CHAMPION BUS, INC. Thor Industries Commercial Bus Division [ ] Safety Recall [X] Field Campaign [ ] Service Information [ ] Product Improvement	**FIELD SERVICE BULLETIN** ***FDOT MODELS THAT USE NON OEM ALTERNATORS*** ***Battery cable routing***	**FSB_2012-101** **Revision: 1** **Issue Date: 12/11/2012** **Manual Section: N/A** **Author: L. Bollini & M. Neuville** **Approval: B. Sprague** **Form Rev. C 06/04/09**

UNITS AFFECTED: Ford and Chevy FDOT models that use an OEM and/or aftermarket alternator.

DESCRIPTION: Cables that are routed across rigid edges can rub and chafe, exposing the conductor material, and cause a short circuit.

CAMPAIGN EXPIRATION DATE: 90 Days

MATERIALS NEEDED: If issues are found or harness repair is necessary: loom, p-clamps, zip-ties, and proper gauge wire.

PROCEDURE:

For any questions that arise while performing these procedures, or for help in completing the service, please contact Ray Cullers with Transit Plus at 813-335-9052.

The goal of this procedure is to identify high-current cables that require extra scrutiny to ensure they are not chafing or otherwise allowed to short circuit. First the method of connection between power sources will be discussed and the cables that need attention will be identified. Second, it will be shown where to find the cables. Lastly, a list of best practices will be described to which the cables identified earlier must be compared.

Method of connection, what needs attention

This procedure is for all Ford and Chevy FDOT's that utilize an OEM alternator or aftermarket alternator. Bus models will vary significantly because of model year, option equipment, and chassis; therefore, connections will be described in general. Figure 1 shows the overall method of connection, where the alternator connects to an under-hood stud, the battery connects to a stud in the battery box, and heavy gauge cable runs between them. On some models, the cable from the alternator may encounter other connections before reaching the under-hood stud. Those connections will vary because of the model changes and options, so be sure to examine the cable routing completely from the alternator to the under-hood stud. Do not stop examination too early. The cables that require examination are those pointed to with arrows in Figure 1. An image of an under-hood stud is provided in Figure 2.

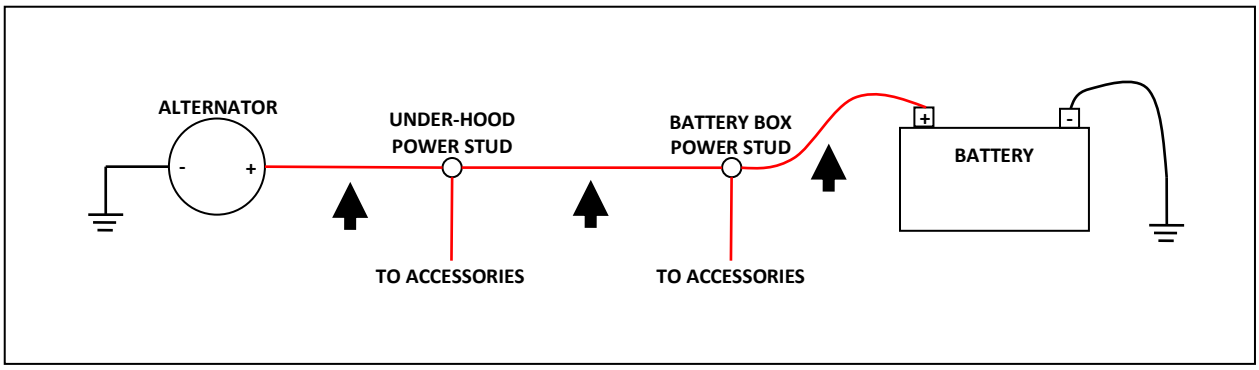


Figure 1: Overall method of connection

Figure 2: Example of under-hood stud.

Figures 3 and 4 show staged examples of a poorly routed power cable. The power cable should not be rubbing against any dip sticks or brackets.

