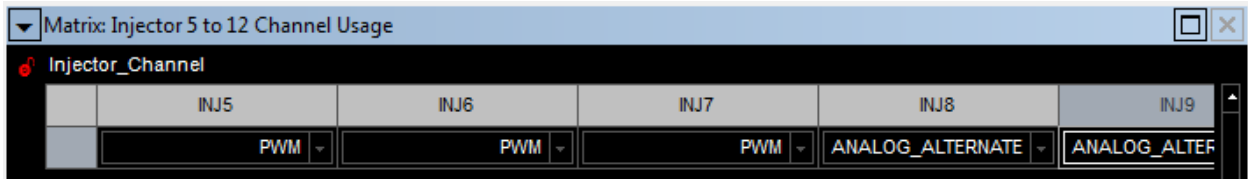
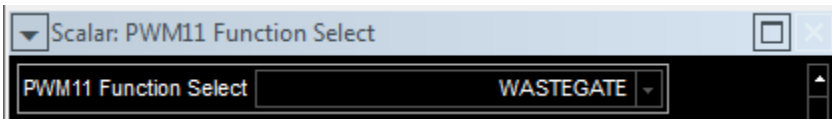


Groups/HARDWARE SETUP/INJECTOR CONFIGURATION/Injector 5 to 12 Channel Usage:

Injectors 5 and 6 are setup for the Phase / Antiphase PWM



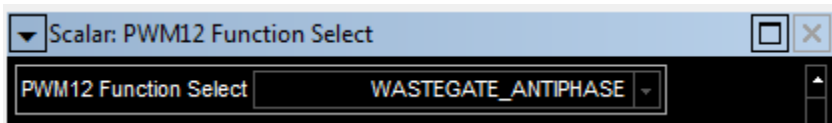
Groups/HARDWARE SETUP/MULTI-FUNCTION OUTPUT CHANNELS/INJECTOR CHANNELS/PWM11 (INJ 5, CN2 B)/ PWM11 Function Select: Phase Solenoid



Groups/HARDWARE SETUP/MULTI-FUNCTION OUTPUT CHANNELS/INJECTOR CHANNELS/PWM11 (INJ 5, CN2 B)/ PWM11 Invert Select: Phase Solenoid



Groups/HARDWARE SETUP/MULTI-FUNCTION OUTPUT CHANNELS/INJECTOR CHANNELS/PWM12 (INJ 6, CN2 T)/ PWM12 Function Select: Antiphase Solenoid



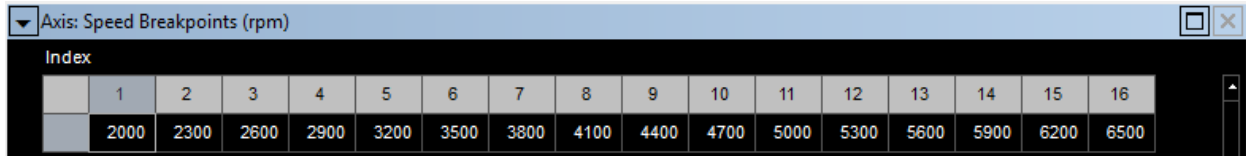
Groups/HARDWARE SETUP/MULTI-FUNCTION OUTPUT CHANNELS/INJECTOR CHANNELS/PWM12 (INJ 6, CN2 T)/ PWM12 Invert Select: Antihase Solenoid



Groups/SOFTWARE SETUP/MAP BREAKPOINTS/WASREGATE CONTROL BREAKPOINTS/

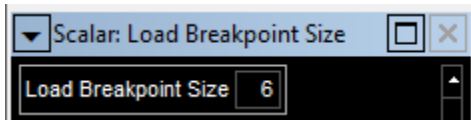
Speed Breakpoint Size: 16

Speed Breakpoints:



