

2009 ELECTRICAL

Battery System - Journey

DESCRIPTION

DESCRIPTION

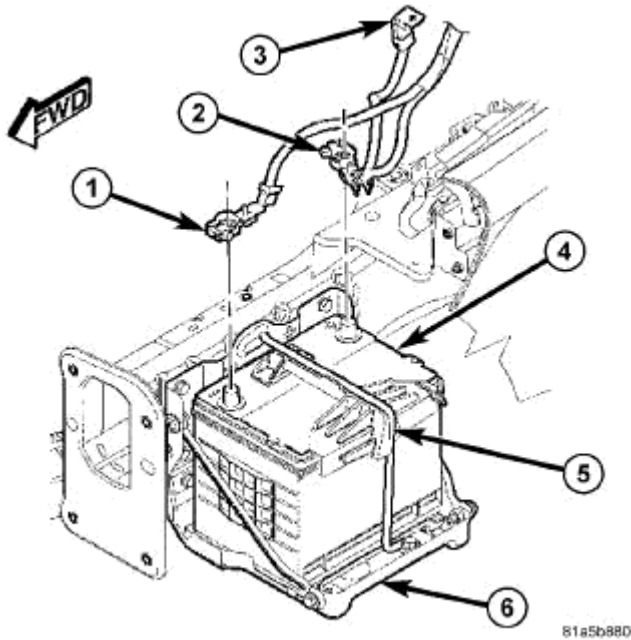


Fig. 1: Battery Components
Courtesy of CHRYSLER LLC

This vehicle is equipped with a single 12-volt battery. All of the components of the battery system are located in the front of the vehicle, just ahead of the left front wheel and tire assembly. The battery system for this vehicle contains the following components:

- **Battery (4)** - The storage battery provides a reliable means of storing a renewable source of electrical energy within the vehicle.
- **Positive (2) and Negative (1) Battery Cables** - The battery cables connect the positive and negative charged battery terminal posts to the vehicle electrical system.
- **Battery Hold-down (5)** - The battery hold-down hardware secures the battery in the battery tray.
- **Battery Tray (6)** - The battery tray provides a secure mounting location in the vehicle for the battery and an anchor point for the battery hold-down hardware.

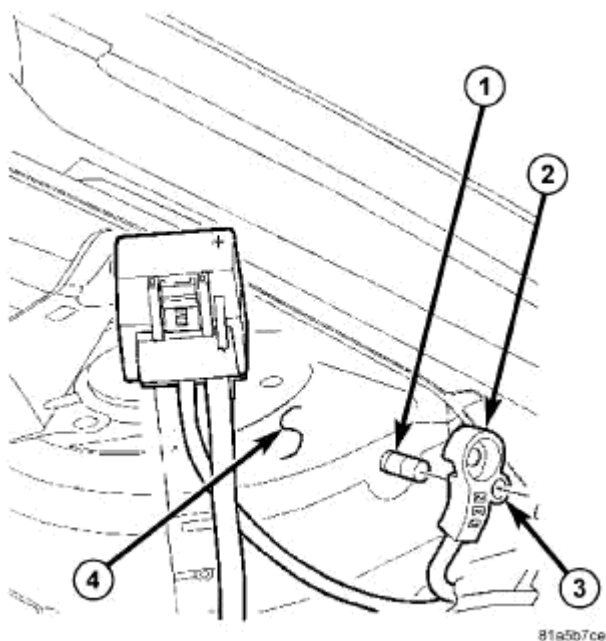


Fig. 2: Identifying Battery Cables & Terminals

Courtesy of CHRYSLER LLC

CAUTION: The negative battery cable remote terminal (2) must be disconnected and isolated from the remote battery post (1) prior to service of the vehicle electrical systems. The negative battery cable remote terminal can be isolated by using the supplied isolation hole (3) in the terminal casing.

For battery system maintenance schedules. Refer to **Vehicle Quick Reference/Maintenance Schedules - Description** . For the proper jump starting procedures, Refer to the vehicle Owner's Manual.

OPERATION

OPERATION

The battery system is designed to provide a safe, efficient, reliable and mobile means of delivering and storing electrical energy. This electrical energy is required to operate the engine starting system, as well as to operate many of the other vehicle accessory systems for limited durations while the engine and/or the charging system are not operating. The battery system is also designed to provide a reserve of electrical energy to supplement the charging system for short durations while the engine is running and the electrical current demands of the vehicle exceed the output of the charging system. In addition to delivering, and storing electrical energy for the vehicle, the battery system serves as a capacitor and voltage stabilizer for the vehicle electrical system. It absorbs most abnormal or transient voltages caused by the switching of any of the electrical components or circuits in the vehicle.

DIAGNOSIS AND TESTING

BATTERY SYSTEM

The battery, starting, and charging systems in the vehicle operate with one another and must be tested as a complete system. In order for the engine to start and the battery to maintain its charge properly, all of the components that are used in these systems must perform within specifications. It is important that the battery, starting, and charging systems be thoroughly tested and inspected any time a battery needs to be charged or replaced. The cause of abnormal battery discharge, overcharging or early battery failure must be diagnosed and corrected before a battery is replaced and before a vehicle is returned to service. The service information for these systems has been separated within this service information to make it easier to locate the specific information you are seeking. However, when attempting to diagnose any of these systems, it is important that you keep their interdependency in mind.

The diagnostic procedures used for the battery, starting, and charging systems include the most basic conventional diagnostic methods, to the more sophisticated On-Board Diagnostics (OBD) built into the Powertrain Control Module (PCM). Use of an induction-type milliammeter, a volt/ohmmeter, a battery charger, a carbon pile rheostat (load tester) and a 12-volt test lamp may be required. All OBD-sensed systems are monitored by the PCM. Each monitored circuit is assigned a Diagnostic Trouble Code (DTC). The PCM will store a DTC in electronic memory for any failure it detects. Refer to **Electrical - Engine Systems/Charging - Diagnosis and Testing** for the proper charging system on-board diagnostic test procedures.

MICRO 420 BATTERY TESTER (GASOLINE ENGINES)

The Micro 420 automotive battery tester is designed to help diagnose the cause of a defective battery. Follow the instruction service information supplied with the tester to properly diagnose a vehicle. If the instruction service information is not available. See **Standard Procedure** which includes the directions for using the Micro 420 battery tester.

OTC ONE STEP BATTERY ANALYZER AND CHARGER (DIESEL ENGINES)

The OTC One Step Battery Analyzer and Charger is designed to help diagnose the cause of a defective battery. Follow the instruction service information supplied with the tester to properly diagnose a vehicle.

BATTERY SYSTEM DIAGNOSIS		
CONDITION	POSSIBLE CAUSES	CORRECTION
THE BATTERY SEEMS WEAK OR DEAD WHEN ATTEMPTING TO START THE ENGINE.	1. The electrical system ignition-off draw is excessive.	1. See <u>Standard Procedure</u> for the appropriate test procedures. Repair the excessive ignition-off draw, as required.
	2. The charging system is inoperative.	2. Determine if the charging system is performing to specifications. Refer to <u>Electrical - Engine Systems/Charging - Diagnosis and Testing</u> for the appropriate charging system diagnosis and testing procedures. Repair the inoperative charging system, as required.
	3. The battery is discharged.	3. Determine the battery state-of-charge using the appropriate battery tester.

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	4. The battery terminal connections are loose or corroded. 5. The battery has an incorrect size or rating for this vehicle. 6. The battery is inoperative. 7. The starting system is inoperative. 8. The battery is physically damaged.	Charge the inoperative battery, as required. 4. See Diagnosis and Testing for the appropriate battery cable diagnosis and testing procedures. Clean and tighten the battery terminal connections, as required. 5. See Specifications for the proper battery size and rating. Replace an incorrect battery, as required. 6. Test the battery using the appropriate battery tester. Replace the inoperative battery, as required. 7. Determine if the starting system is performing to specifications. Refer to Electrical - Engine Systems/Starting - Diagnosis and Testing for the appropriate starting system diagnosis and testing procedures. Repair the inoperative starting system, as required. 8. Inspect the battery for loose terminal posts or a cracked and leaking case. Replace the damaged battery, as required.
THE BATTERY STATE OF CHARGE CANNOT BE MAINTAINED.	1. The battery has an incorrect size or rating for this vehicle. 2. The battery terminal connections are loose or corroded. 3. The electrical system ignition-off draw is excessive. 4. The battery is inoperative. 5. The starting system is inoperative. 6. The charging system is inoperative.	1. See Specifications for the proper battery size and rating. Replace an incorrect battery, as required. 2. See Diagnosis and Testing for the appropriate battery cable diagnosis and testing procedures. Clean and tighten the battery terminal connections, as required. 3. See Standard Procedure for the appropriate test procedures. Repair the excessive ignition-off draw, as required. 4. Test the battery using the appropriate battery tester. Replace the inoperative battery, as required. 5. Determine if the starting system is performing to specifications. Refer to Electrical - Engine Systems/Starting - Diagnosis and Testing for the appropriate starting system diagnosis and testing procedures. Repair the inoperative starting system, as required. 6. Determine if the charging system is performing to specifications. Refer to Electrical - Engine Systems/Charging - Diagnosis and Testing for the

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	7. Electrical loads exceed the output of the charging system. 8. Slow driving or prolonged idling with high-amperage draw loads in use.	appropriate charging system diagnosis and testing procedures. Repair the inoperative charging system, as required. 7. Inspect the vehicle for aftermarket electrical equipment which might cause excessive electrical loads. 8. Advise the vehicle operator, as required.
THE BATTERY WILL NOT ACCEPT A CHARGE.	1. The battery is inoperative.	1. Test the battery using the appropriate battery tester. Replace the inoperative battery, as required.

STANDARD PROCEDURE

BATTERY RECONNECTION

NOTE: This reconnection procedure is to be performed anytime the battery has been disconnected.

1. Connect the negative battery cable remote terminal to the remote battery post and tighten the nut.

CAUTION: Once the battery has been connected, review and perform the following information as applicable.

ELECTRONIC STABILITY PROGRAM (ESP)

If the vehicle is equipped with ESP, once the battery is reconnected, the Steering Angle Sensor (SAS) in the clockspring needs to be calibrated. The SAS requires calibration anytime the battery or an ABS (ESP) component has been disconnected for any length of time. **If the SAS is not calibrated following battery reconnection, the ESP/BAS indicator lamp is illuminated following five ignition cycles indicating the need for calibration.**

To calibrate, perform the following:

1. Start the engine.
2. Center the steering wheel.
3. Turn the steering wheel all the way to the left until the internal stop in the steering gear is met, then turn the wheel all the way to the right until the opposite internal stop in the steering gear is met.
4. Center the steering wheel.
5. Stop the engine.

CLEANING

CLEANING

The following information details the recommended cleaning procedures for the battery and related components. In addition to the maintenance schedules found in this service information and the Owner's Manual, it is recommended that these procedures be performed any time the battery or related components must be removed for vehicle service.

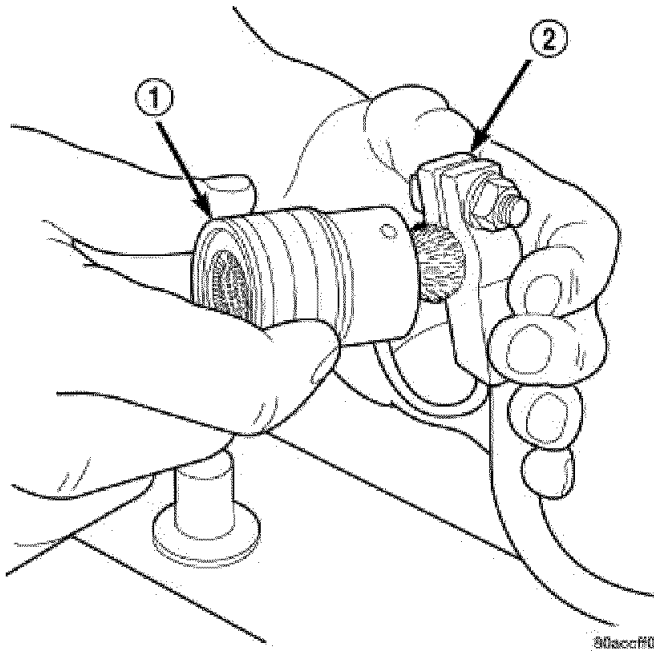


Fig. 3: Cleaning Battery Cable Terminal Clamps Using Terminal Cleaning Tool
Courtesy of CHRYSLER LLC

1. Clean the battery cable terminal clamps (2) of all corrosion. Remove any corrosion using a wire brush (1) or a post and terminal cleaning tool, and a sodium bicarbonate (baking soda) and warm water cleaning solution.
2. Clean the battery tray and battery hold-down hardware of all corrosion. Remove any corrosion using a wire brush and a sodium bicarbonate (baking soda) and warm water cleaning solution. Paint any exposed bare metal.

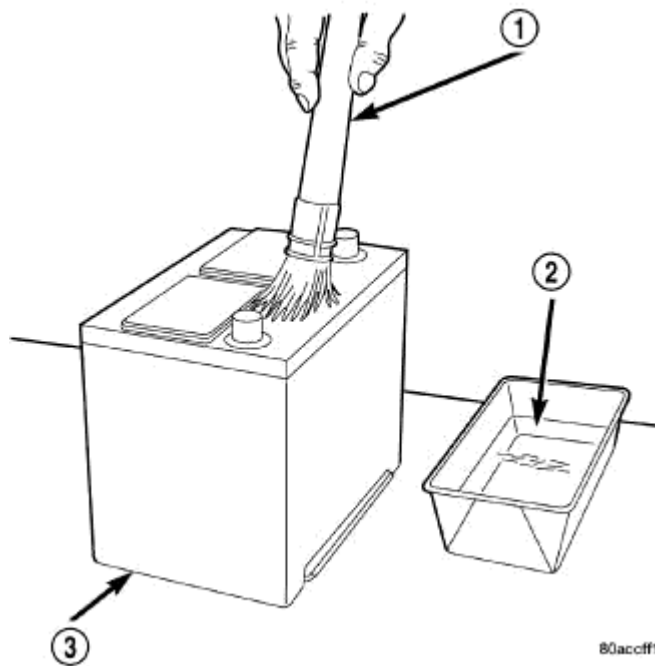


Fig. 4: Cleaning Outside Of Battery Case
Courtesy of CHRYSLER LLC

3. If the removed battery is to be reinstalled, clean the outside of the battery case (3) and the top cover with a sodium bicarbonate (baking soda) and warm water cleaning solution using a stiff bristle parts cleaning brush (1) to remove any acid film. Rinse the battery with clean water. Ensure that the cleaning solution does not enter the battery cells through the vent holes. If the battery is being replaced. See **Specifications** for the factory-installed battery specifications. Confirm that the replacement battery is the correct size and has the correct ratings for the vehicle.
4. Clean the battery thermal guard with a sodium bicarbonate (baking soda) and warm water cleaning solution using a stiff bristle parts cleaning brush to remove any acid film.

