



Technical Service Bulletin

Technical Service Bulletin: TSB180106	Released Date: 26-Nov-2018
Service Instructions for Variable Geometry Turbocharger Actuator Water Intrusion Prevention	

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Warranty Statement

The information in this document has no effect on present warranty coverage or repair practices, nor does it authorize TRP or Campaign actions.

Contents

Product Affected:

- X15 CM2350 X114B
- X15 CM2350 X116B

Original Equipment Manufacturer (OEM):

- Kenworth Model:
 - T680
 - T880
- Peterbilt Model:
 - 579
 - 567

Issue

Symptom:

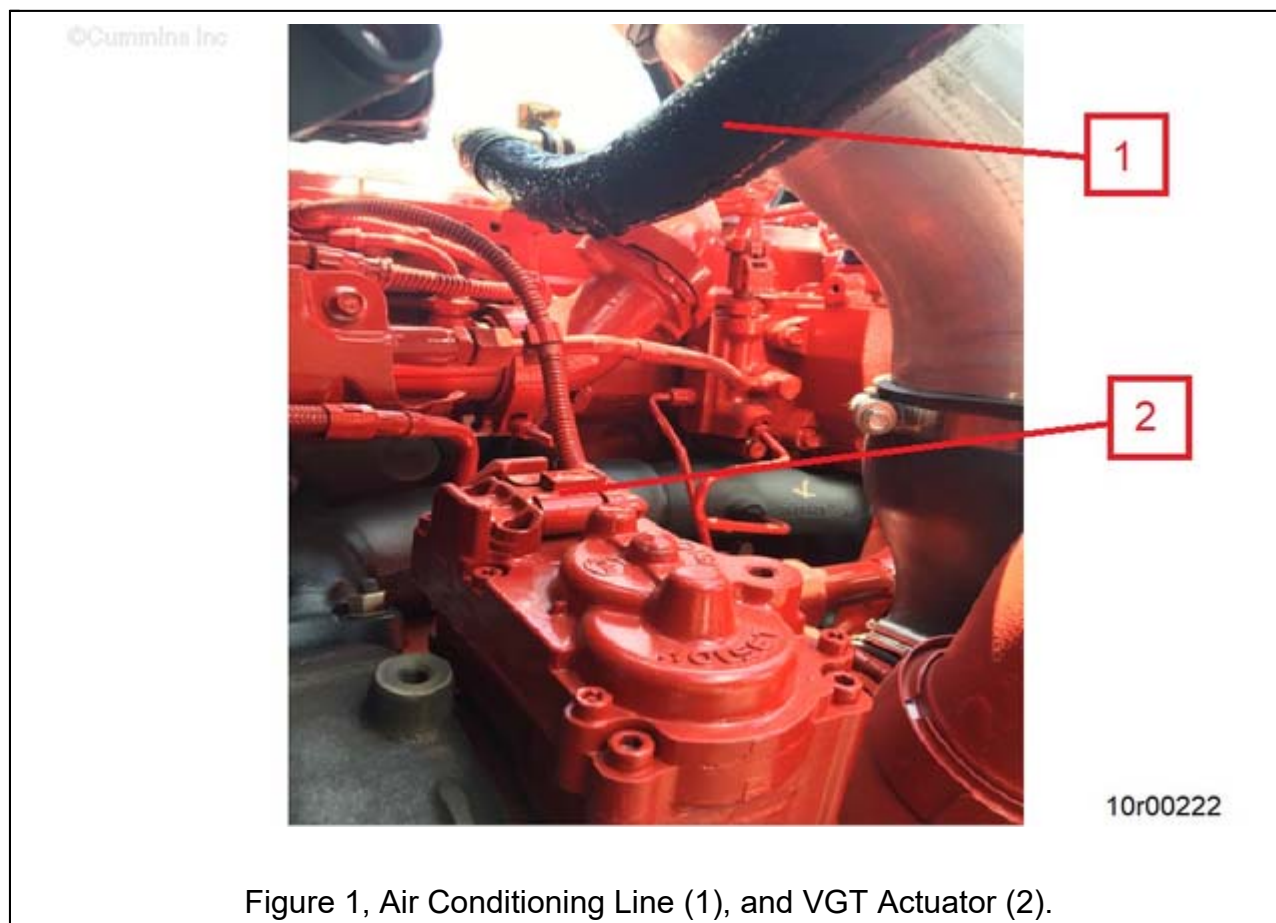
- Fault codes 1894, 2387, 1897, 6432, 5177, 2198, 1976, 1938, 2635, 4956, 4957

Root Cause:

- Prolonged condensate drips from the overhead air conditioning condenser line causes the corrosion of the variable geometry turbocharger (VGT) actuator connector interface.

Verification

Air conditioning line (1) is positioned directly above VGT actuator (2). See Figure 1 below.



Resolution

- A new VGT actuator installation process has been developed to prevent corrosion of VGT actuator connector interface.
- Follow Service Instructions below when installing a new VGT actuator or to prevent corrosion and water intrusion on an existing VGT actuator.

Service Instructions

See VGT Actuator Water Intrusion Prevention Service Instructions video link below:

Note : http://tsb.cumminsvirtualcollege.com/tsb180106_en.aspx
(http://tsb.cumminsvirtualcollege.com/tsb180106_en.aspx)

Parts Required

The parts required to install the sealant and OEM A/C line wrap are provided in Table 1 below.

Table 1, Required Parts	
Part Description	Part Number
Loctite® 290 (50 ml bottle)	3823682
Permatex® Flowable Silicone	81730-1
QD® Contact Cleaner	3824510
Insulation Foam Tape	SKU (IT30/8) (Frost King®)/FT-1 (VAPCO®)
Reflective Heat Shield Tape	14002 (Cool It Thermo Tec®)/010408 (DEI®)
Zip Ties	5158A (Neiko®)

Installation Tools

Additional tools required for the service procedure are listed below in Table 2.

Table 2, Required Items	
Service Tools	Additional
Cleaning brush	Gloves
Automotive pick	Safety glasses
Shop air	-

Objective of Service Instruction:

- Application of Loctite® is to fill in hidden crevices to prevent water intrusion and corrosion.
- Application of Permatex® silicone is to form an external secondary waterproof seal around plastic connector including under connector. See Figure 2 below.

