



**IMPORTANT SERVICE  
INFORMATION FOR:**

- ✓ SERVICE MANAGER
- ✓ SERVICE ADVISOR
- ✓ TECHNICIAN
- ✓ PARTS DEPARTMENT
- ✓ WARRANTY PERSONNEL

BULLETIN NUMBER:  
**SB20-N-001**

ISSUE DATE:  
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GROUP:  
**ELECTRICAL**

## **Starter Clicks When Cranking - E-98 Ground Relocation**

### **AFFECTED VEHICLES**

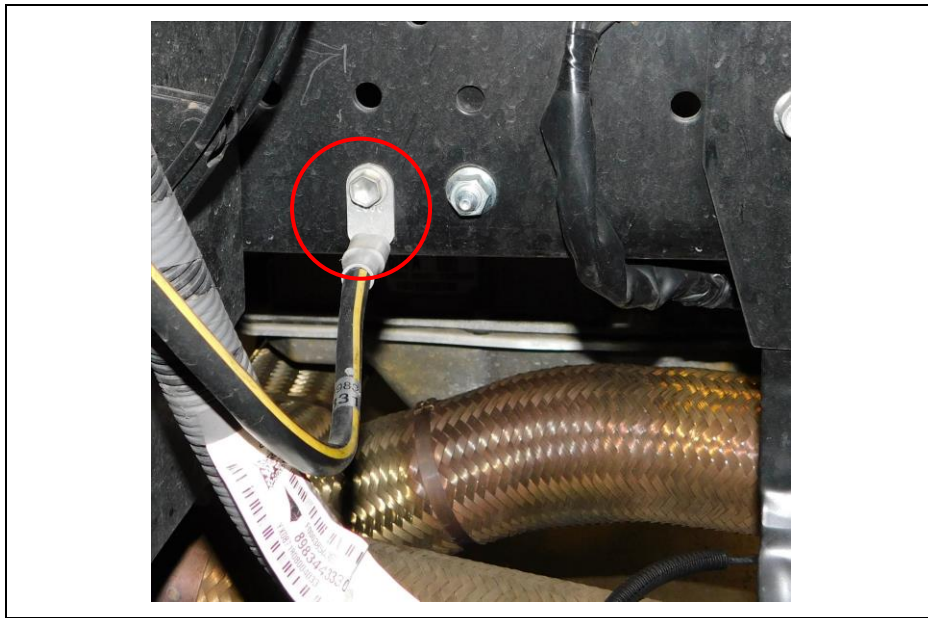
- 2018-2020MY Isuzu NPR/NPRHD equipped with 6.0L Gasoline Engine.

### **INFORMATION**

While attempting to start their vehicle, some customers may experience a condition in which the starter audibly “clicks” one or even a few times before fully engaging. If normal diagnosis cannot find fault with the battery, charging system or any other related system, relocate the E-98 ground as described in the service procedure below to correct the condition.

### **SERVICE PROCEDURE**

1. Set the parking brake and block the wheels.
2. Disconnect the negative battery cable.
3. Per the instructions in the applicable Work Shop Manual (WSM), safely tilt the cab and install the safety lock pin. (On crew cab models, remove the rear engine cover.)
4. Unpackage the new Ground Pigtail and install ¼” convoluted tubing on it. Use convoluted tubing with a minimum temperature range of -40 to 85°C (-49 to 185°F.)
5. Using 3M Temflex™ Tape 1755 (or equivalent) wrap the convoluted tubing at the eyelet to secure it in place and seal the end of the tubing to the extension harness. Wrap tape around the convoluted tubing approximately every 6 inches (150mm). Do not wrap the last 12 inches of the harness/tubing. This area should remain open to complete the splice connection described in Step 17 below.
6. Remove battery negative cable mounting bolt from the frame. (See Figure 1.)