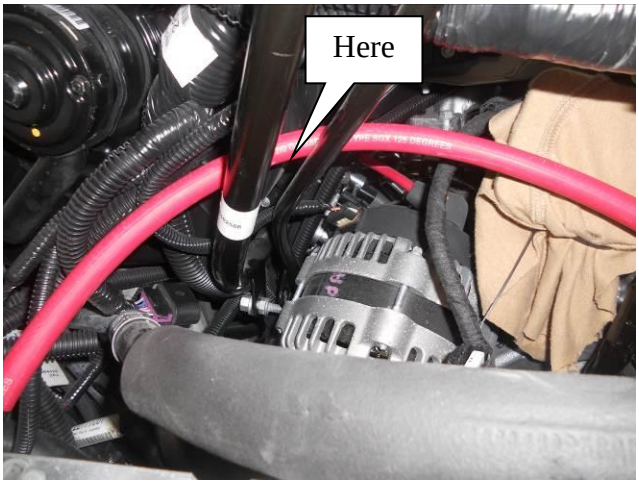


Figure 3: Staged example of power cable rubbing against dip sticks

Figure 4: Staged photo of power cable against alternator

Where to find the cables

First locate your alternator. On Fords, the alternator is usually low on the front of the engine. Figures 5 and 6 show locations for alternators on Chevrolet models.