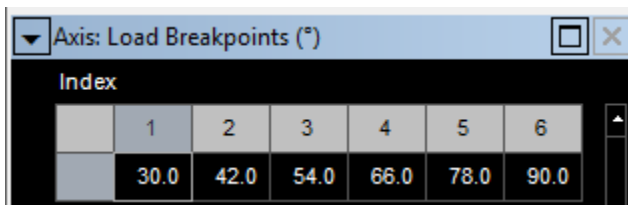
Index	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	2000	2300	2600	2900	3200	3500	3800	4100	4400	4700	5000	5300	5600	5900	6200	6500

Load Breakpoint Size: 4 to 6



Scalar: Load Breakpoint Size

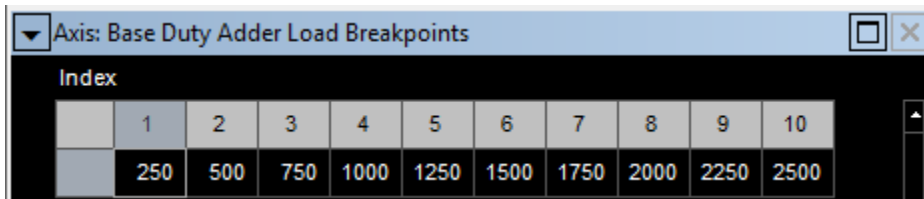
Load Breakpoints:



Index	1	2	3	4	5	6
	30.0	42.0	54.0	66.0	78.0	90.0

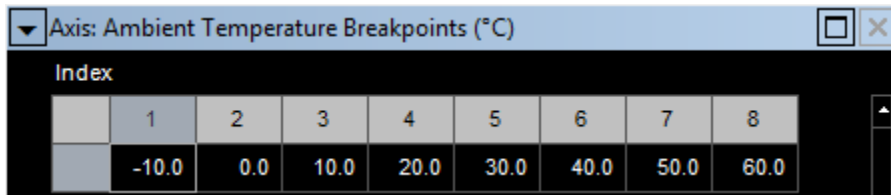
Base Duty Adder Breakpoint Size: 10

Base Duty Adder Load Breakpoints: 0 to 6000



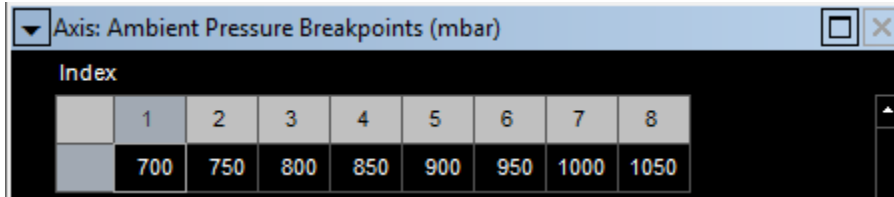
Index	1	2	3	4	5	6	7	8	9	10
	250	500	750	1000	1250	1500	1750	2000	2250	2500

Ambient Temperature Breakpoints:



Index	1	2	3	4	5	6	7	8
	-10.0	0.0	10.0	20.0	30.0	40.0	50.0	60.0

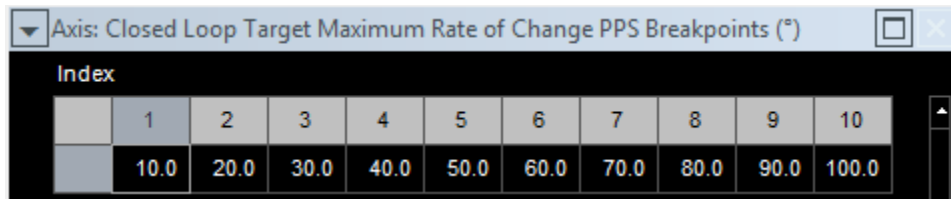
Ambient Pressure Breakpoints:



Index	1	2	3	4	5	6	7	8
	700	750	800	850	900	950	1000	1050

Closed Loop Target Maximum Rate of Change PPS Breakpoint Size: 10

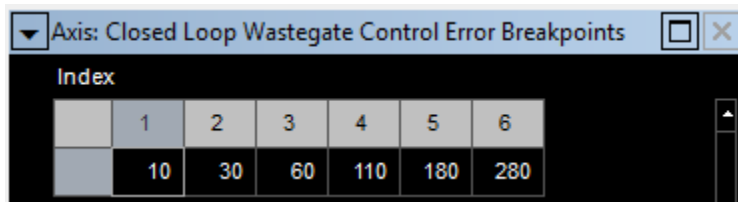
Closed Loop Target Maximum Rate of Change PPS Breakpoints:



Index	1	2	3	4	5	6	7	8	9	10
	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	100.0

Closed Loop Wastegate Control Error Breakpoint Size: 6

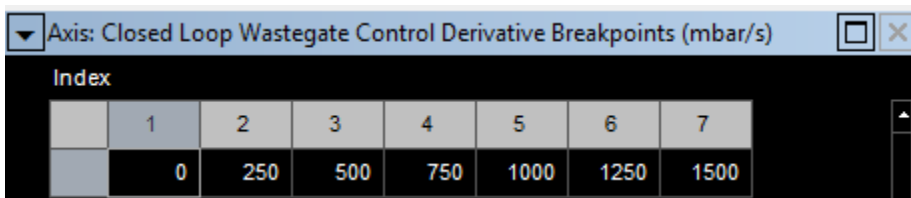
Closed Loop Wastegate Control Error Breakpoints:



Index	1	2	3	4	5	6
	10	30	60	110	180	280

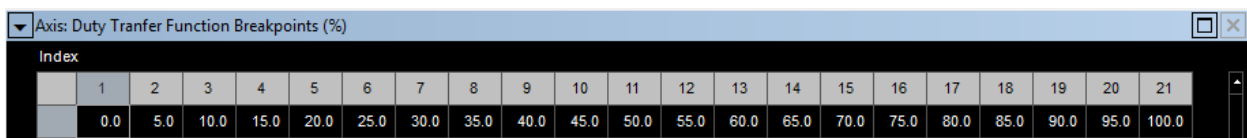
Closed Loop Wastegate Control Derivative Breakpoint Size: 7

Closed Loop Wastegate Control Derivative Breakpoints:



Index	1	2	3	4	5	6	7
	0	250	500	750	1000	1250	1500

Duty Transfer Function Breakpoints:



Index	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0	100.0

Groups/STANDARD MAPPING/BASE CALIBRATION 1/

Base Wastegate Control Duty Map (First Gear)1:

This map is used to determine the base duty cycle for the wastegate control valve. A value of 100 in this map should give maximum boost and a value of 0 minimum. If this is reversed, the "Wastegate Control Valve Configuration" should be checked, as closed loop operation will not function correctly.

The final duty cycle applied to the valve is subject to correction:

```

D_wg_total = D_wg_base           : base duty
              + wg_a_T_air        : air charge temperature correction
              + wg_a_T_amb        : ambient air temperature correction
              + wg_a_P_amb        : ambient pressure correction
              + wg_a_base_T       : adder based on current target
              + wg_a_global       : global correction
              + I_term            : closed loop integral term
              + P_term            : closed loop proportional term
              + D_term            : closed loop derivative term
    
```

The closed loop terms are only applied if closed loop control is enabled.

NOTE: Closed loop operation MUST be disabled when adjusting this map

The current value can be viewed as "D_wg_base" on the dashboard.

If using gear based wastegate control, this map is for the specified gear. If not using gear based control then only the first gear map is used. See the map "Wastegate Gear Based Duty Ratio" for more information on gear based control.

Matrix: Base Wastegate Control Duty Map (First Gear) 1 (%)

RPM (rpm)		2000	2300	2600	2900	3200	3500	3800	4100	4400	4700	5000	5300	5600	5900	6200	6500
wg_demand (%)	90.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	78.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	66.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	54.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	42.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	30.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Base Wastegate Control Duty Map (Top Gear)1:

This map is used to determine the base duty cycle for the wastegate control valve. A value of 100 in this map should give maximum boost and a value of 0 minimum. If this is reversed, the "Wastegate Control Valve Configuration" should be checked, as closed loop operation will not function correctly.