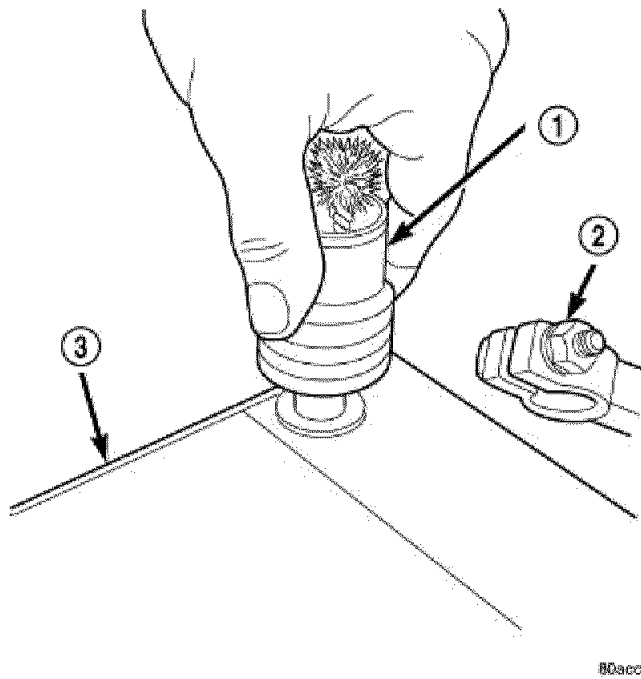


Fig. 5: Cleaning Battery Terminal Post Using Terminal Cleaner
Courtesy of CHRYSLER LLC

5. Clean any corrosion from the battery terminal posts with a wire brush or a post and terminal cleaner, and a sodium bicarbonate (baking soda) and warm water cleaning solution.

INSPECTION

INSPECTION

The following information details the recommended inspection procedures for the battery and related components. In addition to the maintenance schedules found in this service information and the owner's manual, it is recommended that these procedures be performed any time the battery or related components must be removed for vehicle service.

1. Inspect the battery cable terminal clamps for damage. Replace any battery cable that has a damaged or deformed terminal clamp.
2. Inspect the battery tray and battery hold-down hardware for damage. Replace any damaged parts.
3. Slide the thermal guard off of the battery case (if equipped). Inspect the battery case for cracks or other damage that could result in electrolyte leaks. Also, check the battery terminal posts for looseness. Batteries with damaged cases or loose terminal posts must be replaced.
4. Inspect the battery thermal guard for tears, cracks, deformation or other damage (if equipped). Replace any battery thermal guard that has been damaged.
5. Inspect the battery built-in test indicator sight glass (if equipped) for an indication of the battery condition. If the battery is discharged, charge as required. Refer to **Standard Procedure** for detailed instructions.

SPECIFICATIONS

BATTERY

The battery Group Size number, the Cold Cranking Amperage (CCA) rating, and the Reserve Capacity (RC) rating or Ampere-Hours (AH) rating can be found on the original equipment battery label. Be certain that a replacement battery has the correct Group Size number, as well as CCA, and RC or AH ratings that equal or exceed the original equipment specification for the vehicle being serviced. Battery sizes and ratings are discussed in more detail below.

NOTE: Vehicles equipped with a diesel engine utilize a unique battery. The specifications for this battery may differ from the standards shown in this information. Refer to the battery manufacturer for detailed specifications.

- **Group Size** - The outside dimensions and terminal placement of the battery conform to standards established by the Battery Council International (BCI). Each battery is assigned a BCI Group Size number to help identify a correctly-sized replacement.
- **Cold Cranking Amperage** - The Cold Cranking Amperage (CCA) rating specifies how much current (in amperes) the battery can deliver for thirty seconds at -18° C (0° F). Terminal voltage must not fall below 7.2 volts during or after the thirty second discharge period. The CCA required is generally higher as engine displacement increases, depending also upon the starter current draw requirements.
- **Reserve Capacity** - The Reserve Capacity (RC) rating specifies the time (in minutes) it takes for battery terminal voltage to fall below 10.5 volts, at a discharge rate of 25 amperes. RC is determined with the battery fully-charged at 26.7° C (80° F). This rating estimates how long the battery might last after a charging system failure, under minimum electrical load.
- **Ampere-Hours** - The Ampere-Hours (AH) rating specifies the current (in amperes) that a battery can deliver steadily for twenty hours, with the voltage in the battery not falling below 10.5 volts. This rating is also sometimes identified as the twenty-hour discharge rating.
- **Load Test Amperage** - The Load Test Amperage rating specifies the current (in amperes) that a battery should be tested at with the battery load test equipment. This value should always be 50 percent of the CCA. For example: if the CCA for this battery is 700 amps, the Load Test Amperage is 50 percent of that or 350 amps.

BATTERY CLASSIFICATIONS AND RATINGS

BCI Group Size Classification	Cold Cranking Amperage	Reserve Capacity	Ampere - Hours	Load Test Amperage
34	700	120 Minutes	66	350
86	525	150 Minutes	75	265

TORQUE

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Battery Terminal Clamp	5	-	45

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Pinch-Bolt Hex Nut			
Negative Battery Cable Remote Terminal Nut	16.5	-	145
Positive Battery Cable Remote Terminal Nut	16.5	-	145
Battery Hold Down Bolt	16	-	142
Starter Solenoid B(+) Terminal Stud Nut	13	-	115
Battery Negative Cable Ground Eyelet Terminal To Engine Block Bolt	16.5	-	145
Totally Integrated Power Module B(+) Terminal Stud Nut	10	-	90
Battery Tray Support Bolt	16	-	142
Battery Tray Bolt	16	-	142

SPECIAL TOOLS

SPECIAL TOOLS

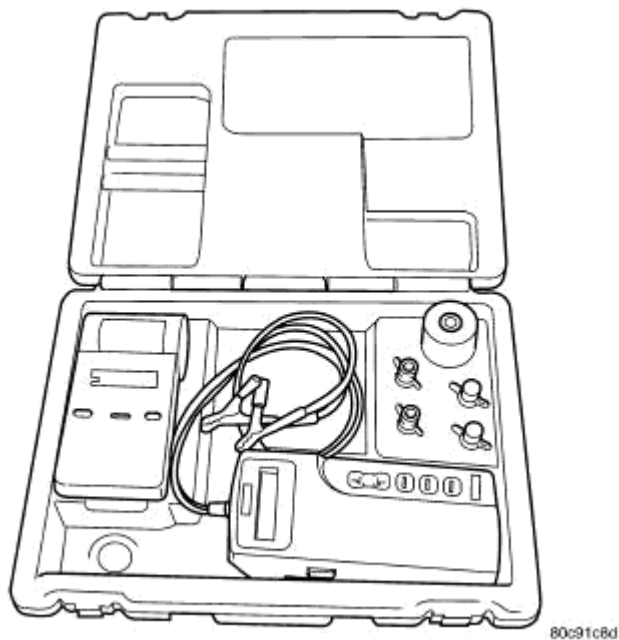


Fig. 6: Micro 420 Battery Tester - PSE p/n 165-EXP-1020KIT
Courtesy of CHRYSLER LLC

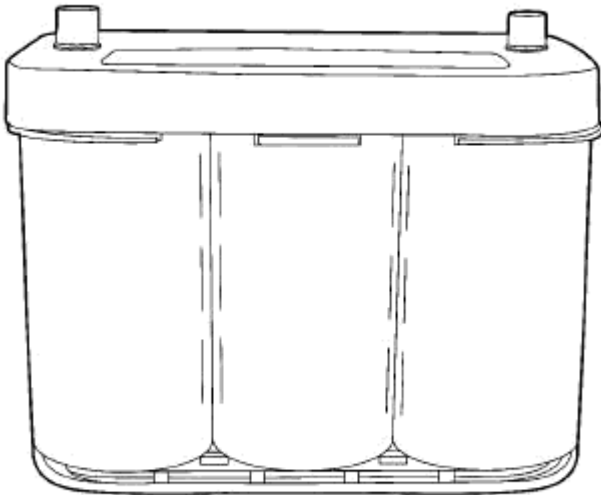
BATTERY

DESCRIPTION

DESCRIPTION

There are two different batteries available for this vehicle. Vehicles equipped with a diesel engine utilize a spiral cell battery with recombination technology. This is a maintenance-free battery that is capable of delivering more power than a conventional battery. This additional power is required by a diesel engine during cold cranking. Vehicles equipped with a gasoline engine utilize a conventional battery. Refer to the following information for detailed differences and descriptions of these two batteries.

SPIRAL CELL BATTERY - DIESEL ENGINE



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Fig. 7: Spiral Plate Battery - Typical
Courtesy of CHRYSLER LLC

WARNING: Never exceed 14.4 volts when charging a spiral cell battery. Personal injury and/or battery damage may result.

By tightly winding layers of spiral grids and acid-permeated vitreous separators into cells, the battery has more power and service life than conventional batteries of the same size. The spiral cell battery is completely, permanently sealed. Through gas recombination, hydrogen and oxygen within the battery are captured during normal charging and reunited to form the water within the electrolyte, eliminating the need to add distilled water. Therefore, these batteries have non-removable battery vent caps.

The acid inside a spiral cell battery is bound within the vitreous separators, ending the threat of acid leaks. This

feature allows the battery to be installed in any position anywhere in the vehicle.

Spiral cell technology is the process by which the cells holding the active material in the battery are wound tightly in coils instead of hanging flat, like conventional batteries. This design has a lower internal resistance and also increases the active material surface area.

Due to the maintenance-free design, distilled water cannot be added to this battery. Therefore, if more than 14.4 volts are used during the spiral cell battery charging process, water vapor can be exhausted through the pressure-sensitive battery vents and lost for good. This can permanently damage the spiral cell battery.

CONVENTIONAL BATTERY - GASOLINE ENGINE

Low-maintenance conventional batteries are used on vehicles equipped with a gasoline engine, these batteries have non-removable battery cell caps. Under normal service, the composition of this battery reduces gassing and water loss at normal charge rates.

Conventional batteries are made up of six individual cells that are connected in series. Each cell contains positive charged cell groups made of lead oxide, and negatively charged cell groups made of sponge lead. The cells are submerged in a sulfuric acid and water solution called electrolyte.

The battery is used to store electrical energy potential in a chemical form. When an electrical load is applied to the battery terminals, an electrochemical reaction occurs within the battery. This reaction causes the battery to discharge electrical current.

OPERATION

OPERATION

The battery is designed to store electrical energy in a chemical form. When an electrical load is applied to the terminals of the battery, an electrochemical reaction occurs. This reaction causes the battery to discharge electrical current from its terminals. As the battery discharges, a gradual chemical change takes place within each cell. The sulfuric acid in the electrolyte combines with the plate materials, causing both plates to slowly change to lead sulfate. At the same time, oxygen from the positive plate material combines with hydrogen from the sulfuric acid, causing the electrolyte to become mainly water. The chemical changes within the battery are caused by the movement of excess or free electrons between the positive and negative plate groups. This movement of electrons produces a flow of electrical current through the load device attached to the battery terminals.

As the plate materials become more similar chemically, and the electrolyte becomes less acid, the voltage potential of each cell is reduced. However, by charging the battery with a voltage higher than that of the battery itself, the battery discharging process is reversed. Charging the battery gradually changes the sulfated lead plates back into sponge lead and lead dioxide, and the water back into sulfuric acid. This action restores the difference in the electron charges deposited on the plates, and the voltage potential of the battery cells. For a battery to remain useful, it must be able to produce high-amperage current over an extended period. A battery must also be able to accept a charge, so that its voltage potential may be restored.

The battery is vented to release excess hydrogen gas that is created when the battery is being charged or

discharged. However, even with these vents, hydrogen gas can collect in or around the battery. If hydrogen gas is exposed to flame or sparks, it may ignite. If the electrolyte level is low, the battery may arc internally and explode. If the battery is equipped with removable cell caps, add distilled water whenever the electrolyte level is below the top of the plates. If the battery cell caps cannot be removed, the battery must be replaced if the electrolyte level becomes low.

DIAGNOSIS AND TESTING

BATTERY

The battery must be completely charged and the terminals should be properly cleaned and inspected before diagnostic procedures are performed. See **Cleaning** for the proper battery cleaning procedures. See **Inspection** for the proper battery inspection procedures. Refer to **Standard Procedure** for the proper battery charging procedures.

MICRO 420 BATTERY TESTER (GASOLINE ENGINES)

The Micro 420 automotive battery tester is designed to help diagnose the cause of a defective battery. Follow the instruction service information supplied with the tester to properly diagnose a vehicle. If the instruction service information is not available refer to **Standard Procedure**, which includes the directions for using the Micro 420 battery tester.

OTC ONE STEP BATTERY ANALYZER AND CHARGER (DIESEL ENGINES)

The OTC One Step Battery Analyzer and Charger is designed to help diagnose the cause of a defective battery. Follow the instruction information supplied with the tester to properly diagnose a vehicle.

WARNING: If the battery shows signs of freezing, leaking or loose posts, do not test, assist-boost, or charge. The battery may arc internally and explode. Personal injury and/or vehicle damage may result.

WARNING: Explosive hydrogen gas forms in and around the battery. Do not smoke, use flame, or create sparks near the battery. Personal injury and/or vehicle damage may result.

WARNING: The battery contains sulfuric acid, which is poisonous and caustic. Avoid contact with the skin, eyes, or clothing. In the event of contact, flush with water and call a physician immediately. Keep out of the reach of children.

WARNING: Never exceed 14.4 volts when charging a spiral cell battery. Personal injury and/or battery damage may result.

A battery that will not accept a charge is faulty, and must be replaced. Further testing is not required. A fully-charged battery must be tested to determine its cranking capacity. A battery that is fully-charged, but fails the OTC One Step Battery Analyzer and Charger or other load test, is faulty and must be replaced.