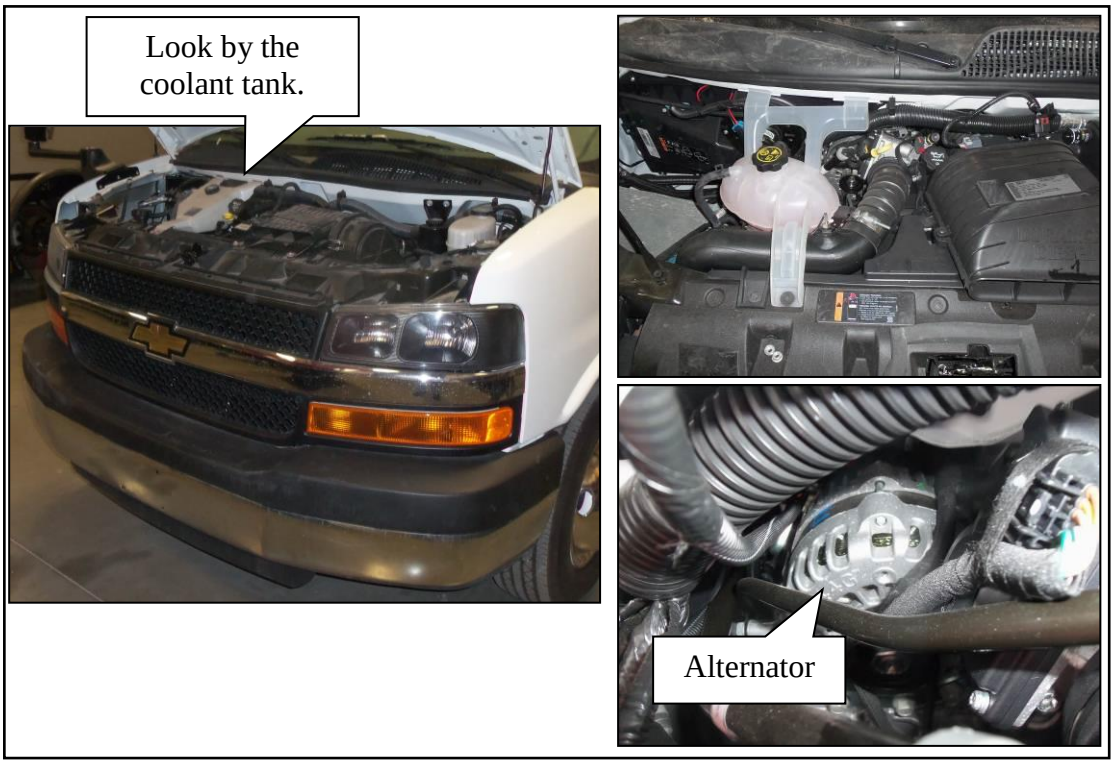


Figure 5: Alternator location on diesel Chevy

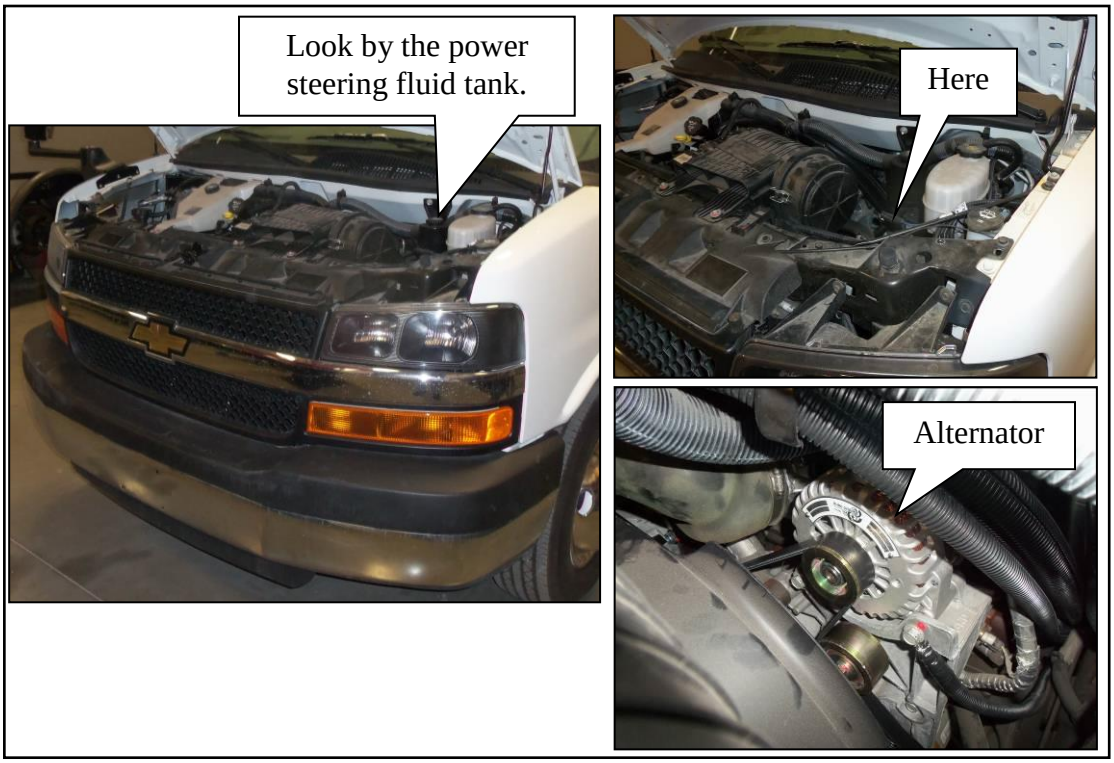


Figure 6: Alternator location on gasoline Chevy

Follow the alternator cables to the under-hood power studs. Ensure it is not resting or rubbing on hot surfaces, valve covers, or dipstick tubes. Figure 7 shows the location of the studs. Figure 8 uses a red line to show the routing between the under-hood stud and battery box.

Figure 7: Location of under-hood studs. The left picture shows the studs covered. Under-hood routing will vary.

