomo Connectors
- Tyco/AMP Connectors
- Yazaki Connectors
- Repairing Connector Terminals