valley longwall
INTERNATIONAL
DIESEL DIVISION

Technical Bulletin / Safety Alert

Unique ID No: DES2011-TBSA-02 **Rev:** 0

Subject: Driftrunner – Coolant Loss Valve, Improved Operation

Date: 18/05/2011

Applicable to: All Driftrunner Vehicles

Note: Minimum PPE required to carry out any inspections contained in this TBSA shall be protective clothing & footwear, safety glasses, hearing protection & any site specific requirements. A JSA or equivalent should be carried out prior to performing these tasks.

Occurance:

Valley Longwall International Diesel Division (VLIDD) has received reports from some end users of unplanned intermittent machine shutdown due to activation of the coolant loss valve (Part No. 9-02161118) on some Driftrunner vehicles.

Investigation & Cause:

Investigation and testing of the existing standard Driftrunner coolant loss valve installation, and a proposed alteration to the coolant loss valve source pressure location, was performed by VLIDD in an attempt to identify an improvement to the reliability of the coolant loss valve operation.

The proposed coolant loss valve source pressure alteration (directly from the water pump) replicates that of the existing standard Brumby coolant loss valve installation.

The detail and results of the coolant loss valve testing are contained in the attached Engineering Report ER1101-1.

In summary, the results highlighted that constant positive pressure was obtained by sourcing the coolant directly from the water pump, whereas the source pressure obtained from the existing installation identified the potential for zero pressure at the coolant loss valve, which could result in coolant loss valve activation and unplanned engine shutdown. This could explain the reported unplanned shutdown events from some end users.
The change in coolant source does not affect the shutdown performance of the coolant loss valve.

Conclusions:

Obtaining coolant loss valve source pressure direct from the water pump on the Driftrunner engine provides more consistent positive pressure during engine operation.

Coolant loss valve shutdown performance is not affected by the change in source pressure.

Recommendations (End User):

End users are recommended to change the coolant loss valve source pressure on their Driftrunner vehicles to the water pump as described below. This should be completed at the next major service interval.

This change does not alter the recommended maintenance cycle or coolant loss shutdown test frequency of the machine. It should also be noted that the coolant loss valve is a serviceable component, and can be disassembled for lubrication purposes as required during its service life.

Recommendations (OEM):

It is recommended the coolant loss valve source pressure on all new Driftrunner builds is obtained from the water pump, as described below.

Installation Details:

The following photographs provide a reference for performing the coolant loss valve installation.

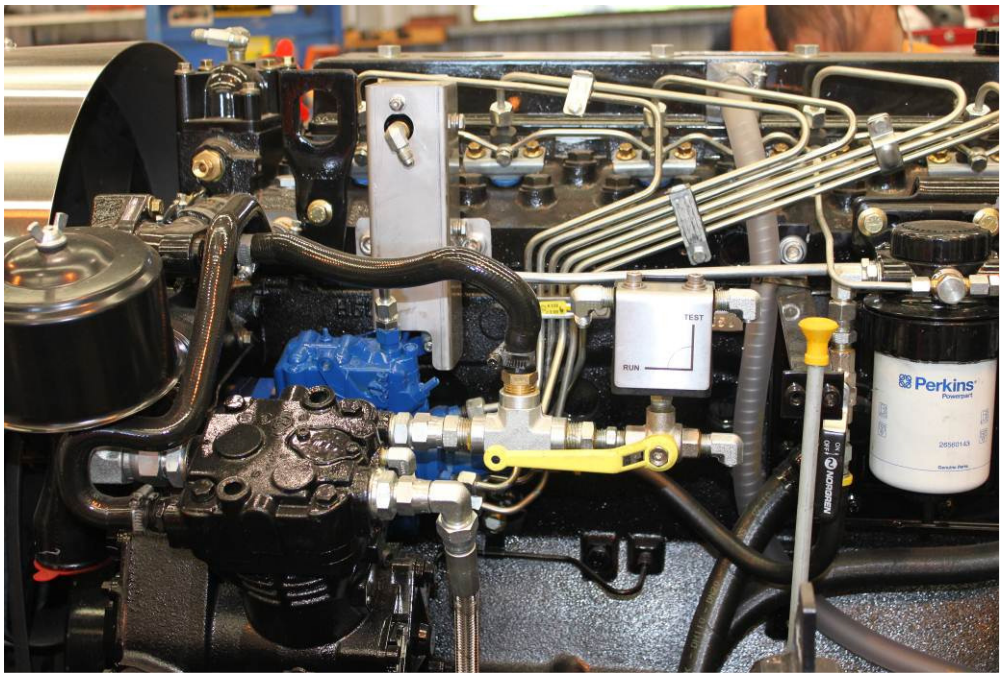

Figure 1: The existing standard coolant loss valve installation.

