Twin Tec TCFI IID Low Idle RPM Tech Note - Preliminary

CAUTION: CAREFULLY READ INSTRUCTIONS BEFORE PROCEEDING.
NOT LEGAL FOR USE OR SALE ON POLLUTION CONTROLLED VEHICLES.

INTRODUCTION

Please note that the term TCFI is used throughout this document as a generic term. In the United States, the TCFI is only sold for professional racing applications. This tech note is only applicable to overseas customers in areas where the use of the TCFI is not prohibited by law.

The normal idle RPM for fuel injected Twin Cam engines is 1000 RPM. Some of our overseas customers desire to lower the idle RPM to simulate the sound of classic Harley-Davidson® engines. If your engine has the original equipment (OE) or mild aftermarket camshafts, you can lower the idle to 700 RPM using the setup files and techniques discussed in this tech note.

Harley-Davidson® has issued a Technical Service Bulletin M-1185. Most 2006 models have narrow 8° spray pattern injectors (P/N 27625-06) that cause poor cold start, idle, and cruise. The replacement injectors (P/N 27709-06A) have a 25° spray pattern. You must verify that the injectors have been replaced. The TCFI will not operate correctly with the original injectors.

The setup files associated with this tech note are only compatible with TCFI IID firmware revision 7.10 or higher. If you have an earlier firmware version, you must update your firmware before proceeding.

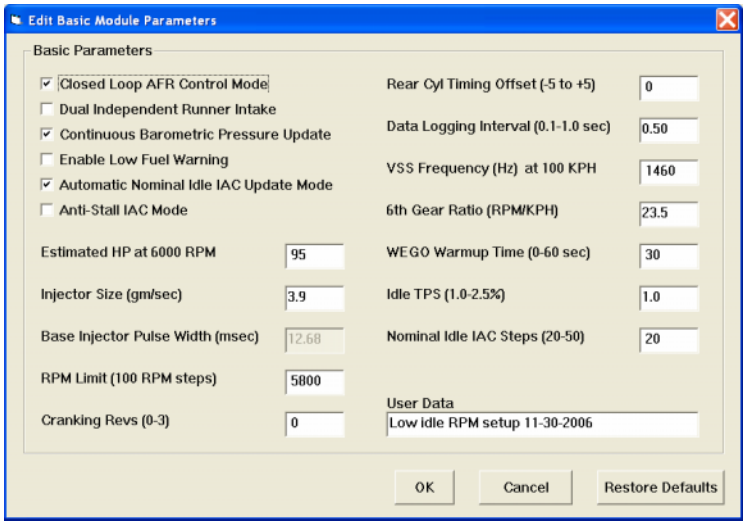
OVERVIEW OF IDLE CONTROL

The TCFI controls idle RPM and AFR (air/fuel ratio) using individual control loops. Each control loop can operate open loop (without feedback correction) or closed loop (with feedback correction) depending on conditions. The AFR control loop functions the same at idle as under other engine operating conditions, but some special considerations apply at idle. For more information, please refer to our TCFI IID Idle Tuning Tech Note.

INITIAL SETUP

Follow the steps outlined in the TCFI IID Tuning Manual. Use the special low idle RPM setup files listed in Table 3. Check module parameters and make any required changes such as estimated horsepower or injector flow rating. You must also set the VSS frequency for your model. This affects speedometer/odometer scaling, idle RPM control, and turn signal cancellation. 2007 models will also require setting the 6th gear ratio.

Table 1 – Basic Module Parameters (2007 Model Shown)



Engine RPM is used as feedback during closed loop idle speed control. Actual engine RPM is compared to the desired set point value in the Engine Temperature (ET) Based Idle RPM 2D table and the closed loop correction value is adjusted accordingly. Table 2 shows typical values. As the engine reaches normal operating temperature, the idle RPM set point drops to 700 RPM.

Table 2 – ET Based Idle RPM

ET (deg C)	-16	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
Idle RPM	1359	1301	1199	1102	1000	949	898	699	699	699	699	699	699	699	699	699	699

THROTTLE BODY SETUP

Follow the steps outlined in the TCFI IID Tuning Manual, except that the nominal idle air control (IAC) value for a low idle RPM application is 20-25. Allow the engine to warm up to normal operating temperature. Monitor the IAC value with TCFI Log software. As the engine warms up and the idle drops to 700 RPM, the IAC value will decrease. If the IAC value drops below 15, you are outside the allowable range for proper idle control and you will have to adjust the idle stop on the throttle body. Turn the idle stop screw counterclockwise in ¼ turn steps between trials to allow less air to flow through the throttle blade. **Please note that if you make any adjustment to the idle stop screw, you must also recheck (and possibly re-adjust) the idle TPS setting as explained in the TCFI IID Tuning Manual.** 2006-2007 Delphi® and Screamin Eagle® throttle bodies may require drilling out and retapping the tamper proof idle stop screw.

If the idle stop setting allows the throttle blade to completely close and contact the throttle bore, the blade may bind while cold. If you adjust the idle stop screw, you must also check to make sure that the throttle blade is not binding when cold.

Table 3 – Low Idle RPM Setup File Listing

Filename	Description
TCFI_Setup_2001_88CID_Low_Idle.dat	2001-2005 88 CID engines with stock compression, mild performance camshafts, low restriction air cleaner, and low restriction exhaust. Also use this file for 2006 engines with aftermarket siamesed runner throttle body.
TCFI_Setup_2006_88CID_Low_Idle.dat	2006 88 CID engines with stock compression, mild performance camshafts, new style H-D throttle body (inc. SE version), low restriction air cleaner, and low restriction exhaust.
TCFI_Setup_2007_96CID_Low_Idle.dat	2007 96 CID engines with stock compression, mild performance camshafts, low restriction air cleaner, and low restriction exhaust.

CHARGING SYSTEM

The alternator is not capable of supporting the normal electrical load when the engine is running at 700 RPM. At this low idle RPM, the battery will slowly discharge. The motorcycle should not be operated at the low idle RPM for extended periods (more than 1-2 minutes).

OIL PUMP

The stock oil pump is not capable of providing sufficient scavenge volume and oil pressure below the normal 1,000 RPM idle speed. Installation of a heavy duty oil pump, such as the Feuling 7000 series is highly recommended.