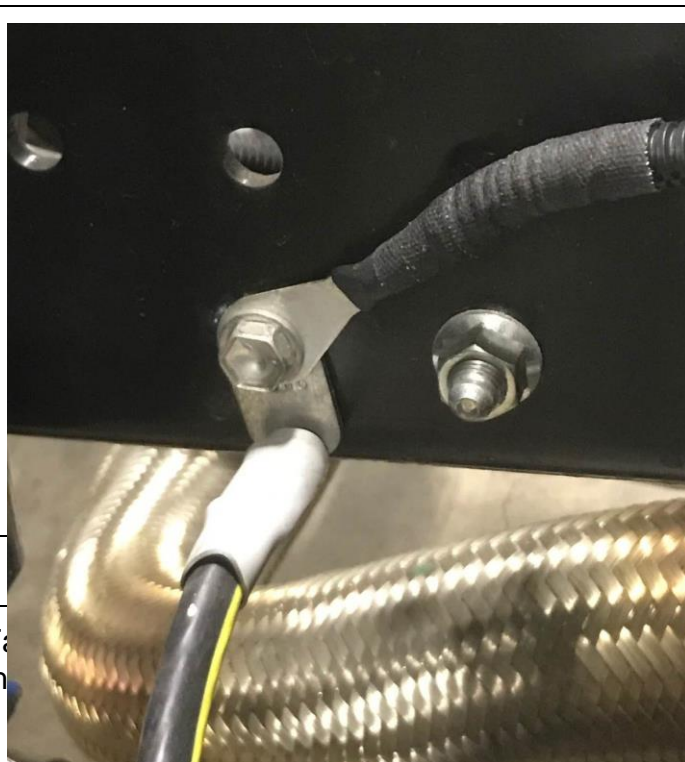
**Figure 1**

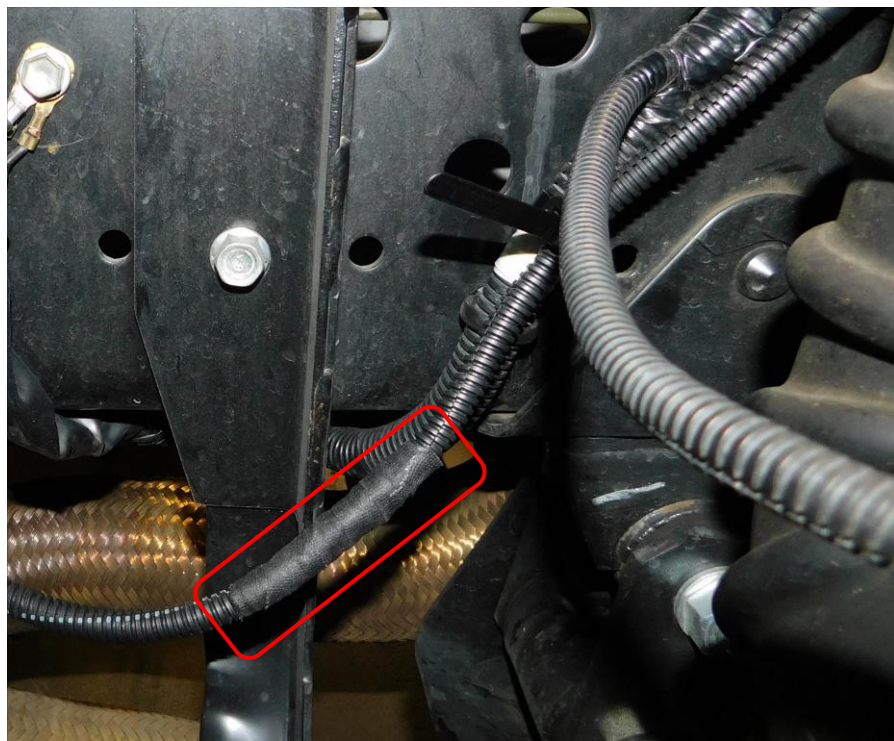
7. Remove the bolt from the negative battery cable. If corrosion is present use a wire brush to clean bolt, cable terminal, and frame contact areas. Insert the bolt into the extension harness eyelet, then into the negative battery cable. Then install the bolt with both harness connections back into the frame tightening to 26Nm (19 lb ft). (See Figure 2.)