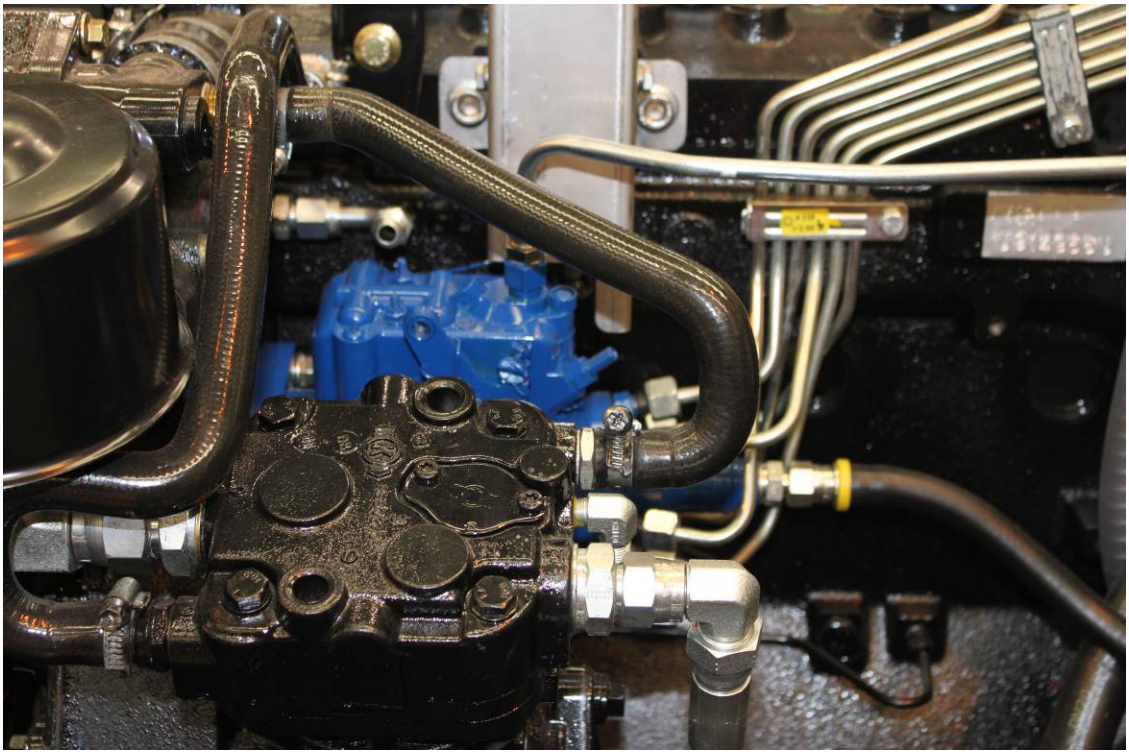

Figure 2: Compressor coolant hose reconnection after removal of coolant loss valve.

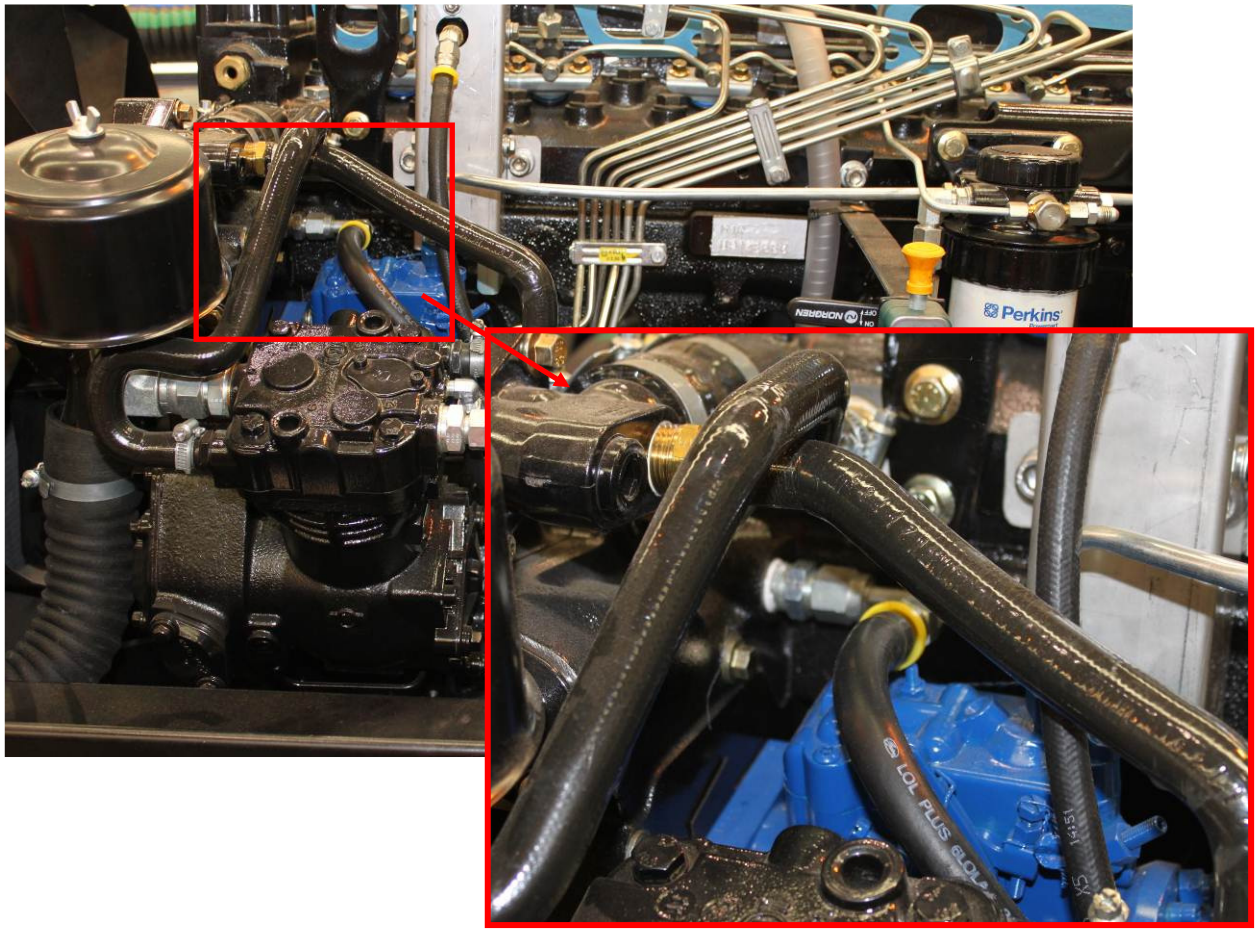

Figure 3: Coolant loss valve supply hose now installed directly to rear of water pump via existing threaded port.

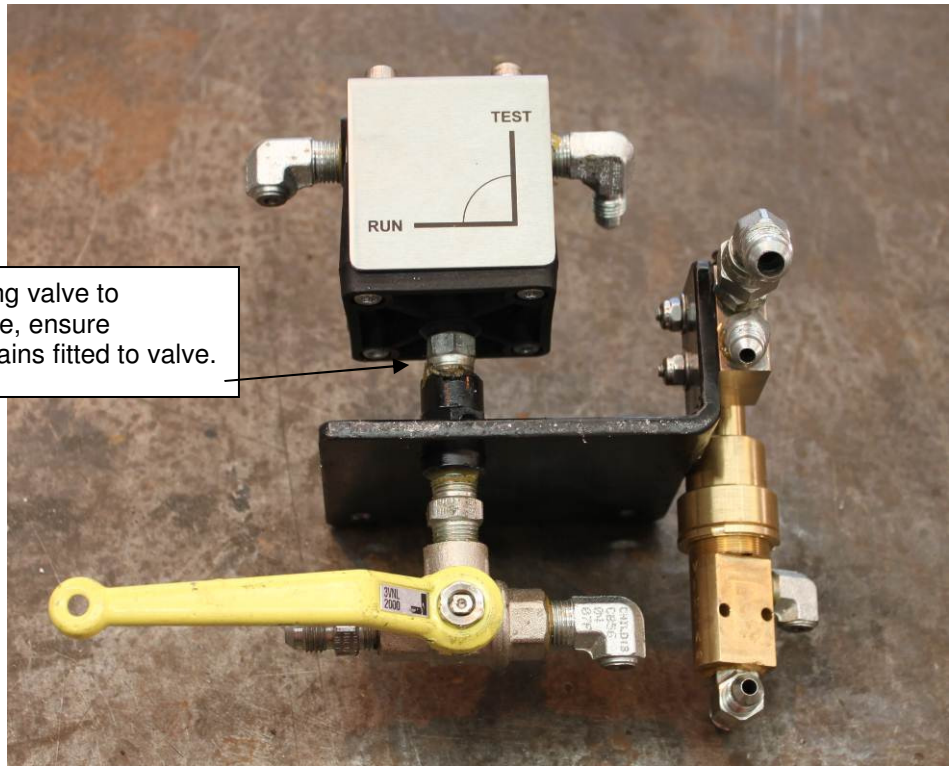

Figure 4: For coolant loss valve installation in the transmission tunnel area, the valve is installed to support bracket (Part No. 5-04282401) and connected to supply hose shown in Figure 3.

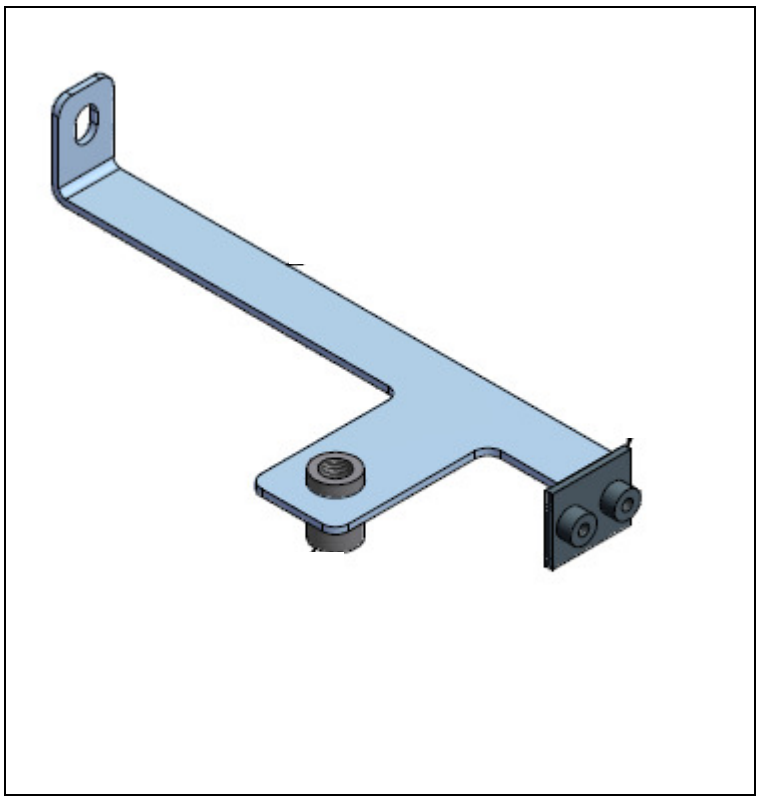

Figure 5: For coolant loss valve installation to the engine bay area, the existing dipstick support can be replaced with a modified support assembly (Part No. 5-04100154).

Maintenance Implications:

The recommended change to the Driftrunner coolant loss valve coolant supply source does not change the existing recommended inspection and maintenance regime as detailed in the service sheets supplied with the equipment plant safety file.

Supporting Documentation:

VLIDD Engineering Report ER1101-1

Please ensure this document is circulated to all relevant personnel within your organisation.

Should you have any further queries please contact your VLI Diesel Representative.

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INTERNATIONAL
DIESEL DIVISION

ENGINEERING REPORT

Unique ID No: ER1101-1 **Date: 28th January 2011**

Subject: Driftrunner Coolant Loss Valve Testing

Introduction

Valley Longwall International Diesel Division (VLIDD) have received reports from some end users of unplanned intermittent machine shutdown due to activation of the coolant loss valve (Part No. 9-02161118) on Driftrunner vehicles.

The reports received indicated that a fluctuation in coolant pressure at the coolant loss valve might have been impacting valve operation. The coolant loss valve is installed with a flow restrictor valve (Part No. Part No. 5-04160141) as standard in order to counter pressure fluctuation.

Despite the presence of the flow restrictor it was suspected that the source of the coolant pressure acting on the coolant loss valve might not provide sufficient force to keep the coolant loss valve from activating in all service conditions. Therefore, investigation and testing of the existing coolant loss valve source pressure, and a proposed alteration to the coolant source pressure, was performed by VLIDD in an attempt to identify an improvement to the reliability of the coolant loss valve operation.

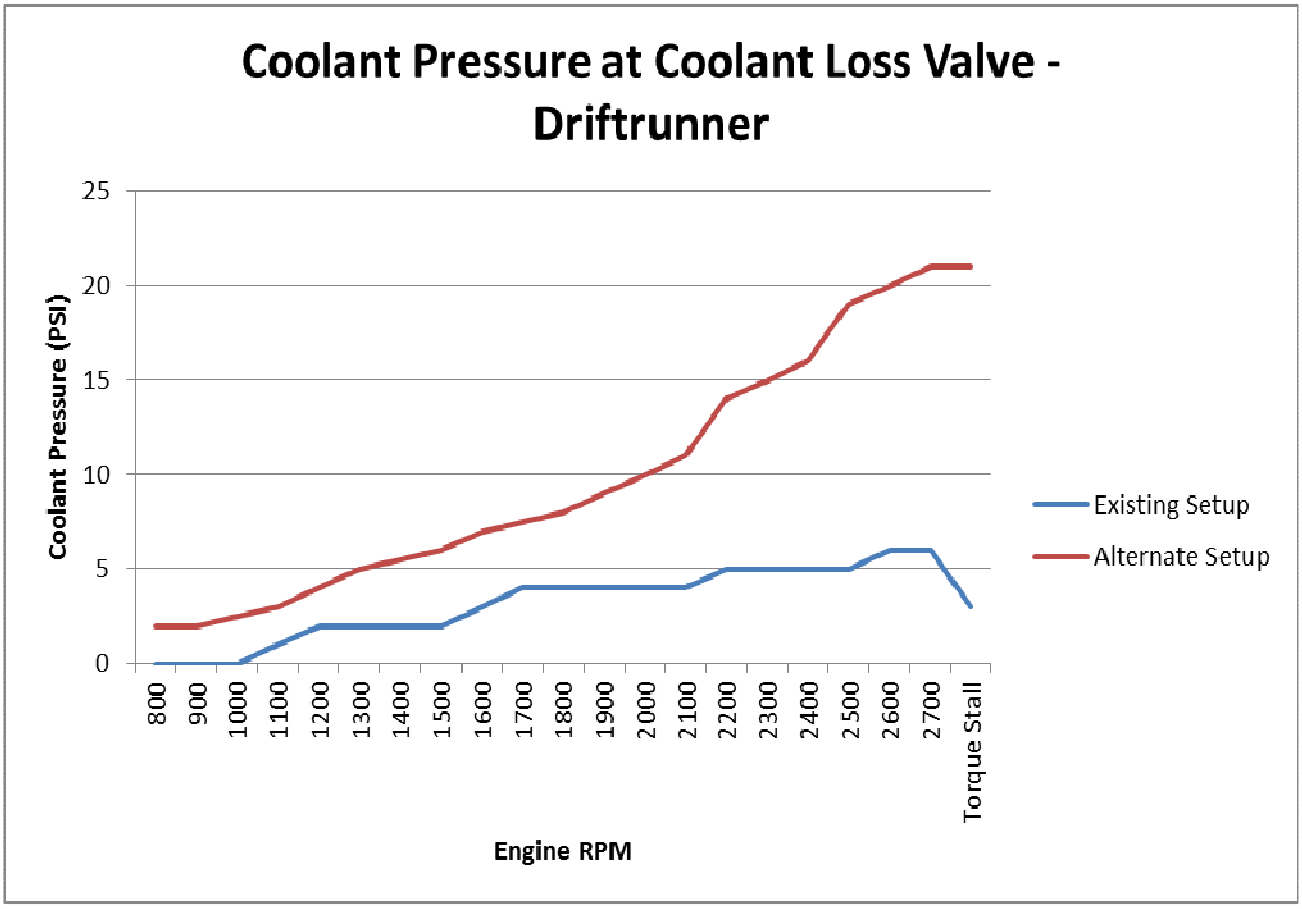
Investigation Results & Discussion

The standard setup for Driftrunner coolant loss valve takes the coolant from a tee on the coolant delivery line between the coolant return and the air compressor (refer Figure 1). A series of tests were performed to measure the coolant pressure at the coolant loss valve with this configuration.

A change was subsequently made to source the coolant for the coolant loss valve directly from the water pump (as is standard for the Brumby installation), after the thermostat housing (Figure 2). Coolant pressure tests were then repeated.

The results of the pressure testing are presented in the table and accompanying graph below.

Engine RPM	Coolant Pressure PSI	
	Existing Setup	Alternate (Brumby) Setup
800	0	2
900	0	2
1000	0	2.5
1100	1	3
1200	2	4
1300	2	5
1400	2	5.5
1500	2	6
1600	3	7
1700	4	7.5
1800	4	8
1900	4	9
2000	4	10
2100	4	11
2200	5	14
2300	5	15
2400	5	16
2500	5	19
2600	6	20
2700	6	21
Torque Stall	3	21



All testing was initially performed on a used Driftrunner machine at VLIDD premises. Testing was performed in the cold condition and also after a warm up period to allow the coolant system to reach normal operating temperatures. Testing was also repeated on a new Driftrunner machine at VLIDD premises. In all cases, the test results reflected the original results presented above.

As highlighted by the test results, there was a significant variation in coolant loss pressure at the coolant loss valve between the different coolant source locations, particularly at increased engine rpm and torque stall conditions.

Based on the results obtained it was considered possible that the existing coolant loss valve setup could see zero pressure at times at low idle and low engine rpm, which would result in coolant loss valve activation and engine shutdown.

The results highlighted that constant positive pressure was obtained by sourcing the coolant directly from the water pump.

Coolant loss shutdown testing was performed with the source pressure coming from the water pump to confirm shutdown performance of the valve had not been compromised by the change.

Conclusions

Testing of the existing Driftrunner coolant loss valve source pressure identified the potential for zero pressure at the coolant loss valve, which could result in coolant loss valve activation and engine shutdown. This could explain the reported shutdown events from some end users.

Testing an alternate source pressure, where coolant is obtained directly from the water pump (standard Brumby installation), identified constant positive pressure.

Recommendations (End User):

Where end users have experienced unplanned and intermittent engine shutdown due to coolant loss valve activation, it is recommended the coolant loss valve source pressure is obtained from the water pump as described in this report.

Recommendations (OEM):

It is recommended the coolant loss valve source pressure on all new Driftrunner builds is obtained from the water pump, as described in this report.

A TBSA will also be released on this subject.

Luke Muras
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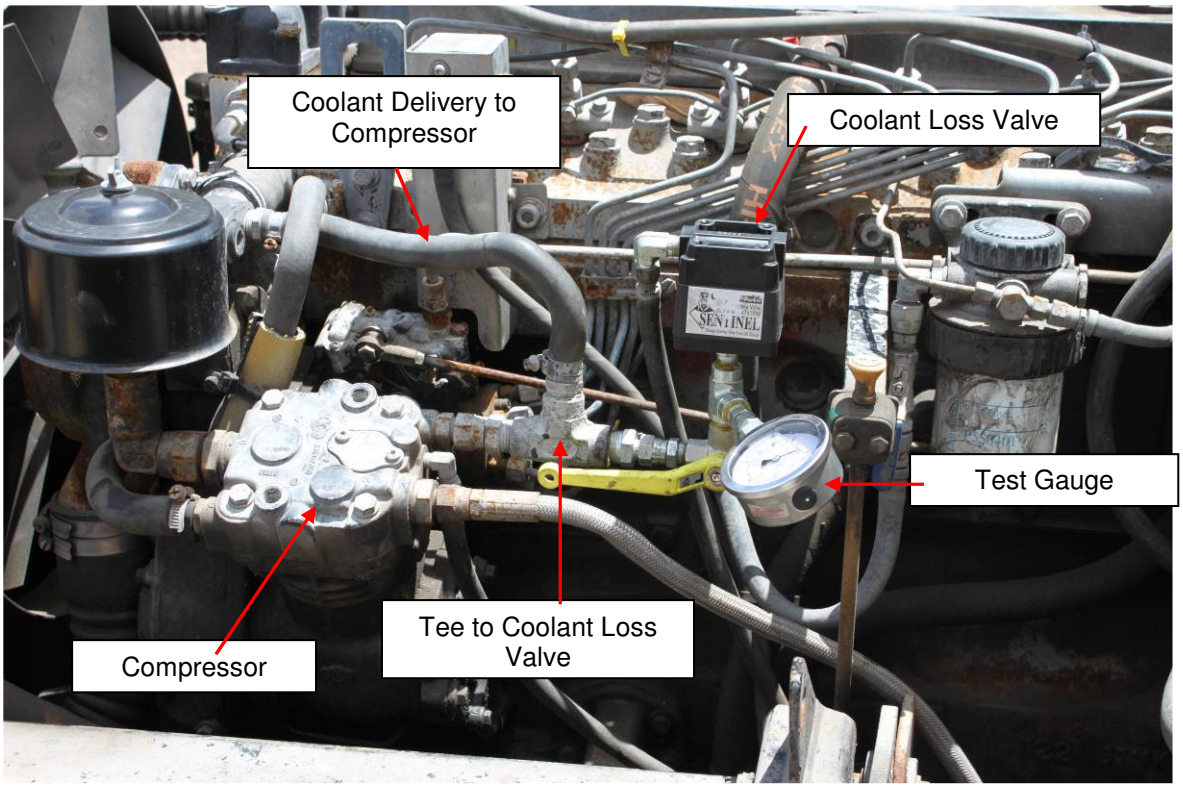