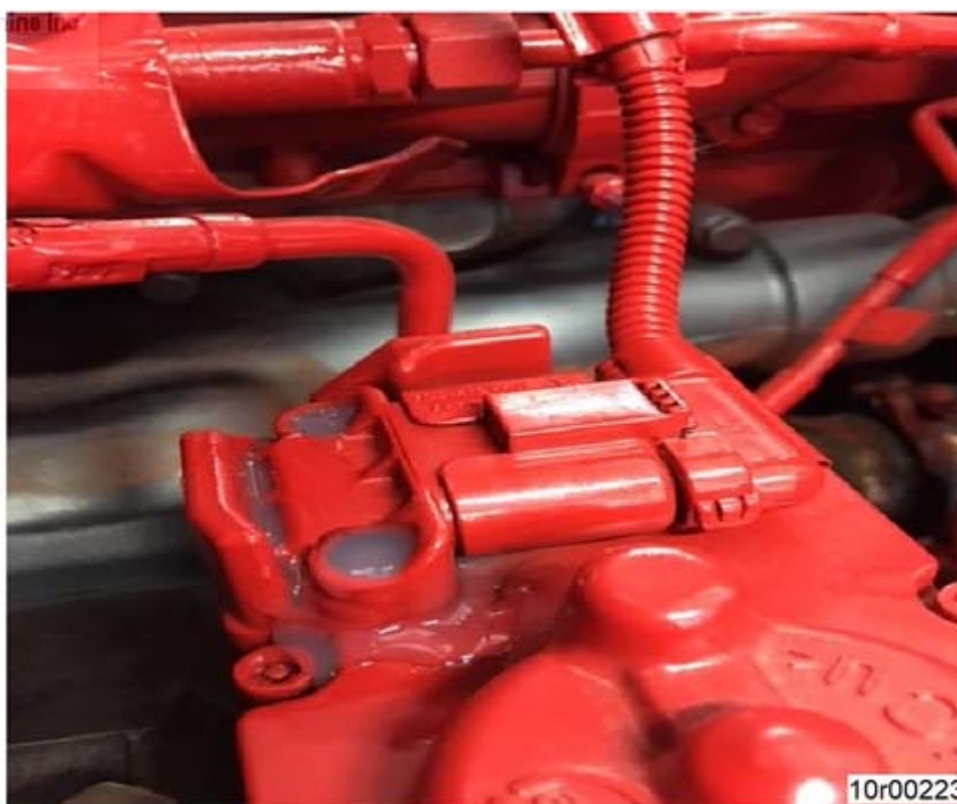


Figure 2, VGT Actuator After Repair.

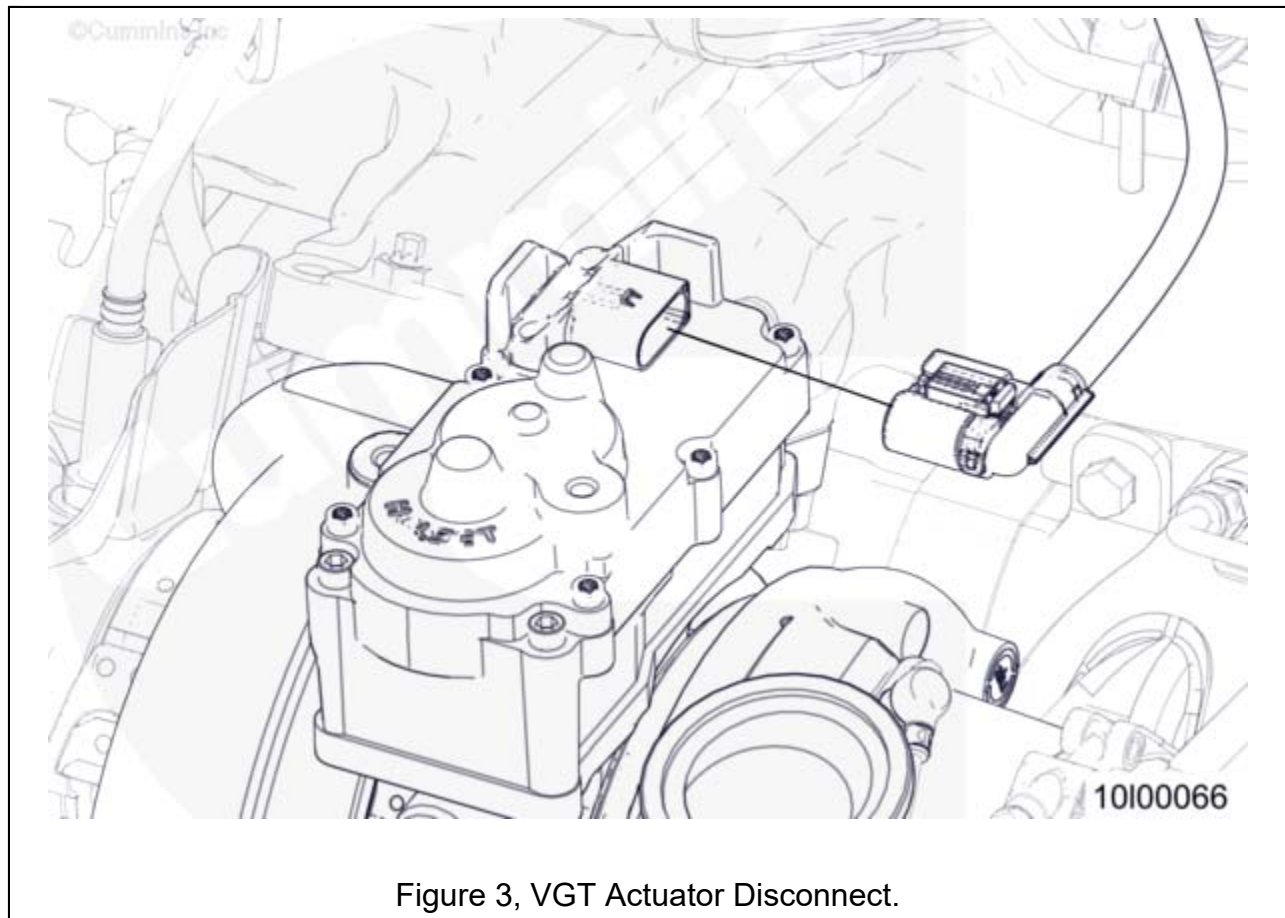
Personal Protection Equipment (PPE)

- Completing a Job Safety Assessment (JSA) prior to performing work helps identify job safety hazards and prevent incidents.
- To reduce the possibility of personal injury, personal protective equipment (PPE) **must** be utilized. Reference General Safety Instructions Procedure 204-006 in Section I of the corresponding Service Manual.

