MSS54

module description
cat heaters

1st

CATHEIZ FUNCTION

In order to shorten the response time of the catalyst after a cold start or to ensure a minimum catalyst conversion temperature when the engine is running, the MSS54 includes catalyst heating functions. These catalyst heating functions are designed to ensure that additional energy reaches the catalyst and heats it up by retarding the ignition angle, leaning or enriching the mixture, adjusting the Vanos and blowing in secondary air.

The catalyst heating module is the central control module for activating and controlling the ignition angle intervention. The control and calculation of the other catalyst heating interventions of injection, Vanos and secondary air as well as their up and down regulation are assigned to the corresponding function modules and are also described there.

1.1. STATE MACHINES OF THE CATHETER FUNCTION IGNITION

Trigger condition for cat heating:

Active time from KL_KATH_T_AKTIV = f(tmotStart) != 0

The activation condition for catalytic converter heating is checked once at the beginning of a start-up process.
If a start is aborted or the engine is switched off while the catalytic converter heating is still active and the engine is started again within the control unit's run-on time, the catalytic converter heating function will continue with the remaining active time.

Termination criteria for cat heating:

An active catalytic converter heating function is aborted if one of the following conditions is met.

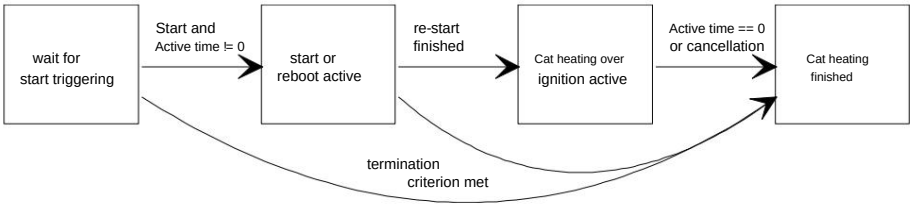
Error in the injection system
fault in the ignition system
Error in the EGas system
Error in the idle control system
Tmot sensor error
Error HFM

	>	K_KATH_NMAX
n rf	>	K_KATH_RFMAX
v	>	K_KATH_VMAX
pwg	>	K_KATH_PWGMAX
t_umg	<	K_KATH_TUMG_MIN (new from V:5.06)

Cat heating function blocked via K_KATH_CONTROL

When abort conditions are detected, the active flags for injection, ignition, Vanos and SLP are deleted. The function modules are responsible for regulating any interventions that may be present.

Figure 1.1 State machine cat heating ignition



1.2. ACTIVATION OF THE CATHETER FUNCTION OF THE FUNCTIONAL MODULES

Ignition: in the states "Start or post-start active" and "Cat heating active"

Injection: in the state "Cat heating active"

Vanos: in the "Cat heating active" state

SLP: in the "Cat heating active" state as soon as pressure release for Vanos system is granted

1.3. DATA OF THE CATHEIZING FUNCTION

Description of the variables:

variable	Meaning
kath_zustand	state machine of the catalytic converter heating function == 0 (no bit set): Cat heating inactive 1 (bit 0 set): wait for start trigger 2 (bit 1 set): start or post-start phase 4 (Bit 2 set): Cat heating active
kath_st	Activation flags for catalyst heating of the function modules Bit 0 : Catalytic converter heating via mixture active 1 : Catalytic converter heating via ignition active 2 : Catalytic converter heating via Vanos active 3 : Catalytic converter heating via secondary air active
kath_active_time	remaining active time of the catalytic converter heating function
kath_end_time	System time at which the cat function is terminated

Description of the application data:

constant	Meaning
K_KATH_CONTROL	control byte of the catalytic converter heating function
K_KATH_NMAX	speed threshold for termination criterion
K_KATH_RFMAX	filling threshold for termination criterion
K_KATH_VMAX	speed threshold for termination criterion
K_KATH_PWGMAX	pedal value threshold for termination criterion
K_KATH_TUMG_MIN	Min. ambient temperature for catalytic heaters
KL_KATH_T_AKTIV	Active time of the catalytic converter heating function depending on the engine temperature at start-up