

Fig. 7: Accelerator pedal with pedal value sender

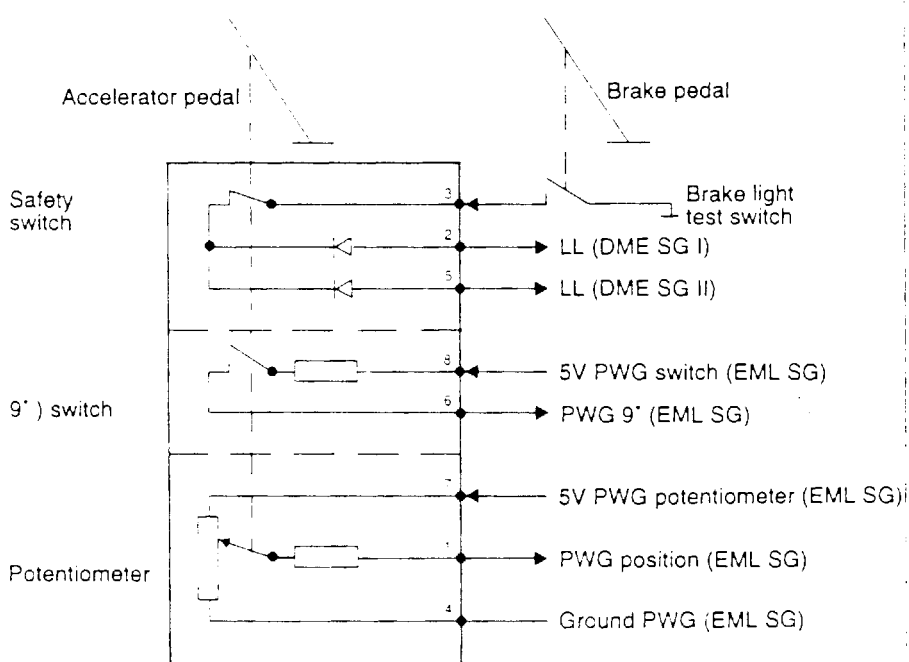


Fig. 8: Diagram of pedal value sender

The pedal value sender is supplied with a voltage regulated at 5 V by the EML control unit (Pin 1 - Switch, Pin 9 - Potentiometer). The electric functions of the pedal value sender include a potentiometer, a switch for monitoring the potentiometers and a switch for the external safety path.

Important:

The 5 V component supply voltage coming from the EML control unit is not absolutely short-circuit-proof.

The potentiometer (voltage divider) of the pedal value sender divides the voltage as a function of the angle of rotation. The partial voltage returned by the potentiometer is converted by an analog/digital converter of the EML control unit to a form which can be processed by the microcomputer and transformed to angular degrees. The valid angle range is from approx. minus 4.7° to approx 100.8°.

The EML control unit carries out a switch range test and compares the switch-on point of the switch (typical value: approx 9° pedal value sender angle) with the angle position of the pedal value sender potentiometer. If the EML control unit detects too great a deviation, the power is limited and the EML warning lamp (Pin 15) lights up.

The switch for the external safety path opens at approx. 2.5°. The switch output is connected in series with a diode and brought out.



EML THROTTLE VALVES (DK)

The two EML throttle valves are each opened against spring tension by means of a servomotor (d.c. motor) by the output stages in the EML control unit. The appropriate output stage pulses the servomotor with square-wave voltage which has a fixed frequency. By altering the ratio of the on and off period, the different positions of the EML throttle valve are achieved.