⚠ WARNING ⚠

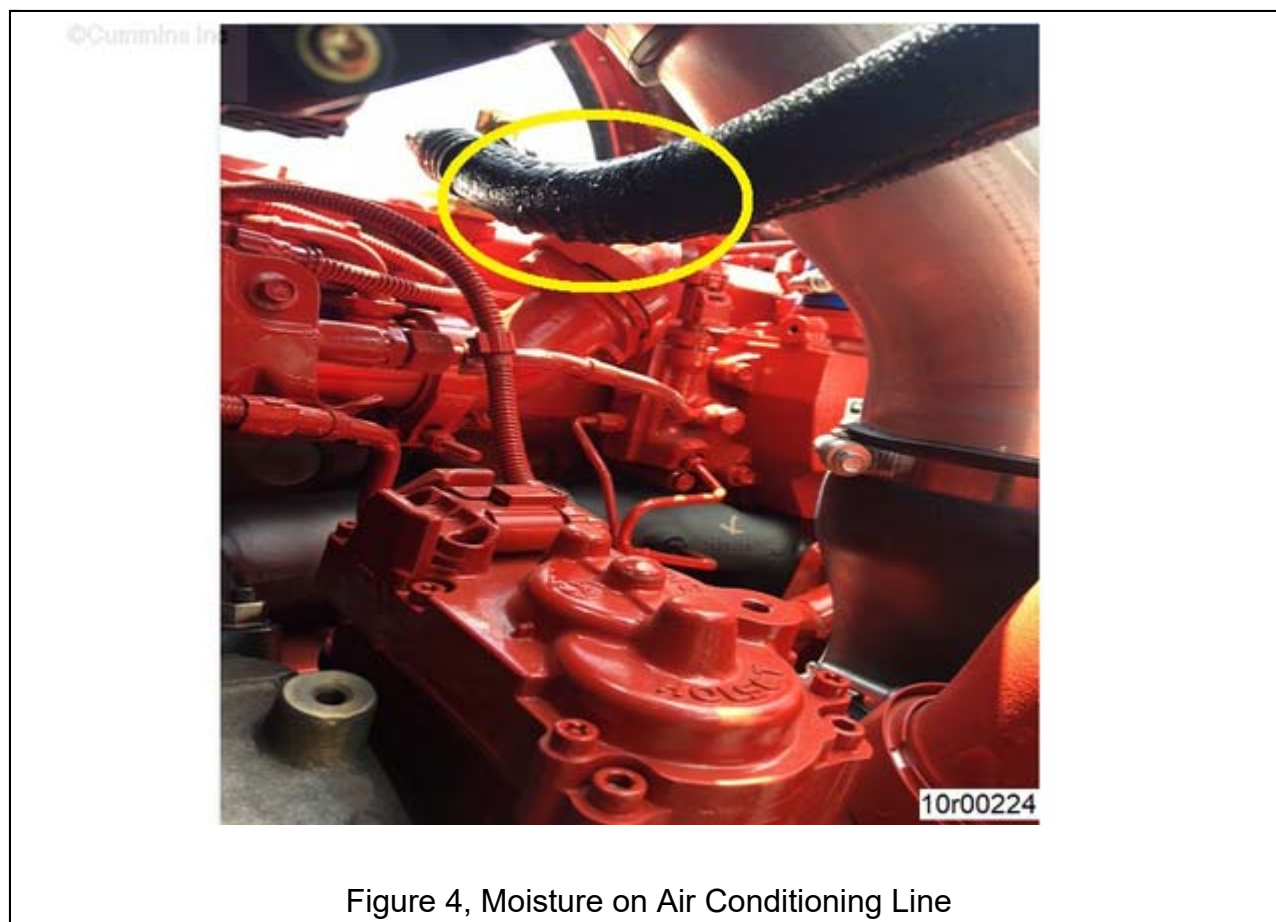
Batteries can emit explosive gases. To reduce the possibility of personal injury, always ventilate the compartment before servicing the batteries. To reduce the possibility of arcing, remove the negative (-) battery cable first and attach the negative (-) battery cable last.

Preparatory Steps



1. Turn keyswitch to OFF position.
2. Disconnect batteries. See equipment manufacturer service information.
3. Disconnect VGT actuator from engine wiring harness. See Figure 3 above.