**Figure 2**

8. Use 3M Temflex™ Tape to secure the connection of the convoluted tubing when the vehicle is in operation. (See Figure 3.)





**Figure 3**

9. Starting near the air cleaner, route the extension harness upward toward the front of the engine. Secure the harness in the frame clip (1) as shown in Figure 4. Ensure there is at least 10mm of space between the air cleaner mounting bracket and the extension harness. Continue routing underneath the air intake duct and finally on top of the air intake duct next to the existing harness as shown in Figure 4.



Figure 4

10. Loosely position the extension harness onto the engine harness along the routing location. (See Figure 4.) Loosen the three 10mm bolts (1) securing the engine identification plate for access when securing harness. (See Figure 5.)

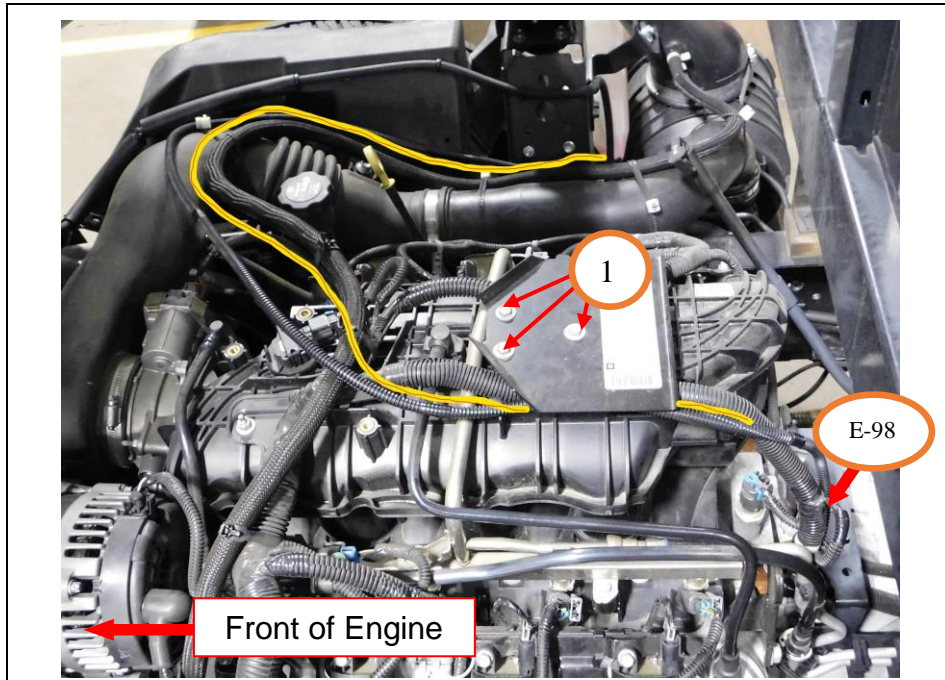
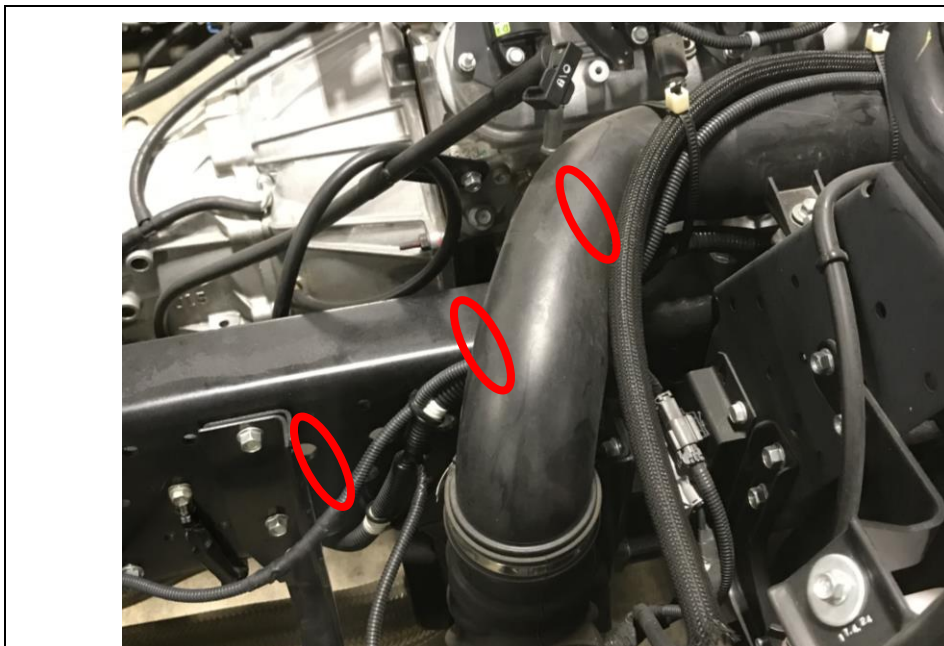