NOTE: Completely discharged batteries may take several hours to accept a charge. Refer to Standard Procedure for the proper battery charging procedures.

STANDARD PROCEDURE

SPIRAL CELL BATTERY CHARGING

WARNING: Never exceed 14.4 volts when charging a spiral cell battery. Personal injury and/or battery damage may result.

Vehicles equipped with a diesel engine utilize a unique spiral cell battery. This battery has a maximum charging voltage that must not be exceeded in order to restore the battery to its full potential, failure to use the following spiral cell battery charging procedure could result in damage to the battery or personal injury.

Battery charging is the means by which the battery can be restored to its full voltage potential. A battery is fully-charged when:

- OTC One Step Battery Analyzer and Charger special tool number OT-3641 or equivalent tester indicates battery is OK.
- Open-circuit voltage of the battery is 12.65 volts or above.
- Battery passes Load Test multiple times.

WARNING: If the battery shows signs of freezing, leaking, loose posts or low electrolyte level, do not test, assist-boost, or charge. The battery may arc internally and explode. Personal injury and/or vehicle damage may result.

WARNING: Explosive hydrogen gas forms in and around the battery. Do not smoke, use flame, or create sparks near the battery. Personal injury and/or vehicle damage may result.

WARNING: The battery contains sulfuric acid, which is poisonous and caustic. Avoid contact with the skin, eyes, or clothing. In the event of contact, flush with water and call a physician immediately. Keep out of the reach of children.

CAUTION: Always disconnect and isolate the battery negative cable before charging a battery. Charge the battery directly at the battery terminals. Do not exceed 14.4 volts while charging a battery.

CAUTION: The battery should not be hot to the touch. If the battery feels hot to the touch, turn off the charger and let the battery cool before continuing the charging operation. Damage to the battery may result.

After the battery has been charged to 12.6 volts or greater, perform a load test to determine the battery cranking capacity. If the battery passes a load test, return the battery to service. If the battery fails a load test, it is faulty

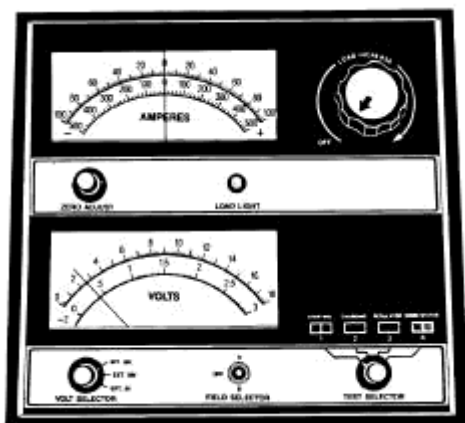
and must be replaced.

Clean and inspect the battery hold downs, tray, terminals, posts, and top before completing battery service. See **Cleaning** for the proper battery system cleaning procedures. See **Inspection** for the proper battery system inspection procedures.

CHARGING A COMPLETELY DISCHARGED SPIRAL CELL BATTERY

WARNING: Never exceed 14.4 volts when charging a spiral cell battery. Personal injury and/or battery damage may result.

The following procedure should be used to recharge a completely discharged battery. Unless this procedure is properly followed, a good battery may be needlessly replaced.



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Fig. 8: Voltmeter

Courtesy of CHRYSLER LLC

1. Measure the voltage at the battery posts with a voltmeter, accurate to 1/10 (0.10) volt. Refer to Battery **Removal** and **Installation** for access instructions. If the reading is below ten volts, the battery charging current will be low. It could take several hours before the battery accepts a current greater than a few milliamperes. Such low current may not be detectable on the ammeters built into many battery chargers.
2. Disconnect and isolate the battery negative cable. Connect the OTC One Step Battery Analyzer and Charger special tool number OT-3641 or equivalent.

NOTE: Some battery chargers are equipped with polarity-sensing circuitry. This circuitry protects the battery charger and the battery from being damaged if they are improperly connected. If the battery state-of-charge is too low for the polarity-sensing circuitry to detect, the battery charger will not operate. This makes it appear that the battery will not accept charging current. See the instructions provided by the manufacturer of the battery charger for details on how to bypass the polarity-sensing circuitry.

3. Battery chargers vary in the amount of voltage and current they provide. The amount of time required for

a battery to accept measurable charging current at various voltages is shown in **SPIRAL CELL BATTERY CHARGE RATE TABLE** . If the charging current is still not measurable at the end of the charging time, the battery is faulty and must be replaced. If the charging current is measurable during the charging time, the battery may be good and the charging should be completed in the normal manner.

SPIRAL CELL BATTERY CHARGE RATE TABLE

Voltage	Minutes
14.4 volts maximum	up to 10 minutes
13.0 to 14 volts	up to 20 minutes
12.9 volts or less	up to 30 minutes

CHARGING TIME REQUIRED

The time required to charge a battery will vary, depending upon the following factors:

- **Battery Capacity** - A completely discharged heavy-duty battery requires twice the charging time of a small capacity battery.
- **Temperature** - A longer time will be needed to charge a battery at -18° C (0° F) than at 27° C (80° F). When a fast battery charger is connected to a cold battery, the current accepted by the battery will be very low at first. As the battery warms, it will accept a higher charging current rate (amperage).
- **Charger Capacity** - A battery charger that supplies only five amperes will require a longer charging time. A battery charger that supplies eight amperes will require a shorter charging time.
- **State-Of-Charge** - A completely discharged battery requires more charging time than a partially discharged battery. Electrolyte is nearly pure water in a completely discharged battery. At first, the charging current (amperage) will be low. As the battery charges, the specific gravity of the electrolyte will gradually rise.

The Battery Charging Time Table gives an indication of the time required to charge a typical battery at room temperature based upon the battery state-of-charge and the charger capacity.

SPIRAL CELL BATTERY CHARGE TIME TABLE

Charging Amperage	5 Amps	8 Amps
Open Circuit Voltage	Hours Charging @ 21° C (70° F)	
12.25 to 12.49	6 hours	3 hours
12.00 to 12.24	10 hours	5 hours
10.00 to 11.99	14 hours	7 hours
Below 10.00	18 hours	9 hours

CONVENTIONAL BATTERY CHARGING

CAUTION: Vehicles equipped with a diesel engine utilize a unique spiral cell battery. This battery has a maximum charging voltage that must be used in order to restore the battery to its full potential, failure to use the spiral cell battery charging procedure could result in damage to the battery or

personal injury. See Standard Procedure for the appropriate procedure.

Battery charging is the means by which the battery can be restored to its full voltage potential. A battery is fully-charged when:

- Micro 420 battery tester indicates battery is OK.
- Open-circuit voltage of the battery is 12.65 volts or above.
- Battery passes Load Test multiple times.

WARNING: If the battery shows signs of freezing, leaking, loose posts, do not test, assist-boost, or charge. The battery may arc internally and explode. Personal injury and/or vehicle damage may result.

WARNING: Explosive hydrogen gas forms in and around the battery. Do not smoke, use flame, or create sparks near the battery. Personal injury and/or vehicle damage may result.

WARNING: The battery contains sulfuric acid, which is poisonous and caustic. Avoid contact with the skin, eyes, or clothing. In the event of contact, flush with water and call a physician immediately. Keep out of the reach of children.

WARNING: If the battery is equipped with removable cell caps, be certain that each of the cell caps is in place and tight before the battery is returned to service. Personal injury and/or vehicle damage may result from loose or missing cell caps.

CAUTION: Always disconnect and isolate the battery negative cable before charging a battery. Do not exceed sixteen volts while charging a battery. Damage to the vehicle electrical system components may result.

CAUTION: Battery electrolyte will bubble inside the battery case during normal battery charging. Electrolyte boiling or being discharged from the battery vents indicates a battery overcharging condition. Immediately reduce the charging rate or turn off the charger to evaluate the battery condition. Damage to the battery may result from overcharging.

CAUTION: The battery should not be hot to the touch. If the battery feels hot to the touch, turn off the charger and let the battery cool before continuing the charging operation. Damage to the battery may result.

After the battery has been charged to an open-circuit voltage reading of 12.4 volts or greater, retest the battery with the Micro 420 tester or perform a load test to determine the battery cranking capacity. See **Standard Procedure** for the proper battery test procedures. If the battery passes a load test, return the battery to service. If the battery fails a load test, it is faulty and must be replaced.

Clean and inspect the battery hold downs, tray, terminals, posts, and top before completing battery service. See **Cleaning** for the proper battery system cleaning procedures. See **Inspection** for the proper battery system inspection procedures.

CHARGING A COMPLETELY DISCHARGED CONVENTIONAL BATTERY

The following procedure should be used to recharge a completely discharged battery. Unless this procedure is properly followed, a good battery may be needlessly replaced.

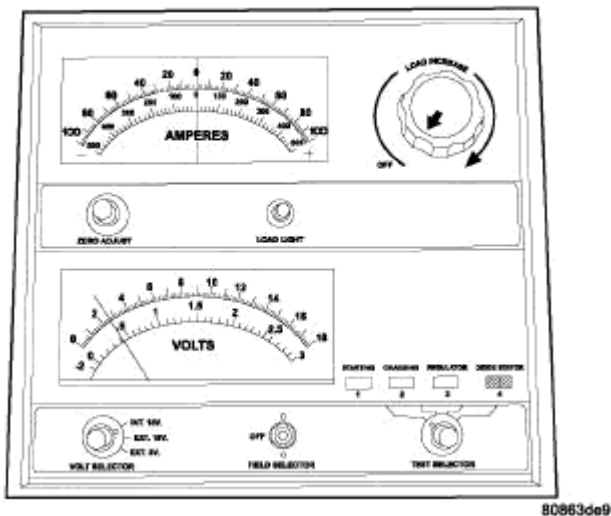


Fig. 9: Identifying Battery Load Tester
Courtesy of CHRYSLER LLC

1. Measure the voltage at the battery posts with a voltmeter, accurate to 1/10 (0.10) volt. If the reading is below ten volts, the battery charging current will be low. It could take some time before the battery accepts a current greater than a few milliamperes. Such low current may not be detectable on the ammeters built into many battery chargers.
2. Disconnect and isolate the battery negative cable. Connect the battery charger leads. Some battery chargers are equipped with polarity-sensing circuitry. This circuitry protects the battery charger and the battery from being damaged if they are improperly connected. If the battery state-of-charge is too low for the polarity-sensing circuitry to detect, the battery charger will not operate. This makes it appear that the battery will not accept charging current. See the instructions provided by the manufacturer of the battery charger for details on how to bypass the polarity-sensing circuitry.
3. Battery chargers vary in the amount of voltage and current they provide. The amount of time required for a battery to accept measurable charging current at various voltages is shown in the **CONVENTIONAL BATTERY CHARGE RATE TABLE** . If the charging current is still not measurable at the end of the charging time, the battery is faulty and must be replaced. If the charging current is measurable during the charging time, the battery may be good and the charging should be completed in the normal manner.

CONVENTIONAL BATTERY CHARGE RATE TABLE

Voltage	Minutes
---------	---------

2009 Dodge Journey R/T

2009 ELECTRICAL Battery System - Journey

16.0 volts maximum	up to 10 min.
14.0 to 15.9 volts	up to 20 min.
13.9 volts or less	up to 30 min.

CHARGING TIME REQUIRED

The time required to charge a battery will vary, depending upon the following factors:

- **Battery Capacity** - A completely discharged heavy-duty battery requires twice the charging time of a small capacity battery.
- **Temperature** - A longer time will be needed to charge a battery at -18° C (0° F) than at 27° C (80° F). When a fast battery charger is connected to a cold battery, the current accepted by the battery will be very low at first. As the battery warms, it will accept a higher charging current rate (amperage).
- **Charger Capacity** - A battery charger that supplies only five amperes will require a longer charging time. A battery charger that supplies twenty amperes or more will require a shorter charging time.
- **State-Of-Charge** - A completely discharged battery requires more charging time than a partially discharged battery. Electrolyte is nearly pure water in a completely discharged battery. At first, the charging current (amperage) will be low. As the battery charges, the specific gravity of the electrolyte will gradually rise.

The Conventional Battery Charging Time Table gives an indication of the time required to charge a typical battery at room temperature based upon the battery state-of-charge and the charger capacity.

CONVENTIONAL BATTERY CHARGING TIME TABLE

Charging Amperage	5 Amps	10 Amps	20 Amps
Open Circuit Voltage	Hours Charging @ 21° C (70° F)		
12.25 to 12.49	6 hours	3 hours	1.5 hours
12.00 to 12.24	10 hours	5 hours	2.5 hours
10.00 to 11.99	14 hours	7 hours	3.5 hours
Below 10.00	18 hours	9 hours	4.5 hours

USING MICRO 420 BATTERY TESTER (GASOLINE ENGINES)

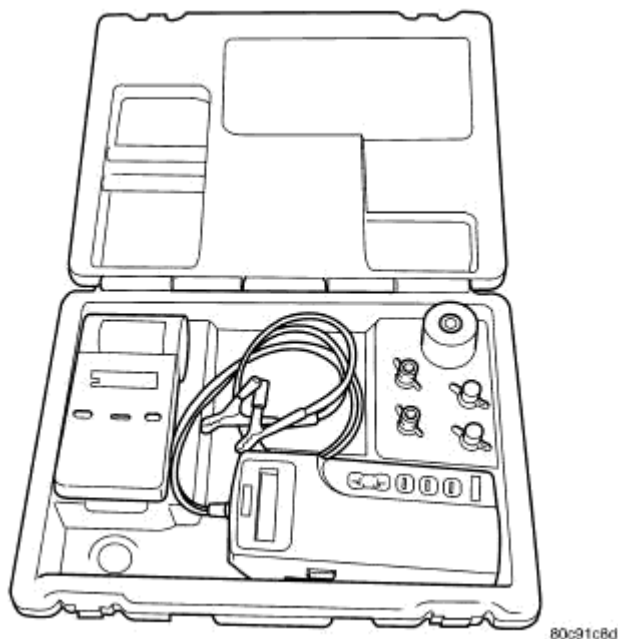


Fig. 10: Identifying Micro Battery Tester
Courtesy of CHRYSLER LLC

NOTE: The Micro 420 battery tester should only be used to test vehicles equipped with gasoline engines. If the vehicle being tested has a diesel engine the OTC, One Step Battery Analyzer and Charger (OTC) special tool number OT-3641 or equivalent should be used to test the battery.

