

Ignition Timing - Primary, Decel, and Startup

For more information on the basics of Ignition Timing and Detonation, see: [Ignition Timing and Knock Control](#).

Targets

Acceleration (or "Primary")

Base and Dynamic Advance

This target is active when the accelerator pedal is depressed, or otherwise when conditions are met for the  **Ignition - Accel. Dynamics - Decel Active (P, ubyte)** parameter to be **zero**. Generally speaking, conditions where this target is active are wide open throttle ("WOT") and cruising (when the accelerator is pressed).

This ignition timing target and its associated tables and parameters are sorted under the **Ignition - Primary** folder and are comprised of four key **base** tables:

-  **Ignition - Primary - TGVs Closed (AVCS Disabled)**
-  **Ignition - Primary - TGVs Closed (AVCS Enabled)**
-  **Ignition - Primary - TGVs Open (AVCS Disabled)**
-  **Ignition - Primary - TGVs Open (AVCS Enabled)**

These four tables are first blended based on the corresponding blending values of  **Engine - AVCS Map Ratio (P, ubyte)** and  **Engine - TGV Map Ratio (P, ubyte)**. The resulting base value can be monitored using the  **Ignition - Primary - Base Table (°, sbyte)** parameter.

Then, a **Dynamic Advance** value is calculated using the  **Knock Control - Dynamic Advance Multiplier (ubyte)**, commonly referred to as "*DAM*". This DAM value ranges from 0.00 to 1.00 and acts as a multiplier to the base dynamic advance table value. This base dynamic advance value is found by using the two primary base tables that are themselves blended using the TGV Map Ratio:

-  **Ignition - Primary - Advance - TGVs Closed (Base)**
-  **Ignition - Primary - Advance - TGVs Open (Base)**

The resulting blended, base value can be monitored using the  **Ignition - Primary - Advance - Table (°, ubyte)** parameter. This value is summed with the  **Ignition - Primary - Base Table**

(°, **sbyte**) to produce a primary base target value.

Tuning Strategy

Tuning the Primary Ignition target maps is critical for any power-related objectives in the Subaru DI platforms, as these tables are designed to control the spark advance in all typical acceleration scenarios when throttle is applied.

With the tables under the **Ignition - Primary - Advance** controlled by the **Dynamic Advance Multiplier** (or DAM), this presents an opportunity to you as a tuner to determine how ignition advance should be delivered in scenarios where the DAM is lowered. The DAM is reduced by negative ignition events such as detonation, therefore these associated tables can be used to design areas of the ignition timing advance that, were detonation to be identified, timing may be removed.

Deceleration (or "Decel")

This target is active when the accelerator pedal is depressed, or otherwise when conditions are met for the  **Ignition - Accel. Dynamics - Decel Active (▮, ubyte)** parameter to be **one**.

This ignition timing target and its associated tables and parameters are sorted under the **Ignition - Decel.** folder and are comprised of two key **base** tables:

-  **Ignition - Decel. - TGVs Closed**
-  **Ignition - Decel. - TGVs Open**

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