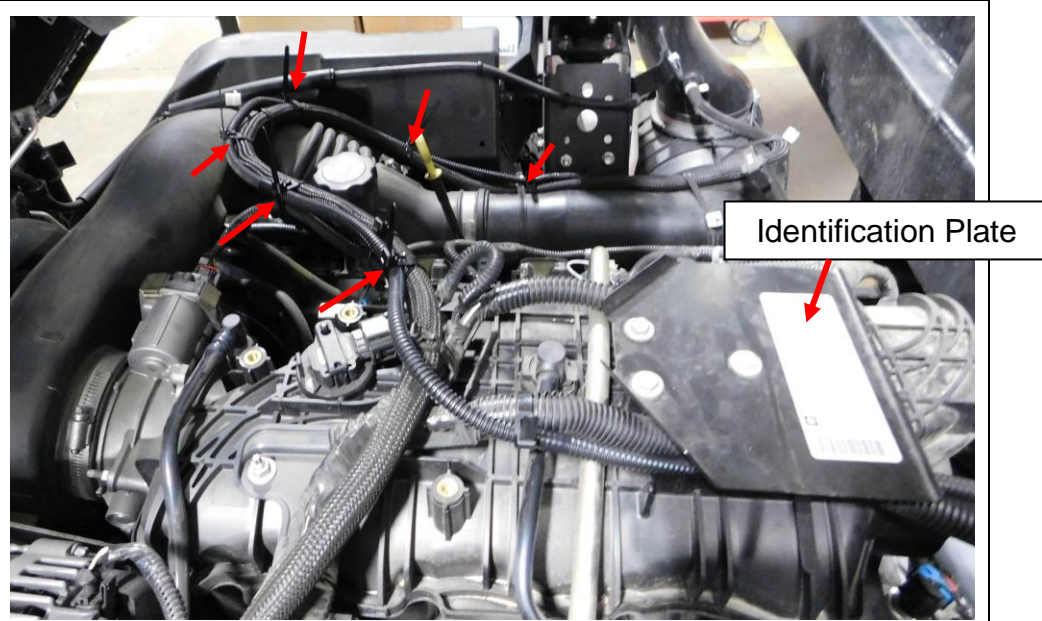
Figure 5

11. Loosely install 3 tie straps securing the extension harness to the chassis harness beneath the air intake duct. Place the tie straps approximately 6 inches (150mm) apart from each other in the locations shown in Figure 6.