Always use the Micro 420 instruction manual that was supplied with the tester as a reference. If the instruction manual is not available the following procedure can be used:

WARNING: Always wear appropriate eye protection and use extreme caution when working with batteries. Failure to do so may result in serious or fatal injury.

BATTERY TESTING

1. If testing the battery out of vehicle, clean the battery terminals with a wire brush before testing. If the battery is equipped with side post terminals, install and tighten the supplied lead terminal stud adapters. Do not use steel bolts. Failure to properly install the stud adapters or using stud adapters that are dirty or worn-out may result in false test readings.
2. If testing the battery in the vehicle, make certain all of the vehicle accessory loads are off, including the ignition.
3. Connect the tester to the battery, the red clamp to the positive (+) terminal and the black clamp to the negative (-) terminal.

NOTE: Multiple batteries connected in parallel must have the ground cable disconnected to perform a battery test. Failure to disconnect may result in false battery test readings.

4. Using the ARROW key select **in** or **out** of vehicle testing and press ENTER to make a selection.
5. If not selected, choose the Cold Cranking Amp (CCA) battery rating. Or select the appropriate battery rating for your area (see menu). The tester then runs its self programmed test of the battery and display the results. Refer to the BATTERY TEST RESULTS chart.

CAUTION: If replacing the battery is the result of the test, this may mean a poor connection between the vehicle cables and battery exists. After disconnecting the vehicle battery cables from the battery, retest the battery using the out of vehicle test before replacing.

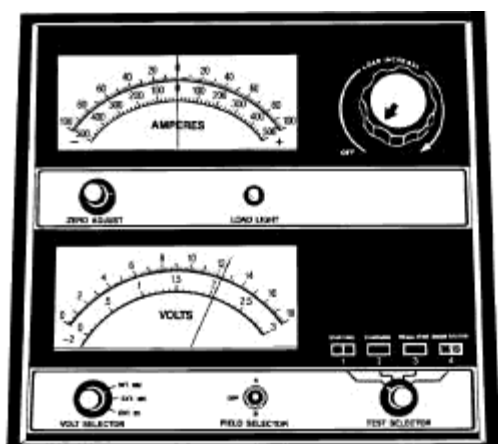
6. While viewing the battery test result, press the CODE button and the tester, prompts you for the last 4 digits of the VIN. Use the UP/DOWN arrow buttons to scroll to the correct character, then press ENTER to select and move to the next digit. Press the ENTER button to view the service code. Pressing the CODE button a second time returns you to the test results.

BATTERY TEST RESULTS	
GOOD BATTERY	Return to service.
GOOD - RECHARGE	Fully charge battery and return to service.
CHARGE AND RETEST	Fully charge battery and retest battery.
REPLACE BATTERY	Replace the battery and retest complete the system.
BAD-CELL REPLACE	Replace the battery and retest complete the system.

OPEN-CIRCUIT VOLTAGE TEST

A battery open-circuit voltage (no load) test will show the approximate state-of-charge of a battery.

Before proceeding with this test, completely charge the battery, refer to the appropriate battery charging procedure.



898A.7

Fig. 11: Voltmeter

Courtesy of CHRYSLER LLC

1. Before measuring the open-circuit voltage, the surface charge must be removed from the battery. Turn on the headlamps for fifteen seconds, then allow up to five minutes for the battery voltage to stabilize.
2. Disconnect and isolate both battery cables, negative cable first.
3. Using a voltmeter connected to the battery posts (see the instructions provided by the manufacturer of the voltmeter), measure the open-circuit voltage.

See the OPEN-CIRCUIT VOLTAGE chart. This voltage reading will indicate the battery state-of-charge, but will not reveal its cranking capacity. If a battery has an open-circuit voltage reading of 12.4 volts or greater, it may be load tested to reveal its cranking capacity.

OPEN CIRCUIT VOLTAGE TABLE	
Open Circuit Voltage	Charge Percentage
11.7 volts or less	0%
12.0 volts	25%
12.2 volts	50%
12.4 volts	75%
12.6 volts or more	100%

IGNITION-OFF DRAW TEST

The term Ignition-Off Draw (IOD) identifies a normal condition where power is being drained from the battery with the ignition switch in the Off position. A normal vehicle electrical system will draw from five to thirty-five milliamperes (0.005 to 0.035 ampere) with the ignition switch in the Off position, and all non-ignition controlled circuits in proper working order. Up to thirty-five milliamperes are needed to enable the memory functions for the Powertrain Control Module (PCM), digital clock, electronically tuned radio, and other modules which may vary with the vehicle equipment.

A vehicle that has not been operated for approximately twenty days, may discharge the battery to an inadequate level. When a vehicle will not be used for twenty days or more (stored), remove the IOD fuse from the Totally Integrated Power Module (TIPM). This will reduce battery discharging.

Excessive IOD can be caused by:

- Electrical items left on.
- Faulty or improperly adjusted switches.
- Faulty or shorted electronic modules and components.
- An internally shorted generator.
- Intermittent shorts in the wiring.

If the IOD is over thirty-five milliamperes, the problem must be found and corrected before replacing a battery. In most cases, the battery can be charged and returned to service after the excessive IOD condition has been

corrected.

1. Verify that all electrical accessories are off. Turn off all lamps, remove the ignition key, and close all doors. If the vehicle is equipped with an illuminated entry system or an electronically tuned radio, allow the electronic timer function of these systems to automatically shut off (time out). This may take up to three minutes.
2. Determine that the underhood lamp is operating properly, then disconnect the lamp wire harness connector or remove the lamp bulb.
3. Disconnect the battery negative cable.
4. Set an electronic digital multi-meter to its highest amperage scale. Connect the multi-meter between the disconnected battery negative cable terminal clamp and the battery negative terminal post. Make sure that the doors remain closed so that the illuminated entry system is not activated. The multi-meter amperage reading may remain high for up to three minutes, or may not give any reading at all while set in the highest amperage scale, depending upon the electrical equipment in the vehicle. The multi-meter leads must be securely clamped to the battery negative cable terminal clamp and the battery negative terminal post. If continuity between the battery negative terminal post and the negative cable terminal clamp is lost during any part of the IOD test, the electronic timer function will be activated and all of the tests will have to be repeated.
5. After about three minutes, the high-amperage IOD reading on the multi-meter should become very low or nonexistent, depending upon the electrical equipment in the vehicle. If the amperage reading remains high, remove and replace each fuse or circuit breaker in the Totally Integrated Power Module (TIPM), one at a time until the amperage reading becomes very low, or nonexistent. **Refer to SYSTEM WIRING DIAGRAMS for complete TIPM fuse, circuit breaker, and circuit identification.** This will isolate each circuit and identify the circuit that is the source of the high-amperage IOD. If the amperage reading remains high after removing and replacing each fuse and circuit breaker, disconnect the wire harness from the generator. If the amperage reading now becomes very low or nonexistent. Refer to **Electrical - Engine Systems/Charging - Diagnosis and Testing** for the proper charging system diagnosis and testing procedures. After the high-amperage IOD has been corrected, switch the multi-meter to progressively lower amperage scales and, if necessary, repeat the fuse and circuit breaker remove-and-replace process to identify and correct all sources of excessive IOD. It is now safe to select the lowest milliampere scale of the multi-meter to check the low-amperage IOD.

CAUTION: Do not open any doors, or turn on any electrical accessories with the lowest milliampere scale selected, or the multi-meter may be damaged.

6. Observe the multi-meter reading. The low-amperage IOD should not exceed thirty-five milliamperes (0.035 ampere). If the current draw exceeds thirty-five milliamperes, isolate each circuit using the fuse and circuit breaker remove-and-replace process in 5. The multi-meter reading will drop to within the acceptable limit when the source of the excessive current draw is disconnected. Repair this circuit as required; whether a wiring short, incorrect switch adjustment, or a component failure is at fault.

REMOVAL

REMOVAL

WARNING: To protect the hands from battery acid, a suitable pair of heavy duty rubber gloves should be worn when removing or servicing a battery. Safety glasses also should be worn.

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

CAUTION: The negative battery cable remote terminal (2) must be disconnected and isolated from the remote battery post (1) prior to service of the vehicle electrical systems. The negative battery cable remote terminal can be isolated by using the supplied isolation hole (3) in the terminal casing.

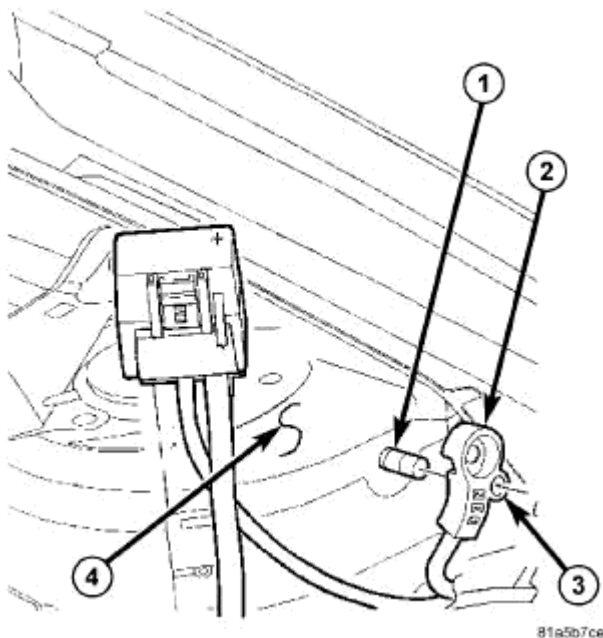


Fig. 12: Identifying Battery Cables & Terminals
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable remote terminal from the remote battery post.

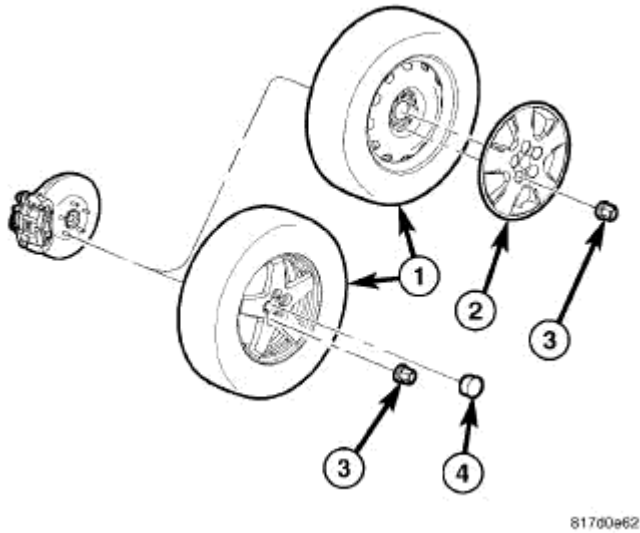


Fig. 13: TIRE AND WHEEL MOUNTING
Courtesy of CHRYSLER LLC

2. Remove the left front wheel and tire assembly. Refer to **Tires and Wheels - Removal**.

NOTE: Gasoline battery shown in illustration, diesel battery similar.

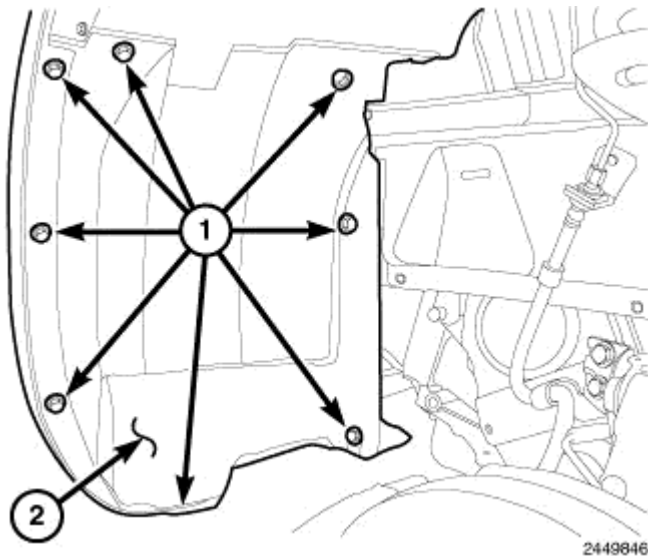
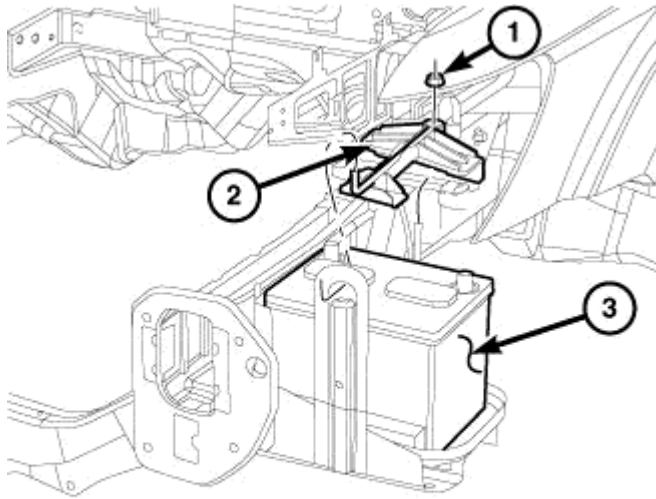


Fig. 14: Push-Pins & Splash Shield
Courtesy of CHRYSLER LLC

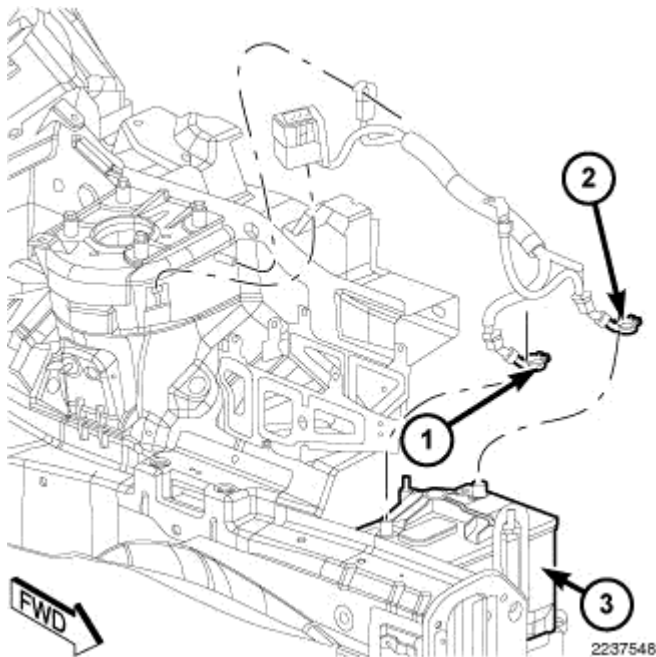
3. Remove the push pins (1) and remove the left front wheelhouse splash shield (2). Refer to **Body/Exterior/SHIELD, Splash - Removal**.



