Coolant / Vacuum / Temperature fault codes - Check Engine Light with DTCs P003313, P0299FA, P0299FB, P226100, P261F71, P012800, and P012809

Topic number	LI07.09-N-063338
Version	8
Design group	07.09 Vacuum system
Date	07-11-2017
Validity	OM651
Reason for change	Software numbers for updated guided tests
Reason for block	

Complaint:

Check engine light with some or all the following DTCs relating to the cooling / vacuum systems.

- P003313 - "The output for the switchover valve of bypass flap 'Charge air' has an electrical fault. There is an open circuit."
- P0299FA - "The boost pressure of turbocharger 1 is too low."
- P0299FB - "The boost pressure of turbocharger 1 is too low."
- P226100 - "The bypass flap 'Charge air' has a mechanical malfunction."
- P261F71 - "The output for the recirculation pump 'coolant' has a malfunction or does not switch on. The actuator is blocked."
- P012800 - "The coolant temperature is below the coolant thermostat specified temperature."
- P012809 - "The coolant temperature is below the coolant thermostat specified temperature. There is a component fault."

Cause:

The above codes may be created by the following:

1- Vacuum Leak

2- Damaged O-Ring

3- Contamination: Coolant or Oil

4- Damaged water pump impeller

(View attached images for examples)

Attachments	
File	Description
Mounting Plate.JPG	Mounting plate
Vacuum connection on mounting plate.JPG	Vacuum connection on mounting plate
Water pump vacuum line.JPG	Water pump vacuum line. Green points to vacuum port
Water Pump.JPG	Water Pump. Green points to vacuum ports. Red points to shield
Leaking vaccum manifold.jpg	Leaking vacuum manifold

Particulate contamination of vacuum reservoir.JPG	Particulate contamination from vacuum reservoir
Vacuum reservoir contaminated output ports.jpg	Vacuum reservoir contaminated output ports
Vacuum Reservoir 1 bottom.JPG	Vacuum reservoir 1 bottom
Vacuum reservoir 1 top.JPG	Vacuum reservoir 1 top
Vacuum reservoir 1 angle.JPG	Vacuum reservoir 1 angled
Vacuum Reservoir 2 bottom.JPG	Vacuum reservoir 2 bottom
Vacuum reservoir 2 top.JPG	Vacuum reservoir 2 top
Vacuum reservoir 2 angle.JPG	Vacuum resevoir 2 angled
Liquid contamination vacuum reservoir.jpg	Liquid contamination coming from the vacuum reservoir
Contaminated water pump valve.jpg	Contaminated water pump valve
Contaminated EV Valve.jpg	Contaminated EV Valve
New vacuum reservoir bottom.jpg	New vacuum reservoir bottom
New vacuum reservoir top.jpg	New vacuum reservoir top
New vacuum reservoir output ports.JPG	New vacuum reservoir output ports
Vac Reservoir w oil.JPG	Vacuum Reservoir with oil contamination
Brake Booster with oil.JPG	Brake booster with oil contamination
water pump impeller.JPG	Damaged water pump impeller

Remedy:

1- Inspect the vacuum system for loose connections or cracked hoses (See Vacuum Diagram)
-Yellow color -> part #9 --> connection point behind the coolant pump bracket
-Green color --> part #14 --> vacuum reservoir
2- Smoke test or pressurize the system to detect a leak especially in the following known areas
-Water pump mounting plate
-Vacuum connection on water pump mounting plate
-Water pump O-ring
-Water pump vacuum line
-Water pump
-Vacuum manifold / Vacuum reservoir
Note: ONLY USE LOW PRESSURE MAXIMUM 1BAR / 14.7psi TO AVOID DAMAGES

3- Remove vacuum hoses from vacuum reservoir and look for the following
- Particulate matter
- Contamination of the inside of the vacuum connection
- Any signs of coolant and / or oil on the inside of vacuum connections on the vacuum reservoir
Note:
The vacuum reservoir is a sealed unit. Pictures attached show internal contamination of the vacuum reservoirs. The vacuum reservoirs were cut open for informational purposes only. DO NOT cut open the vacuum reservoir.
4 - Perform all Diagnostic procedure before replacing any parts. The guided test have been updated as of the following software releases:
AddOn 7739 for XENTRY 03/2017
AddOn 7740 for XENTRY 05/2017
AddOn 7741 for XENTRY 07/2017
XENTRY 09/2017 will contain the updated guided tests.
5 - If coolant is found in the vacuum system replace the water pump, vacuum reservoir, change-over valve and clean the vacuum lines.
6 - If oil contamination is found in the vacuum system replace the vacuum pump, vacuum reservoir, brake booster and clean the vacuum lines.

7 - Remove and inspect water pump impeller for damage, replace as needed.