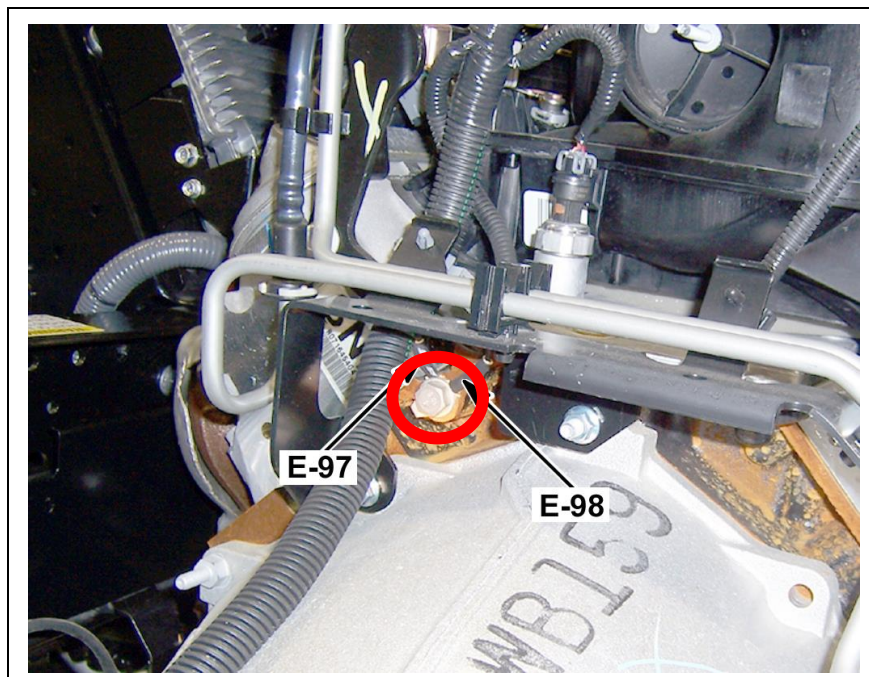
**Figure 6**

12. Install 6 tie straps to secure the extended harness onto the engine harness approximately every 6 inches (150mm) up to the identification plate as shown in Figure 7. Do not secure the harness under the identification plate until the end of this procedure.