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Fig. 15: Battery, Bracket & Nut
Courtesy of CHRYSLER LLC

4. Loosen the nut (1) and position the battery hold down bracket out of the way (3).



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Fig. 16: Battery And Pinch Clamp Bolts
Courtesy of CHRYSLER LLC

5. Loosen the pinch clamp bolts and position aside the battery cable clamps from the battery.

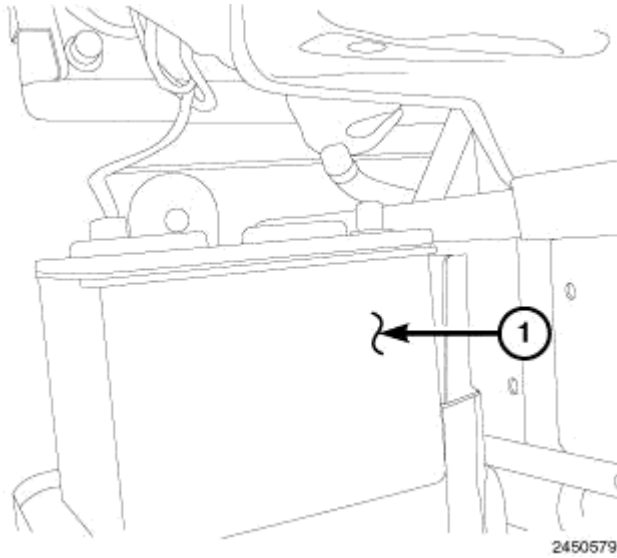


Fig. 17: Battery

Courtesy of CHRYSLER LLC

6. Remove the battery (1) from the battery tray (2).

INSTALLATION

INSTALLATION

WARNING: To protect the hands from battery acid, a suitable pair of heavy duty rubber gloves should be worn when removing or servicing a battery. Safety glasses also should be worn.

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

CAUTION: The negative battery cable remote terminal (2) must be disconnected and isolated from the remote battery post (1) prior to service of the vehicle electrical systems. The negative battery cable remote terminal can be isolated by using the supplied isolation hole (3) in the terminal casing.

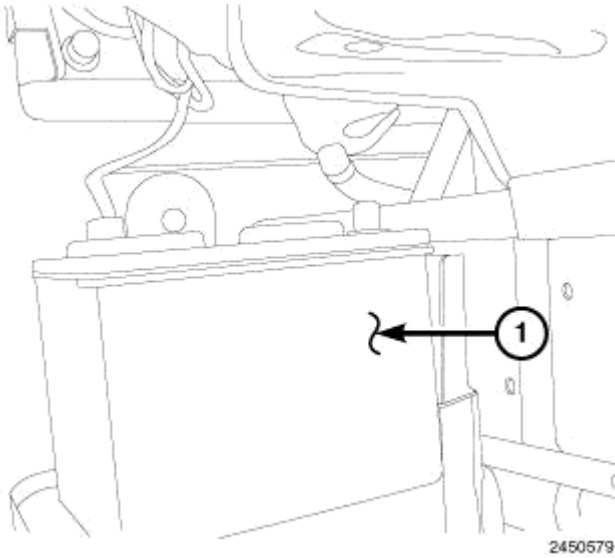


Fig. 18: Battery
Courtesy of CHRYSLER LLC

1. Install the battery (1) into the battery tray (2).

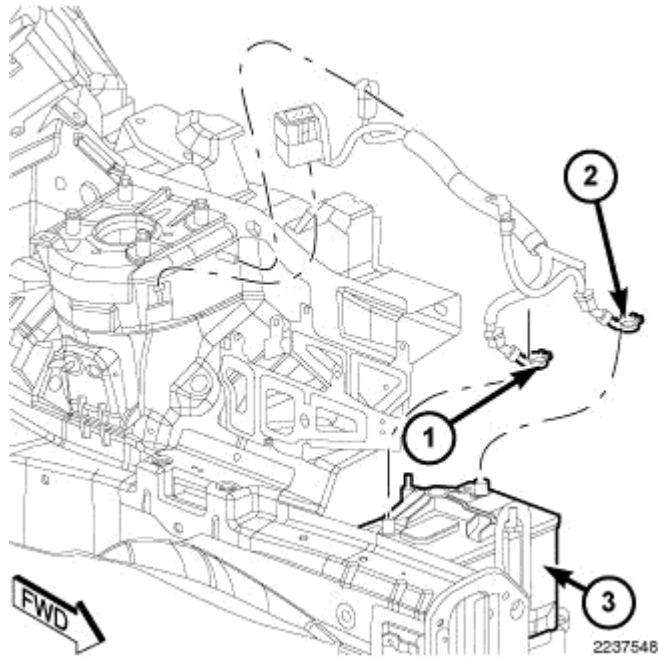
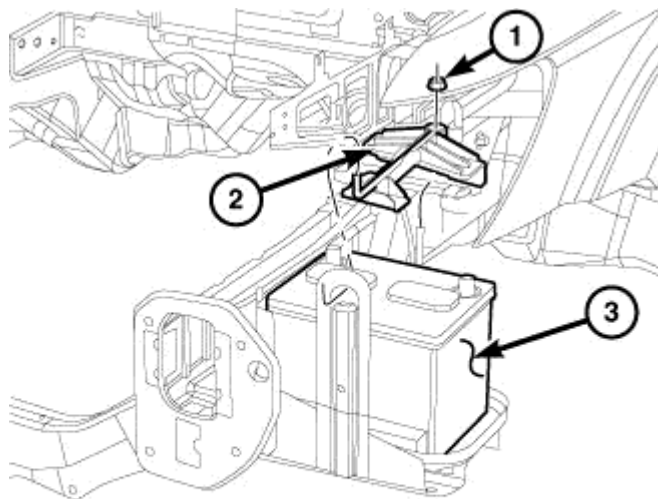


Fig. 19: Battery And Pinch Clamp Bolts
Courtesy of CHRYSLER LLC

2. Install the battery terminal pinch clamps (1, 2) onto the battery posts.

Tighten the pinch clamp nut to 17.5 N.m (13 in. lbs.)

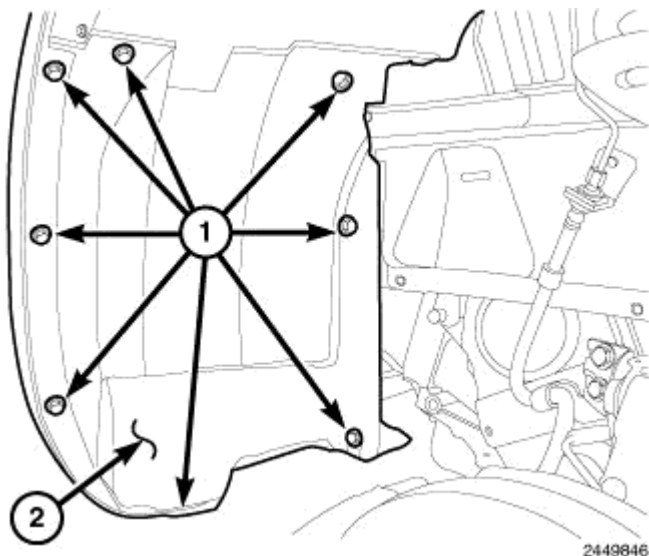


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Fig. 20: Battery, Bracket & Nut
Courtesy of CHRYSLER LLC

3. Position back the battery hold down bracket (3) and install the bracket nut (1).

Tighten the pinch clamp nut to 55 N.m (40 ft. lbs.)



2449846

Fig. 21: Push-Pins & Splash Shield
Courtesy of CHRYSLER LLC

4. Install the left front wheelhouse splash shield (2) and push pins (1). Refer to **Body/Exterior/SHIELD, Splash - Installation**.

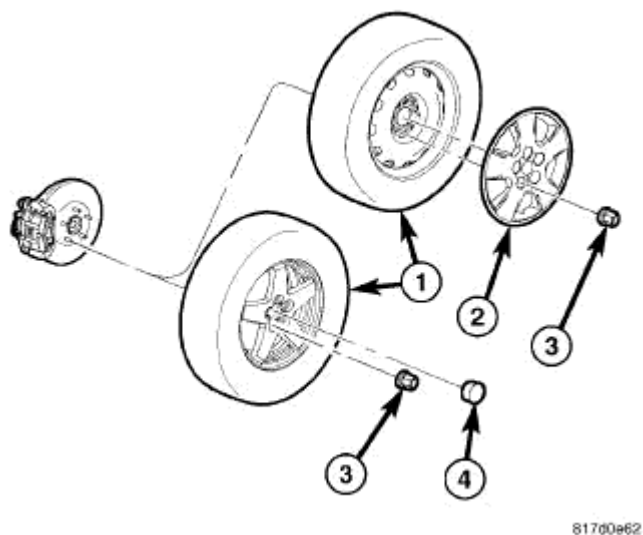


Fig. 22: TIRE AND WHEEL MOUNTING
Courtesy of CHRYSLER LLC

5. Install the left front wheel and tire assembly. Refer to **Tires and Wheels - Removal** .

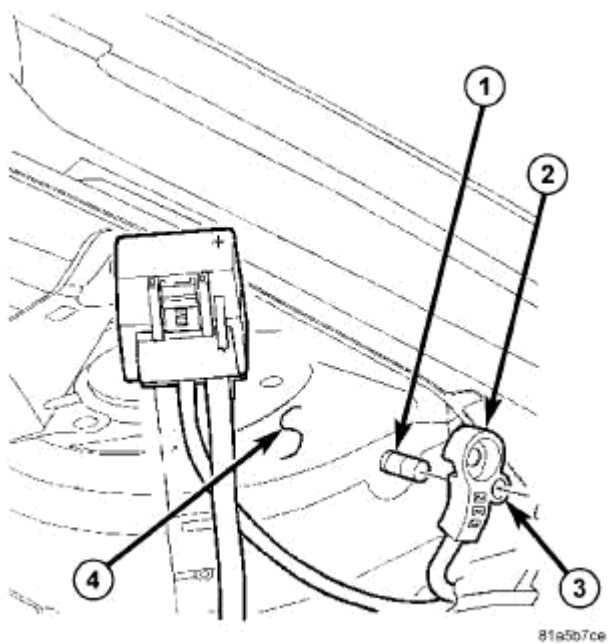


Fig. 23: Identifying Battery Cables & Terminals
Courtesy of CHRYSLER LLC

6. Install the negative battery cable remote terminal onto the remote battery post.

Tighten the nut to 28 N.m (9.5 in. lbs.)

CABLES, BATTERY

DESCRIPTION

DESCRIPTION

The battery cables are large gauge, stranded copper wires sheathed within a heavy plastic or synthetic rubber insulating jacket. The wire used in the battery cables combines excellent flexibility and reliability with high electrical current carrying capacity. The battery cables feature a clamping type female battery terminal made of stamped sheet metal that is die cast onto one end of the battery cable wire. A pinch-bolt and nut are installed at the open end of the female battery terminal clamp. Large eyelet type terminals are crimped onto the opposite end of the battery cable wire and then soldered. The battery positive cable wires feature a larger female battery terminal clamp to allow connection to the larger battery positive terminal post. The battery negative cable wires have a smaller female battery terminal clamp.

There are two separate battery cable harnesses used on this vehicle. The battery harness includes both the battery positive and negative cables to the remote battery connection and may include portions of the wiring circuits for other components on some vehicles. The starter harness includes both the battery positive and negative cables from the remote battery connection down to the starter and engine ground location. These two harnesses are sold as separate assemblies.

OPERATION

OPERATION

The battery cables connect the battery terminal posts to the vehicle electrical system. These cables also provide a path back to the battery for electrical current generated by the charging system for restoring the voltage potential of the battery. The female battery terminal clamps on the ends of the battery cable wires provide a strong and reliable connection of the battery cable to the battery terminal posts. The terminal pinch bolts allow the female terminal clamps to be tightened around the male terminal posts on the top of the battery. The eyelet terminals secured to the opposite ends of the battery cable wires from the female battery terminal clamps provide secure and reliable connection of the battery cables to the vehicle electrical system.

One wire has an eyelet terminal that connects the battery positive cable to the B(+) terminal stud of the Totally Integrated Power Module (TIPM), and the other wire has an eyelet terminal that connects the battery positive cable to the B(+) terminal stud of the engine starter motor solenoid. The battery negative cable terminal clamp has one wire as an eyelet terminal that connects the battery negative cable to the vehicle powertrain through a ground connection, typically on the engine cylinder block.

DIAGNOSIS AND TESTING

BATTERY CABLES

A voltage drop test will determine if there is excessive resistance in the battery cable terminal connections or the battery cable. If excessive resistance is found in the battery cable connections, the connection point should be disassembled, cleaned of all corrosion or foreign material, then reassembled. Following reassembly, check the voltage drop for the battery cable connection and the battery cable again to confirm repair.

When performing the voltage drop test, it is important to remember that the voltage drop is giving an indication of the resistance between the two points at which the voltmeter probes are attached. **EXAMPLE:** When testing the resistance of the battery positive cable, touch the voltmeter leads to the battery positive cable terminal clamp and to the battery positive cable eyelet terminal at the starter solenoid B(+) terminal stud. If you probe the battery positive terminal post and the battery positive cable eyelet terminal at the starter solenoid B(+) terminal stud, you are reading the combined voltage drop in the battery positive cable terminal clamp-to-terminal post connection and the battery positive cable.

VOLTAGE DROP TEST

The following operation will require a voltmeter accurate to 1/10 (0.10) volt. Before performing this test, be certain that the following procedures are accomplished:

- The battery is fully-charged and load tested. Refer to **Standard Procedure** for the proper battery charging and load test procedures.
- Fully engage the parking brake.
- If the vehicle is equipped with an automatic transmission, place the gearshift selector lever in the Park position. If the vehicle is equipped with a manual transmission, place the gearshift selector lever in the Neutral position and block the clutch pedal in the fully depressed position.
- Verify that all lamps and accessories are turned off.
- To prevent the engine from starting, remove the Automatic Shut Down (ASD) relay. The ASD relay can be found in the Junction Block located in the left front engine compartment area. See the layout label affixed to the underside of the Junction Block cover for ASD relay identification and location.