The final duty cycle applied to the valve is subject to correction:

```

D_wg_total = D_wg_base           : base duty
              + wg_a_T_air        : air charge temperature correction
              + wg_a_T_amb        : ambient air temperature correction
              + wg_a_P_amb        : ambient pressure correction
              + wg_a_base_T       : adder based on current target
              + wg_a_global       : global correction
              + I_term            : closed loop integral term
              + P_term            : closed loop proportional term
              + D_term            : closed loop derivative term
    
```

The closed loop terms are only applied if closed loop control is enabled.

NOTE: Closed loop operation MUST be disabled when adjusting this map

The current value can be viewed as "D_wg_base" on the dashboard.

If using gear based wastegate control, this map is for the specified gear.
 If not using gear based control then only the first gear map is used.
 See the map "Wastegate Gear Based Duty Ratio" for more information on gear based control.

Matrix Base Wastegate Control Duty Map (Top Gear) 1 (%)

RPM (rpm)		2000	2300	2600	2900	3200	3500	3800	4100	4400	4700	5000	5300	5600	5900	6200	6500
wg_demand (%)	90.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
	78.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
	66.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
	54.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
	42.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
	30.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0

Closed Loop Wastegate Control Target 1: Maps 1-4 set the same

This map sets the closed loop target for the wastegate control system. The target type (MANIFOLD_PRESSURE, RESTRICTOR_PRESSURE, TURBO_SPEED or MANIFOLD_PRESSURE_2, P_WASTEGATE, DUAL_MAP_AND_PRP) should first be set in the "Closed Loop Wastegate Control Target Type".

Closed loop control is only enabled if the throttle angle is greater than or equal to the angle at the top row of the base duty map.

The target is subject to correction:

```

wg_target_total = ( wg_target_base      : base target
                   + wg_target_a_T_air  : air charge temperature correction
                   + wg_target_a_T_amb   : ambient air temperature correction
                   + wg_target_a_P_amb   : ambient pressure correction
                   x wg_target_m_torque  : strain gauge torque correction

```

The current value can be viewed as "wg_target_base" on the dashboard.

For a turbo speed target the units are 100 RPM/bit
 For pressure targets the units are always 1 mbar/bit

Matrix: Closed Loop Wastegate Control Target 1 (Target)

RPM (rpm)		2000	2300	2600	2900	3200	3500	3800	4100	4400	4700	5000	5300	5600	5900	6200	6500
90.0	wg_demand (°)	1350	1350	1350	1350	1500	1650	1800	1900	2000	2100	2300	2400	2500	2500	2500	2500
78.0		1350	1350	1350	1350	1400	1625	1750	1800	1900	2000	2250	2250	2250	2250	2250	2250
66.0		1350	1350	1350	1350	1350	1550	1625	1700	1800	1900	2150	2150	2150	2150	2150	2150
54.0		1350	1350	1350	1350	1350	1450	1500	1600	1700	1800	1800	1800	1800	1800	1800	1800
42.0		1350	1350	1350	1350	1350	1350	1500	1550	1600	1700	1700	1700	1700	1700	1700	1700
30.0		1350	1350	1350	1350	1350	1350	1350	1500	1500	1500	1500	1500	1500	1500	1500	1500

Closed Loop Wastegate Control Target 1- PRP: PRP target used when dual control (MAP and PRP) is selected

Matrix: Closed Loop Wastegate Control Target 1 - PRP (Target)

RPM (rpm)		3200	3500	3800	4100	4400	4700	5000	5300	5600	5900	6200	6500
70.0	wg_demand (°)	0	0	0	0	0	0	0	0	0	0	0	0
55.0		0	0	0	0	0	0	0	0	0	0	0	0
40.0		0	0	0	0	0	0	0	0	0	0	0	0
25.0		0	0	0	0	0	0	0	0	0	0	0	0
10.0		0	0	0	0	0	0	0	0	0	0	0	0
6.0		0	0	0	0	0	0	0	0	0	0	0	0

Groups/STANDARD MAPPING/WASTEGATE CONTROL

Wastegate Gear Based Duty Ratio (%):

The ratio entered here determines the interpolation between the first gear and top gear wastegate base duty maps.
 A value of 0% uses the first gear map directly.
 A value of 100% uses the top gear map directly.
 A value between 0-100% is a linear interpolation between the first gear and top gear map values.
 If gear based control is not required, this map should be set to all 0%, then the duty in the first gear map will always be used.