**Figure 7**

13. Remove the ground-mounting bolt for E-97 and E-98. (See Figure 8.)



**Figure 8**

14. Pull the E-97/E-98 grounds up past the bracket. (See Figure 9.)



**Figure 9**

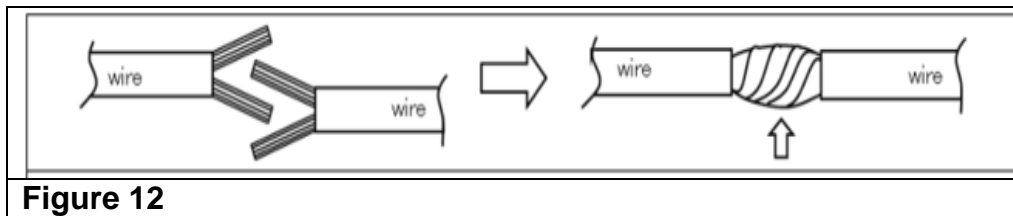
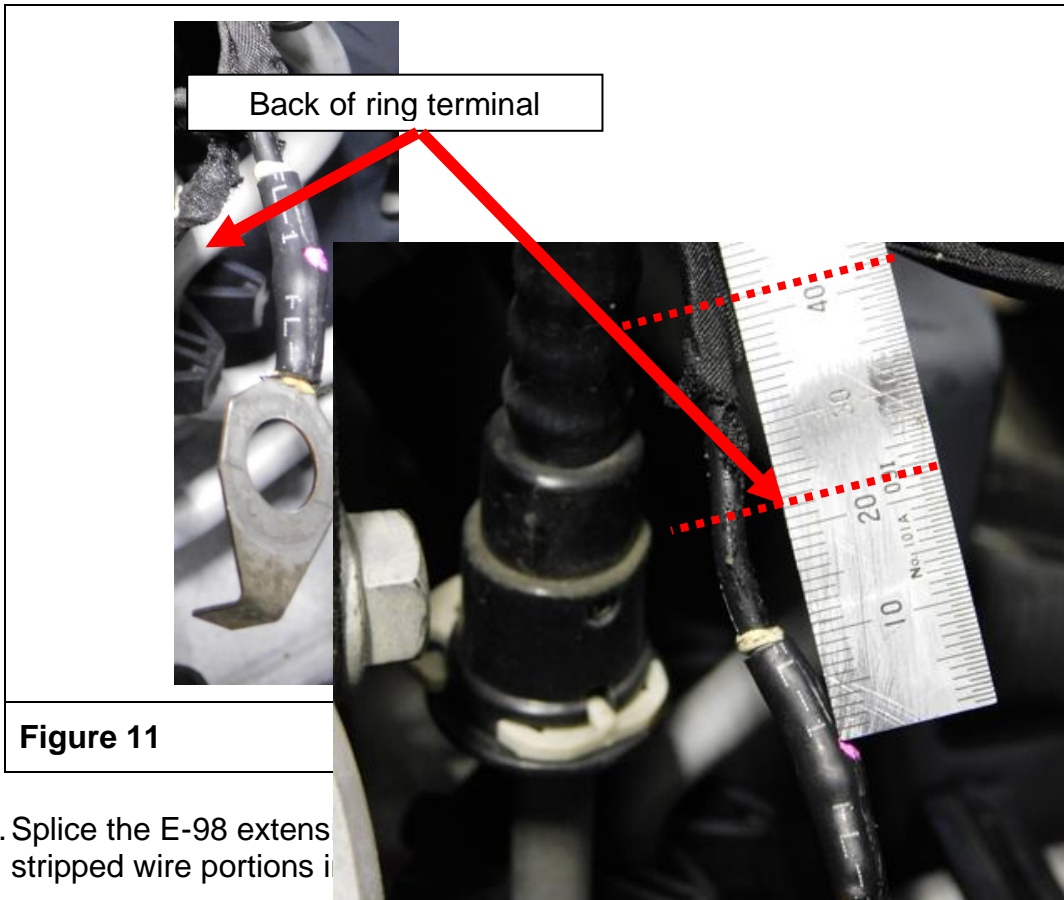
15. Remove tape from the end of the engine harness and pull back on the convoluted tubing as necessary to expose the ground wires. Find the E-98 ground, the largest gauge wire in the tubing, and separate it from other wires. (See Figure 10.)