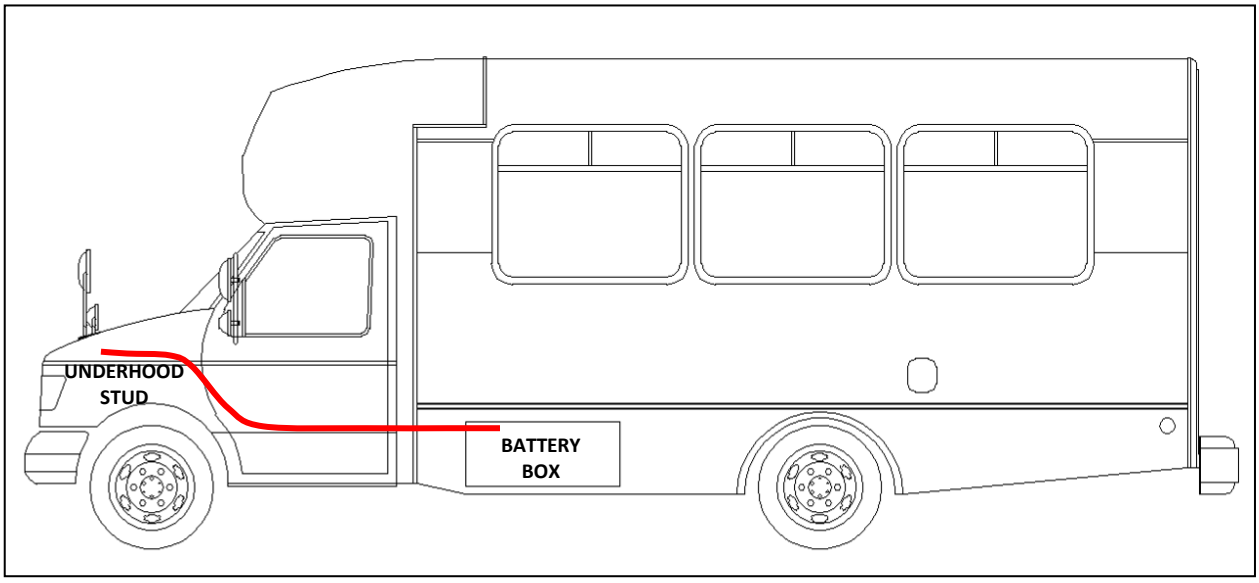
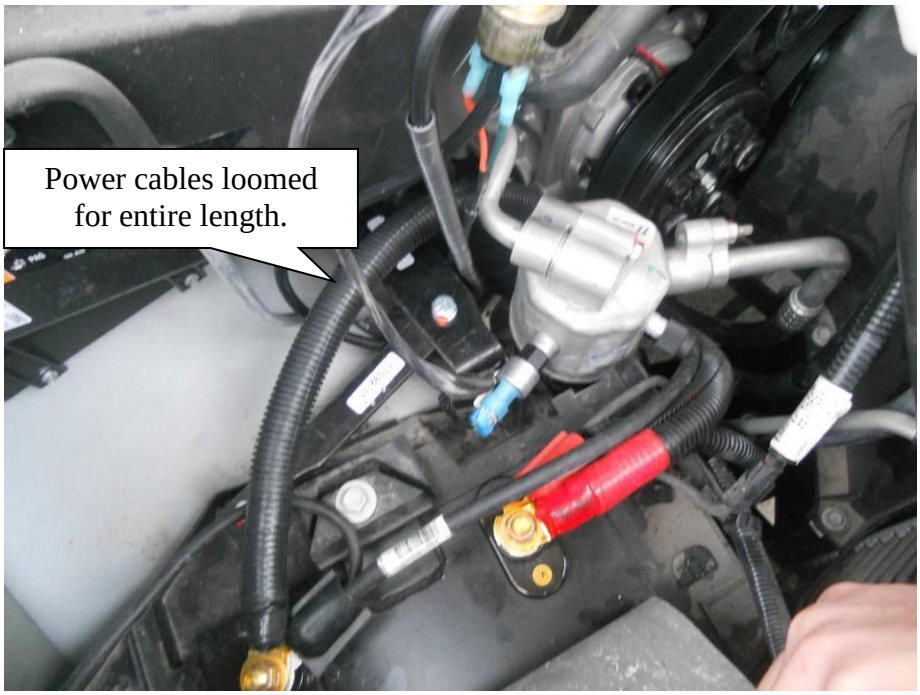


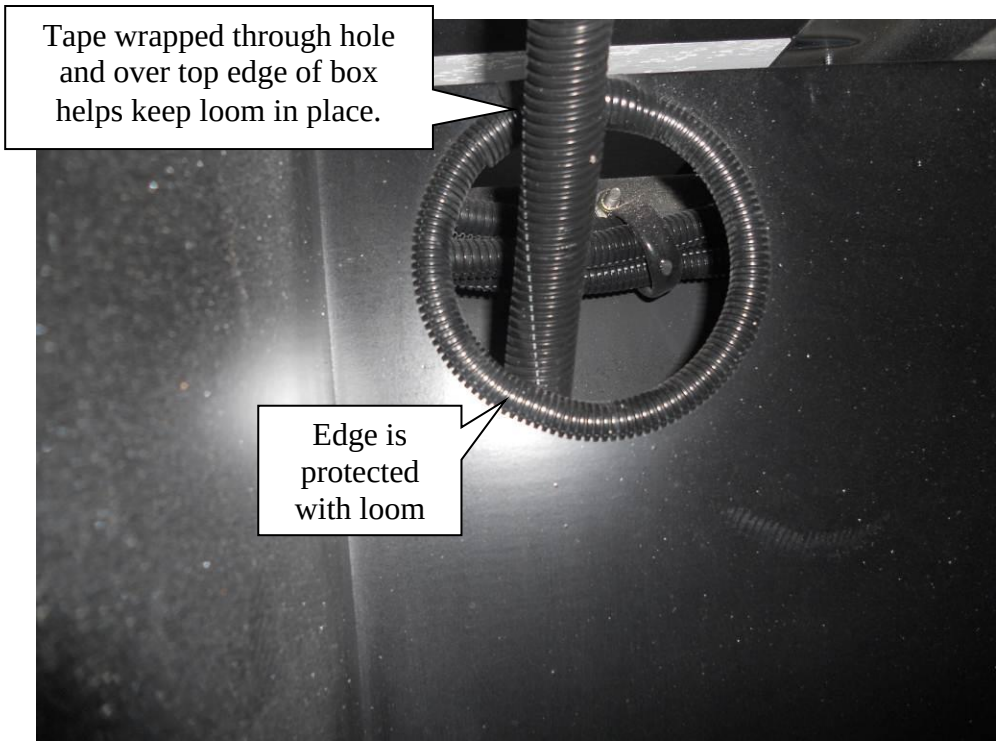
Figure 8: General cable routing, under-hood stud to battery box.

Best practices for securing cables

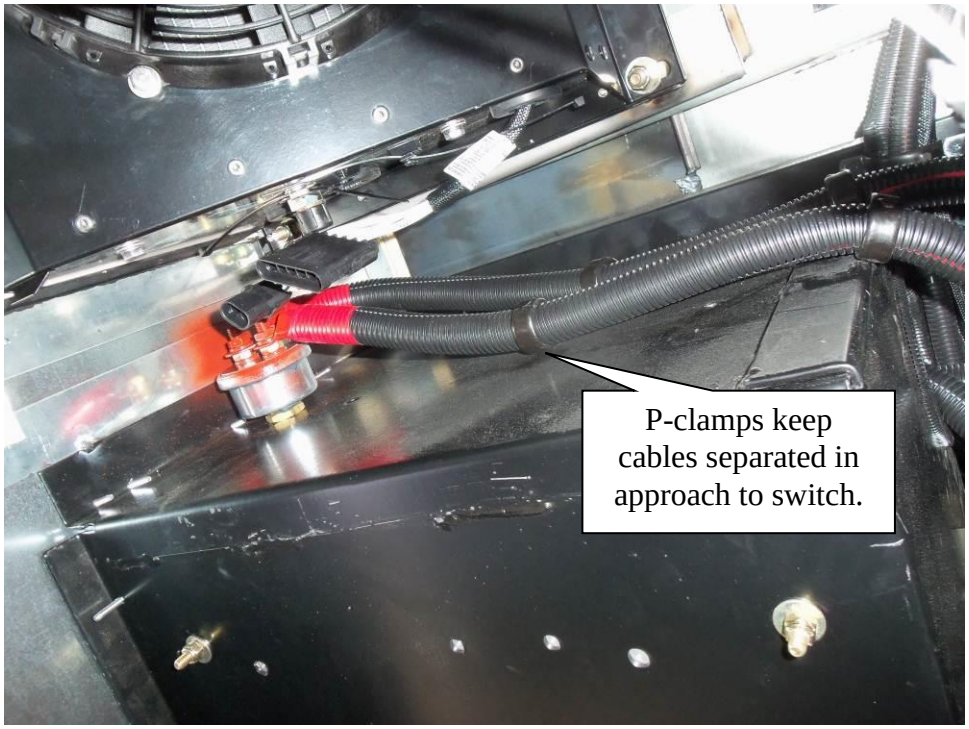
With the cables now identified and located, compare the cables on the bus to the cables shown in the pictures below. These photos show best practices, so if any cables do not reflect these practices, it is important to change the cables on your bus to match these practices as closely as possible. **Important note:** Any p-clamps used MUST BE RUBBER COATED! Also, ensure p-clamps are sized so they are snug to the cable they hold, but not crushing them. Oversized p-clamps are not acceptable because they allow too much movement.



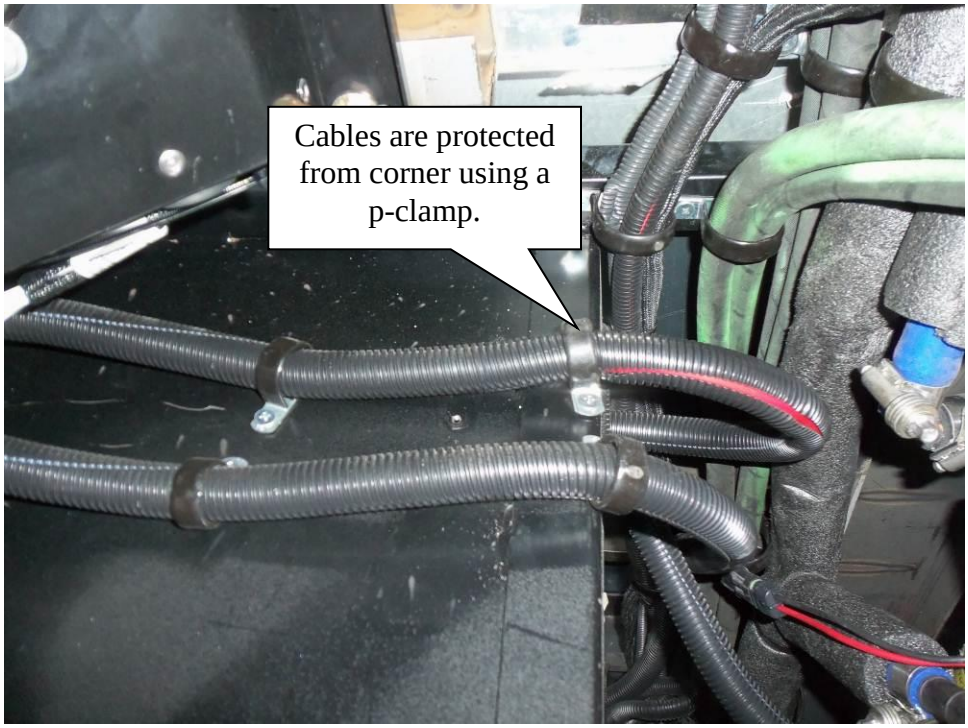
Practice 1: Ensure all power cables are loomed for their entire length throughout the bus. Loom must be rated for high temperatures.



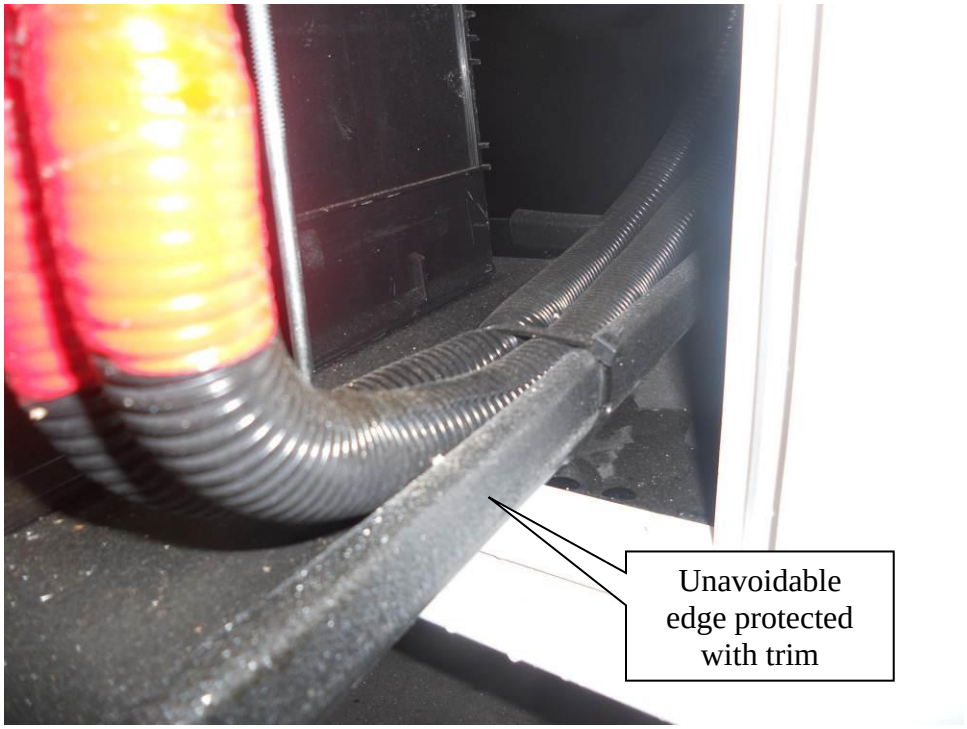
Practice 2: Battery box pass-through edges are protected with loom.