Matrix: Wastegate Gear Based Duty Ratio (%)

gear_pos	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH	EIGHTH
	0.0	0.0	30.1	100.0	100.0	100.0	100.0	100.0

Wastegate Control Demand Mode:

This parameter allows the user to decide on the source channel for Y axis lookups for a number of wastegate control maps.

Scalar: Wastegate Control Demand Mode

Wastegate Control Demand Mode **WG_DEMAND_PPS**

Base Wastegate Control Valve Duty Correction f(ACT)

This map is used to apply a correction to the wastegate duty cycle as the air charge temperature changes. It is normally used to help prevent engine damage by reducing the boost when intake temperatures get too high.
 NOTE: If closed loop wastegate control is enabled the target should have a similar correction applied.
 The current value can be viewed as "wg_a_T_air" on the dashboard.

Matrix: Base Wastegate Control Valve Duty Correction f(ACT) (%)

ACT (°C)	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	-4.0	-6.0	-8.0	-10.0	-12.0	-14.0

Base Wastegate Control Valve Duty Correction f(AAT) (%): Correction for Ambient Air Temperature

Matrix: Base Wastegate Control Valve Duty Correction f(AAT) (%)

AAT (°C)	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120	130
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Base Wastegate Control Valve Duty Correction f(ECT): Correction for Engine Coolant Temperature

Matrix: Base Wastegate Control Valve Duty Correction f(ECT) (%)																	
ECT (°C)																	
	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120	130
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Base Wastegate Control Valve Duty Correction f(EOT) (%): Correction for Engine Oil Temperature

Matrix: Base Wastegate Control Valve Duty Correction f(EOT) (%)																	
EOT (°C)																	
	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120	130
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Base Wastegate Control Valve Duty Correction f(BAP) (%): Barometric Air Pressure Correction

Matrix: Base Wastegate Control Valve Duty Correction f(BAP) (%)											
BAP (mbar)											
	600	650	700	750	800	850	900	950	1000	1050	1100
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Base Wastegate Control Valve Duty Correction f(BPOT) (%): User Controlled Potentiometer

Matrix: Base Wastegate Control Valve Duty Correction f(BPOT) (%)																	
RPM (rpm)																	
BPOT		2300	2600	2900	3200	3500	3800	4100	4400	4700	5000	5300	5600	5900	6200	6500	
	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Base Wastegate Control Valve Duty Adder

This map allows an adder to the wastegate base duty to be applied based on the current total wastegate target 'wg_target_total' and engine speed.
 NOTE: This parameter does not contribute to the total base duty when the 'Closed Loop Wastegate Control Target Type' is set to DUAL_MAP_AND_PRP.

Matrix: Base Wastegate Control Valve Duty Adder (%)

RPM (rpm)		2000	2300	2600	2900	3200	3500	3800	4100	4400	4700	5000	5300	5600	5900	6200	6500
wg_target_total	2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2250	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1750	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1250	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	750	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	250	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Global Wastegate Control Valve Duty Correction (%)

Scalar: Global Wastegate Control Valve Duty Correction (%)

Global Wastegate Control Valve Duty Correction (%) 0.0

Wastegate Control Valve On f(TPS)

The wastegate control valve is enabled when the throttle position is greater than this threshold.

Scalar: Wastegate Control Valve On f(TPS) (°)

Wastegate Control Valve On f(TPS) (°) 20.0

Wastegate Control Valve Off f(TPS)

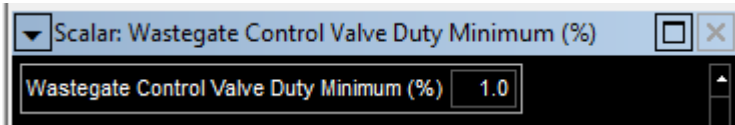
The wastegate control valve is disabled when the throttle position is less than this threshold.