Cleaning and Preparation: OEM A/C Line

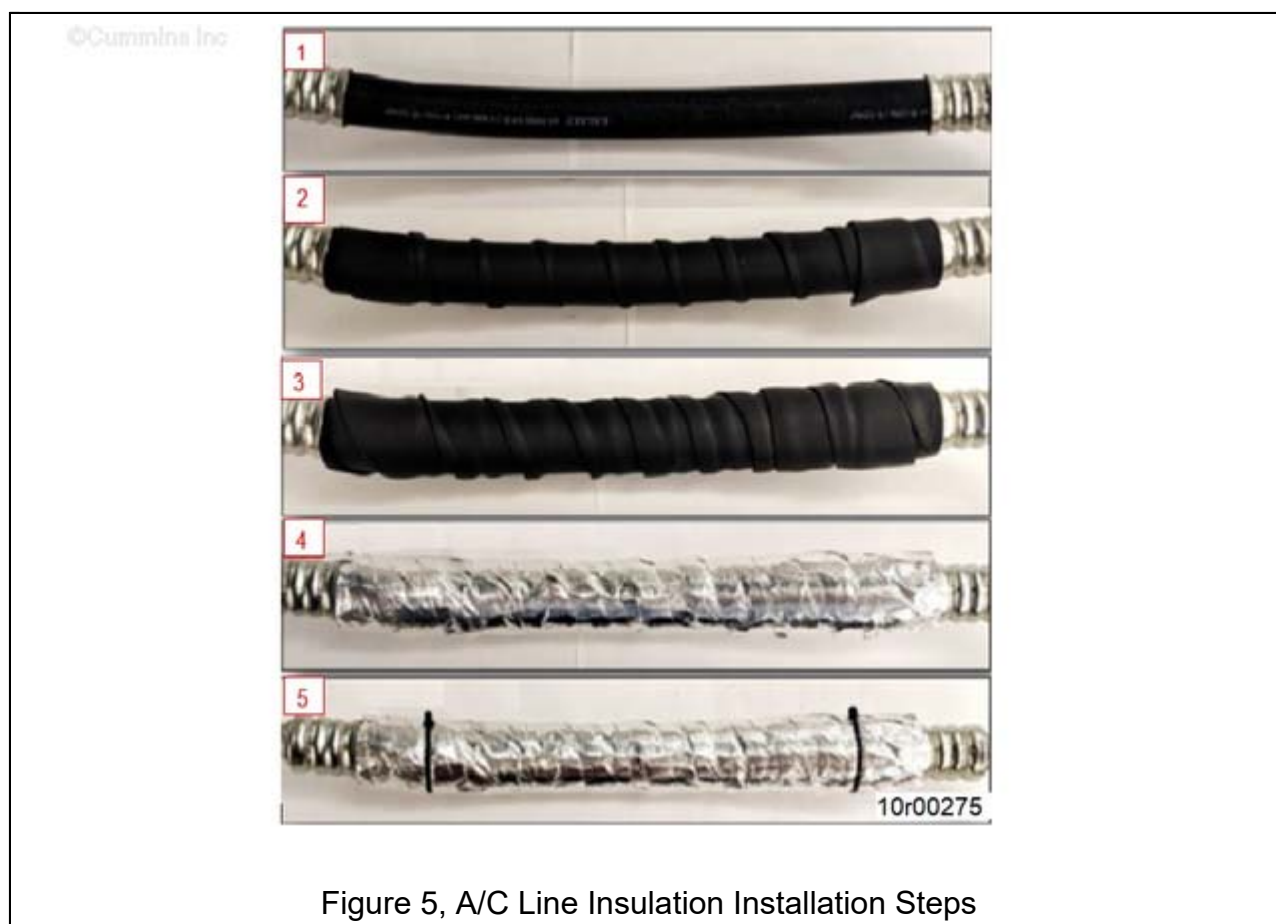


1. Clean air conditioner line to remove moisture. See Figure 4 above.
2. Verify water does **not** drop on VGT actuator during cleaning.

OEM A/C Line Insulation Wrap

If A/C line (1) is routed above the actuator (2) as depicted in the Figure 1 (above), use wrap detailed in parts section to insulate the A/C line.

A/C Line Insulation Installation Procedure



1. Clean hose and remove any oil or dirt (Figure 5, Item 1).
2. Wrap A/C line with two layers of cross-linked polyethylene insulating foam tape (Figure 5, Item 2) and (Figure 5, Item 3). Target two 7.5 ft [2.3 m] section of insulation tape.
3. Apply final wrap to the A/C line wrap with reflective heat shield tape (Figure 5, Item 4). Target 10 ft [3 m] of thermo-shield wrap.
4. Secure the wrap in place using two zip ties on each end of the wrap (Figure 5, Item 5) Target 2 inches [50mm] in from the metal connection on the A/C line.
5. Complete installation of line insulation. See Figure 5 above.

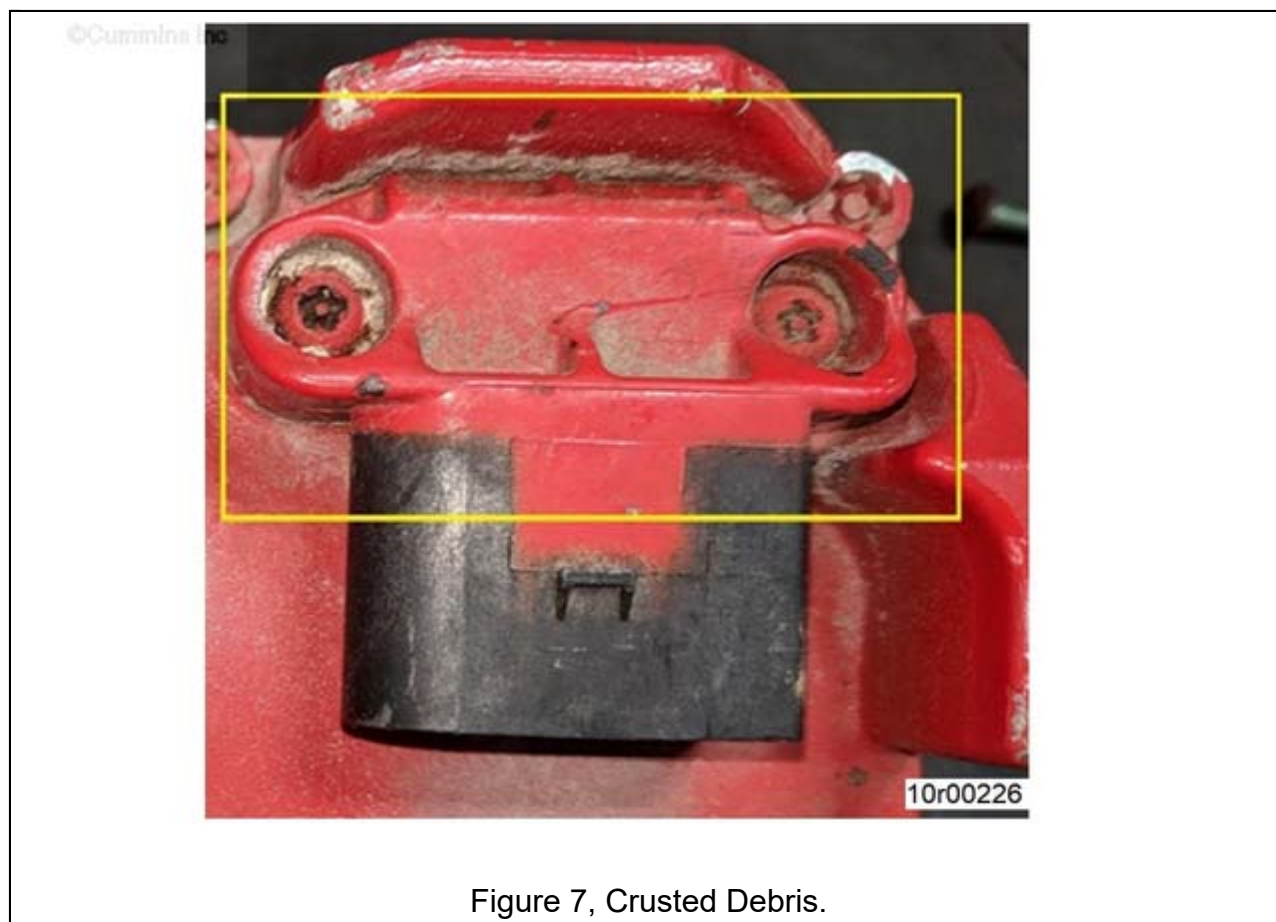
⚠ WARNING ⚠

Wear appropriate eye and face protection when using compressed air. Flying debris and dirt can cause personal injury.