Figure 1: Standard Coolant Loss Valve Setup (with gauge installed for testing).

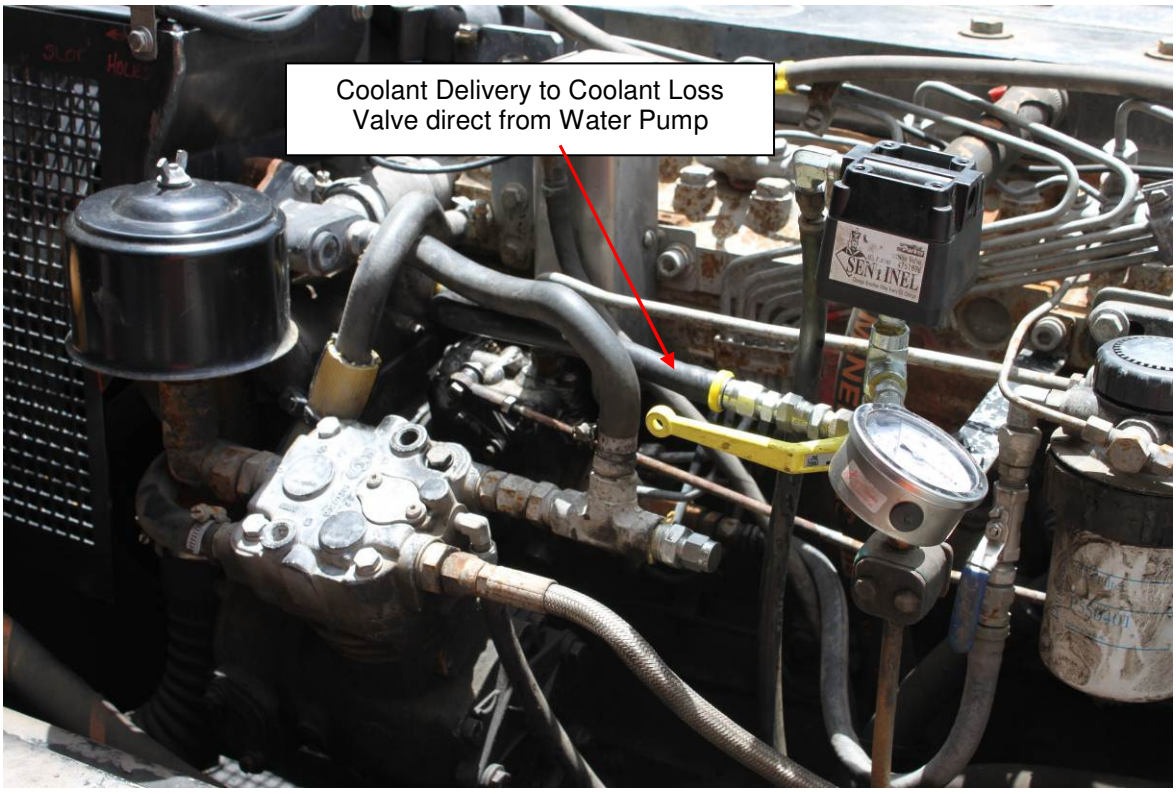

Figure 2: Alternate Coolant Loss Valve Setup – Brumby Installation (with gauge installed for testing).