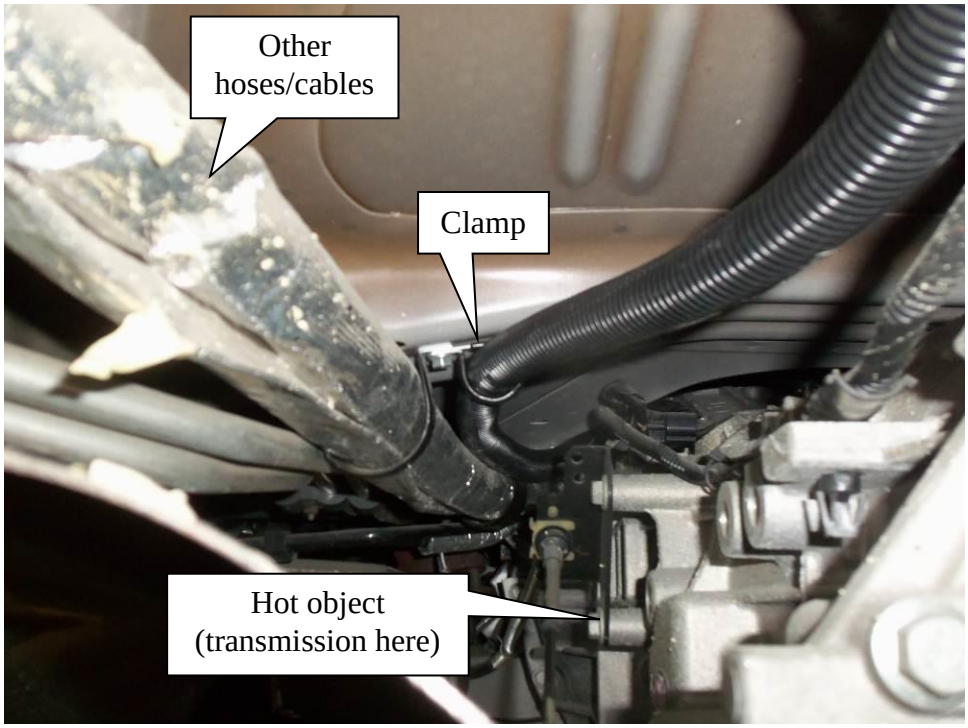
Practice 3: P-clamps separate cables in approach to component.



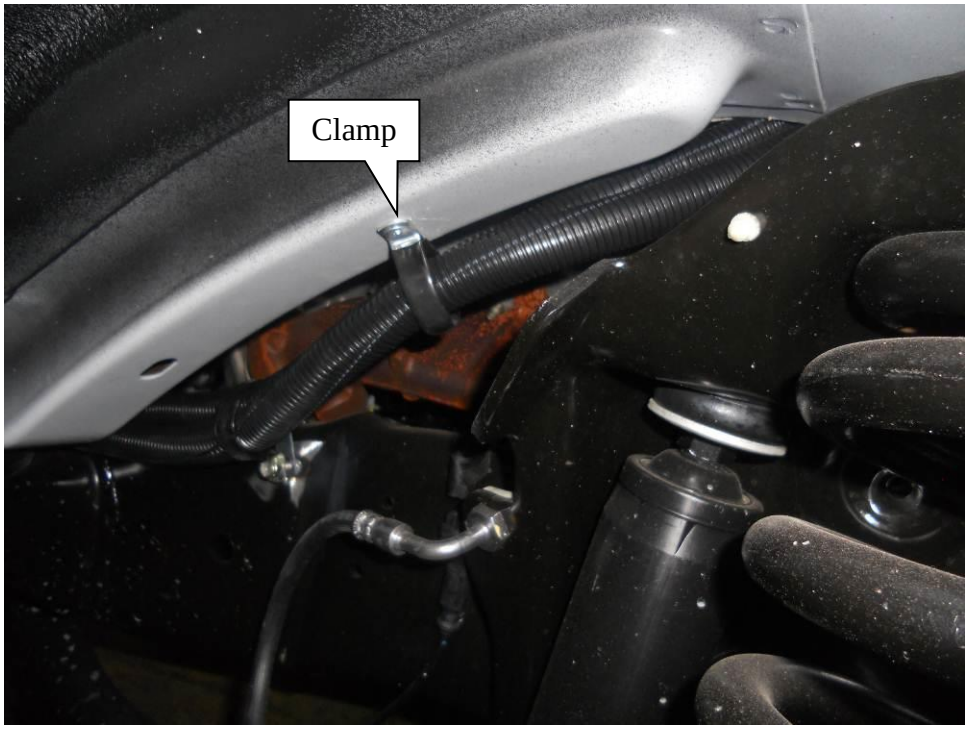
Practice 4: If cables must cross a corner, use P-clamps to hold them in place.