Cleaning and Preparation: VGT Actuator



Figure 6, Cleaning VGT Actuator With Brush.



1. Remove loose dirt and debris from around VGT Actuator with brush. See Figure 6 above.
2. Use an automotive pick to loosen any debris between connector and shield. See Figure 7 above.
3. Apply QD® Contact Cleaner, Part Number 3824510, and use a brush around the VGT actuator connector to remove as much oil and dirt as possible.
4. Use shop air to remove any remaining loose debris.

⚠ CAUTION ⚠

Do not apply Loctite® 290 to pin area of the connector. Do not apply Loctite® 290 to connector capscrews.

Loctite® 290 Application

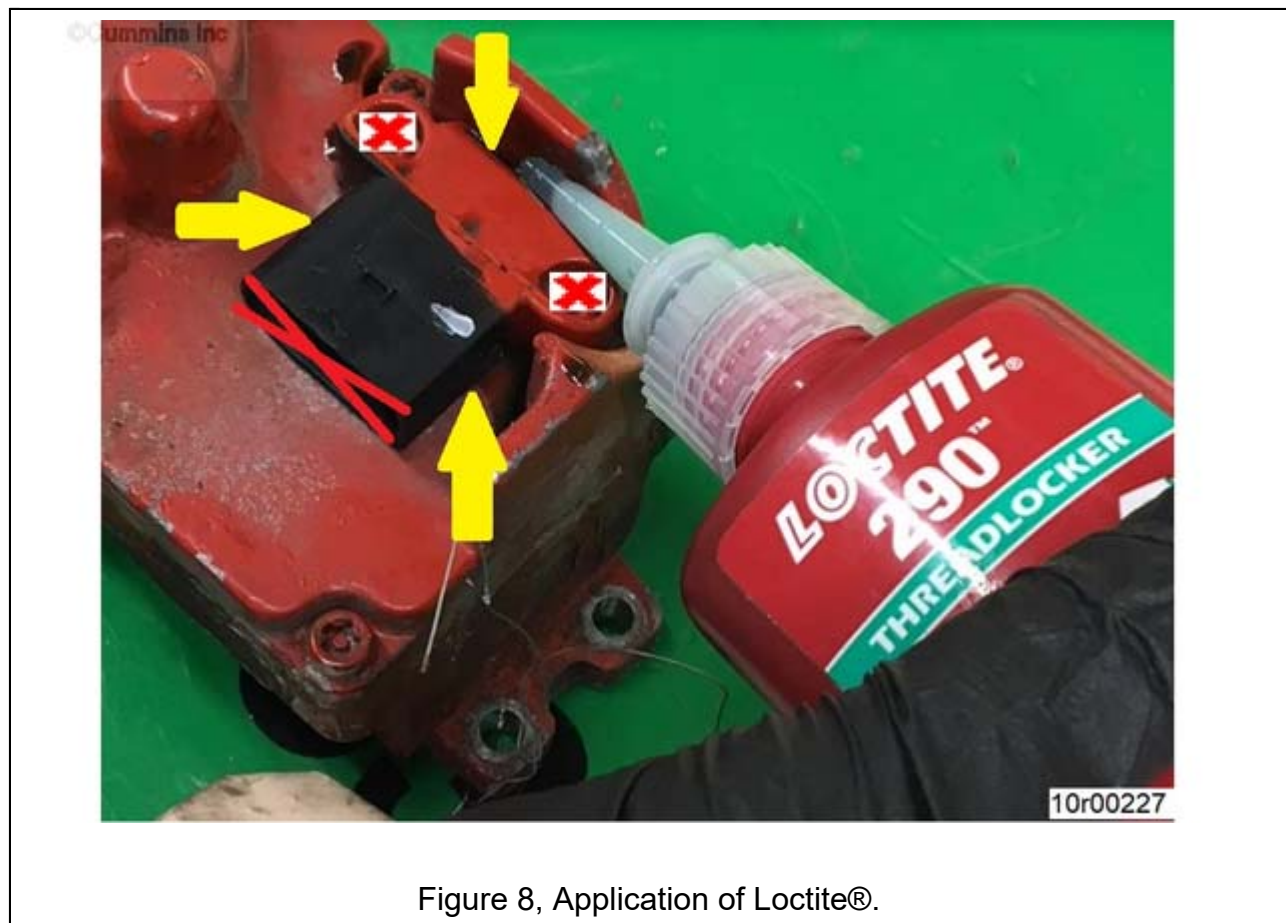


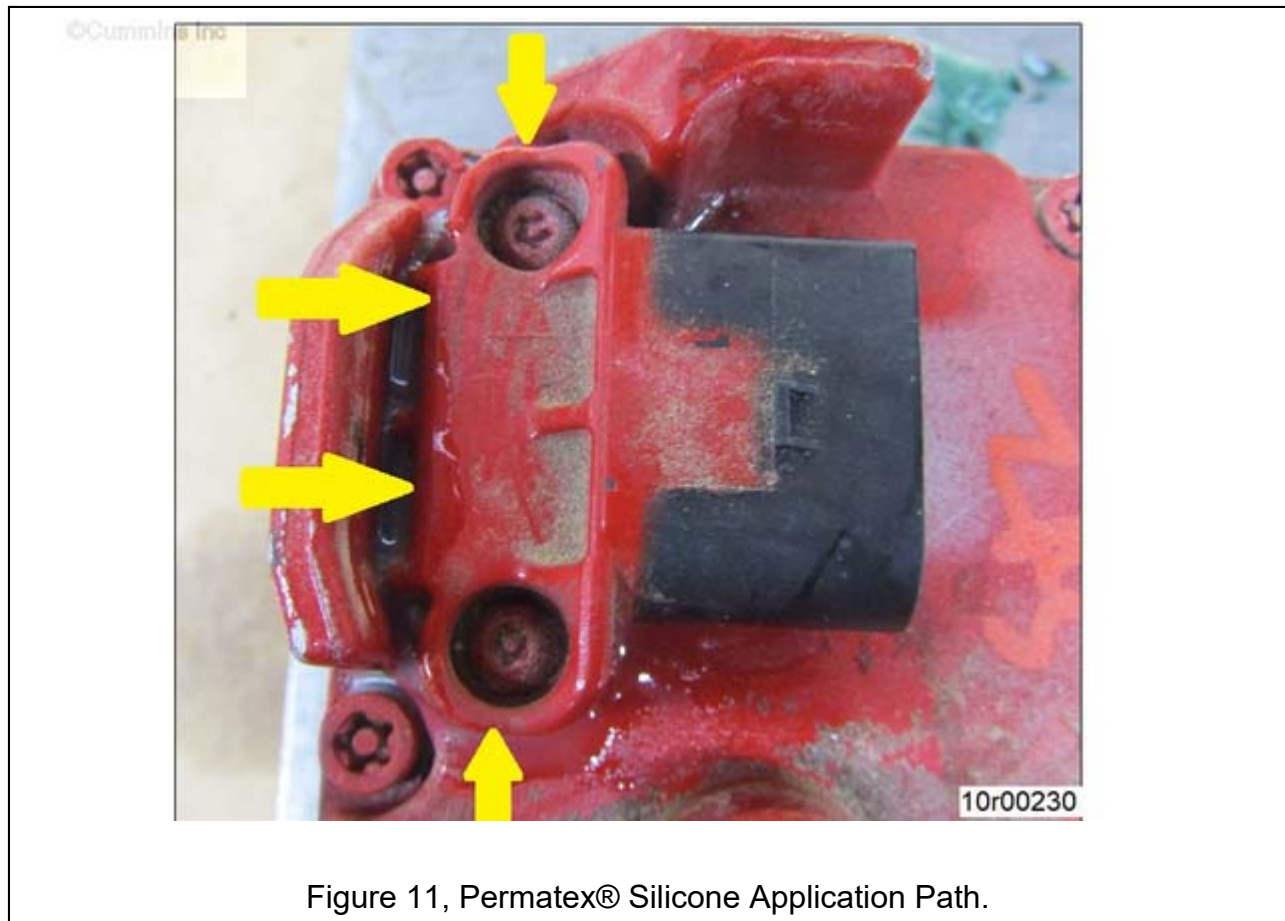




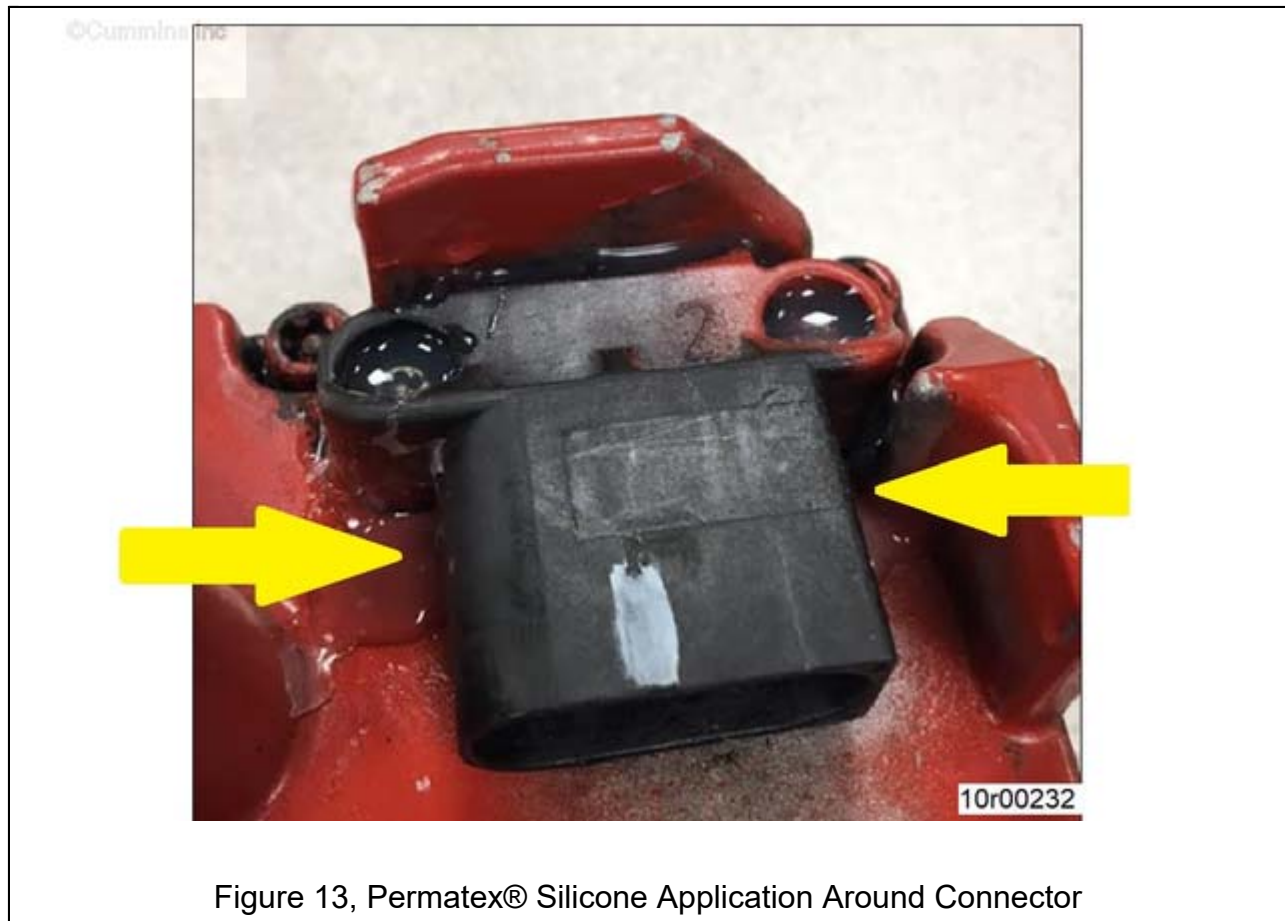
Figure 10, Cleaning Excess Loctite®.

