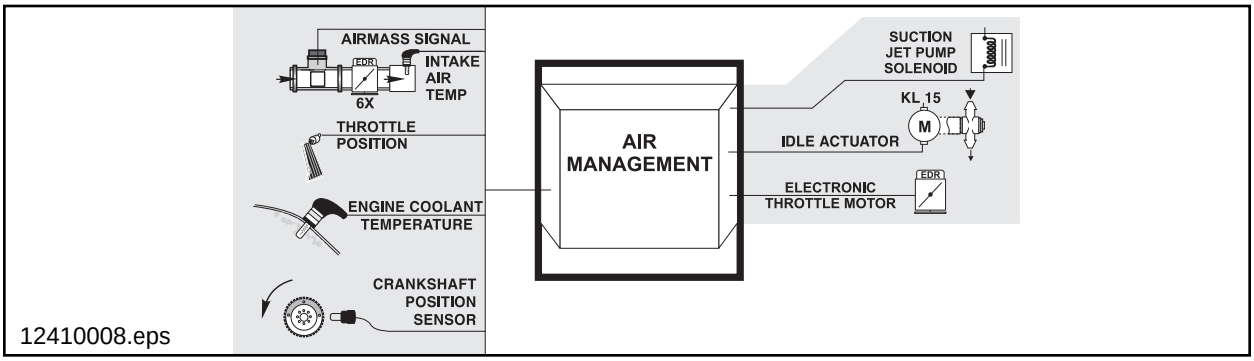
Air Management



Throttle Valves: The mechanical throttle valves regulate the intake air flow and are operated by an Electronic Throttle Actuator (1 EDR).

The throttle valves are an assembly of six individual throttle housings linked by a common shaft. The throttle opening depends on engine rpm and load (1000 kg/h maximum air flow).

Refer to the Repair Instructions for throttle adjustments.

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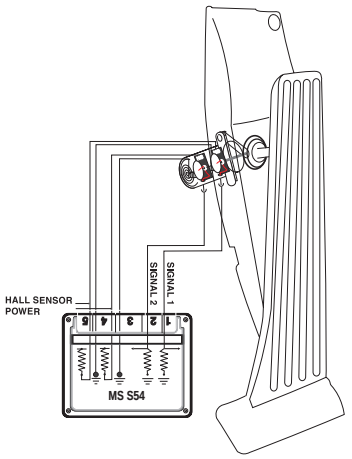
Accelerator Pedal Position (PWG): The accelerator pedal module (E46 M3) provides two variable voltage signals to the ECM that represents accelerator pedal position and rate of movement. The ECM will activate the EDR and Idle Air actuator based on the request.

Dual Hall sensors are integral in the accelerator pedal module. The ECM compares the two values for plausibility.

The M roadster and M coupe use a remote mounted PWG. This type uses twin potentiometers to produce the same input signals (voltage) as the Hall sensors.



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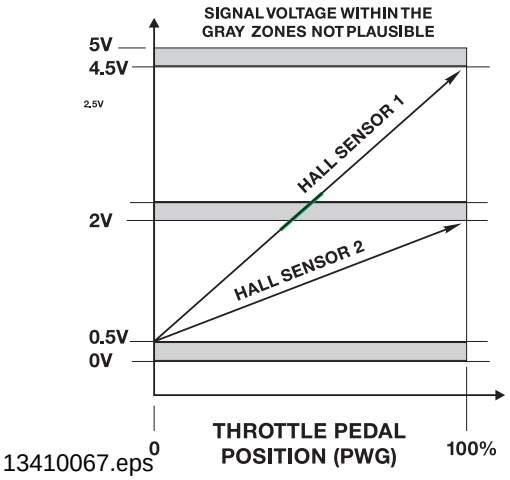
The ECM provides voltage (5v) and ground for the Hall sensors. As the accelerator pedal is moved from rest to full throttle, the sensors produce a variable voltage signal.

Hall sensor 1(request) = 0.5 to 4.5 volts
Hall sensor 2 (plausibility) = 0.5 to 2.0 volts

If the signals are not plausible, the ECM will use the lower of the two signals as the request input. The throttle response will be slower and the maximum throttle response will be reduced.



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The potentiometer PWG produces the same voltage signals to the ECM.

Electronic Throttle Actuator (EDR): The EDR is specifically designed for the S54 engine. This allows one actuator to operate all six throttles via a common linkage.

The ECM provides the operating voltage and ground to the EDR for opening and closing the throttles. The ECM monitors a feedback potentiometer located on the actuator shaft (arrow) for actuator position/plausibility (closed 4.5v - full open 0.5v).

There is a return spring fitted to the actuator lever end that assists in closing the throttles.


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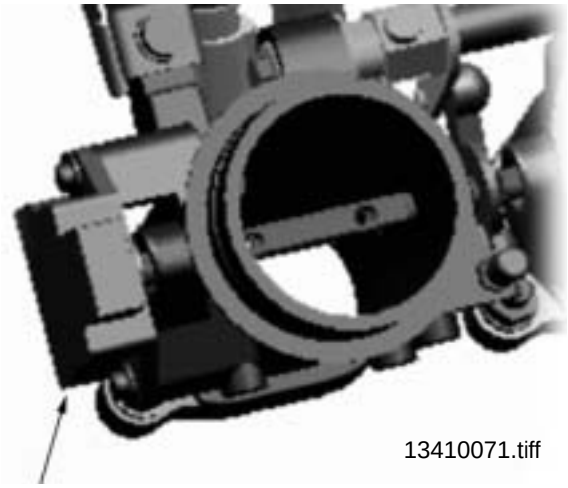
Throttle Valve Position: A potentiometer is fitted to the end of the throttle shaft (arrow) that allows the ECM to monitor throttle position.

This signal is used by the ECM for a position/ plausibility check (closed 0.5v - full open 4.5v).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