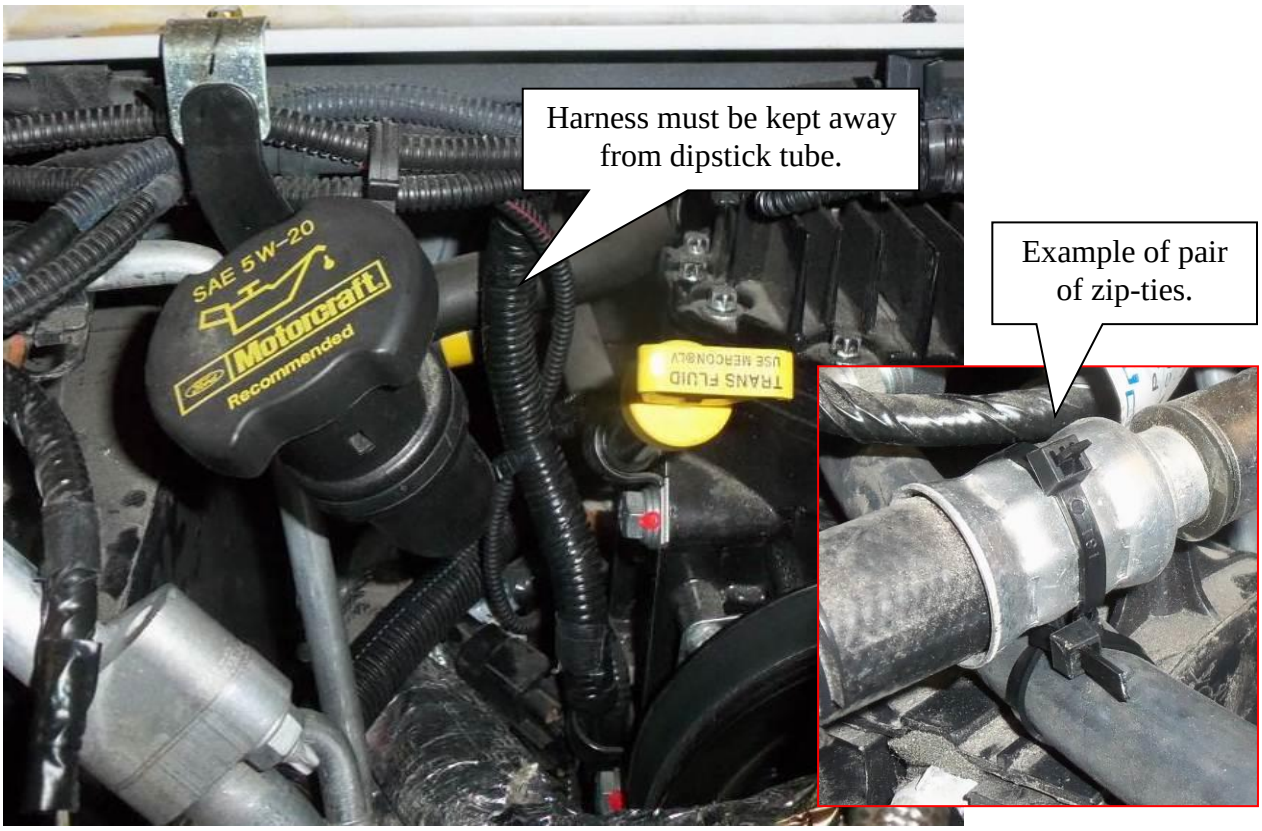
Practice 5: Edge trim protects unavoidable edges.



Practice 6: P-clamp to hold cables away from hot objects and other hoses/cables. Specifically check for this under the cab of the vehicle.



Practice 7: Where cables must run through difficult areas like this wheel well, use p-clamps to secure them in one spot.



Practice 8: Keep electrical harnesses away from dipstick tubes. If re-routing the harness is not possible, use zip-ties or P-clamps to keep the dipstick tube and electrical harness separated. In this picture, two zip ties were used to maintain spacing. One was looped loosely around both the dipstick and harness, and a second was looped tightly between them to form a "waist." The first one was then tightened.

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