**NOTE: E-98 has a single wire going to the ring terminal.**

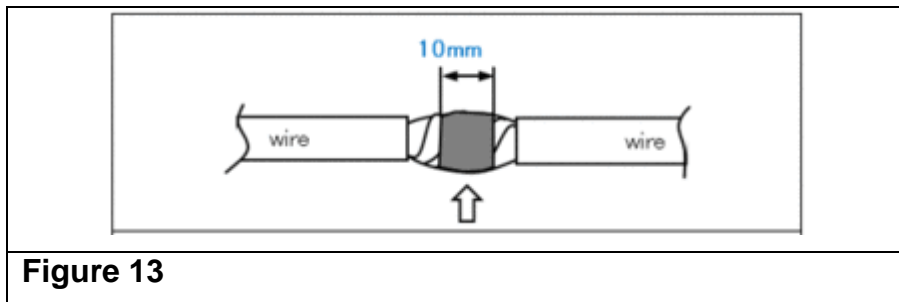


**Figure 10**

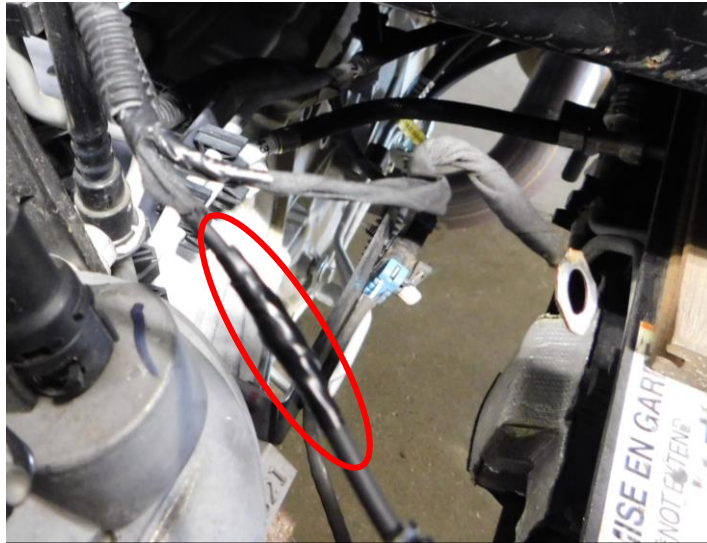
16. Measure 20mm from the back of the E-98 ground ring terminal and cut the wire. Discard the terminal. (See Figure 11.)



18. Solder the twisted wire joint together. Make sure that the soldered joint goes completely around the wires and is at least 10mm in length. (See Figure 13.)

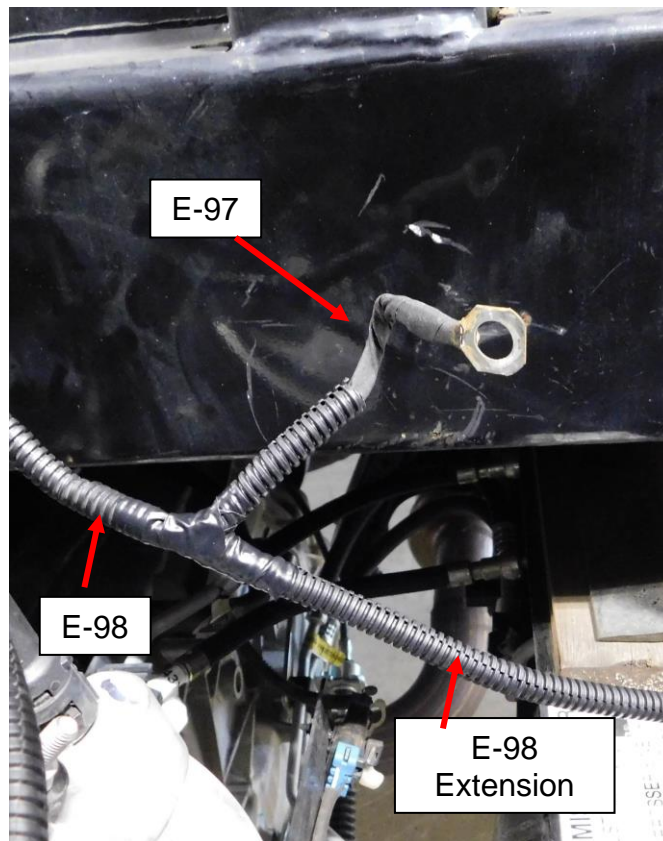


19. Weatherproof the splice connection using heat shrink tubing or Scotch® Professional Grade Rubber Mastic Sealing Tape 2228 (or equivalent). (See Figure 14.)



**Figure 14**

20. Tape and secure the engine harness into three directions with black vinyl electrical tape. Cover the connections with 3M Temflex™ Tape 1755 (or equivalent). (See Figure 15.)