Attachments	
File	Description
Sprinter OM651 vaccum diagram.jpg	Vacuum diagram

Symptoms
Power generation / Engine cooling system / Function / Does not reach operating temperature
Power generation / Engine cooling system / Function / Has a high coolant temperature
Power generation / Engine management / Indicator lamp / Engine diagnosis / lit
Power generation / Engine management / Engine start/stop / Does not start
Power generation / Engine management / Engine performance / Goes into limp-home mode
Power generation / Engine management / Engine performance / Poor/delayed throttle response
Power generation / Engine management / Engine performance / No/poor output
Power generation / Engine management / Engine performance / Cuts off
Power generation / Engine management / Engine performance / Poor acceleration
Power generation / Engine management / Boost effect / Nonfunctional

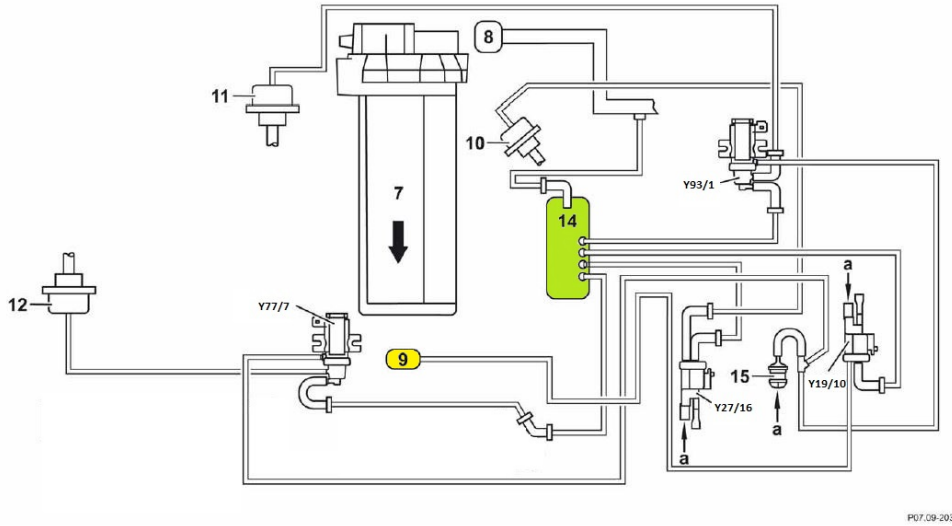
Control unit/fault code		
Control unit	Fault code	Fault text
N3/33 - Motor electronics 'CDI43' for combustion engine 'OM651' (CDI) (CR43)	P003313	The output for the switchover valve of bypass flap 'Charge air' has an electrical fault. There is an open circuit.
N3/33 - Motor electronics 'CDI43' for combustion engine 'OM651' (CDI) (CR43)	P0299FA	The boost pressure of turbocharger 1 is too low. _
N3/33 - Motor electronics 'CDI43' for combustion engine 'OM651' (CDI) (CR43)	P0299FB	The boost pressure of turbocharger 1 is too low. _
N3/33 - Motor electronics 'CDI43' for combustion engine 'OM651' (CDI) (CR43)	P226100	The bypass flap 'Charge air' has a mechanical malfunction. _
N3/33 - Motor electronics 'CDI43' for combustion engine 'OM651' (CDI) (CR43)	P261F71	The output for the circulation pump 'Coolant' has a malfunction or does not switch on. The actuator is blocked.
N3/33 - Motor electronics 'CDI43' for combustion engine 'OM651' (CDI) (CR43)	P012800	The coolant temperature is below the coolant thermostat specified temperature. _
N3/33 - Motor electronics 'CDI43' for combustion engine 'OM651' (CDI) (CR43)	P012809	The coolant temperature is below the coolant thermostat specified temperature. There is a component fault.

Parts						
Part number	ES1	ES2	Designation	Quantity	Note	EPC
A 651 070 07 68			Vacuum Reservoir	1	As needed in EPC	X

A 002 540 70 97			Change-Over Valve	1	As needed in EPC	X
A 651 200 03 01			Water Pump	1	As needed in EPC	X
A 906 431 00 27			Brake Booster	1	As needed in EPC	X
A 651 230 05 65			Vacuum Pump	1	As needed in EPC	X

Attachments

Sprinter OM651 vaccum diagram.jpg:

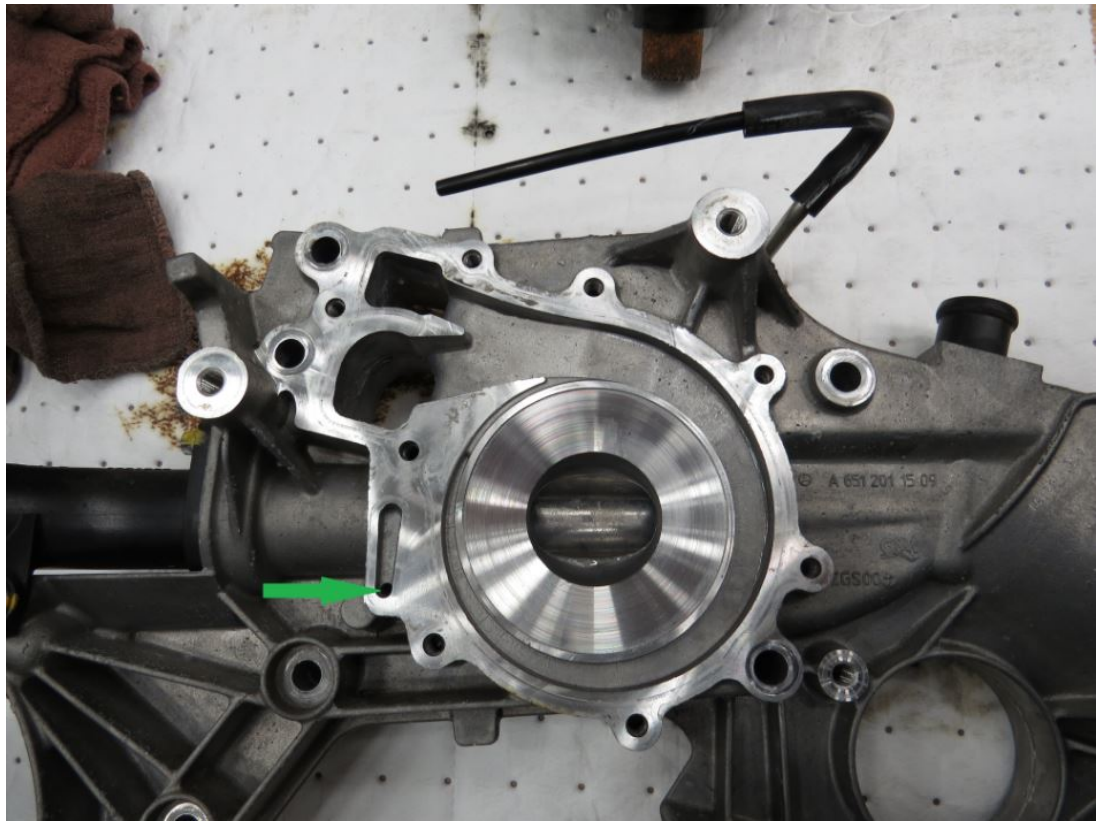


P07.09-2038-00

Vacuum system shown on engine 651.911

➡	*Travel direction arrow*	*11*	*Boost pressure control flap vacuum unit*	Y77/7	*Wastegate control pressure transducer*
a	*Ambient pressure*	*12*	*Wastegate vacuum unit*	Y27/16	*EGR cooler bypass switchover valve*
7	*Cylinder head*	*13*	*Charge air bypass flap vacuum unit*	Y93/1	*Boost pressure control flap pressure transducer*
8	*Vacuum pump*	*14*	*Vacuum reservoir*	Y19/10	*Coolant pump switchover valve*
9	*Coolant pump*	*15*	*Vent filter for* Y77/7 and Y93/1		
10	*EGR cooler bypass vacuum unit*				

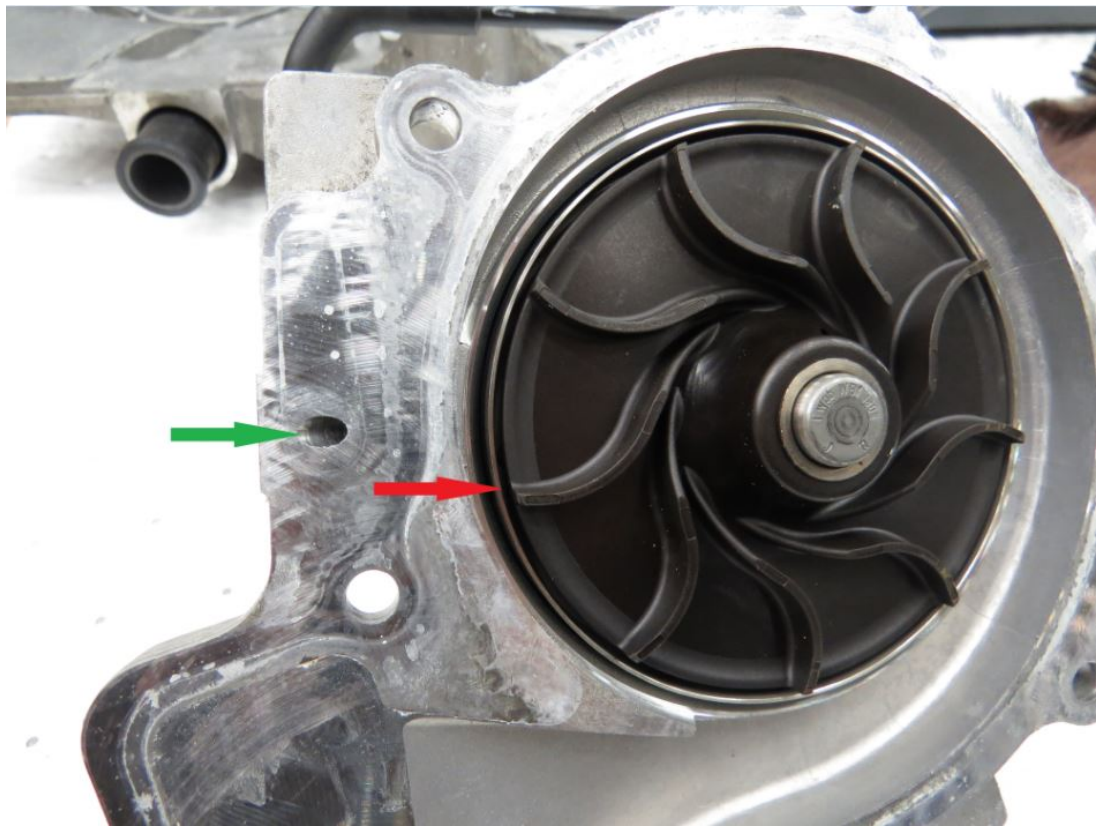
Mounting Plate.JPG:



Vacuum connection on mounting plate.JPG:

Water pump vacuum line.JPG:

Water Pump.JPG:



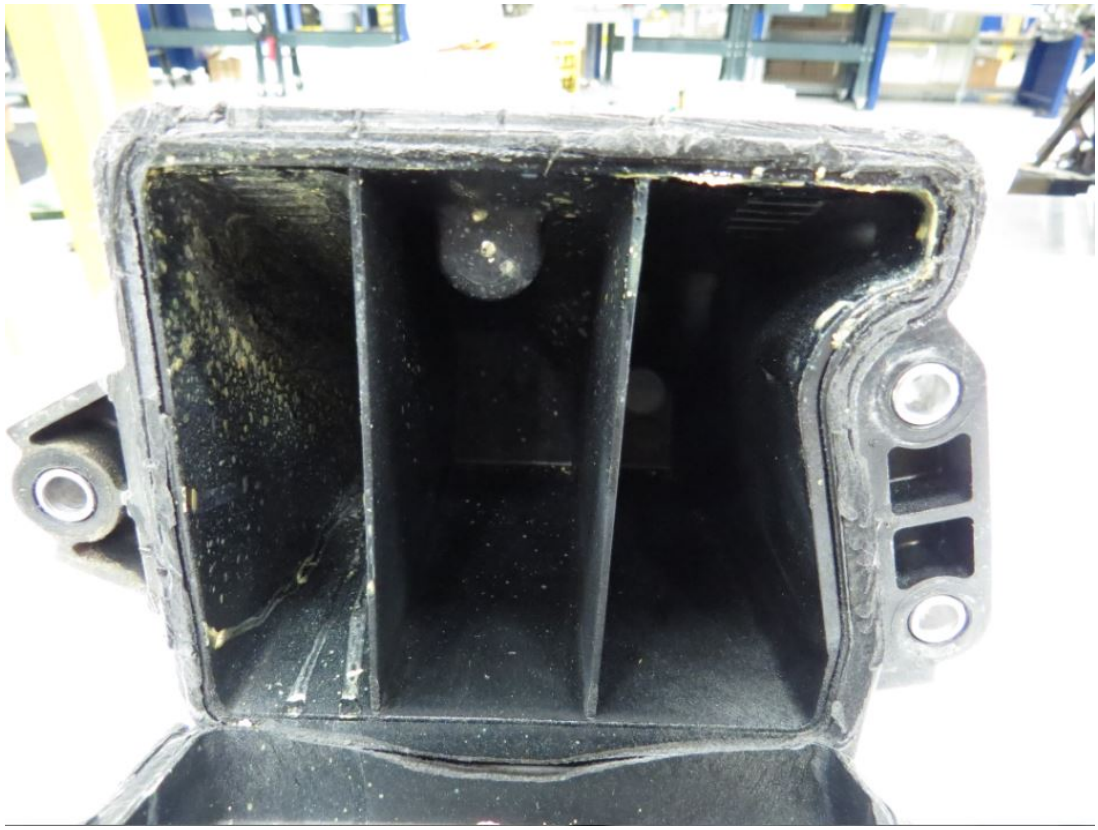
Leaking vaccum manifold.jpg:

Particulate contamination of vacuum reservoir.JPG:

Vacuum reservoir contaminated output ports.jpg:

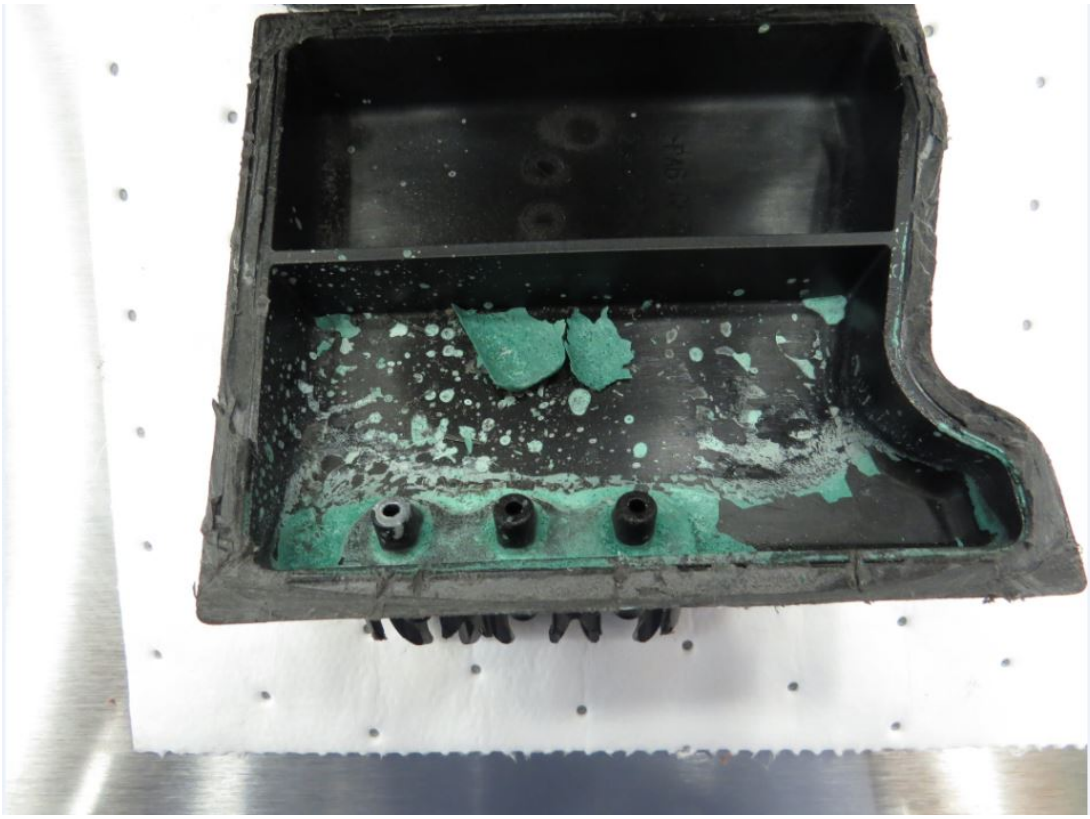
Vacuum Reservoir 1 bottom.JPG:

Vacuum reservoir 1 top.JPG:

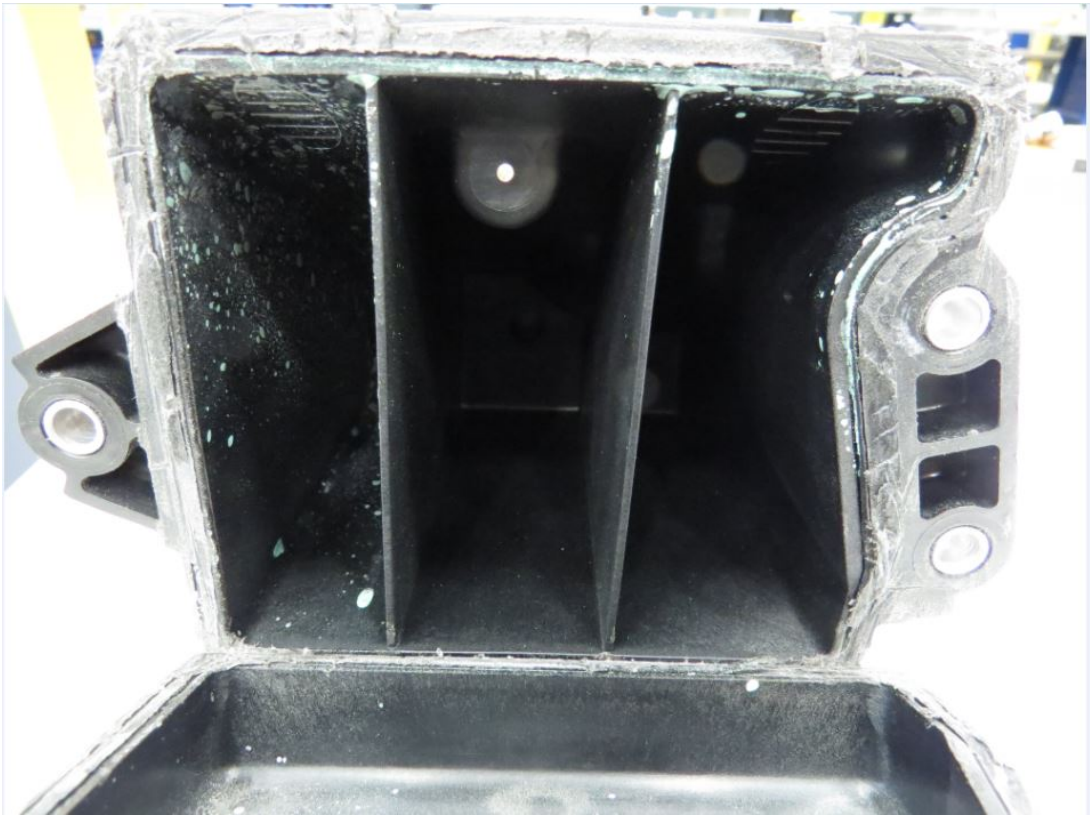


Vacuum reservoir 1 angle.JPG:

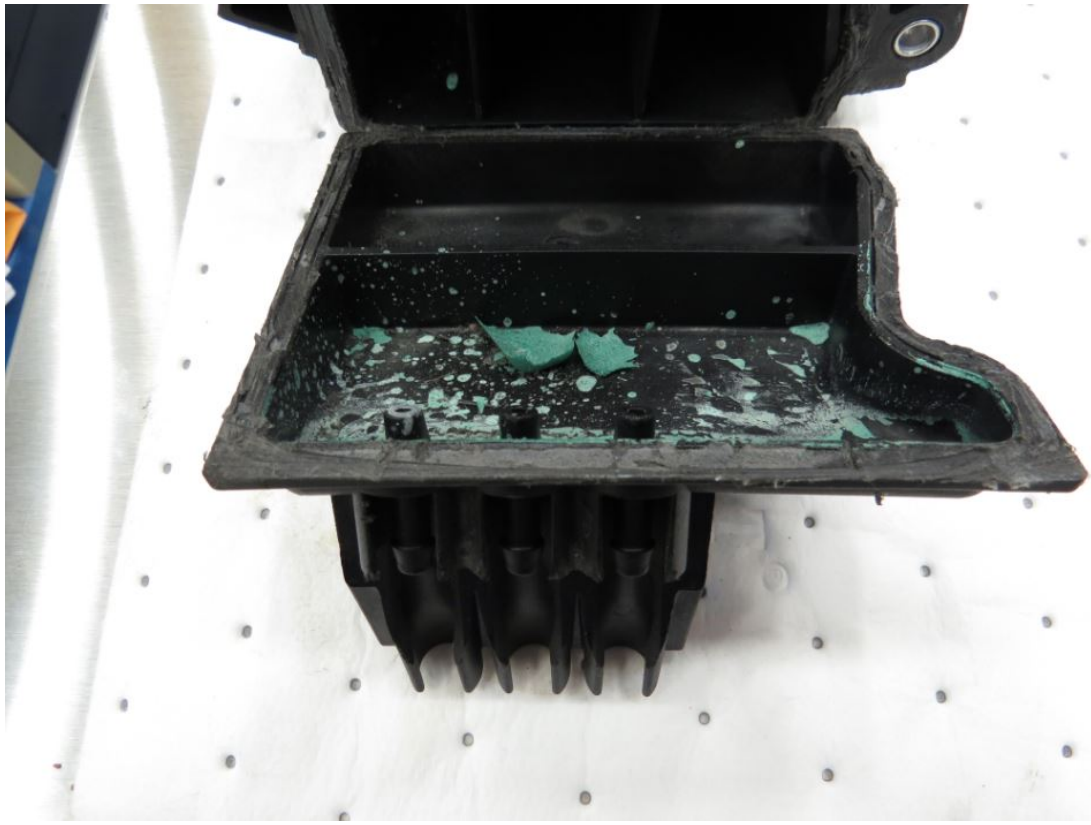
Vacuum Reservoir 2 bottom.JPG:



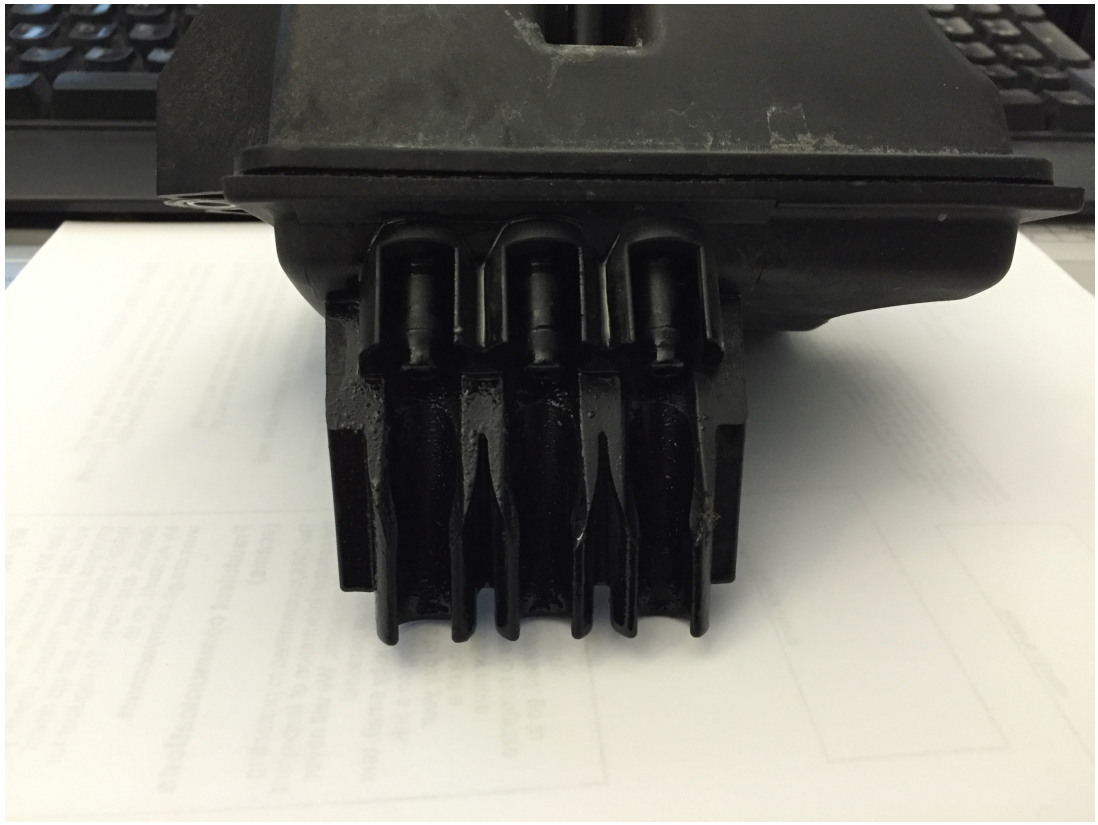
Vacuum reservoir 2 top.JPG:



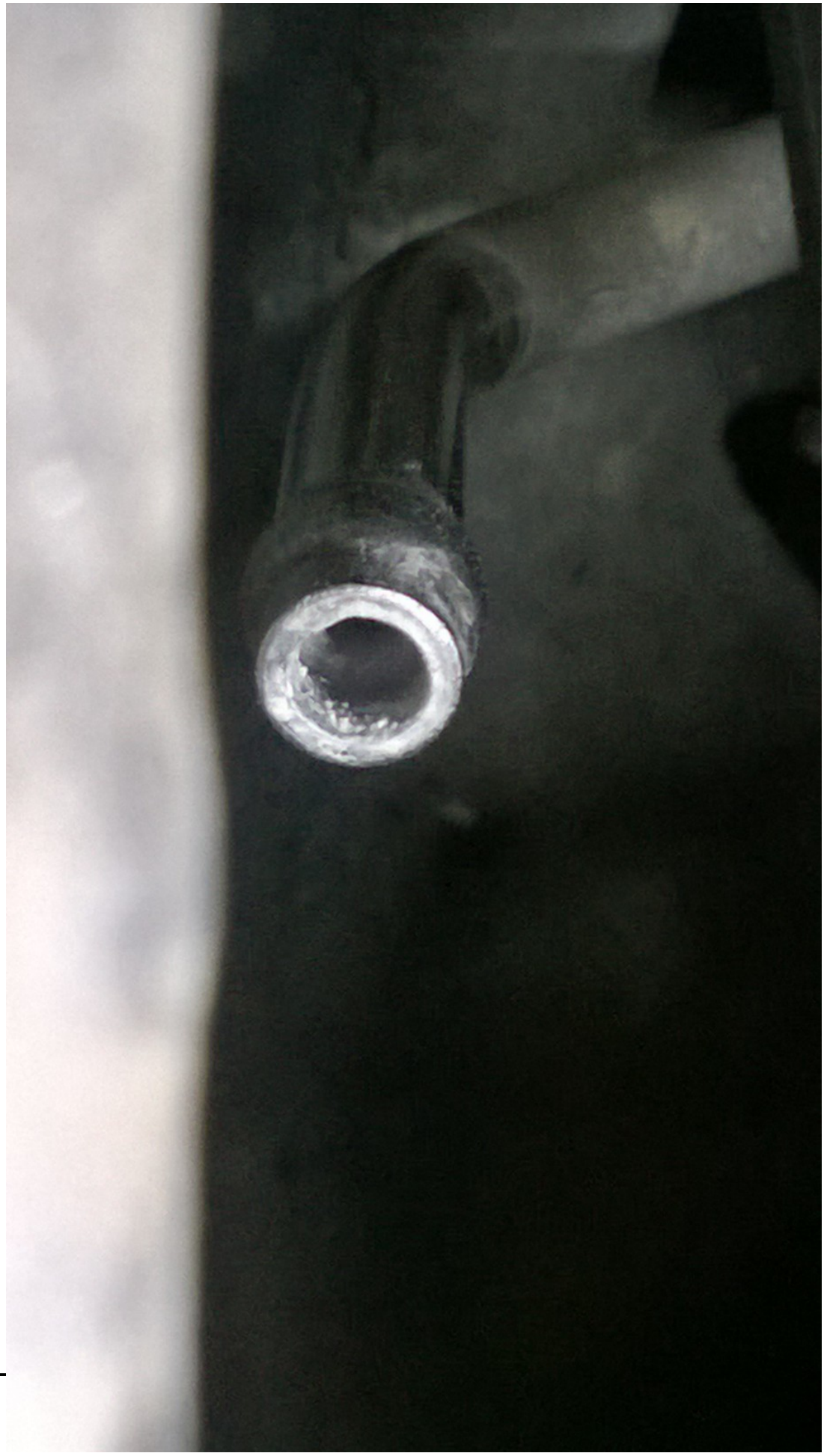
Vacuum reservoir 2 angle.JPG:



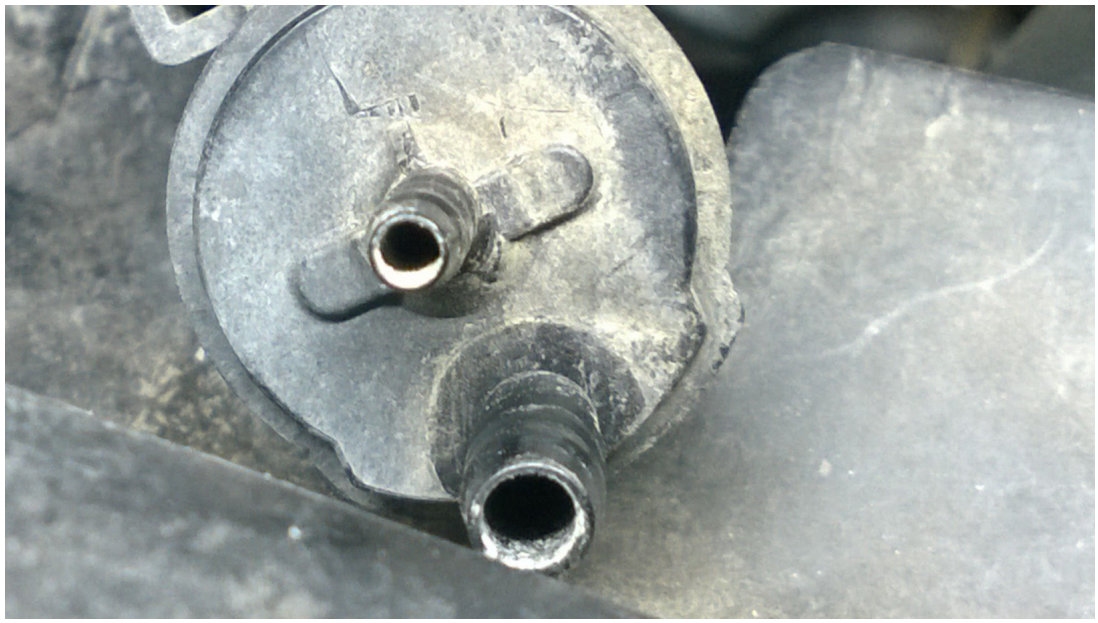
Liquid contamination vacuum reservoir.jpg:



Contaminated water pump valve.jpg:

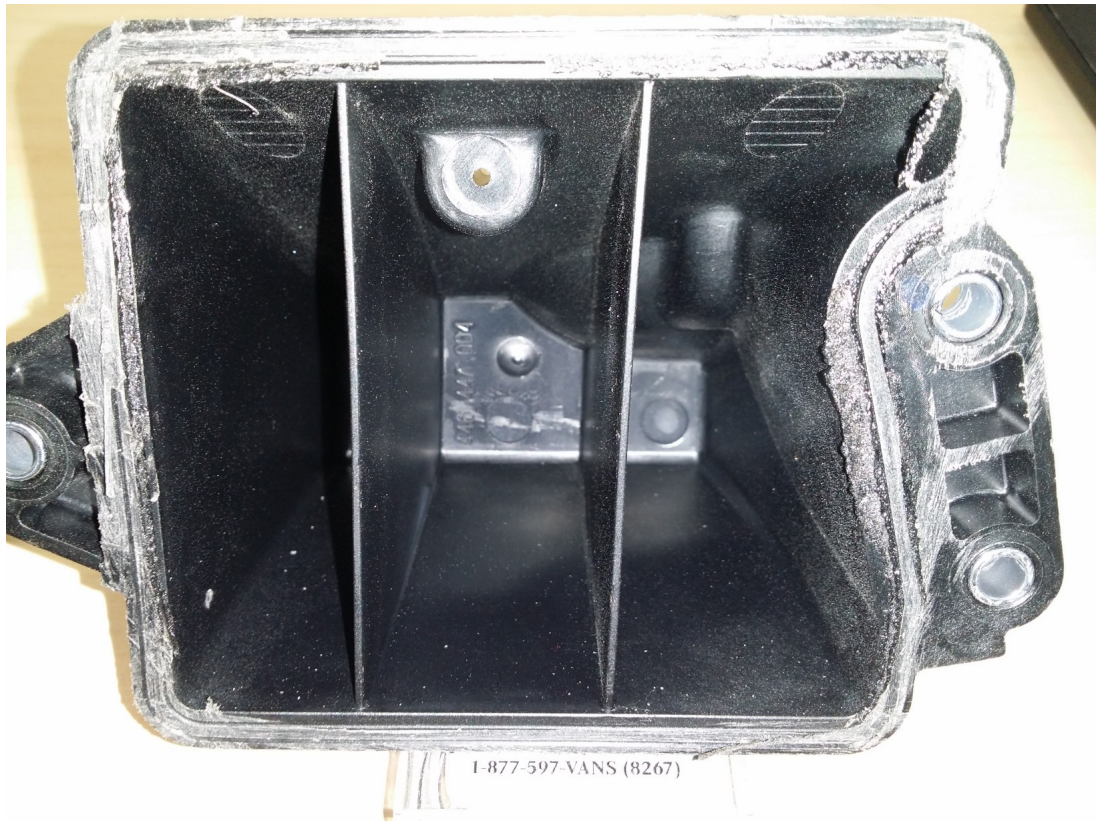


Contaminated EV Valve.jpg:

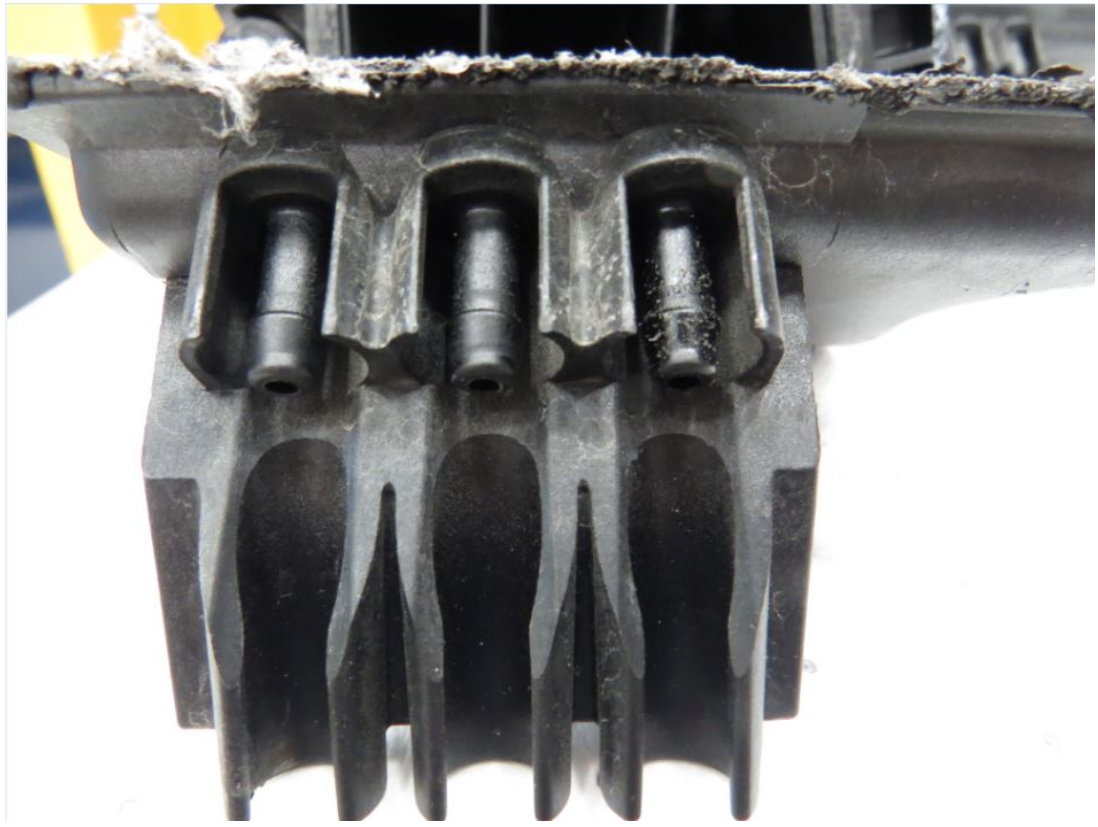


New vacuum reservoir bottom.jpg:

New vacuum reservoir top.jpg:



New vacuum reservoir output ports.JPG:



Vac Reservoir w oil.JPG:

Brake Booster with oil. JPG:

water pump impeller.
JPG: