


Computers and Control Systems: Diagnostic Trouble Code Tests and Associated Procedures

Diagnostic Trouble Code (DTC) Information

		Secondary air injection malfunction (causal chain)
1	Fault code (USA) Display on generic scan tool	P2003 (P0410)
2	Fault storage Activation of malfunction indicator lamp for engine diagnosis (EURO3/4) or CHECK ENGINE (MIL) (USA)	after the end of the test period and faults after two successive driving cycles with faults
3	Frequency of the test	once per driving cycle
4	Checked signal or status	Lambda control
5	Fault setting conditions Test duration	Increase of lambda control factor by at least +23 % ("rich" - stop) approx. 10 s
6	Test prerequisites	<ul style="list-style-type: none"> - Engine at idle speed - vehicle at rest - air pump activated at least once after engine start - no fault in voltage supply for purge control valve, air pump control valve and electric air pump - no fault in purge - no fault in throttle valve actuator - no combustion misfires - no fault in oxygen sensor upstream of TWC, aging - no fault in CAN data bus - self-adaptation of the mixture formation not at limit - air pressure greater than approx. 780 hPa (i.e. no test is performed above a height of approx. 2500 m) - coolant temperature greater than 50 °C - lambda control enabled - air conditioning off
7	Test sequence	At the beginning of the causal chain, all the functions for automatic mixture adaptation are blocked, the purge control valve is closed and the current lambda control factor is determined. This is followed by secondary air injection. The mixture must lean out. The lambda control factor reacts correspondingly with an increase of approx. +23 %.
8		If a prerequisite changes during the test, the test is interrupted and started again later.

Secondary air injection for Engine 113

126/1 Shut-off valve for secondary air injection on left (combination valve: check valve integrated)

126/2 Shut-off valve for secondary air injection on right (combination valve: check valve integrated)

128 Check valve (intake manifold vacuum)

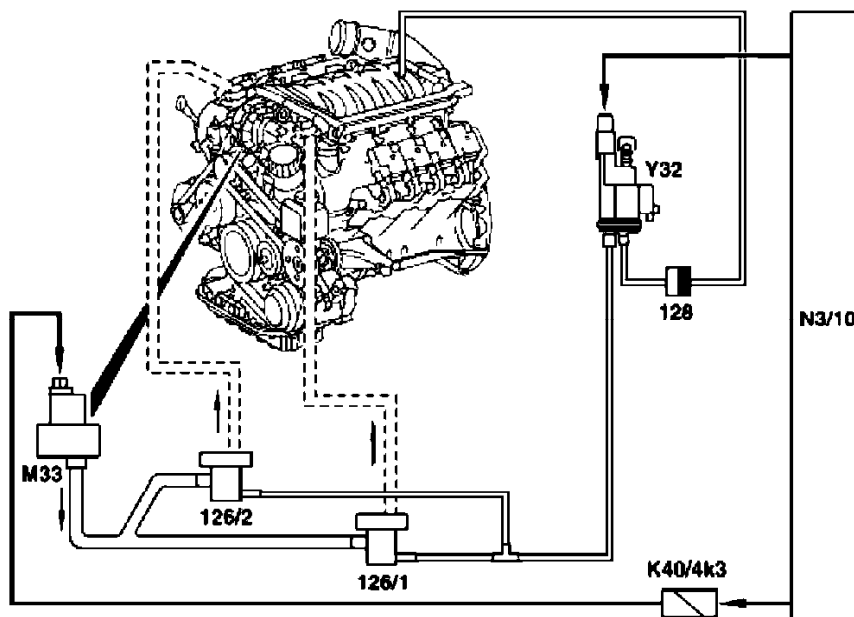
K40/4k3 Relay for secondary air injection


e.g. Models 208, 210

M33 Electric air pump

N3/10 ME-SFI control module

Y32 Air pump switchover valve



		Secondary air injection relay (K17, F1k28, K40/4k3, K40k6, N10/1kO, K40/7kN)
1	Fault code (USA) Display on generic scan tool)	P2023 (P0410)
2	Fault storage Activation of malfunction indicator lamp for engine diagnosis (EURO3/4) or CHECK ENGINE (MIL) (USA)	after the end of the test period and faults after two successive driving cycles with faults
3	Frequency of the test	continuous
4	Checked signal or status	Current/voltage check on secondary air injection relay
5	Fault setting conditions Limits Short circuit to ground Short circuit to +12 V Cable open-circuit	Voltage < 2.5 V Current > 4.2 A No voltage at secondary air injection relay approx. 4 - 8 V at unloaded output of ME-SFI control module
6	Test prerequisites	Battery voltage between 8 - 17.1 V
7		- The actuation is checked for cable open-circuit and short-circuit (to ground or battery voltage). Short circuit to ground and cable open-circuit is determined with a blocked output stage, whereas short circuit to battery voltage is determined with a conducting output stage. - The output stage is no longer actuated immediately in the event of a fault