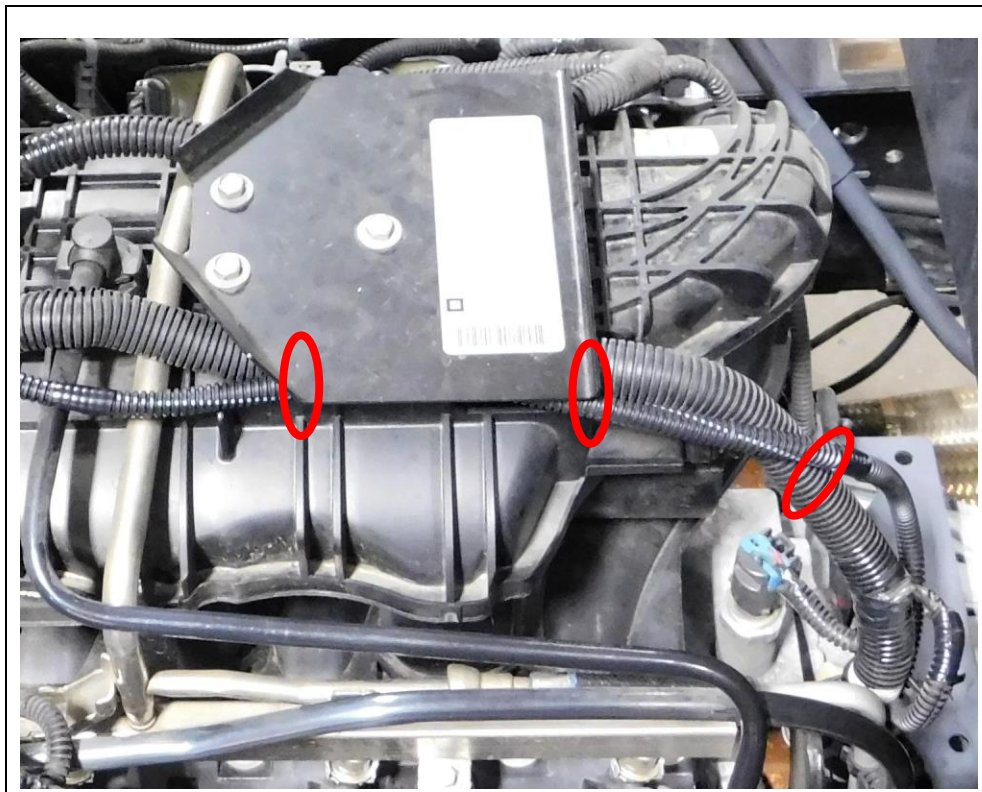


**Figure 15**

21. Using the ground-mounting bolt removed in Step 13, install the E-97 ground terminal into its original location and tighten to 33Nm (24.5 lb ft). (Refer back to Figure 8.)



22. Loosely install three additional tie straps starting approximately 6 inches (150mm) beneath the engine identification plate as shown in Figure 16.



**Figure 16**

23. Tighten all tie straps starting from E-98 ground, securing the extension harness to the chassis harness and engine harness. Be careful not to stretch, crush, or damage the extension harness.
24. Tighten the three 10mm bolts that secure the engine identification plate (that were loosened in Step 10) to 5 Nm (44 lb in).
25. Per the instructions in the applicable WSM, remove and properly stow the safety lock pin and tilt the cab back down. Ensure the cab is locked into place. (On crew cab models install the rear engine cover 13 Nm (9.5 lb ft).
26. Connect the negative battery cable.
27. Start the vehicle and verify the repair.

### **PARTS INFORMATION**

The following parts are available from AIPDN (American Isuzu Parts Distribution Network)

<b>Part Number</b>	<b>Description</b>	<b>Quantity</b>
2-90120-320-0	Ground Pigtail	1

Source the following from a local parts retailer.

Description	Quantity
¼" Convolute Tubing 8' (2500mm)	1
Tie Straps 5mm X 205mm	12
3M Temflex™ Tape 1755 8' (2500mm)	1
Heat Shrink Tubing (60mm) or Scotch® Professional Grade Rubber Mastic Sealing Tape 2228 8' (60mm)	1

### WARRANTY INFORMATION

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time	Net Item
N6980	E-98 Extension Harness Install Add: For Crew Cab	0.9 0.5	\$25.00