1. Apply a liberal amount of Loctite® 290 around entire black plastic VGT actuator connector body where it meets aluminum actuator cover. See Figure 8 above.
2. Clean up any excess Loctite®.
3. Loctite® 290 will wick under plastic cover and fill any gaps that may create a leak path.
4. Check for Loctite® 290 around entire plastic connector body.
5. Wait 5 minutes to allow Loctite® 290 to wick into any crevices.
6. Wipe away excess Loctite® 290 from the VGT actuator and connector with a lint free cloth. See Figures 9 and 10 above.

Permatex® Silicone Application







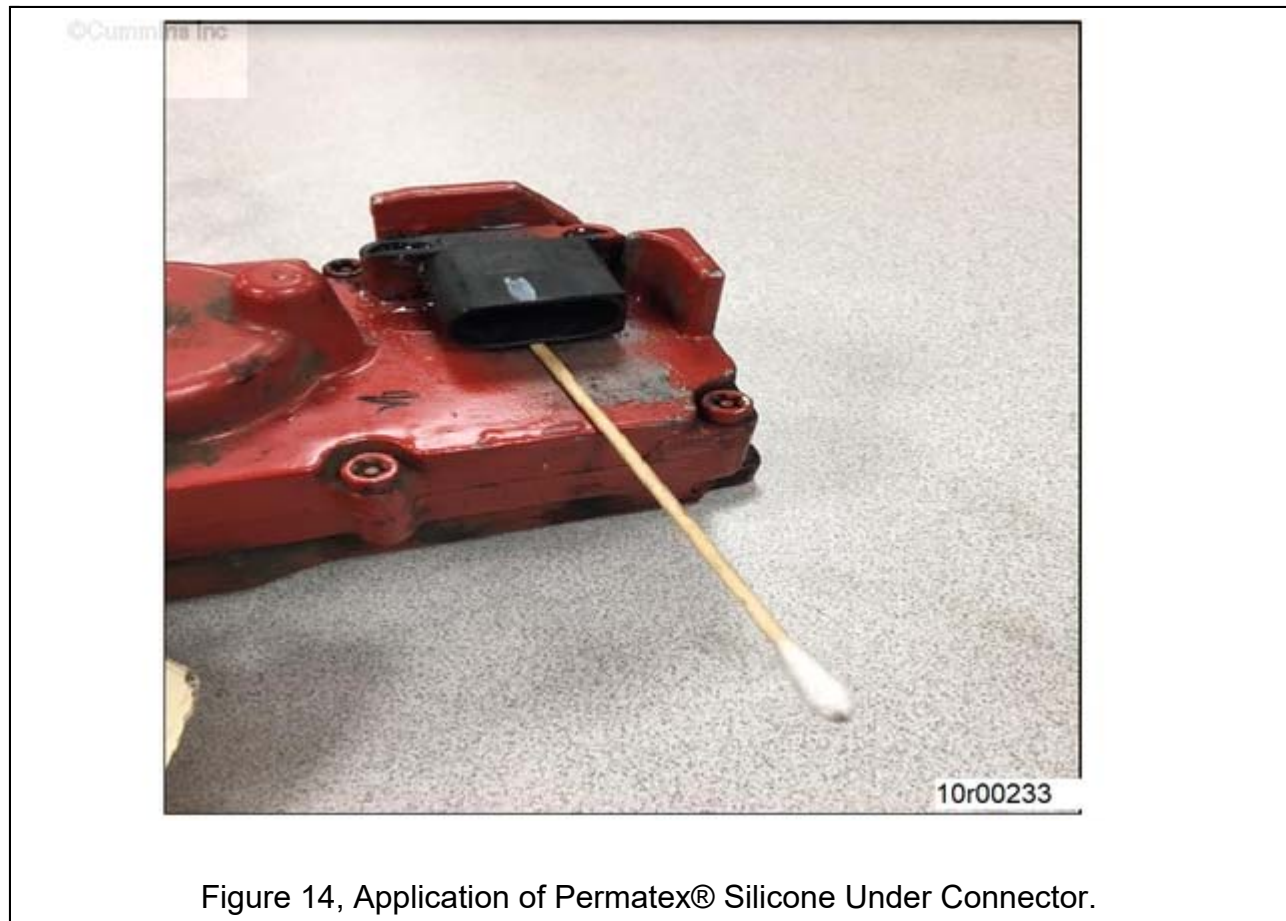
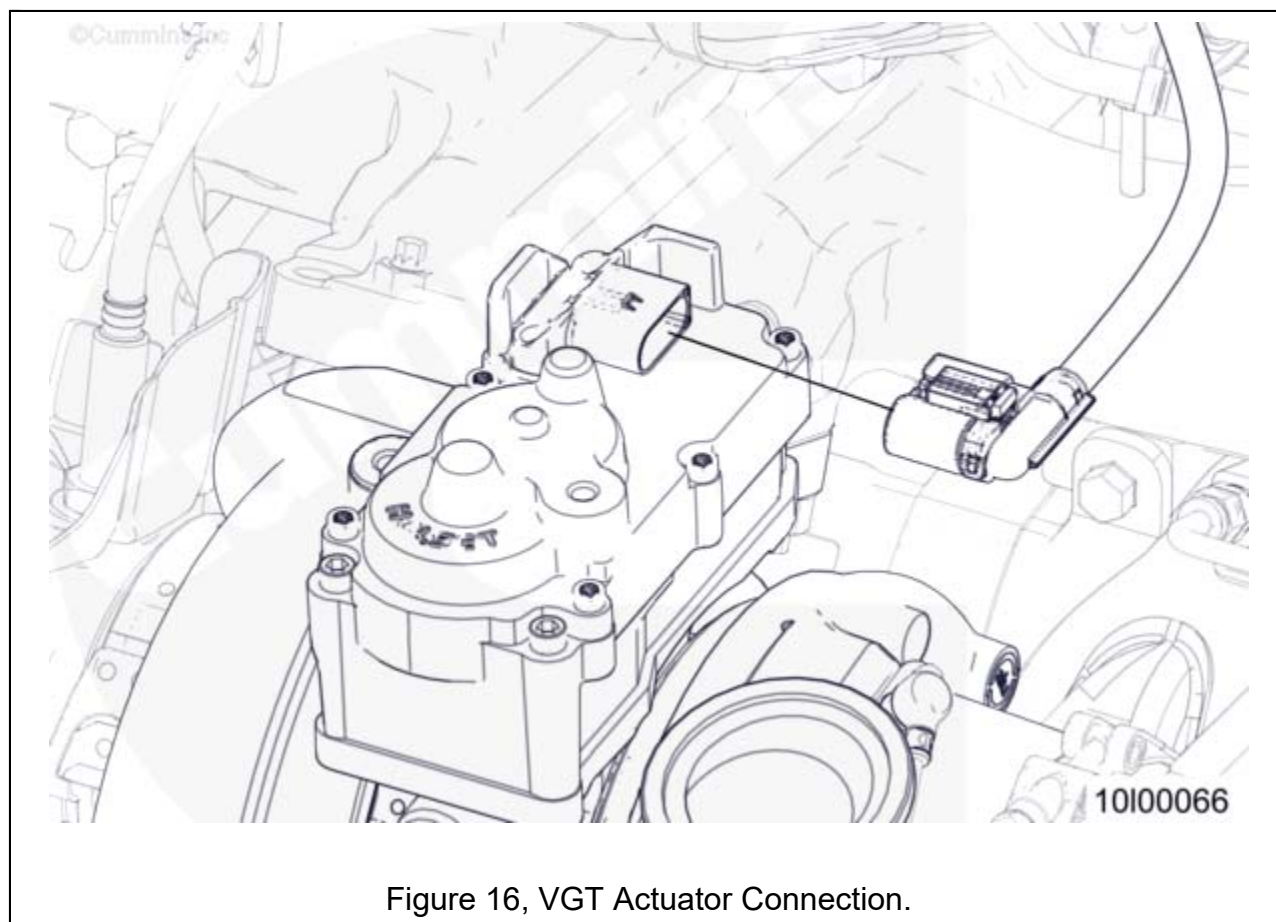




