MSS54
module description

dynamic lead

Change documentation:

V:5.00 Extension K_DYN_TRIGGER_DBGR to KL_DYN_TRIGGER_DBGR = f(n)

Table of contents:

1st DYNAMIC RESERVE

Depending on the load step and the current operating point, there are three different transient interventions in the ignition.

- ÿ Knock protection dynamic lead
- ÿ Dynamic reserve for cylinder pressure limitation

The basis for triggering a dynamic lead is the detection of a load jump within the last angle segment (6cyl: 120°; 8cyl: 90°). The load jump is calculated using a Delta_rf, which is converted into a Delta_tl for the dynamic module.

Calculation of the load step:

delta_rf = KF_RF_N_DK(wdkt , nt) - KF_RF_N_DK(wdkt-20ms , nt)

dyn_trigger = Conversion_rf_tl(delta_rf , n)

If the trigger condition is met, the dynamic lead pulls the ignition angle by a defined offset in the retard direction. This occurs directly and without a change limit. This offset then remains at this amount for an applicable number of angle segments. The ignition angle intervention is then regulated synchronously with the angle via a change limit ZWB.

If several dynamic advances are active at the same time, all measures are calculated including their change limitation and the intervention that retards the most is included in the ignition angle path.

Retriggering of a dynamic lead is only taken into account if the resulting ignition angle offset is adjusted further in the retard direction than the current value of the ignition angle.

1.1. KNOCK PROTECTION DYNAMIC ADVANCE

Trigger condition:

B_TL or B_VL
and d_wdk > K_DYN_DWDK_MIN and // minimum positive DK gradient
dyn_trigger > KL_DYN_TRIGGER_KR(n)
// Load step greater than trigger threshold

Calculation of the ignition angle offset:

dyn_comf_tz = KL_DYN_TZ_KR(tan)

Duration of intervention: K_TZ_SEGM_DYN_KR
Adjustment ramp: K_TZ_ZWB_DYN_KR

1.2. DYNAMIC RESERVE FOR CYLINDER PRESSURE LIMITATION

Trigger condition:

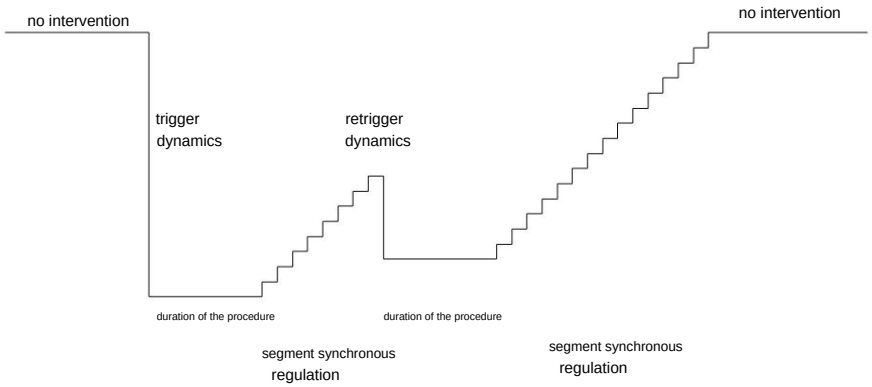
B_TL or B_VL
and d_wdk > K_DYN_DWDK_MIN and // minimum positive DK gradient
dyn_trigger > KL_DYN_TRIGGER_DBGR

// Load step greater than trigger threshold
and n > K_DYN_DBGR_N_MIN and wdk > // speed threshold
K_DYN_DBGR_WDK_MIN and tmot > // DK threshold
K_DYN_DBGR_TMOT_MIN // Motor temperature threshold

Calculation of the ignition angle offset:
dyn_dbgr = KL_DYN_TZ_DBGR(n)

Intervention duration: K_TZ_SEGM_DYN_DBGR
Adjustment ramp: K_TZ_ZWB_DYN_DBGR

1.3. PRINCIPLE OF IGNITION ANGLE INTERVENTION



1.4. DATA DYNAMIC RESERVE

variable

name	Meaning
dyn_trigger	load jump of the last segment
dyn_trigger_dbgr	trigger threshold pressure limitation
dyn_trigger_kr	trigger threshold KR dynamics
dyn_kr_tz	ignition angle intervention KR Dynamic
dyn_dbgr_tz	ignition angle intervention dynamic pressure limitation
dyn_kr_st	Status KR Dynamics
dyn_dbgr_st	Status Dynamic Pressure Limitation

constant

name	Meaning
K_DYN_DWDK_MIN	minimum DK gradient for all dynamic reserves
K_DYN_DBGR_N_MIN	speed threshold for pressure limitation
K_DYN_DBGR_WDK_MIN	DK threshold for pressure limitation
K_DYN_DBGR_TMOT_MIN	Tmot threshold for pressure limitation
KL_DYN_TRIGGER_DBGR	Trigger threshold for pressure limitation = f(n)
KL_DYN_TRIGGER_KR	trigger threshold for KR dynamics
KL_DYN_TZ_KR	Ignition angle offset at KR = f(tan
KL_DYN_TZ_DBGR	Ignition angle offset at pressure limitation = f(n)
K_TZ_DYN_KR_SEGM	duration of the KR dynamics intervention
K_TZ_DYN_DBGR_SEGM	duration of the dynamic pressure limitation