Scalar: Wastegate Control Valve Off f(TPS) (°)

Wastegate Control Valve Off f(TPS) (°) 18.0

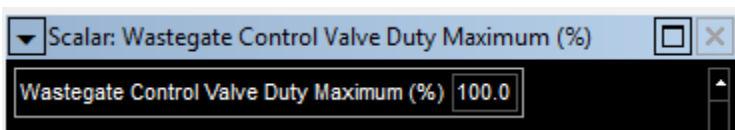
Wastegate Control Valve Duty Minimum

If the wastegate control valve duty is below this threshold the valve is turned fully on/off depending on the "Wastegate Control Valve Configuration".



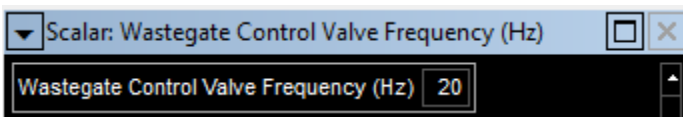
Wastegate Control Valve Duty Maximum

If the wastegate control valve duty is above this threshold the valve is turned fully on/off depending on the "Wastegate Control Valve Configuration".



Wastegate Control Valve Frequency

This map selects the frequency at which the wastegate control valve will oscillate when enabled. Air flow is regulated to the wastegate by varying the MARK/SPACE ratio of the valve.



Wastegate Control Valve Configuration:

The "Wastegate Control Valve Configuration" is used to select the logic used to drive the wastegate control valve. This map should be set to BLEED_ON/BLEED_OFF depending on whether air is bled onto/off of the wastegate when the valve is turned on. When this map is set correctly 100% in the base duty map will give maximum boost, and 0% minimum.

NOTE: Closed loop wastegate control will not operate correctly if this is not set corretly.



Wastegate Duty Transfer Function : Phase Solenoid connected to top of wastegate.

If the wastegate control valve duty is below this threshold the valve is turned fully on/off depending on the "Wastegate Control Valve Configuration".

Matrix: Wastegate Duty Transfer Function (%)

D_wg_total (%)	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0	100.0
0.0	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0	100.0

Wastegate Antiphase Duty Transfer Function: Antiphase Solenoid connected to side of the wastegate.

Matrix: Wastegate Antiphase Duty Transfer Function (%)

D_wg_total (%)	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0	100.0
100.0	100.0	95.0	90.0	85.0	80.0	75.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	0.0

Enable Time Based Wastegate Control: **DISABLED**

GEAR CHANGE WASTEGATE CONTROL:

Gear Change Wastegate Control Duty (%)

Matrix: Gear Change Wastegate Control Duty (%)

RPM (rpm)	1800	3600	5400	7200
100.0	100.0	100.0	100.0	100.0

Gear Change Wastegate Control Time (s)

Matrix: Gear Change Wastegate Control Time (s)

RPM (rpm)	2000	4000	6000	8000
0.30	0.30	0.30	0.30	0.30

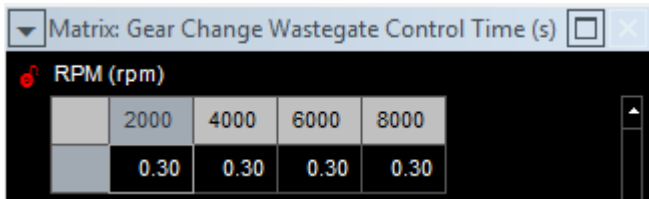
LEGACY GEAR CHANGE

Gear Change Wastegate Control Duty

Matrix: Gear Change Wastegate Control Duty (%)

RPM (rpm)	2000	4000	6000	8000
55.0	55.0	55.0	55.0	55.0

Gear Change Wastegate Control Time



RPM (rpm)	2000	4000	6000	8000
	0.30	0.30	0.30	0.30

CLOSED LOOP WASTEGATE CONTROL:

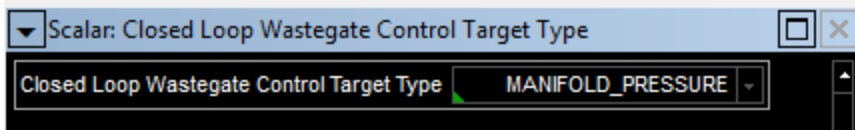
Closed Loop Wastegate Control Enable: **ENABLED**

Closed loop wastegate control can be enabled/disabled using this map. When mapping the Base Wastegate Control Duty Map it is important to **DISABLE** closed loop control.

Closed Loop Wastegate Control Target Type

This map selects which input signal (manifold pressure, restrictor pressure, turbo speed, manifold pressure 2 or dual manifold and restrictor pressure) is used as the target for the closed loop wastegate control system.

Note that each reading of the manifold pressure sensor is always at the same engine position (angle-based). All other signals (restrictor pressure, turbo speed or manifold pressure 2) will be read at a fixed rate as specified in the "Sample Rate" map for each analog channel configuration.



Closed Loop Wastegate Control Target Type
MANIFOLD_PRESSURE

Closed Loop Wastegate Target Maximum Rate of Change: 100 to 500000

This parameter can be used to limit the maximum rate of change of the calculated 'wg_target_total' channel, used for determining the target level of engine boost.

The ability to limit the rate of change of 'wg_target_total' is intended for transient conditions so they do not drastically affect the level of boost, such conditions exist when a vehicle goes over a jump for instance.

In all other circumstances, when there is a change actioned that may be calibrated with significantly different target levels, this rate of change will not be applied.

These circumstances include: change of Base Calibration, entering Start Line mode, Gear Shifts and finally when the DUAL target option is selected, each time there is a change in target.

Since the target is a generic target type, suitable for turbo speed in 100 RPM/bit or a pressure targeted in 1 mbar/bit, depending on the 'Closed Loop Wastegate Control Target Type', the units of this parameter are (100 RPM)/sec or mbar/sec.

Matrix: Closed Loop Wastegate Target Maximum Rate of Change (Target/s)

gear_pos	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	100.0
EIGHTH	500000	500000	500000	500000	500000	500000	500000	500000	500000	500000
SEVENTH	500000	500000	500000	500000	500000	500000	500000	500000	500000	500000
SIXTH	500000	500000	500000	500000	500000	500000	500000	500000	500000	500000
FIFTH	500000	500000	500000	500000	500000	500000	500000	500000	500000	500000
FOURTH	500000	500000	500000	500000	500000	500000	500000	500000	500000	500000
THIRD	500000	500000	500000	500000	500000	500000	500000	500000	500000	500000
SECOND	500000	500000	500000	500000	500000	500000	500000	500000	500000	500000
FIRST	500000	500000	500000	500000	500000	500000	500000	500000	500000	500000
NEUTRAL	500000	500000	500000	500000	500000	500000	500000	500000	500000	500000
REVERSE	500000	500000	500000	500000	500000	500000	500000	500000	500000	500000

Closed Loop Wastegate Control Throttle Angle Enable:

Scalar: Closed Loop Wastegate Control Throttle Angle Enable (°)

Closed Loop Wastegate Control Throttle Angle Enable (°)	30.0
---	------

Closed Loop Wastegate Control Target Correction f(ACT): Air Charge Temperature

Matrix: Closed Loop Wastegate Control Target Correction f(ACT) (Target)

ACT (°C)	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120	130
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Closed Loop Wastegate Control Target Correction f(ECT): Engine Coolant Temperature

Matrix: Closed Loop Wastegate Control Target Correction f(ECT) (Target)

ECT (°C)

	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120	130
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Closed Loop Wastegate Control Target Correction f(EOT): Engine Oil Temperature

Matrix: Closed Loop Wastegate Control Target Correction f(EOT) (Target)

EOT (°C)