Figure 15, Witness Mark Applied.

1. Apply Permatex® silicone, Part Number 81730-1, around the plastic VGT actuator connector body. See Figure 11 above.
2. Apply Permatex® silicone on top of VGT actuator connector mounting capscrews. See Figure 12 above.
3. Apply Permatex® silicone on edges shown, using swab stick to spread silicone underneath to make a thin layer at VGT actuator connector interface. See Figures 13 and 14 above.
4. Using a white paint marker, apply witness mark “X” on VGT actuator body. See Figure 15 above.
5. Witness mark indicates repair has been made to VGT actuator.

Finishing Steps



1. Connect engine wiring harness connector to VGT Actuator. See Figure 16 above.
2. Install any clips or wire ties that were disturbed.
3. To enable optimum curing, do **not** idle engine with air conditioner ON after application of Loctite® and Permatex® Silicone.
4. Return to service as soon as possible.

Loctite® and Permatex® Silicone Curing:

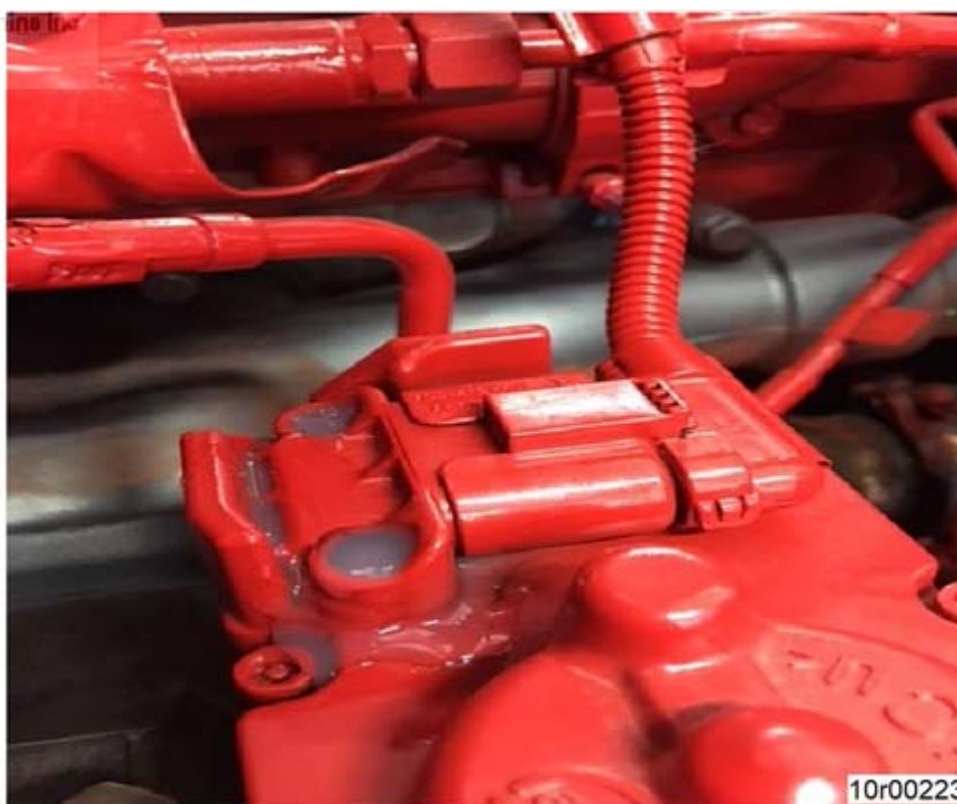


Figure 17, Completed Repair.

- Expect Loctite® to cure as shown in Figure 17 (above) in 2 hours after vehicle returns to service
- Expect the Permatex® Silicone to be tack-free in one hour. Full cure within 24 hours after application

Production Status

Implemented for production. See Table 3.

Table 3, Production Information		
ESN First	Build Date ¹	Plant
80080832	2 July 2018	Jamestown Engine Plant
¹ Engine build date can be found on engine dataplate.		

Document History

Date	Details
2018-8-8	Module Created

Date	Details
2018-8-17	Quick Fix application: Viktoriia opened document to troubleshoot issue.
2018-11-20	Updated video link, added AC line wrap instructions.

Last Modified: 26-Nov-2018