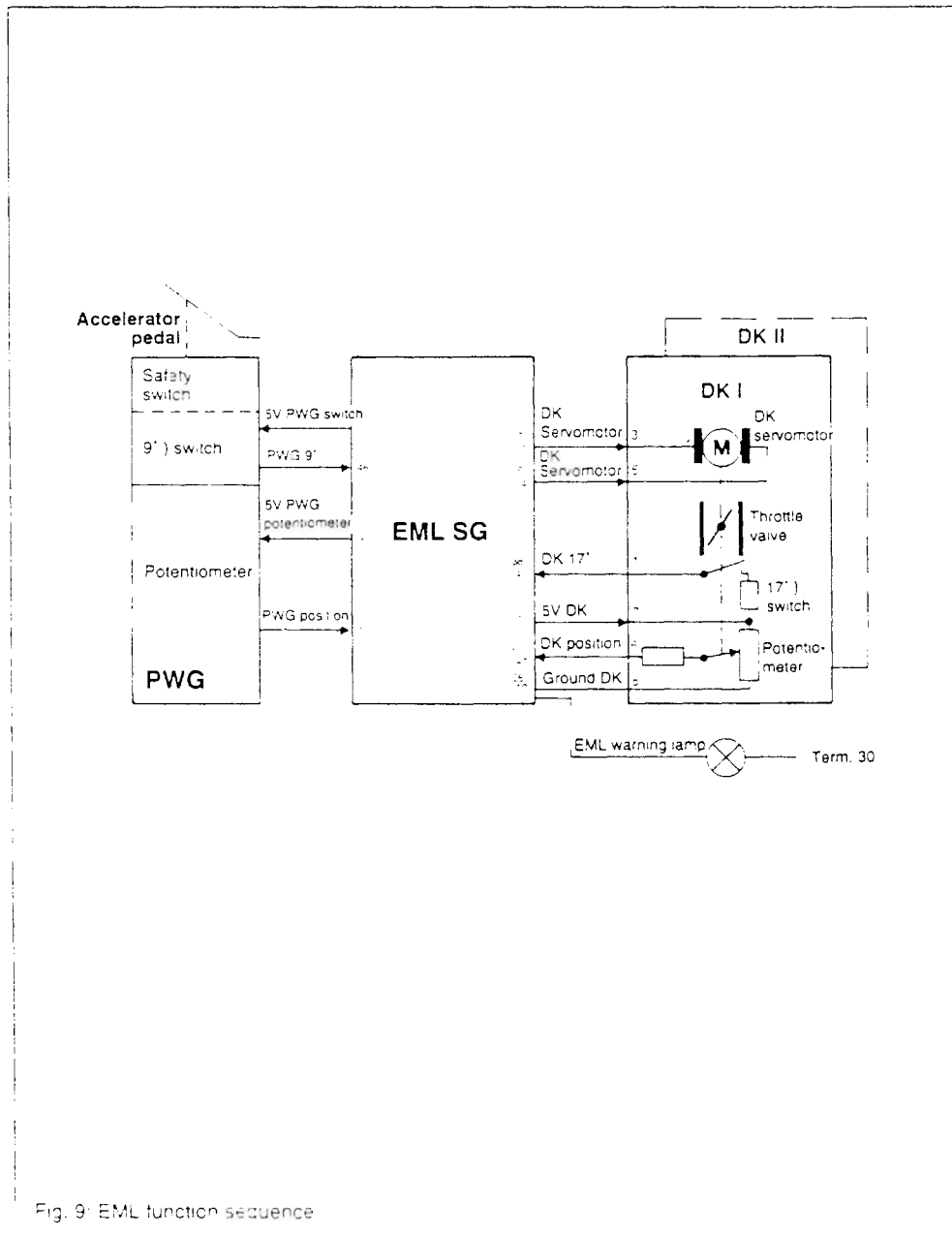
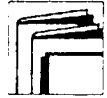


Fig. 9 EML function sequence

When the ignition is switched on, the EML is activated. On the instrument cluster, the EML warning lamp lights up for a period of 1 second.



If the accelerator pedal is actuated when the engine is running, the 9° switch of the pedal value sender closes. At the same time, an accelerator pedal position signal is sent via the potentiometer to the EML control unit (pedal value sender position: Pin 7). The EML control unit sends an exactly determined actuating current to the throttle valve servomotors (Pins 17 (16), 35 (34)). When the throttle valve is opened, the 17° switch is opened.

A potentiometer (signal potentiometer) integrated in the throttle valve actuator sends signal to the EML control unit on the completed movement of the throttle valve (throttle valve position: Pin 27 (28)).

Both switches (9° and 17°) serve for logic monitoring - they have no influence on the operation of the pedal value sender or the throttle valves.

In the event of replacement of the EML control unit or the EML throttle valve, or if the control unit is de-energized, the information for the lower throttle valve stop is deleted or wrong. The EML control unit therefore learns the stop again and again. With this learning, the EML creates the connection between the mechanical stop and the throttle valve potentiometer angle. The learning process presupposes that the vehicle is in overrun, the water temperature is detected to be > 80° C and the engine speed is > 2180 rpm. If these conditions are fulfilled, the throttle valve is slowly moved by the throttle valve servomotor towards the lower mechanical stop. When the stop is reached, the EML stores the learning value. This learning procedure is carried out with each vehicle start-up until a new learning value can be stored.