	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120	130
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Closed Loop Wastegate Control Target Correction f(BAP): Barometric Air Pressure

Matrix: Closed Loop Wastegate Control Target Correction f(BAP) (Target)

RPM (rpm)

BAP (mbar)

	2000	2300	2600	2900	3200	3500	3800	4100	4400	4700	5000	5300	5600	5900	6200	6500
1050	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
950	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
850	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Closed Loop Wastegate Control Target Correction f(AAT): Ambient Air Temperature

Matrix: Closed Loop Wastegate Control Target Correction f(AAT) (Target)

RPM (rpm)

AAT (°C)

	2000	2300	2600	2900	3200	3500	3800	4100	4400	4700	5000	5300	5600	5900	6200	6500
60.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Closed Loop Wastegate Control Target Correction f(BPOT) (%): User Boost Controlled Potentiometer

Matrix: Closed Loop Wastegate Control Target Correction f(BPOT) (%)

RPM (rpm)		2000	2300	2600	2900	3200	3500	3800	4100	4400	4700	5000	5300	5600	5900	6200	6500
BPOT	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Closed Loop Wastegate Control Target Correction f(TORQUE error): Based on Strain Gauge inputs/gear

Matrix: Closed Loop Wastegate Control Target Correction f(TORQUE error)

TORQUE error (Nm)		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

INTEGRAL TERM:

Closed Loop Wastegate Control Integrator Gain (Positive Error)

Matrix: Closed Loop Wastegate Control Integrator Gain (Positive Error) (%)

wg_error		25	50	100	150	200	250
		0.0	1.2	4.4	7.2	10.0	15.2

Closed Loop Wastegate Control Integrator Gain (Negative Error)

Matrix: Closed Loop Wastegate Control Integrator Gain (Negative Error) (%)

wg_error		25	50	100	150	200	250
		0.0	1.2	4.4	7.2	10.0	15.2

Maximum Integrator (Positive Error) (%): 10%

Maximum Integrator (Negative Error) (%): 15%

PROPORTIONAL TERM:

Closed Loop Wastegate Control Proportional Gain (Positive Error):

	10	30	60	110	180	280
wg_error	1.6	6.6	13.1	18.0	20.2	21.6

Closed Loop Wastegate Control Proportional Gain (Negative Error):

	25	50	100	150	200	250
wg_error	0.0	0.5	1.7	2.6	4.0	10.0

DERIVATIVE TERM:

Closed Loop Wastegate Control Derivative Gain

	0	250	500	750	1000	1250	1500
deltaMap (mbar/s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Closed Loop Wastegate Control Derivative Decay Positive (%/s): 0.4 to 10000.0

Scalar: Closed Loop Wastegate Control Derivative Decay Positive (%/s)	10000.0
---	---------

Closed Loop Wastegate Control Derivative Decay Negative (%/s): 0.4 to 10000.0

Scalar: Closed Loop Wastegate Control Derivative Decay Negative (%/s)	10000.0
---	---------

DUAL CLOSED LOOP CONTROL: Not used...For Restrictors

BOOST LIMITS:

Boost Limit

If the manifold pressure exceeds this threshold, a soft limit is applied which randomly cuts cylinders. The method of cut (fuel or ignition) is selected by the "Boost Limit Torque Reduction Mode". The severity of the limit is set in the "Boost Limit Torque Reduction".

This entry is above our closed loop target of 2500 mbar.

RPM (rpm)	2000	2300	2600	2900	3200	3500	3800	4100	4400	4700	5000	5300	5600	5900	6200	6500
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000

Boost Limit Torque Reduction

The "Boost Limit Torque Reduction" is used to set the severity of the limit used when the manifold pressure exceeds the boost limit
A value of 0 gives no limit.
A value of 100 gives a complete cut
As the value increases from 1-100 the limit increases in severity

Scalar: Boost Limit Torque Reduction (%)

Boost Limit Torque Reduction (%) 50.0

STEPPER MOTOR CONTROL: Not Usedfor Wastegate Control

PHASE / ANTIPHASE SOLENOID DIAGRAM

