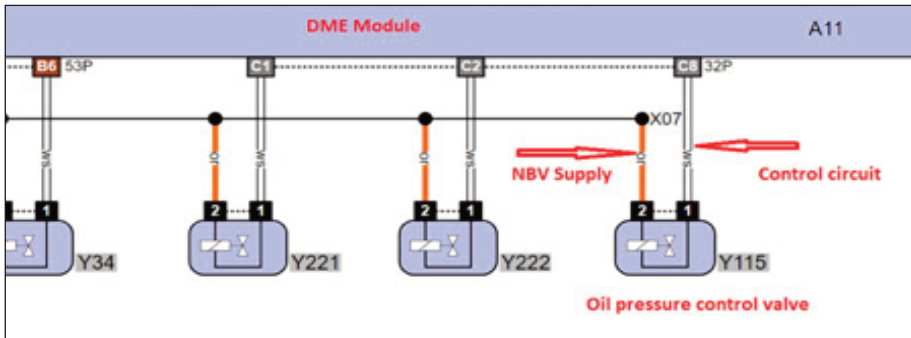




**Tim Stock**

## Mini high and low oil pressure issues



The oil pressure control valve is controlled by the DME Module and varies engine oil pressure depending on engine speeds

The Helpline continues to receive calls regarding the oil pressure control on engines fitted to both the Mini and PSA variants. These engines operate on a variable engine oil pressure control principle. This variable oil pressure can be used to reduce the load on the oil pump drive system when engine does not require a high oil pressure.

These systems utilise a solenoid control valve installed in the main oil gallery that returns excess oil back to the sump, precisely controlling the pressure in the main gallery.

The minimum oil pressure recorded at idle should be 0.7 bar, and the controlled pressure at 3000 rpm should be between 1.2-6.5 bar.

The oil control solenoid is fitted with an inlet screen to filter out any contamination that could damage the valve.

The valve is controlled by varying the duty cycle on the ground side circuit. And the power supply comes from the DME module. The default for a failed circuit is to close the valve and run at maximum oil pressure. This can result in a fault code for circuit failure, and for high oil pressure.

But the valve can get stuck in the open position, usually due to contamination getting past the filter screens. This results in a lower oil pressure

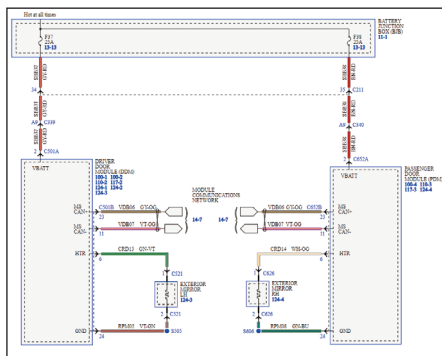


Contaminated filter screens like this can seize the solenoid and cause low engine oil pressure

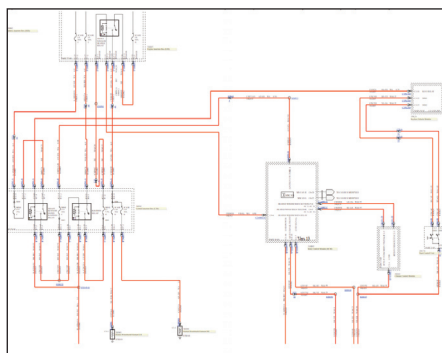
than required, and a resultant fault code P33FD logged.

So before condemning the oil pump for a low-pressure issue, check the control valve for contamination. For high-pressure fault codes, check the control valve circuit. Typical control valve resistance is approximately 7 ohms. The best solution for checking the signal is to scope the current trace on the control valve. Typical current should be 2 amps during the control on phase indicating circuit integrity.

Other manufacturers are utilising this type of oil pump control to reduce engine emissions, so these faults may not be limited to one vehicle brand.



Wiring diagrams for the heated mirrors and heated windscreen were essential to this diagnosis



The diagrams showed what the affected circuits had in common and were supplied by the Helpline

## Ford heated windscreen and door mirrors issue

It is always this time of year that the Helpline is flooded with heating related issues, especially now that vehicles have been stood still for many months. This is one of those unusual problems that has many technicians confused.

The complaint was that both the heated front screen and the heated mirrors were not working, even though they had no problems when the vehicle was last used. A code scan revealed no issues, so a diagram was the next step to begin the diagnosis.

As expected, the control for the heated screens come via the BCM, which in turn utilizes the medium speed CAN network, for information on when to operate both systems. If any faults are present on the system, the BCM would report these errors. No fault codes were present in any system relating to the screen heaters or the mirror heating. As the customer complaint was also related to the heated mirrors a diagram check was needed for these systems.

The only connection with the mirror issues was that they were also controlled by the medium speed CAN network. Again, no faults were recorded from either door module. Because the windows and door lockingsystems

worked, we knew that the network was working correctly.

Both the screen and the mirror heating are commanded from the automatic temperature control module, and the module showed data for switch status was working correctly.

As this is a known issue, we had already mentioned the battery condition was important in the correct operation of these systems. The technician had tested the battery and it had passed after a recharge.

But we also asked for the state of health (SOH) and state of charge (SOC) data from the data stream of the vehicle, regardless of the battery test results. As expected, both SOH and SOC showed a battery issue.

After replacing the battery, the heated windscreen and heated mirrors returned to a functioning state. Interestingly, this also has been found to affect the operation of Stop-Start systems, that require a minimum state of charge above 80%.

As more and more demand is placed on modern vehicle electrical systems, it is important to check both state of health and state of charge of the battery before any electrical diagnostic process is performed.