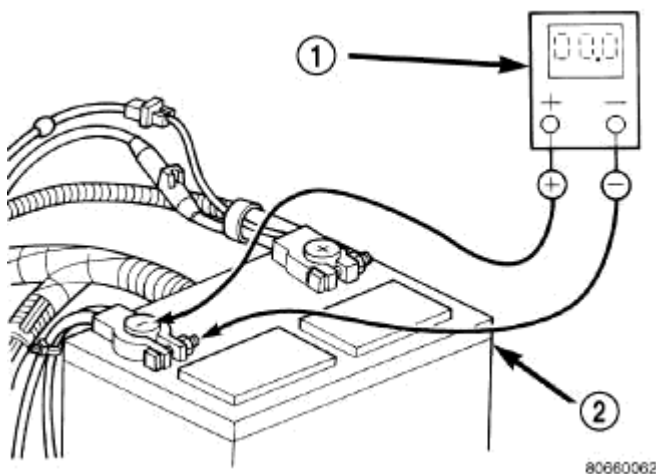


Fig. 24: Connecting Voltmeter Leads To Battery Negative Terminal
Courtesy of CHRYSLER LLC

1. Connect the positive lead of the voltmeter (1) to the battery (2) negative terminal post. Connect the negative lead of the voltmeter (1) to the battery (2) negative cable terminal clamp. Rotate and hold the ignition switch in the Start position. Observe the voltmeter. If voltage is detected, correct the poor connection between the battery negative cable terminal clamp and the battery negative terminal post.

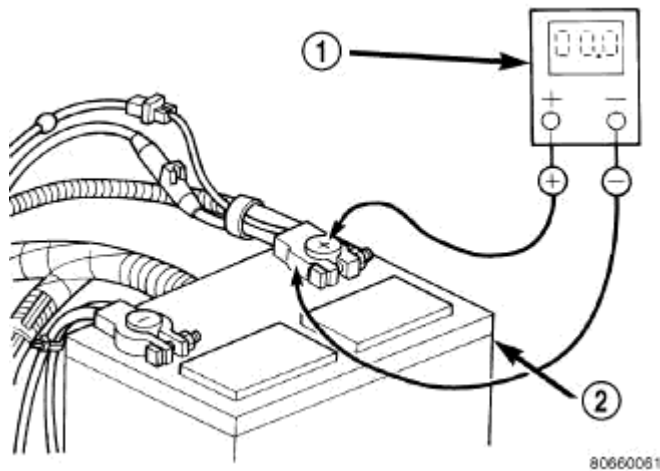


Fig. 25: Connecting Voltmeter Leads To Battery Positive Terminal
Courtesy of CHRYSLER LLC

2. Connect the positive lead of the voltmeter (1) to the battery (2) positive terminal post. Connect the negative lead of the voltmeter (1) to the battery (2) positive cable terminal clamp. Rotate and hold the ignition switch in the Start position. Observe the voltmeter. If voltage is detected, correct the poor connection between the battery positive cable terminal clamp and the battery positive terminal post.

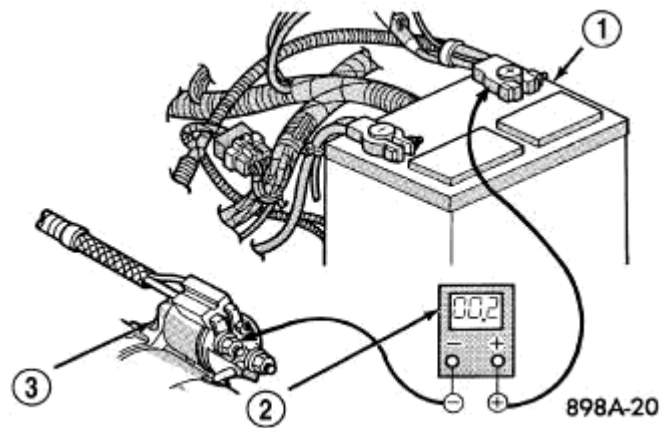


Fig. 26: Connecting Voltmeter To Terminal Clamp And Stud
Courtesy of CHRYSLER LLC

3. Connect the voltmeter (2) to measure between the battery positive cable terminal clamp (1) and the starter solenoid B(+) terminal stud (3). Rotate and hold the ignition switch in the Start position. Observe the voltmeter. If the reading is above 0.2 volt, clean and tighten the battery positive cable eyelet terminal connection at the starter solenoid B(+) terminal stud. Repeat the test. If the reading is still above 0.2 volt, replace the faulty battery positive cable.

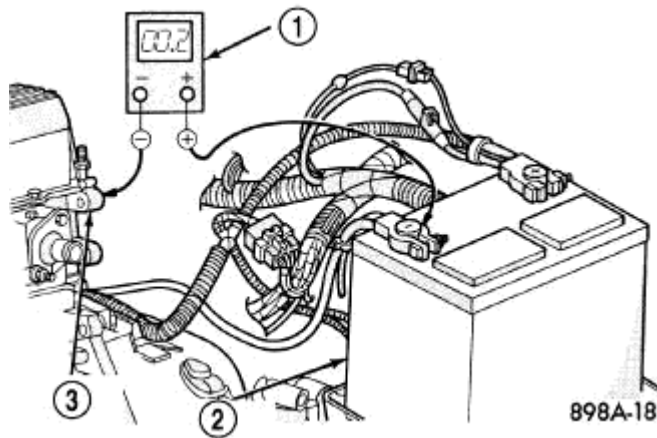


Fig. 27: Connecting Voltmeter To Battery And Engine Block
Courtesy of CHRYSLER LLC

4. Connect the voltmeter (1) to measure between the battery (2) negative cable terminal clamp and a good clean ground on the engine block (3). Rotate and hold the ignition switch in the Start position. Observe the voltmeter. If the reading is above 0.2 volt, clean and tighten the battery negative cable eyelet terminal connection to the engine block. Repeat the test. If the reading is still above 0.2 volt, replace the faulty battery negative cable.

REMOVAL

REMOVAL

BATTERY HARNESS

WARNING: To protect the hands from battery acid, a suitable pair of heavy duty rubber gloves should be worn when removing or servicing a battery. Safety glasses also should be worn.

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

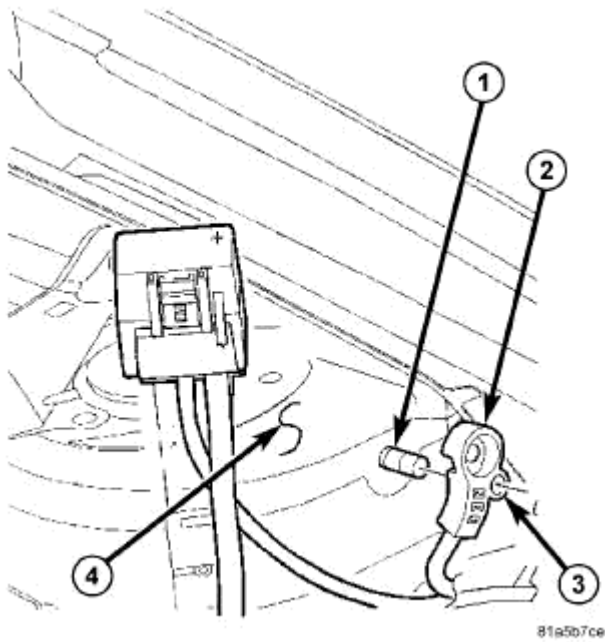


Fig. 28: Identifying Battery Cables & Terminals
Courtesy of CHRYSLER LLC

CAUTION: The negative battery cable remote terminal (2) must be disconnected and isolated from the remote battery post (1) prior to service of the vehicle electrical systems. The negative battery cable remote terminal can be isolated by using the supplied isolation hole (3) in the terminal casing.

1. Disconnect and isolate the negative battery cable (2) remote terminal from the remote battery post (1).

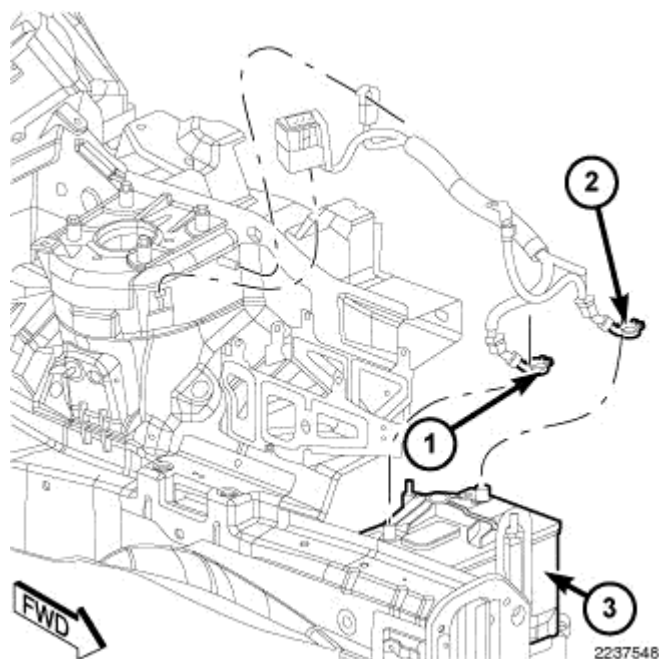


Fig. 29: Battery And Pinch Clamp Bolts

2. Raise vehicle on hoist. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure** .
3. Remove the battery and set aside. See **Removal** .
4. On diesel engine equipped vehicles, disconnect the in-line connector to the instrument panel harness (2)

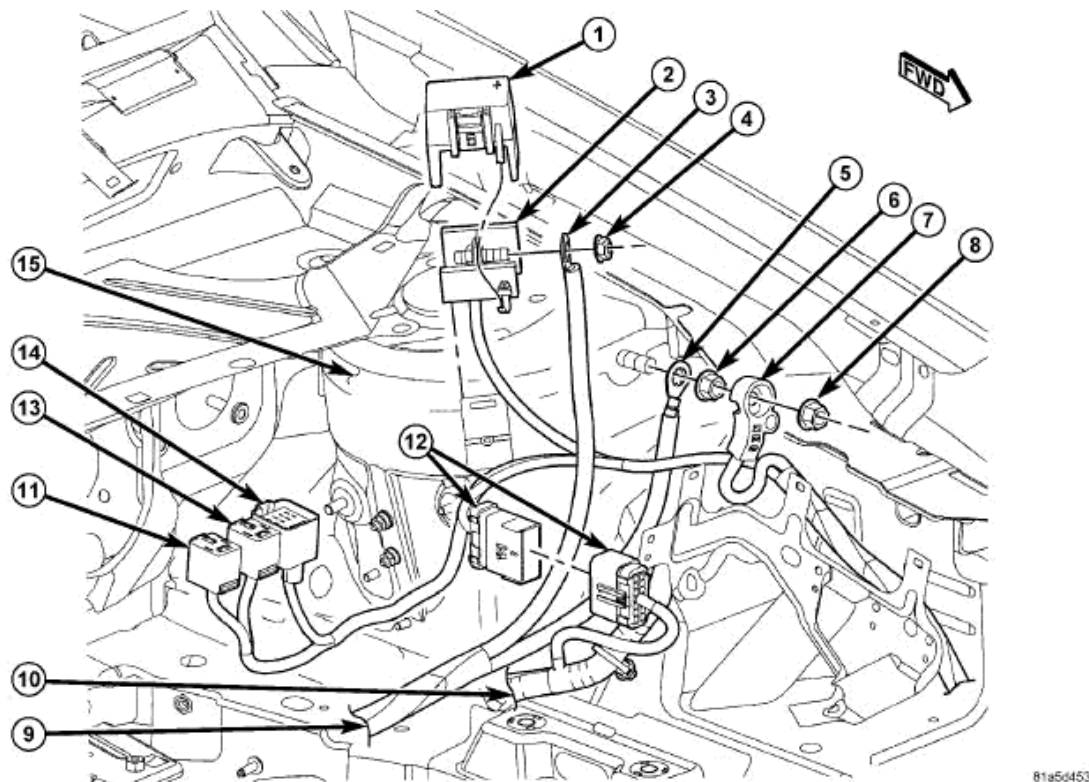


Fig. 30: View Of Battery Harness & Attachments - Diesel Shown, Gasoline Similar
 Courtesy of CHRYSLER LLC

NOTE: Diesel battery harness shown in illustration, gasoline battery harness similar.

5. Lower the vehicle.
6. Remove the negative battery cable remote terminal nut (8) from the remote negative battery post. Remove the battery harness negative cable (7) from the remote negative battery post.
7. Remove the cover (1) from the remote positive battery terminal (2). Remove the starter harness positive cable retaining nut (4) and remove the cable (3) from the remote positive battery post.
8. Remove the remote positive battery terminal (2) from mounting bracket on the left strut tower (15) by lifting straight up.
9. On diesel engine equipped vehicles:
 - Disconnect the glow plug module connector (14)
 - Disconnect the cabin heater relay connectors (11 and 13)
 - Disconnect the in-line connector to the instrument panel harness (12)

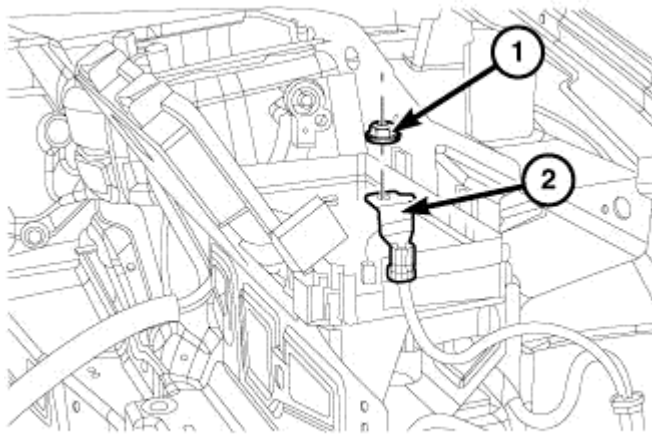


Fig. 31: Retaining Nut And Battery Harness Cable
Courtesy of CHRYSLER LLC

10. Remove the retaining nut (1) and remove the battery harness cable (2) from the TIPM stud.

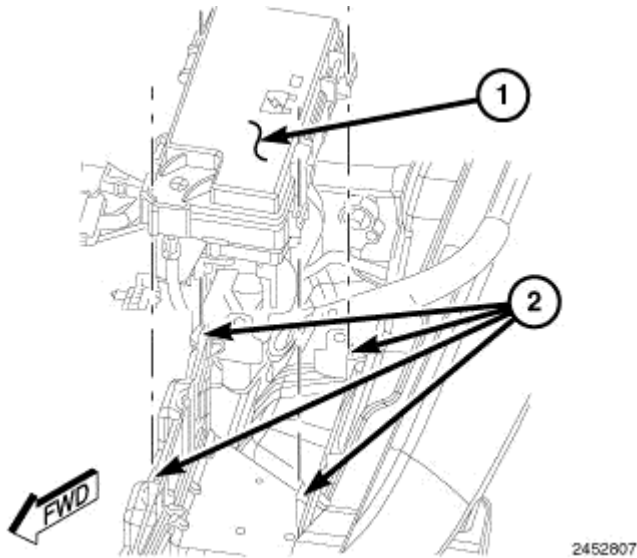


Fig. 32: Mounting Clips And TIPM Housing
Courtesy of CHRYSLER LLC

11. Depress the four mounting clips (2) to disengage and remove the TIPM housing (1) from its mounting bracket, position aside to allow access to the battery harness.
12. One at a time, trace any remaining battery harness retaining push pins, fasteners and routing clips until the harness is free from the vehicle.
13. Remove the battery harness from the vehicle.

STARTER HARNESS

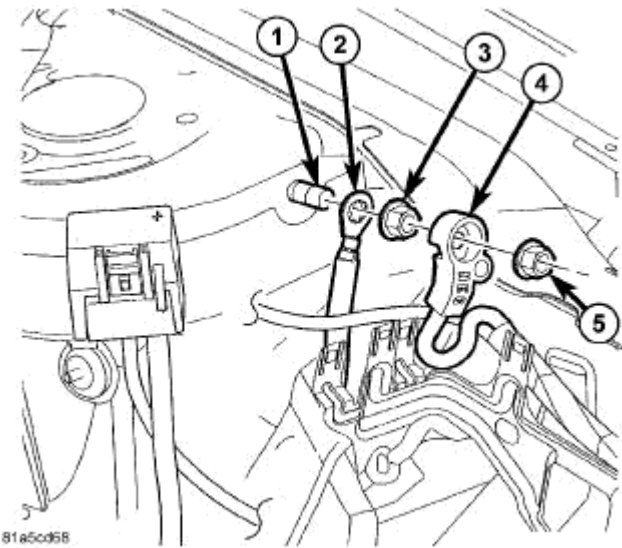


Fig. 33: Identifying Starter Harness Negative Cable Retaining Nut & Cable
Courtesy of CHRYSLER LLC

1. Remove the negative battery cable remote terminal nut (5) from the remote negative battery post (1). Remove and isolate the battery harness negative cable (4) on something other than the remote negative battery post (1).
2. Remove the starter harness negative cable retaining nut (3) and remove the cable (2) from the remote negative battery post (1).

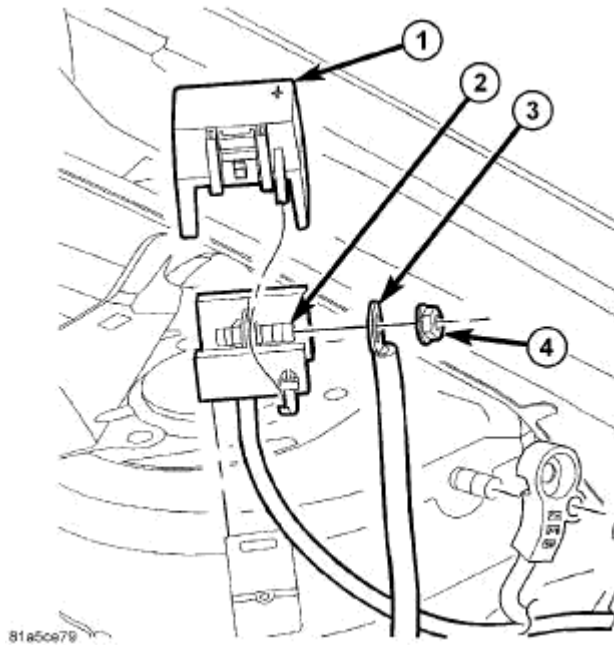


Fig. 34: Identifying Positive Cable Retaining Nut & Cable

Courtesy of CHRYSLER LLC

3. Remove the cover (1) from the remote positive battery terminal. Remove the starter harness positive cable retaining nut (4) and remove the cable (3) from the remote positive battery post (2).

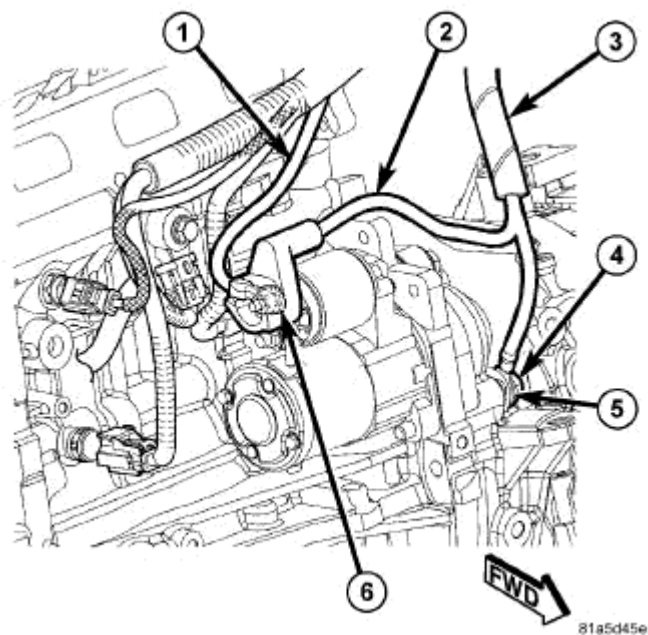


Fig. 35: Identifying Starter & Cables

Courtesy of CHRYSLER LLC

4. Raise vehicle on hoist. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure**.
5. Remove the starter harness negative cable retaining bolt (4) and remove the cable (5) from the engine block.
6. Remove the starter harness positive cable retaining nut (6) and remove the cable (2) from the starter positive battery post.
7. One at a time, trace any remaining starter harness retaining pushpins, fasteners and routing clips until the harness is free from the vehicle.
8. Remove the starter harness (3) from the engine compartment.

INSTALLATION

INSTALLATION

BATTERY HARNESS

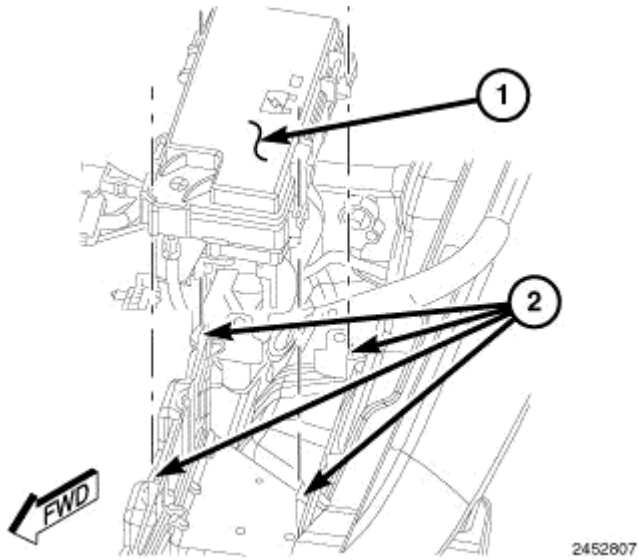


Fig. 36: Mounting Clips And TIPM Housing
Courtesy of CHRYSLER LLC

1. Position the battery harness into the vehicle.
2. One at a time, install the battery harness retaining pushpins, fasteners and routing clips until the harness is installed exactly where it was in the vehicle.
3. Position the battery harness cable (2) onto the TIPM stud (3). Install the retaining nut (1) and tighten to 10 N.m (90 in. lbs.)
4. Install the TIPM on the bracket posts, push down until you hear a click.

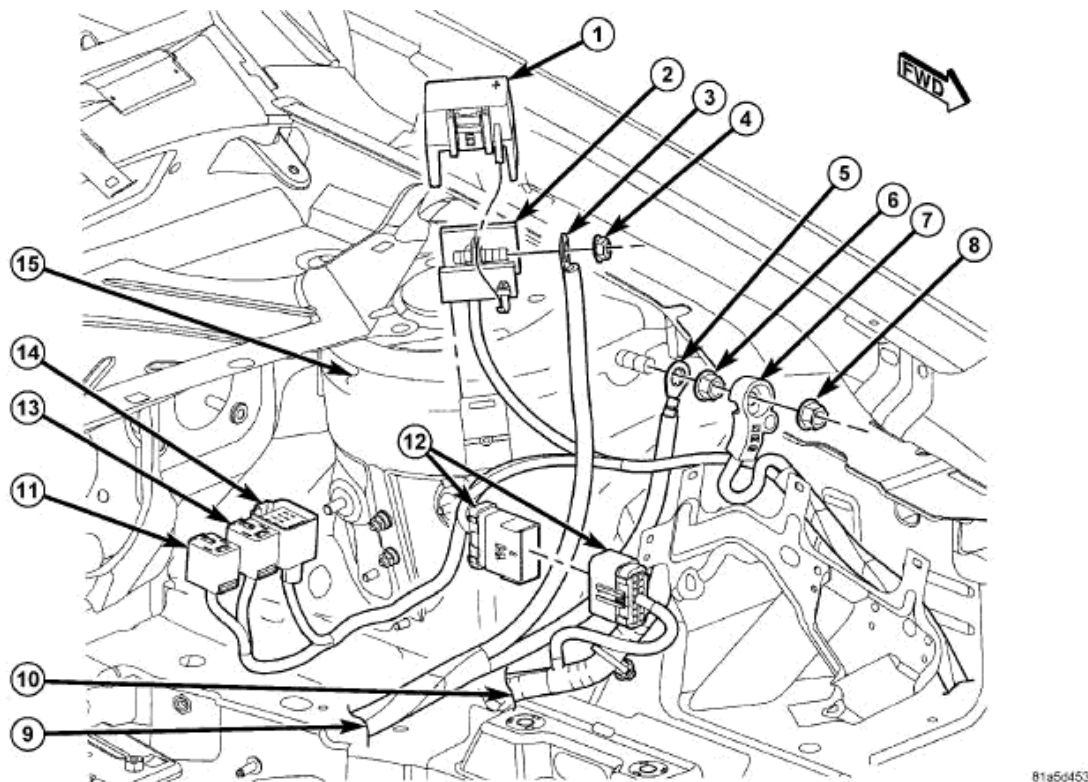


Fig. 37: View Of Battery Harness & Attachments - Diesel Shown, Gasoline Similar
Courtesy of CHRYSLER LLC

NOTE: Diesel battery harness shown in illustration, gasoline battery harness similar.

5. On diesel engine equipped vehicles:
 - Connect the glow plug module connector (14)
 - Connect the cabin heater relay connectors (11 and 13)
 - Connect the in-line connector to the instrument panel harness (12)
6. Install the remote positive battery terminal (2) onto the mounting bracket on the left strut tower (15) by pushing straight down until fully engaged.
7. Remove the cover (1) from the remote positive battery terminal (2). Position the starter harness positive cable (3) onto the remote positive battery post. Install the retaining nut (4) and tighten to 16.5 N.m (145 in. lbs.) Install the cover (1) onto the remote positive battery terminal (2).

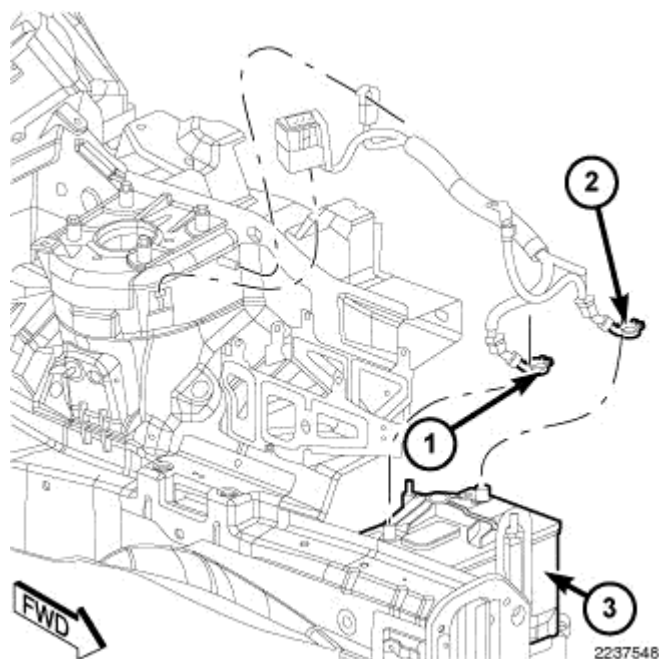


Fig. 38: Battery And Pinch Clamp Bolts
Courtesy of CHRYSLER LLC

8. Raise vehicle on hoist. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure** .
9. Install the battery. See **Installation** .

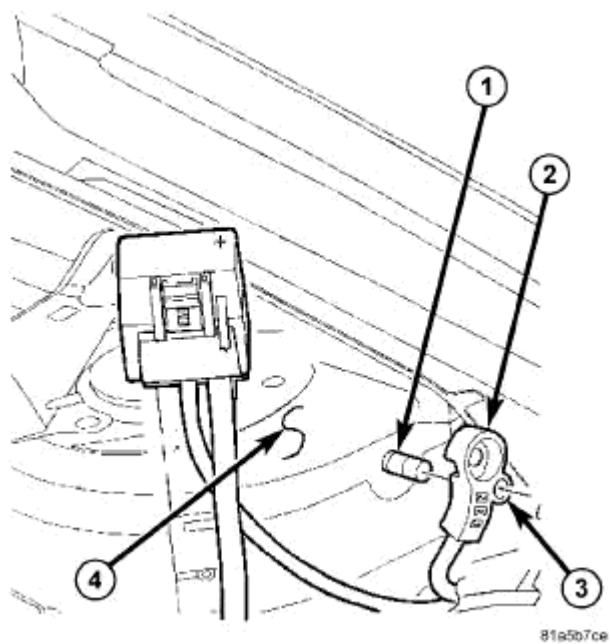


Fig. 39: Identifying Battery Cables & Terminals
Courtesy of CHRYSLER LLC

10. Lower the vehicle.
11. Install the negative battery cable remote terminal (2) onto the remote battery post (1). Install the nut (3) and tighten to 16.5 N.m (145 in. lbs.)

STARTER HARNESS

WARNING: To protect the hands from battery acid, a suitable pair of heavy duty rubber gloves should be worn when removing or servicing a battery. Safety glasses also should be worn.

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

CAUTION: The negative battery cable remote terminal (2) must be disconnected and isolated from the remote battery post (1) prior to service of the vehicle electrical systems. The negative battery cable remote terminal can be isolated by using the supplied isolation hole (3) in the terminal casing.

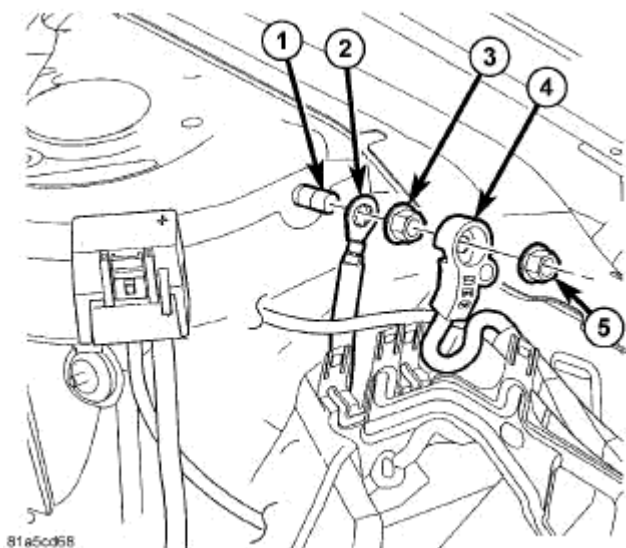


Fig. 40: Identifying Starter Harness Negative Cable Retaining Nut & Cable
Courtesy of CHRYSLER LLC

1. Remove and isolate the battery harness negative cable (4) on something other than the remote negative battery post (1).
2. Position the starter harness into the vehicle.
3. One at a time, install the starter harness retaining pushpins, fasteners and routing clips until the harness is installed exactly where it was in the vehicle.
4. Position the starter harness negative cable (2) onto the remote negative battery post (1). Install the retaining nut (3) and tighten to 16.5 N.m (145 in. lbs.)

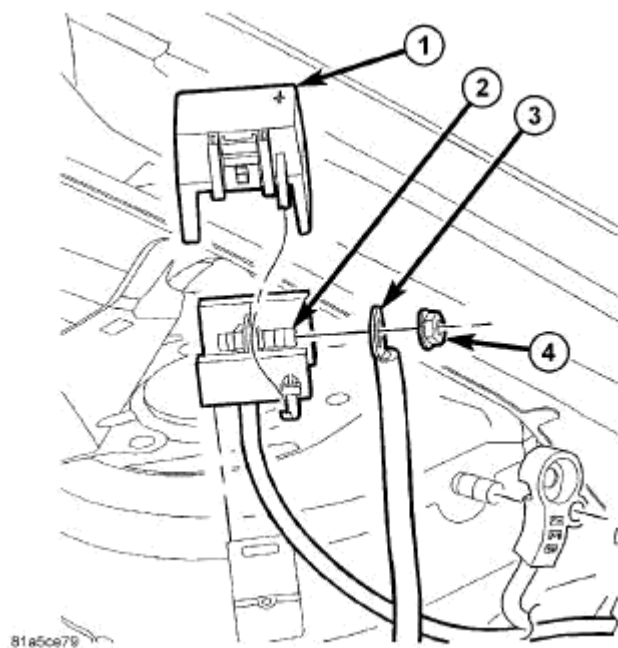


Fig. 41: Identifying Positive Cable Retaining Nut & Cable
Courtesy of CHRYSLER LLC

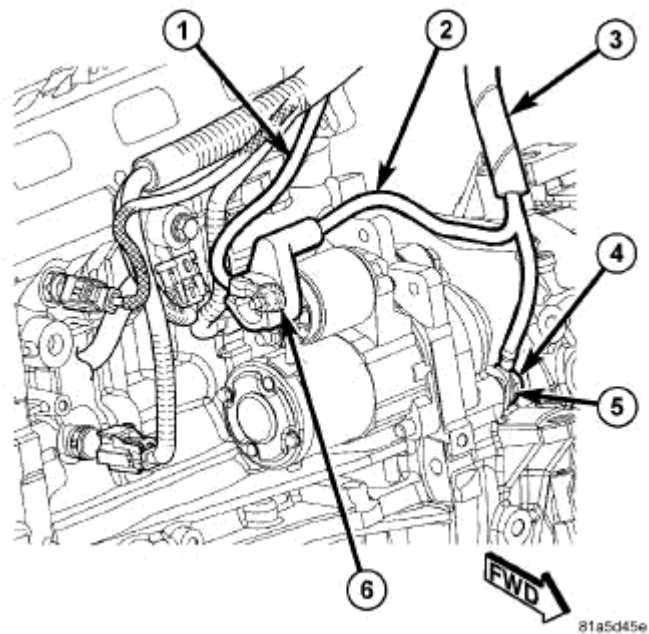


Fig. 42: Identifying Starter & Cables
Courtesy of CHRYSLER LLC

Remove the cover (1) from the remote positive battery terminal (2). Position the starter harness positive cable (3) onto the remote positive battery post. Install the retaining nut (4) and tighten to 16.5 N.m (145

in. lbs.) Install the cover (1) onto the remote positive battery terminal (2).

5. Raise vehicle on hoist. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure** .
6. Position the starter harness positive cable (2) onto the starter positive battery post. Install the retaining nut (6) and tighten to 13 N.m (115 in. lbs.)
7. Position the starter harness negative cable (5) onto the engine block. Install the retaining bolt (4) and tighten to 16.5 N.m (145 in. lbs.)

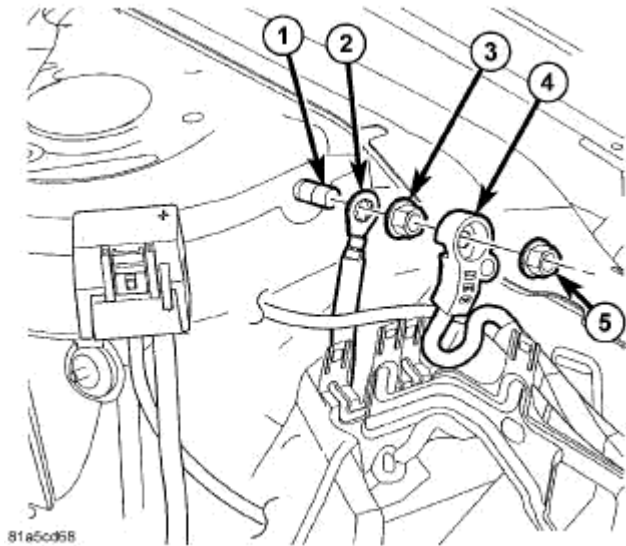


Fig. 43: Identifying Starter Harness Negative Cable Retaining Nut & Cable
Courtesy of CHRYSLER LLC

8. Lower the vehicle.
9. Position the negative battery harness cable remote terminal (4) onto the remote battery post (1). Install the nut (5) and tighten to 16.5 N.m (145 in. lbs.)

TRAY, BATTERY

DESCRIPTION

DESCRIPTION

The battery is placed and secured in a stamped steel battery tray. The battery tray is located in the left front side of the vehicle, just ahead of the left front wheel and tire assembly. The battery tray is secured to the left front frame rail with four bolts.

REMOVAL

REMOVAL

WARNING: To protect the hands from battery acid, a suitable pair of heavy duty rubber gloves should be worn when removing or servicing a battery. Safety glasses also should be worn.

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

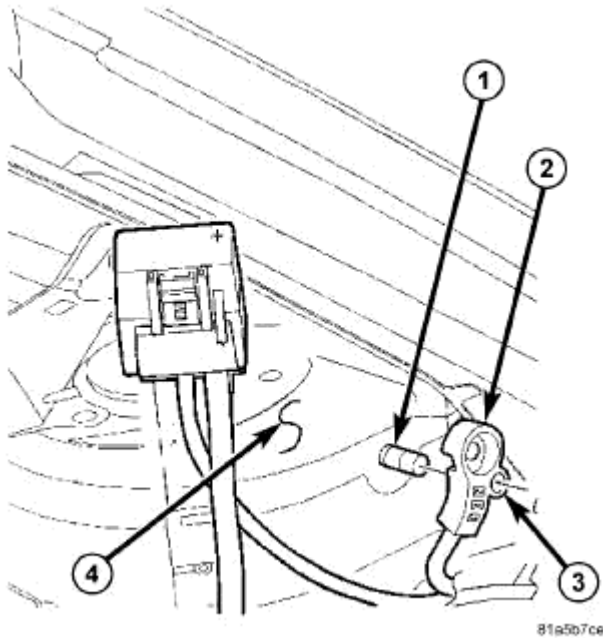


Fig. 44: Identifying Battery Cables & Terminals
Courtesy of CHRYSLER LLC

CAUTION: The negative battery cable remote terminal (2) must be disconnected and isolated from the remote battery post (1) prior to service of the vehicle electrical systems. The negative battery cable remote terminal can be isolated by using the supplied isolation hole (3) in the terminal casing.

1. Disconnect and isolate the negative battery cable remote terminal from the remote battery post.
2. Remove the battery. See **Removal**.

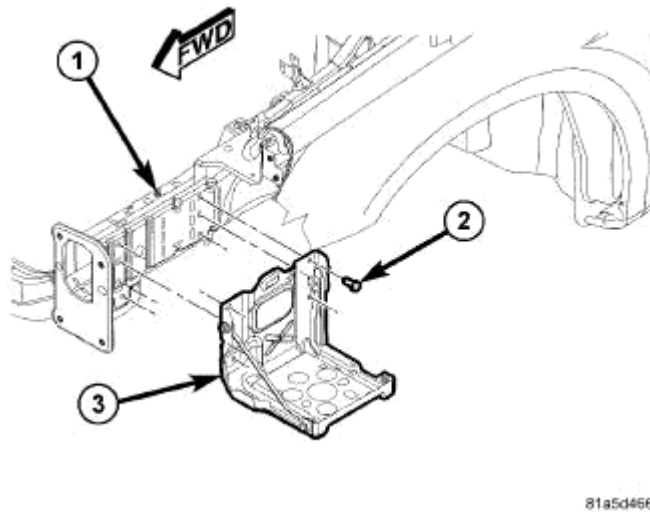


Fig. 45: View Of Battery Tray & Fasteners
Courtesy of CHRYSLER LLC

3. Remove the four bolts (2) securing the battery tray (3) to the left front frame rail (1).
4. Remove the battery tray from the vehicle.

INSTALLATION

INSTALLATION

WARNING: To protect the hands from battery acid, a suitable pair of heavy duty rubber gloves should be worn when removing or servicing a battery. Safety glasses also should be worn.

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

CAUTION: The negative battery cable remote terminal (2) must be disconnected and isolated from the remote battery post (1) prior to service of the vehicle electrical systems. The negative battery cable remote terminal can be isolated by using the supplied isolation hole (3) in the terminal casing.

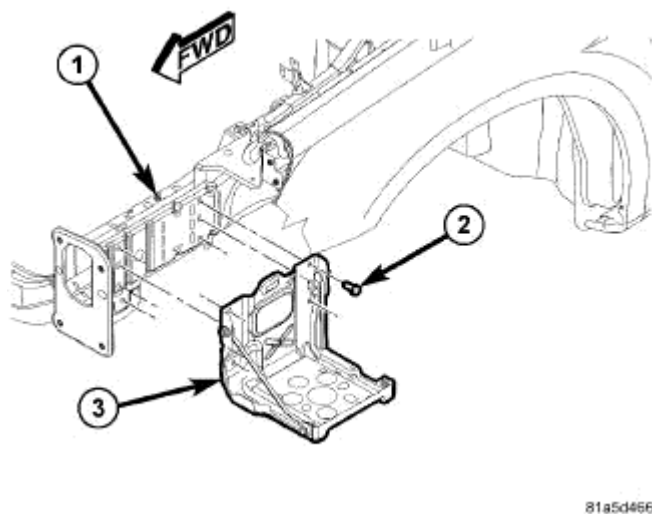


Fig. 46: View Of Battery Tray & Fasteners
Courtesy of CHRYSLER LLC

1. Position the battery tray (3) onto the left front frame rail (1).
2. Install the bolts (2) securing the battery tray (3) to the frame rail (1).

Tighten the bolts to 16 N.m (142 in. lbs.)

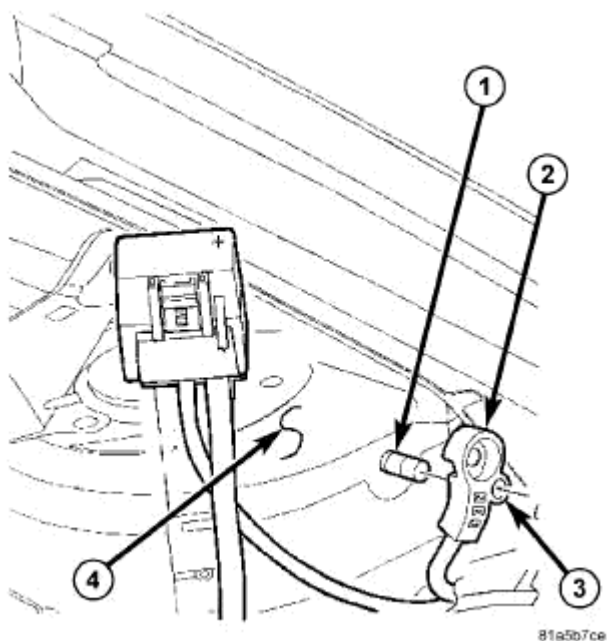


Fig. 47: Identifying Battery Cables & Terminals
Courtesy of CHRYSLER LLC

2009 Dodge Journey R/T

2009 ELECTRICAL Battery System - Journey

3. Install the battery. See **Installation** .
4. Install the negative battery cable remote terminal onto the remote battery post.

Tighten the nut to 16.5 N.m (145 in. lbs.)